AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY
Batch 70

1. SUBJECT CLASSIFICATION

A. PRIMARY: Health

NA00-0000-G512

B. SECONDARY: General--Bolivia

2. TITLE AND SUBTITLE

Health sector assessment for Bolvia

3. AUTHOR(S)

AID/LA/USAID/Bolivia

4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1975	510p.	ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS

AID/LA/USAID/Bolovia

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*

9. ABSTRACT

10. CONTROL NUMBER

PN-AAE-654

11. PRICE OF DOCUMENT

12. DESCRIPTORS

Bolivia
Sector analysis

13. PROJECT NUMBER

14. CONTRACT NUMBER

AID/LA/USAID/Bolivia

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

B O L I V I A

H E A L T H S E C T O R

A S S E S S M E N T

UNITED STATES AID MISSION TO BOLIVIA

LA PAZ, JANUARY 1975

PREFACE

The ultimate objective of the U.S. technical and financial assistance programs is to help the Republic of Bolivia attain its socio-economic development goals. The following Health Sector Assessment is one of three* efforts designed to analyze the current status of sector activities in Bolivia and to provide guidance for planning future USAID programs. It is the intent of the Mission to provide coordinated, mutually supportive interventions in the agriculture, education and health sectors.

A simultaneous review of health problems and programs was undertaken by a specially convened Interministerial Commission. The Commission included more than 60 government technicians and planners from 12 agencies. The Commission worked for over six months through 11 subcommissions, and provided much of the basic data contained in this document. The Mission and GOB were assisted by 15 short-term specialist consultants. In addition to providing analytic services and assistance in drafting certain aspects of the report, the consultants spent a considerable amount of their time visiting rural areas gathering relevant information.

We believe, the Assessment process has had the following beneficial outcomes:

i) the involvement of Bolivian officials and technical personnel from many agencies in the analysis and initial planning of sector activities;

ii) the participation of other donor organizations which should contribute to better coordination of external assistance;

iii) the documentation of some baseline data and the provision of a single reference source for health information on Bolivia;

---

* The reader is referred to Education in Bolivia: A Preliminary Sector Assessment (May 1974) and Agricultural Development in Bolivia: A Sector Assessment (August 1974)

iv) the development of a sector assessment methodology which may be beneficial to similar undertakings by other international assistance agencies.

The Assessment is composed of ten chapters, each beginning with a summary statement which should facilitate easy review by the reader. The first four chapters provide background information regarding conditioning factors, health status, socio-economic impact, and the structure of the sector. The following three chapters are analytical; they deal with sector programs, infrastructure and intersectorial activities. The last three chapters describe the various responses to the situation--i.e., GOB plans, international donor activities, and the proposed USAID program.

The major limiting factor in carrying out the Assessment was the weak data base for Bolivia. Most significant is the lack of a national census since 1950. Health and management information systems also are deficient. Thus, the bulk of the data presented must be considered questionable and based on the "best information available". Due to the nature of the information and the difficult and time-consuming efforts to collect meaningful data, there are significant gaps in the Assessment.

These include:

i) economic and financial data regarding the impact of the health situation in Bolivia and the costs of the various health programs;

ii) quantitative information on the private, voluntary and traditional health sub-sectors; and

iii) age and disease-specific mortality and morbidity rates and other vital statistics including birth and age-specific fertility rates.

While "best available estimates" have been provided, it is recognized that the Assessment will have to be complemented and revised as more accurate information becomes available. The Mission intends to carry out research in these areas over the coming years.

The Mission views its three Assessments as a continuing endeavor to be periodically updated as more data become available and changes

take place in Bolivia. Toward this end, the Mission would appreciate and welcome comments on the contents of this document and observations on errors or oversights herein. Please forward to:

Humanitarian Assistance Division
USAID/Bolivia
Casilla 673
La Paz, Bolivia

The U.S.A.I.D. Mission to Bolivia
January 24, 1975

ACKNOWLEDGEMENTS

The Health Sector Assessment was carried out and written by the staff of the Humanitarian Assistance Division of USAID/Bolivia, under the direction of Mr. A. S. Landry, MSPH. He was assisted throughout the process by Mr. James N. Becht who coordinated many of the activities and edited the bulk of the report. The Mission was fortunate to receive the services of various consultants many of whom had previous working experience in Bolivia. Particular mention should be made of the assistance of the following:

Alan G. Austin, Ph.D. State University of New York	Public Administration
James N. Becht, M.P.H. Private Consultant	Health Planning and Coordination
John A. Daly, Ph.D. D.H.E.W./O.I.H.	Planning/Information Systems
H. Robert Douglass, A.I.A. University of Texas, S.P.H.	Health Facilities
Oscar Echeverri, M.D. Universidad del Valle, Colombia	Rural Delivery Systems
James C. Eckroad, M.S. Community Systems Foundation	Environmental Sanitation
Robert Fisher, M.D., M.P.H. D.H.E.W./O.I.H.	Health Economics
Julia Elena Fortun, Ph.D. Ministerio de Educación, Bolivia	Anthropology/Sociology
Leonard F. Krystynak, Ph.D. University of Florida	Human Resources
Robert H. LeBow, M.D., M.P.H. U.S. Public Health Service	Rural Health Services

Ronald, St.John, M.D. D.H.E.W./C.D.C.	Communicable Diseases
B. Brooks Taylor, M.D., M.P.H. Texas State Health Department	Rural Health Services
Dean Wilson, M.S. Community Systems Foundation	Nutrition
Roberto Zachmann Community Systems Foundation	Pharmaceutical Supplies
Dieter K. Zschock, Ph.D. State University of New York	Health Economics and Financing

Finally, the Mission wishes to extend its sincere gratitude to the members of the Bolivian Interministerial Commission, and especially to Dr. Antonio Brown Lema, for their constant cooperation and effective participation in the realization of this project.

Administrative and research assistance: Dr. Alberto Gumiel B.

Secretarial assistance: Rodolfo Chavez, Ana Maria de Del Castillo, Teresa de Muñoz, Giannina de Lijerón, Teresa de Silberstein, Teresa Aguirre, Teresa Sainz

Photographs: Pg. 82, J.N.Becht; cover and all others, R.H.LeBow

See country or XV

TABLE OF CONTENTS

PREFACE iii

ACKNOWLEDGEMENTS vii

TABLE OF CONTENTS ix

LIST OF TABLES xvii

LIST OF FIGURES xxv

LIST OF ANNEXES xxvii

CHAPTER I - THE SETTING - FACTORS CONTRIBUTING TO HEALTH STATUS ... 1

A. Summary 1

B. Geographic Characteristics 3
   1. Physiography and climate 3
   2. Natural resources 10
   3. Communications and transportation 15
   4. Geography and health 20

C. Demographic Characteristics 22
   1. Population distribution 22
   2. Migration patterns 27
   3. Family size and housing 32
   4. Educational and economic patterns 36
   5. Demography and health 40

D. Socio-Cultural Characteristics 45
   1. Ethnic groups and languages 45
   2. Several aspects of social organization 50
   3. Indigenous health practices 51

E. Consumer and Provider Attitudes Towards Health and Health Programs 53
   1. Health development and behavioral change 53
   2. Selected attitudinal studies 55
   3. Family planning 56
   4. Community organization and health development 57

CHAPTER II - HEALTH STATUS AND MAJOR PROBLEMS 65

A. Summary 65

B. Mortality and Morbidity 69
1. Disease patterns 69
2. Mortality 70
3. Morbidity - hospital discharge data 74
4. Morbidity - outpatient data 76
5. Significance of mortality and morbidity data 78

C. Specific Diseases of Importance 78
1. Malnutrition 78
2. Communicable diseases 83
3. Non-communicable diseases and problems 89

D. Problems in the Health System 91
1. Lack of preventive medicine 91
2. Inappropriate training 91
3. Inadequate supply supervision 91
4. Minimal community involvement and confidence 91
5. Integration with other programs and within the health sector 92

CHAPTER III - ROLE OF HEALTH PROGRAMS IN SOCIAL AND ECONOMIC DEVELOPMENT 95

A. Introduction 95

B. Economic Costs of Current Health Conditions 96
1. The direct cost of diagnosis and care 96
2. The indirect costs of lost wages and lost productivity .. 99
3. The indirect costs attributed to increased caloric needs of the population working and non-working 103
4. The indirect costs attributed to investment in individuals who die as a result of disease 104
5. The indirect costs to the government through Social Security payments 105
6. Summary 106

C. Benefits of Health Programs on Socio-Economic Development 109
1. Introduction 109
2. Relationship between health status and production 109
3. The relationship between health and other-than-health expenditures 111
4. Health services and employment expansion 112

D. The Costs of Health Sector Investment 112
1. Opportunity costs 112
2. Effects of health on population growth 113
3. Effects of health on unemployment 114
4. Health services and other potential problems 115

E. Benefit to Cost Analysis: The Value of Health Services Investment in Bolivia 115

CHAPTER IV - THE STRUCTURE OF THE HEALTH SECTOR 121

A. Summary 121

B. Political Framework 122
1. Government organization 122
2. Politics and health 125
3. Pertinent legislation related to health 128

C. Institutional Framework 130
1. Ministry of Social Welfare and Public Health 130
2. Bolivian Social Security Institute 132
3. National Social Development Council 134
4. National Institute of Colonization 135
5. National Railroad Company 135
6. National Road Service 136
7. National Community Development Service 136
8. Agencies involved in water supply and sewerage programs. 137
9. Departmental development organizations 138

D. Non-Governmental Health Institutions 139
1. The Bolivian University 139
2. The private sector 140
3. Religious and voluntary organizations 140

CHAPTER V - ANALYSIS OF HEALTH PROGRAMS 143

A. Summary 143

B. Maternal and Child Health 144
1. Overview 144
2. Institutions with MCH programs 145
3. Status of maternal and child health activities: An analysis 148
4. Summary 160

C. Communicable Diseases 160
1. Overview 160
2. Overall structure of communicable disease programs within the MOH 161
3. Specific diseases and programs 162

D. Environmental Sanitation 171
1. Status of the problem 171
2. Institutional aspects 175
3. Financial aspects 177
4. Manpower constraints 180
5. Material constraints 181
6. Water resources 182
7. Prospects for the future 183

E. Medical and Hospital Attention 186
1. Overview 186
2. Programs in medical and hospital attention 189
3. Outpatient utilization 199
4. Emergency care 204
5. Home visits 205
6. Inpatient utilization 205
7. Tertiary care and dental care 208
8. Ancillary services 210
9. Conclusions 212

F. Integrated Intrasectorial Programs 214
1. Summary 214
2. The programs 214
3. Conclusions 217

CHAPTER VI - ANALYSIS OF THE INFRASTRUCTURE 219

A. Summary 219

B. Program Administration 220
1. Financial administration 221
2. Personnel administration 225
3. Maintenance and supply 228
4. Organizational structure 229

C. Health Financing 229
1. Summary 229
2. Definition of health sector expenditures 230
3. Total public health sector expenditures in Bolivia .. 232
4. MOH health sector expenditures 236
5. SSS health sector expenditures 240
6. Other public health sector expenditures 243

7. Public health sector sources of revenue 244
8. Private health sector expenditures 245
9. Efficiency of the public health sector 249

D. Health Manpower 250
1. Current situation 250
2. Manpower projections 255
3. Implications of manpower projections and distribution 260
4. The educational system for health manpower 263
5. Conclusions 267

E Facilities and Equipment 268
1. Availability of facilities 268
2. New investment 271
3. Quality and condition of facilities 274
4. Utilization of facilities 281
5. Planning and administration of health facilities 284
6. Conclusions related to facilities 287

F. Pharmaceutical Supply System 287
1. The general problem 287
2. The nature of drugs used 290
3. Sources and marketing of drugs and vaccines 290
4. Distribution systems 292
5. Conclusions 294

G Planning and Information Systems 294
1. Planning 294
2. Information systems and data availability 297
3. The health information system 299
4. Program of UNDP/PAHO 300
5. Health research 301
6. Conclusions 301

CHAPTER VII - PROBLEMS AND PROGRAMS WHICH REQUIRE INTERSECTORIAL COORDINATION 305

A. Summary 305

B. Nutrition Program 306
1. Introduction: nutrition and malnutrition 306
2. Agricultural production and food consumption 310
3. Food processing; storage and transportation 319
4. Distribution systems 321
5. Current agricultural sector resources 325
6. Current nutrition programs of the health sector 330

C. Community Health Promotion 332
1. Introduction: health education 332
2. Rural education 333
3. Teacher training 337
4. The National Community Development Service 342
5. Health education programs 346

CHAPTER VIII - GOVERNMENT PLANS FOR THE HEALTH SECTOR 353

A. Summary 353

B. Ministry of Social Welfare and Public Health 355
1. The National Health Plan, 1973-1978 356
2. Regional Plan for Socio-Economic Development, Chuquisaca - Tarija 364
3. The coordination of external assistance 370

C. Other Sector Agencies 373
1. CONEPLAN - population problems 373
2. The Bolivian Social Security Institute - rural social security 374

D. The Interministerial Commission on the Health Sector 376
1. Sector priorities 378
2. The National Health Service 380
3. Rural health services 382
4. Conclusions and implications 382

CHAPTER IX - THE ROLE OF FOREIGN ASSISTANCE IN THE HEALTH SECTOR .. 387

A. Summary 387

B. General Role of Foreign Assistance 389

C. Predecessor U.S.G. Agencies and Present USAID Programs 390
1. SCISP, 1942-62 390
2. The Alliance for Progress and USAID, 1962 to 1973 397

D. International Donors, 1949 to date 408
1. Pan American Health Organization (PAHO) 408
2. United Nations Children's Fund (UNICEF) 419
3. UNFPA, IPPF and Pathfinder 425

E. Private Voluntary Agencies 425
1. Catholic Relief Services 425

other donors?

CHAPTER X - THE MISSION'S PROPOSED HEALTH SECTOR PROGRAM 433

A. Summary 433

B. Program Framework 434
1. Resumé of sector's salient characteristics and performance 434
2. Major constraints which have unfavorably influenced the current status of the health sector performance . 441
3. Factors which should favorably influence future health sector development 447

C. Goals, Plans, Priorities and Interrelationships 448
1. GOB 448
2. International donor plans 450

D. Rationale and Strategy of USAID's Assistance 452
1. Reasons for attention to health problems 452
2. Key development problems to be addressed by USAID ... 453
3. Program focus 455
4. Program units of implementation 461
5. Role of women 474
6. Financial plan and resources 475
7. Commitments to be sought from the GOB 476
8. Fiscal implications of proposed programs 478

REFERENCES 483

Document looks at Health Sector completely, but in a parochial ~~[illegible]~~ context

(3) What is AID program as a whole in Bolivia?

(2) what is U.S. policy as a whole vis-a-vis Bolivia?

(4) what remains to be done by U.S. other GOB + other donor efforts?

(1) omits: what are the national goals/desire of Bolivia?
what are national Bolivian plans?
(what are the Bolivian people looking for?)

(2) what is Bolivia's own development program?

5. what commitments of ~~other~~ donors other than U.S.?

6) is Plan scaled down to Bolivian self-support levels?

LIST OF TABLES

Table 1.1 - Geographic and Climate Data for Selected Locations..... 6
Table 1.2 - Land Use in Bolivia, 1972..... 13
Table 1.3 - Number of Radio Stations in Bolivia by Departments, 1973..... 16
Table 1.4 - Length of Railways in Bolivia, 1971..... 19
Table 1.5 - Number of Aircraft Landings in Bolivia by Locality, 1971..... 20
Table 1.6 - Estimated Population of Bolivia by Age and Sex, 1974.... 23
Table 1.7 - Estimated Population Distribution and Density by Department and Urban/Rural Classification, 1973..... 25
Table 1.8 - Population Distribution by Size of Locality, 1973..... 26
Table 1.9 - Bolivian Residents in other Countries, 1967..... 27
Table 1.10 - Population Growth in the Department Capitals, 1972..... 31
Table 1.11 - Summary of Colonies and Families Settled in Colization Zones through June 1973..... 33
Table 1.12 - Number Live Birth per Females, 45-49 yrs., 1968..... 35
Table 1.13 - Average Number of Live Births of Married Interviewees by Level of Education, 1968..... 35
Table 1.14 - Average Number of Live Births of Married Interviewees by Principal Language Spoken on the Family, 1968..... 35
Table 1.15 - Housing Factors, Bolivia, 1970..... 36
Table 1.16 - Educational Factors - Total Population and Registered in Educational Center by Age Group, 1968..... 37
Table 1.17 - Distribution of Gross Domestic Products by sector of Activity, 1967 and 1971..... 38
Table 1.18 - Estimated size of Labor Force by Sector of Activity, 1967..... 38
Table 1.19 - Income Distribution by Sector Activity, 1967..... 38
Table 1.20 - Estimated Income Distribution in Bolivia and Latin America..... 39
Table 1.21 - Unemployment in Bolivia by Area, 1968..... 39
Table 1.22 - Comparison of Population Growth Projections..... 41

Table 2.1 - Comparison of Vital Statistics in Latin America, 1971..... 66
Table 2.2 - Major Causes of Mortality by Age Groups, 1969..... 71
Table 2.3 - Childhood Mortality in La Paz and Viacha, by Age Groups, 1968-1970..... 73
Table 2.4 - Major Causes of Morbidity by Age Groups, 1970..... 75
Table 2.5 - Major Causes of Morbidity All Ages, 1971..... 77
Table 2.6 - Nutritional Status of Children (Study Results, 1965-74..... 80

Table 3.1 - Expenditures for Bolivian Health Institutions, 1974 97
Table 3.2 - Estimated Cost of Curative Services in Urban versus Rural Areas in 1974 98
Table 3.3 - Bolivian Labor Force Production Estimates by Sector, 1974 101
Table 3.4 - Estimated Value of Lost Productivity of Bolivian Labor Force Due to Illness, 1974 102
Table 3.5 - Summary of Estimated Costs of Disease in Bolivia, 1974 107
Table 3.6 - Summary of Outpatients Visits Attended by the Ministry of Health by Category of Disease, 1968 117

Table 4.1 - Historical Ministers of Health, 1952-1974 126

Table 5.1 - Distribution of Maternal and Child Health Population, 1974 144
Table 5.2 - Number of Pre-Natal Visits and Institutional Deliveries in Selected Areas, 1972 148
Table 5.3 - Number of Mothers' Clubs and Beneficiaries, August, 1974 149
Table 5.4 - Estimated percent of Deliveries done in Institutions by Selected Provincial Towns or Areas in Bolivia, 1973 152
Table 5.5 - Complication of Pregnancy: Abnormal Deliveries and Abortions, 1972 155
Table 5.6 - Number of Vaccinations Given by the Ministry of Health for DPT, Polio and Measles, 1970-72 157
Table 5.7 - Desire to Increase Family Size by Urban and Rural Areas of Three Departments, 1968 159
Table 5.8 - Deaths from all Causes and Measles La Paz, July 1968 - July-1969 16
Table 5.9 - Reported Cases of Venereal Diseases, Bolivia, 1966-1973 169
Table 5.10 - Populations Served with Water Supply and Sewerage for Selected Latin American and Caribbean Countries, 1970 172
Table 5.11 - Population Served by Public Water Supplies, 1973 173
Table 5.12 - Population Served by Public Sewerage and Sanitation Facilities in Bolivia, 1973 173
Table 5.13 - Resumé of National and Local Agencies Responsible for the Planning and Execution of Water Supply and Sewerage Programs 176
Table 5.14 - Urban Water and Sewerage Supply, Population Coverage, 1974-1980 184

Table 5.15 - Rural Water and Sanitation Supply, Population Coverage, 1974-1980 185
Table 5.16 - Health Resources: The Urban-Rural Split, Bolivia 187
Table 5.17 - Comparative Utilization Data - All Health Care Sources, Bolivia, 1971 188
Table 5.18 - Distribution of Health Facilities in Bolivia, 1973 191
Table 5.19 - Average Number of Outpatients Visits per Month Reported by Type of Facility and Health District Rural Areas, 1970 and 1973 200
Table 5.20 - Selected Outpatients and Inpatients Utilization Data for Rural Chuquisaca Department, 1973 201
Table 5.21 - Selected Outpatients and Inpatients Utilization Data for Rural Cochabamba Department, 1973 201
Table 5.22 - Selected Outpatients and Inpatients Utilization Data for Rural La Paz Department, 1973 202
Table 5.23 - Selected Outpatients and Inpatients Utilization Data for Rural Oruro Department, 1974 (January) 202
Table 5.24 - Hospital Utilization by Agency, Bolivia, 1972 207
Table 5.25 - Selected Urban Hospital Utilization, Bolivia, 1972-73 207

Table 6.1 - Bolivian Public Health Sector Expenditures, 1970-76 233
Table 6.2 - Public Health Sector Expenditures as a Proportion of Gross Domestic Product, 1970-76 234
Table 6.3 - Health Budget of the Ministry of Health (MOH) as a Proportion of the Consolidated and Central Government Budgets, 1970-74 237
Table 6.4 - Operating and Investment Expenditures, Ministry of Social Welfare and Public Health, 1970-74 239
Table 6.5 - Health Operating Budget by Categories, Ministry of Social Welfare and Public Health, 1970-74 239
Table 6.6 - Population Covered by Social Security System 242
Table 6.7 - Health Services Expenditures of the Social Security System, 1970-73 242
Table 6.8 - Sources of Health Budget - Ministry of Health, 1970-74 246
Table 6.9 - Estimated Number of Health Workers in Bolivia 251
Table 6.10 - Distribution of Professional Health Workers by Specialization, 1970 251
Table 6.11 - Estimated Availability of Physicians by Ministry of Health Regional Health Office and Rural/Urban Location, 1974 254

Table 6.12 - Estimated Numbers of Graduates from Health Professional Training Programs.....256
Table 6.13 - Professional Health Graduates (Egresados) from Universities in Bolivia, 1956-1966.....256
Table 6.14 - Estimated Professional Market, Schools of Health Sciences.....258
Table 6.15 - Migration of Medical Manpower from Bolivia, 1975.....259
Table 6.16 - Occupational Migration of Medical Manpower in Bolivia, 1967.....259
Table 6.17 - Estimated Manpower needs for 1980, Assuming the Development of a Low Cost Delivery System.....261
Table 6.18 - Enrollment in Bolivian Universities by Faculty and Sex, 1966.....262
Table 6.19 - University Health Science Programs Authorized to Grant Degress.....264
Table 6.20 - Ratio of Graduates (Egresados) to Enrolled Student in Professional Health Faculties, 1960 and 1966.....266
Table 6.21 - Distribution of Health Facilities by Health District and Agency, 1973.....269
Table 6.22 - Distribution of Hospital Beds by Departments and Agency, 1973.....270
Table 6.23 - Distribution and Demand for Ministry of Health Rural Health Facilities by Health District, 1973.....272
Table 6.24 - Proposed Facilities Investments Ministry of Health, 1974-1978.....273
Table 6.25 - Distribution of Inpatients Facilities by Number of Beds and Agency, 1973.....275
Table 6.26 - Status of Buildings, Equipment and Drug Supplies for Sixty-six Rural Medical Facilities, 1974.....275
Table 6.27 - Utilization of Hospital Beds by Agency and Location, 1973.....282
Table 6.28 - Average Number of Reported Outpatient Visits per Month by Type of Facility and Health District, Rural Areas, 1970-1973.....283
Table 6.29 - Imports of Principal Pharmaceutical Raw Materials, 1971.....291
Table 6.30 - Importation of Pharmaceutical Products, 1971.....291
Table 6.31 - Number and Percentage of Civil Registry Offices that Provide Vital Statistics by Year and Urban/Rural Areas, 1971-1973.....298
Table 6.32 - Percentage of Ministry of Health Facilities Providing Information on Activities, 1971-72.....298
Table 6.33 - Institutions engaged in Scientific Activities Related to Public Health.....302

Table 7.1 - Mortality Rates due to Nutritional Deficiency (Principal or associated cause) by Age Group..... 307
Table 7.2 - Percentage Deaths from Diarrheal Disease in Children 28 days to Five Months of Age..... 308
Table 7.3 - Percentage Deaths for Children Less than One Year of Age with Malnutrition as Basic or Associated Cause..... 308
Table 7.4 - Percentage of Nutritional Intake Attained in Different Regions of Bolivia, 1972..... 309
Table 7.5 - Calories Consumed per Day by Income Group in Bolivia, 1970..... 310
Table 7.6 - Projected Consumption Patterns of Basic Food Stuffs, 1980..... 311
Table 7.7 - Projection of Per Capita Nutrient Availability..... 312
Table 7.8 - Production and Importation of Wheat and Flour, 1970-1973..... 313
Table 7.9 - Price and Indices, La Paz, 1960-1974, Cost of Living..... 314
Table 7.10 - Production, Consumption Growth Rates and Farm Prices for Various Agricultural Products, 1972.....316
Table 7.11 - Changes in Yield, Land Use and Growth Rates for Various Agricultural Products, 1963-5 and 1970-2.....316
Table 7.12 - Cultivated Areas of Selected Crops by Area, Bolivia, 1972.....317
Table 7.13 - Spoilage Conditions by Type of Product, La Paz, 1967.....320
Table 7.14 - Price Movements in Potatoes and Rice During 1966..... 320
Table 7.15 - Percentages of Retail Price of Selected Products Absorbed at Each Level in Channel, 1976..... 322
Table 7.16 - Family Income, Expenditures and Marginal Propensity to Consume by Income Class, La Paz, 1967..... 324
Table 7.17 - Estimated Disposition of Principal Crops Produced in Bolivia, 1973..... 325
Table 7.18 - Distribution of Agriculutral Extension Workers by Position and Department, 1974..... 327
Table 7.19 - Level of Education of Agricultural Extension Workers by Position and Training, 1974..... 327
Table 7.20 - Distribution of Agricultural Research Stations by Location and Principal Focus, 1974..... 329
Table 7.21 - Food Distribution Programs in Bolivia..... 331
Table 7.22 - Distribution of Schools, Teachers and Students by Level of Education, 1968..... 334
Table 7.23 - Distribution of Nuclear Schools, Sectional Schools and Rural Teachers, 1971..... 335
Table 7.24 - Teacher Graduated from Normal Schools and Institutes of Rural Education, 1970-1973..... 338

Table 7.25 - Summary of National Community Service Expenditures by Type of Project, 1965-1973.....343
Table 7.26 - Genergal Budget of the National Community Development Service by Source of Financing and Type of Project, 1974.....345
Table 7.27 - Proposed Staffing Pattern of National Community Development Service by Position and Location, 1975..... 348

Table 8.1 - Summary of Ministry of Health Priorities, Objectives, Program Emphasis, Measurable Indicators and Proposed Increase in Resources, 1973-1978..... 358-9
Table 8.2 - Summary of Proposed Health Expenditure Increases of the Ministry of Health by Program, 1974-78..... 360
Table 8.3 - Summary of Proposed Health Financing of the Ministry of Health by Program, 1974-1978..... 360
Table 8.4 - Summary of Proposed Health Personnel Increases of the Ministry of Health by Program, 1974-78..... 360
Table 8.5 - Comparison of Proposed and Actual Health Budgets of the Ministry of Health, Per Capita Expenditures and Percentage Allocations of the National Treasury, 1970-1978..... 362
Table 8.6 - Tentative Health Budget Increase as Compared with the Fiscal Needs of the Ministry of Health for 1975..... 364
Table 8.7 - Summary of National and Regional (Chuquisaca-Tarija) Development Objectives and Strategies..... 366
Table 8.8 - Summary of UNICEF Social Development Objectives and Activities for the Chuquisaca-Tarija Regional Development Program..... 368
Table 8.9 - Summary of Social Development Financing for the Chuquisaca-Tarija Regional Development Program by Program and Year..... 369
Table 8.10 - Summary of Health Financing for the Chuquisaca-Tarija Regional Development Program by Project and Year..... 371
Table 8.11 - Summary of Objectives and Priorities for External Cooperation in the Health Sector..... 372

Table 9.1 - A Resumé of SCISP Expenditures, 1942-62..... 393
Table 9.2 - Summary of USAID Family Care Project Expenditures by Activity, 1968-1974..... 402
Table 9.3 - Summary of USAID/ETD-PWO Projects, 1963-1967..... 407
Table 9.4 - Descriptive Resume of PAHO Program Activities, 1965-72..... 409

Table 9.5 - Summary of PAHO Communicable Disease Control Interventions, 1965-72 412
Table 9.6 - A Comparison of PAHO and GOB Expenditures in the Bolivian Health Sector, 1931-1971.....414
Table 9.7 - PAHO Proposed Program and Budget Estimates for 1973-76.....417
Table 9.8 - Summary of UNICEF Expenditures by Program, 1949-1966.....419
Table 9.9 - Results of UNICEF Support for Training and Provision of Equipment, 1967-1973.....420
Table 9.10 - A Resumé of Transportation Equipment Donated by UNICEF to the Ministry of Health by Program Category, 1950-71.....421
Table 9.11 - A Resumé of Proposed UNICEF Assistance to Bolivia, 1974-1977.....423
Table 9.12 - Food and other Commodities Distributed by Catholic Relief Services by Wright, Dollar Value and Fiscal Year of Operation.....426
Table 9.13 - Catholic Relief Services Title II Food Assistance by Commodity and Value for Fiscal Years, 1969-73.....426

Table 10.1 - Summary of Estimated of Disease in Bolivia, 1974.....440
Table 10.2 - GOB Treasury and Ministry of Health.....478

LIST OF FIGURES

Figure 1.1 - Physiographic Regions of Bolivia..... 4
Figure 1.2 - Climate Zones of Bolivia 5
Figure 1.3 - Distribution of Mineral Resources in Bolivia, 1973.. 12
Figure 1.4 - Communications Map of Bolivia, 1974 18
Figure 1.5 - Estimated Population Pyramid for Bolivia, 1974 23
Figure 1.6 - Estimated Population Distribution by Department and Urban/Rural Classification, 1973 25
Figure 1.7 - Population Distribution by Size of Locality, 1973 .. 26
Figure 1.8 - Rural Population Density by Province, 1973 28
Figure 1.9 - Principal Migratory Patterns in Bolivia, 1973 29
Figure 1.10 - Comparison of Population Growth Projections 41
Figure 1.11 - Ethno-Linguistic Map of Bolivia 46

Figure 2.1 - Infant Mortality Rates por 1000 Live Births, by Selected Urban Areas, 1972 66
Figure 2.2 - Selected Causes of Mortality by Relative Importance within Age Group, 1969 72
Figure 2.3 - Mayor Causes of Morbidity, All Ages, 1971 77
Figure 2.4 - Mayor Causes of Morbidity, All Ages, 1973 79
Figure 2.5 - Epidemiological Maps of Selected Communicable Diseases in Bolivia 84
Figure 2.6 - Incidence of Reported Communicable Diseases, 1971 .. 85

Figure 4.1 - Political Sub-Divisions of Bolivia 124
Figure 4.2 - Distribution of Health Resources and Population by Size of Localities, 1968 127
Figure 4.3 - Organizational Structure of the Ministry of Social Welfare and Public Health, 1974 131
Figure 4.4 - Regional Health Office and Jurisdictions of the MOH, 1974 133

Figure 5.1 - Proposed Organizational Structure of the Water Supply and Sewerage Sector, Phase I. 178
Figure 5.2 - Proposed Organizational Structure of the Water Supply and Sewerage Sector, Phase II. 179
Figure 5.3 - Evaluation of Sixty-Six Rural Health Centers, by Thirteen Criteria, 1974 192
Figure 5.4 - Evaluation of Sixty-Six Rural Health Centers by Criteria and Higher versus Lower Utilization, 1974. 193

Figure 6.1 - Projected Supply of Physicians Graduating from Bolivian Universities by Retention Rates, 1970-1980. 257

Figure 6.2 - Projected Persons per Physician Ratio by Retention Rates, 1970-1980 257

Figure 7.1 - Location of Agricultural Research Stations and Extension Agents, 1974 328
Figure 7.2 - Location of Normal Schools and Institutes of Rural Education, 1974 340
Figure 7.3 - Location of National Community Development Service Offices and Training Centers, 1975 347

Figure 8.1 - Comparison of Requested Ministry of Health Budgets for Health Programs, 1970-1978, with Actual National Treasury Allocations, 1970-1975 363
Figure 8.2 - Areas of Implementation for the Proposed Campesino Social Security System by Phases 277
Figure 8.3 - Relationship of Programatic Factors to Health Problems and Sector Goal 279
Figure 8.4 - Rating of Health Sector Priorities 279
Figure 8.5 - Priority Areas for the Implementation of Rural Health Delivery Systems 383

Figure 9.1 - The Three-Prong Approach to Responsible Parenthood in Bolivia 401
Figure 9.2 - A Comparison of Cumulative per Capita Expenditures by WHO (PAHO) and GOB, 1931 - 1971 415
Figure 9.3 - PAHO Programmatic Areas of Concentration, 1974 and beyond 418
Figure 9.4 - Number of Food for Peace Recipients by Category, Area Percentages and Fiscal Years 427
Figure 9.5 - Comparison of Food Commodities Approved Versus Quantities Actually Distributed and Future Program Levels 429

Figure 10.1 - Major Bolivian Health Problems and Linkages 438
Figure 10.2 - Institutional Considerations: Some Aspects of the Administrative Jig-saw Puzzle and Impact on the Provision of Health Services 445
Figure 10.3 - Principal Bolivian Development Goals and Related Health Interactions 451
Figure 10.4 - A Milestone Diagram for the Bolivian Health Sector Assessment and Possible Loan to Finance a Comprehensive Rural Health Delivery System (CRHDS) 456
Figure 10.5 - USAID Methodology for Planning and Implementing a Comprehensive Rural Health Delivery System 457
Figure 10.6 - A Functional Approach to Health Program Development by Systems Analysis 463

Figure 10.7 - Schematic Outline of Mission's Rationale and Strategy for Health Sector Interventions 465
Figure 10.8 - The Relationship Between USAID Inputs to the GOB Health Hierarchical Structure and Expected Health Outputs 466
Figure 10.9 - GOB Inputs Required for a Comprehensive and Integrated Rural Health Delivery System 467

LIST OF ANNEXES

Annex 1.1 - Estimated Population, Area and Density by Department and Provinces, 1973 59

Annex 4.1 - Capital Cities, Dates of Creation and Political Sub-Divisions by Department and Province..... 142

CHAPTER I

THE SETTING - FACTORS CONTRIBUTING TO HEALTH STATUS

A. Summary

The health status of the Bolivian population is conditioned by factors not generally accorded adequate attention in descriptions of disease patterns and health program design. These factors include the geographic, demographic, social, cultural and political characteristics of the country. The relationship among these factors and the health aspects of the society is one of interdependence. Due attention must be paid to these factors in order both to understand fully the causes of health problems and to encounter effective solutions. No attempt is made here to describe all facets of these factors. The limited intent is to identify those principal aspects that are most directly related to health status and program development. Political considerations will be discussed in Chapter IV.

Bolivia's extreme variances in geography and climate, from tundra to tropical jungles, present diverse patterns of disease, and hence pose whole sets of varied challenges to the implementation of effective programs. These environmental characteristics have direct effects on both the health status of each population group and the resultant demands for health services. Many major diseases are functions of regional ecological factors. Settlement patterns have been determined largely by geographical considerations. Almost all regions in the country possess considerable reserves of untapped natural resources which, if exploited, would greatly increase Bolivia's ability to support health and other social development activities. Communication and transportation systems, essential not only for economic development but also for the delivery of social services, are very deficient; in Bolivia, the development of such basic systems is very difficult and costly because of geographic obstacles.

It is estimated that there now are slightly over five million inhabitants in Bolivia. All such figures, are based on statistical inferences from the 1950 census however, and are therefore not very reliable. Depending on one's definition of "rural", between two-thirds and four-fifths of the population lives in rural areas. About 60 percent of the population is either completely dispersed or lives in communities of fewer than 200 inhabitants; dispersion *per se* poses considerable obstacles to the provision of health services. The overall population density

in Bolivia is only about five persons per square kilometer, the density for potentially productive land, however, is 38 persons per square kilometer. Over half the population is under the age of twenty, thereby determining predominant disease patterns characteristic of the young. Average family size ranges between six and nine members, accompanied by high levels of infant mortality and abortion. Life expectancy at birth is currently estimated to be 46 years

The majority of housing is of low quality and crowded. At least sixty percent of the population over 15 years of age is estimated to be illiterate, and less than half the school age population is currently registered in school Agriculture accounts for less than one-fifth of the gross domestic product; nevertheless, about two-thirds of the labor force is engaged in agriculture and related activities More than thirteen percent of the urban labor force is unemployed. Some rural-urban migration within Bolivia is taking place, but it does not seem overly-significant based on available data. External emigration from Bolivia, on the other hand, is significant in terms of a professional drain. The government has continually expressed support of colonization activities over the past twenty years; however, less than five percent of the population has been successfully resettled

Health behavior in Bolivia is highly conditioned by cultural beliefs and social structures Between 50 and 60 percent of the population is Indian, and a large percentage of the Indian population is monolingual in either Aymara or Quechua. As much as one-third of the population is mestizo and less than ten percent is "white" of European descent. Regional isolation of ethnic groups is diminishing due to increased geographic mobility Likewise, increasing social mobility due to demands for administrative and commercial activities has contributed to a growing middle class The agrarian reform of 1953 has had a significant effect on the life of the campesinos, combining "freedom" with a forced self-dependency Traditional practices regarding health and the treatment of disease continue to provide "solutions" where modern medicine has failed to reached the majority of the population.

Consumer as well as provider attitudes regarding "acceptable" health practices in Bolivia determine to a great extent the effectiveness of health programs and the health status of the population. The majority of Bolivia's inhabitants do not utilize government services because they feel that such services do not adequately meet their needs.

Provider orientation and lack of empathy with consumer needs create barriers to service utilization. On the other hand traditional methods of dealing with health problems in many cases offer adequate solutions. Health is a significant concern to Bolivians, perhaps secondary only to concern for economic well-being. This is indicated by the utilization not only of "good" services, when available, but also of traditional and

modern organizational mechanisms at the local level to achieve community cooperation toward the solution of common health problems.

B. Geographic Characteristics

1. Physiography and climate

An area of about 424,000 square miles makes Bolivia fifth in size in South America, about equal to Utah, Colorado, New Mexico and Arizona combined. The country can be divided into two major geographic regions: the Andean zone and the eastern plains. Eight different physiographic regions and eight climate regions which are not coincidental, however, provide a variety of environmental conditions; these influence the social, economic and health characteristics of the population. As its widest point, West to East, Bolivia covers approximately 780 miles; from North to South the distance is about 900 miles.

The Andean zone includes high mountains, the cold and semi-arid altiplano and highland valleys; it covers the southwestern third of the country. The remaining two-thirds consist of tropical lowlands in the northern and eastern sections. Rainfall and temperature increase from west to east and from south to north; considerable seasonal and year-to-year variations cause intermittant floods and droughts. In Bolivia, difficult terrain, extreme climatic conditions and deficient transportation and communications systems prevail. It appears that watersheds or drainage systems and environmental conditions have been the major determinants of settlement and development patterns.

It has been convenient and customary to describe Bolivia in terms of three geographic regions. However, this simplification can be misleading in terms of conceptualizing actual conditions and making programatic determinations. A contemporary analysis of Bolivia's physiographic and climatic regions, documented by Jorge Muñoz Reyes(1), is illustrated in Figures 1.1 and 1.2. A sample of climatic variations is shown in Table 1.1. Bolivia's extraordinary conditions range from polar and tundra zones to tropical jungles and green deserts, from mountains over 21,000 feet to flat plains at 500 feet and a multitude of variations in between.*

The Andean zone is comprised of four physiographic regions:

a. Western mountain range (Cordillera Occidental)

The Andes Mountains run the length of South America along the Pacific coast. The Andes reach their widest point in Bolivia, and it is within Bolivia that the chain divides into two major ranges. The origins and composition of these ranges are quite different, however.

---

* For orientation purposes refer to the Political Map of Bolivia, Figure 4.1, Chapter IV.

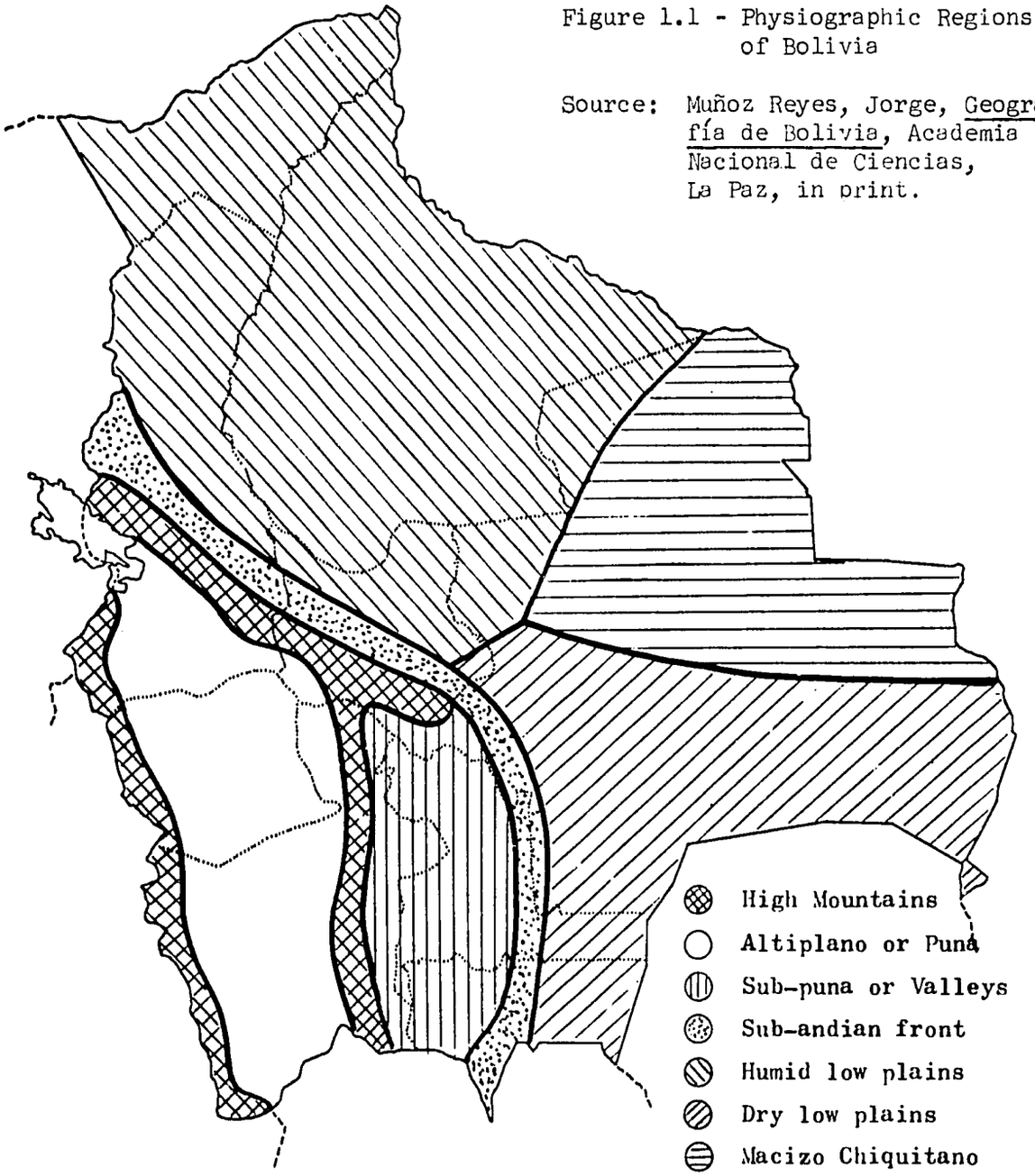


Figure 1.1 - Physiographic Regions of Bolivia

Source: Muñoz Reyes, Jorge, Geografía de Bolivia, Academia Nacional de Ciencias, La Paz, in print.

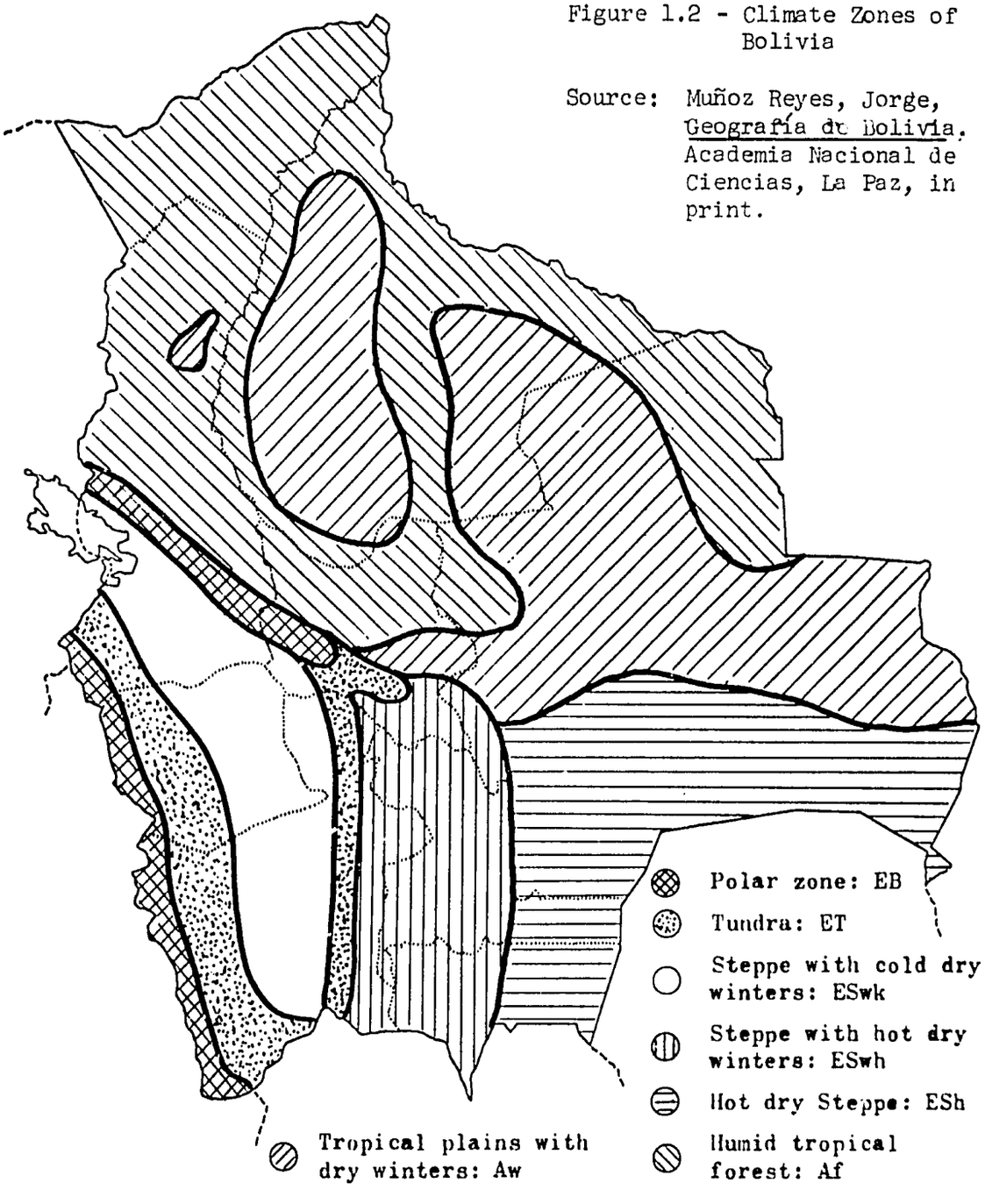


Figure 1.2 - Climate Zones of Bolivia

Source: Muñoz Reyes, Jorge, Geografía de Bolivia, Academia Nacional de Ciencias, La Paz, in print.

Table 1.1 - Geographic and Climate Data for Selected Locations

Location	Geographic Region[a]	Altitude (meters)[b]	Climate (Zone)[a]	Temperature (°F)		Precipitation (mm.)			Relative Humudity Annual Percent	Dominant Wind (knots)
				Ave. Max. Annual	Ave. Min. Annual	Aver.Max. Monthly	Ave. Min. Monthly	Ave.Total Annual		
La Paz	Altiplano	3,632	Ebwk	63	39	210	< 1	556	57	SE-4
Oruro	or Puna	3,706		65	45	216	< 1	400	40	N-5
Potosí	High	4,000	ET	60	36	191	2	514	NA	NE-1
Cochabamba	Mountains	2,570	ESwh	76	47	296	< 1	524	45	NW-2
Sucre	Sub-puna	2,850	ESwh	73	47	286	< 1	578	48	NE-3
Tarija	or Valleys	1,950		79	48	283	< 1	640	57	SE-4
Villa Tunari	Sub-andean front	290	Af	86[b]	67[b]	NA	NA	4,724[b]	86[a]	NA
Trinidad	Humid low	236	Af	88	67	530	2	1,777	72	NW-7
Cobija	plains	260		76*	NA	NA	NA	1,767	84	NW-3
Santa Cruz	Dry low plains	445	Aw	84	66	396	< 1	1,113	68	NW-10
Concepción	Brazilian shield	490	Aw	79[b]	66[b]	NA	NA	1,015[b]	67	NA

NA = Not Available

* = Average annual temperature

Sources: Unless otherwise noted, Dirección Nacional de Meteorología e Hidrología

[a]Muñoz Reyes, Jorge, Geografía de Bolivia, Academia Nacional de Ciencias, La Paz, in print. See accompaning maps for description.

[b]Ahlfled, Federico E., Geografía Física de Bolivia, Editorial "Los Amigos del Libro", La Paz, 1973

The Western range forms Bolivia's boundary with Chile. Its length is approximately 400 miles and its average width about 20 miles. The mountains originated with volcanic erruptions and, although new eruptions have not occurred in the recent past, several mountains continue to emit smoke and sparks. The range is classified as a polar zone, covered with snow and ice year around. It is characterized by abrupt peaks with intermittent mesas and severe erosion. Bolivia's highest mountain, Sajama, lies in the Western range with an altitude over 21,000 feet.

The eastern (Bolivian) flank of this range is composed of lava rock and volcanic ash. It is classified as a tundra zone with harsh climatic conditions. Temperatures range from -35°C (-30°F.) at night to +25°C (77°F.) during the day. It is very dry and has frequent dust storms. As a result, very few people inhabit the region. The region does contain considerable mineral resources and vast salt deposits, both the result of past volcanic action.

b. Eastern mountain range (Cordillera Oriental)

The Eastern mountain range is actually composed of two chains: the Cordillera Real, which runs NW-SE from northeast of Lake Titicaca to central Cochabamba, and the Cordillera Central, which begins in southeastern Cochabamba and extends south through the Department of Potosí into Argentina. These chains are about equal in length, having a total length of approximately 625 miles.

Unlike the Western range, the Cordillera Oriental was caused by tectonic uplift, with no volcanic actions. Thus it contains soils more conducive to agricultural production.

Generally lower than those of the Western range, this range contains several mountains with altitudes over 20,000 feet in the polar zone of the Cordillera Real. The Cordillera Central is classified as tundra, losing its snow during most of the year. Potosí, at 14,000 feet, lies in this chain and is Bolivia's highest major city. Most of Bolivia's mining activities occur in the Eastern range.

The northeastern flank of the Cordillera Real drops abruptly into the tropical plains of Cochabamba and northern La Paz Departments. Included in the Cordillera Real and running its length, roughly between altitudes of 3,000 and 8,000 feet, is the Yungas. This sub-region is characterized by deep, narrow valleys and a semi-tropical climate. Difficult terrain limits its potential for agricultural development, but the Yungas does produce significant hillside crops such as coffee, bananas and coca.

c. The Altiplano

Lying between the two mountain ranges, and extending over 400 miles from Lake Titicaca into Chile in the South, is Bolivia's high and vast Altiplano. Its climate is classified as a steppe with cold dry winters, with limited rainfall and daytime temperatures around 40° to 60°F in the summer. It consists primarily of extensive natural grazing lands and large salt flats.

Relatively flat, the Altiplano is divided into four watersheds separated by three low mountain chains which run east and west. These drainage systems are (1) Lake Titicaca in the north, at an altitude of 12,366 feet, (2) Jesus de Machaca, in southern La Paz and northern Oruro, (3) Lake Poopo in Oruro at 11,993 feet, and (4) the Uyuni basin in northern Potosí at 11,895 feet. From here the Altiplano again rises, entering Chile at over 12,000 feet. These four interconnected drainage systems are self contained; that is, they have no exit to the sea. The large amounts of water entering the system from surrounding mountains are balanced by high rates of evaporation.

Approximately one-fifth of Bolivia's population lives on the Altiplano, which comprises less than one-eighth of the nation's land area. Over half of the Altiplano's inhabitants are located in its northern third, concentrated around Lake Titicaca. Very few inhabitants are found in the southern (Potosi) third, which is dominated by vast stretchs of tundra and the Salar de Uyuni. This salt flat, with an area of over 3,500 square miles, is slightly larger than that of Lake Titicaca (3,400 square miles).

d. Sub-puna or Valley region

Extending eastward from the Cordillera Central is what is known as the valley region of Bolivia. It contains most of Chuquisaca, the western half of Tarija and portions of southern Cochabamba and eastern Potosí. It is thought that, prior to the tectonic uplift that created the eastern mountain range, this region formed part of the Altiplano system, and provided the major natural drainage for the Altiplano. The climates of the two regions are somewhat similar, with the valleys being warmer due to lower altitudes. Geographically the sub-puna is characterized by a series of low mountain chains with warm fertile valleys, though not nearly as abrupt as the Yungas. Over 25 percent of Bolivia's population lives in the valleys, which comprise only ten percent of the country's land area.

The region is sub-divided by the north-south continental divide, which extends roughly from Sucre southeastward through Azurduy,

and contains four major drainage systems. In the north, waters from the Valle Alto (Cliza, Punata, etc.) drain westward through Cochabamba (at over 6,300 feet) and Quillacollo, cutting south and then east into the Rio Grande. The Mizque watershed, in southern Cochabamba, also drains eastward into the Rio Grande. These systems form part of the headwaters of the Amazon basin. South of the continental divide the major watershed drains into the Pilcomayo river, drawing on waters not only in Chuquisaca but also eastern and southern Potosi. A minor system is that of the Bermejo river in southwestern Tarija. These two rivers form, in part, the headwaters of the River Plate basin.

The eastern plains of Bolivia is also divided into four physiographic regions:

e. Subandean front

The subandean front is a narrow belt of rolling tropical hills which separates the andean zone from the low plains of northern and eastern Bolivia. It consists primarily of dense undergrowths and in part heavy forests. The northern sector parallels the Cordillera Real, at altitudes between 1,000 and 3,000 feet, with an average width of about 40 miles. The meridian sector, extending south from a point just northwest of the city of Santa Cruz, has an average width of about 55 miles and diminishing rainfall from north to south.

The subandean front is significant for its considerable agricultural potential and low propensity for flooding. Bolivia's four major colonization areas (Alto Beni, Chapare, Santa Cruz and Bermejo) lie in or astride this region. It also contains navigable waters of the Beni, Mamore, Rio Grande and Pilcomayo river systems and the headwaters of the Parapetí river (near Camiri) which drain into the Izozog swamp in southern Santa Cruz.

f. Humid low plains

The northern third of Bolivia consists of humid low plains, with tropical forests (mainly along the rivers) and vast grasslands (or pampas). Over its 500 miles from south to north, elevation drops an average of only eight inches per mile, and extensive flooding occurs during a third of the year. Rainfall averages over 70 inches annually and temperatures range between 70° and 90°F with over 75 percent humidity in most places. Only five percent of Bolivia's population inhabit the region, devoting most of their efforts to cattle, Brazil nuts and survival.

g. Dry low plains

To the south and east of the city of Santa Cruz lies the vast stretch of hot dry low plains, commonly called the "green hell", of the Bolivian Chaco. It is characterized by extremely dense and harsh undergrowth (monte bajo) and very sandy soils, scarred by gullies. Along its edges (the two railroads and the Parapeti and Pilcomayo rivers) the inhabitants engage in cattle raising and, near Santa Cruz, some agriculture.

Temperatures often reach over 100°F and rainfall is rare. During the winter months periodic surazos, southern winds which originate in the southern Argentine pampas and reach into the Beni, may drop temperatures to the mid-thirties for several days or weeks. These variances restrict the growth of certain tropical plants which otherwise would flourish in the region.

h. Brazilian Shield (Macizo Chiquitano)

Wedged between the humid and dry low plains in northeastern Santa Cruz lies the Brazilian shield. This is a mass of higher, hard ground extending east from the San Julian river and north of the Santa Cruz-Corumba railroad to the Brazilian border. It is characterized by low mountain chains which run NW-SE, the highest of which reaches almost 5,000 feet. Temperatures are slightly lower than surrounding areas (65°-80°F) but rainfall is substantial in the summer months (40 inches/year). Due to its relative elevation, drainage is good and its compact soils offer many clear rivers. The central portion of the shield is largely pampa and good grazing lands. To the north and west, lower elevations give way to tropical forests. The eastern section is covered mainly with swamps (headwaters of the Paraguay and Itenez rivers) and the southern portion extends into the Chaco. The shield also forms part of the north-south continental divide. This region holds considerable potential for development, especially cattle grazing.

2. Natural Resources

It has been said that Bolivia is like a pauper sitting on a throne of gold.(2) This derogatory statement does hold some truth. Like many less-developed countries, Bolivia depends to a great extent on external assistance to overcome the inertia of development. At the same time, however, it possesses tremendous potential wealth in terms of its vast untapped natural resources. These resources consist principally of diverse mineral resources in the Andean region, petroleum and natural gas in a wide belt paralleling the sub-andean front, immense hardwood forests in the Amazon basin, and extensive pastures and ranges in the lowlands as well as the Altiplano. With few exceptions, however,

considerable barriers must be overcome in order to fully exploit these resources. The primary needs are for investment capital, communication and transportation systems and an administrative structure capable of effectively managing development activities.

a. Mineral Resources

Bolivia has enormous mineral resources, in terms of both size of deposits and variety of ores. The sale of minerals, primarily tin, has been the mainstay of the economy for almost a century. Nonetheless, the untapped reserves outweigh the minerals that have been extracted many times over and new discoveries are being made periodically.(3) Most of the minerals are contained in the eastern mountain range, and particularly the Cordillera Real. (See Figure 1.3). Primarily base metals, these include the hemisphere's largest reserves of tin and far greater reserves of zinc. In addition, this belt contains lead, bismuth, antimony, tungsten,(wolfram), wolframite and, in the northern part, nickel, mercury and fluorite. Oruro has become the center of the Bolivian mining industry.(4)

The Western mountain range contains considerably less minerals, the most important being sulfur in the southern part. The vast salt flats in the southern Altiplano are also potential sources of borax. Copper is found in the northern Altiplano as well as in the tin belt. Bismuth, asbestos, magnesite and gypsum are found in the valley region and vast deposits of iron and manganese are beginning to be exploited in Santa Cruz near the Brazilian border. Uranium and molybdenum have been reported in La Paz Department and recent satellite surveillance has indicated uranium and other mineral deposits in Santa Cruz.. Bolivia has no known coal reserves and precious metals (silver and gold) are believed to have been almost depleted. Some gold, however, is still being extracted in the Yungas region of La Paz.(5)

Bolivia also has significant petroleum and natural gas reserves, though their extent is still unknown. Most production presently occurs in the Departments of Santa Cruz, Chuquisaca and Tarija, along the sub-andean front and in the Chaco. Intense exploration, however, is now being undertaken in areas of the Beni, Altiplano, and Santa Cruz.

b. Land Resources(6)

Bolivia's land area totals approximately 109.8 million hectares. Table 1.2 shows actual and potential land use based on information for 1972. About 27 percent is in forests; 63 percent is classified as natural pastures, ranges and watershed; and three percent is in wasteland (cities, lakes, rivers, etc.). Approximately seven percent

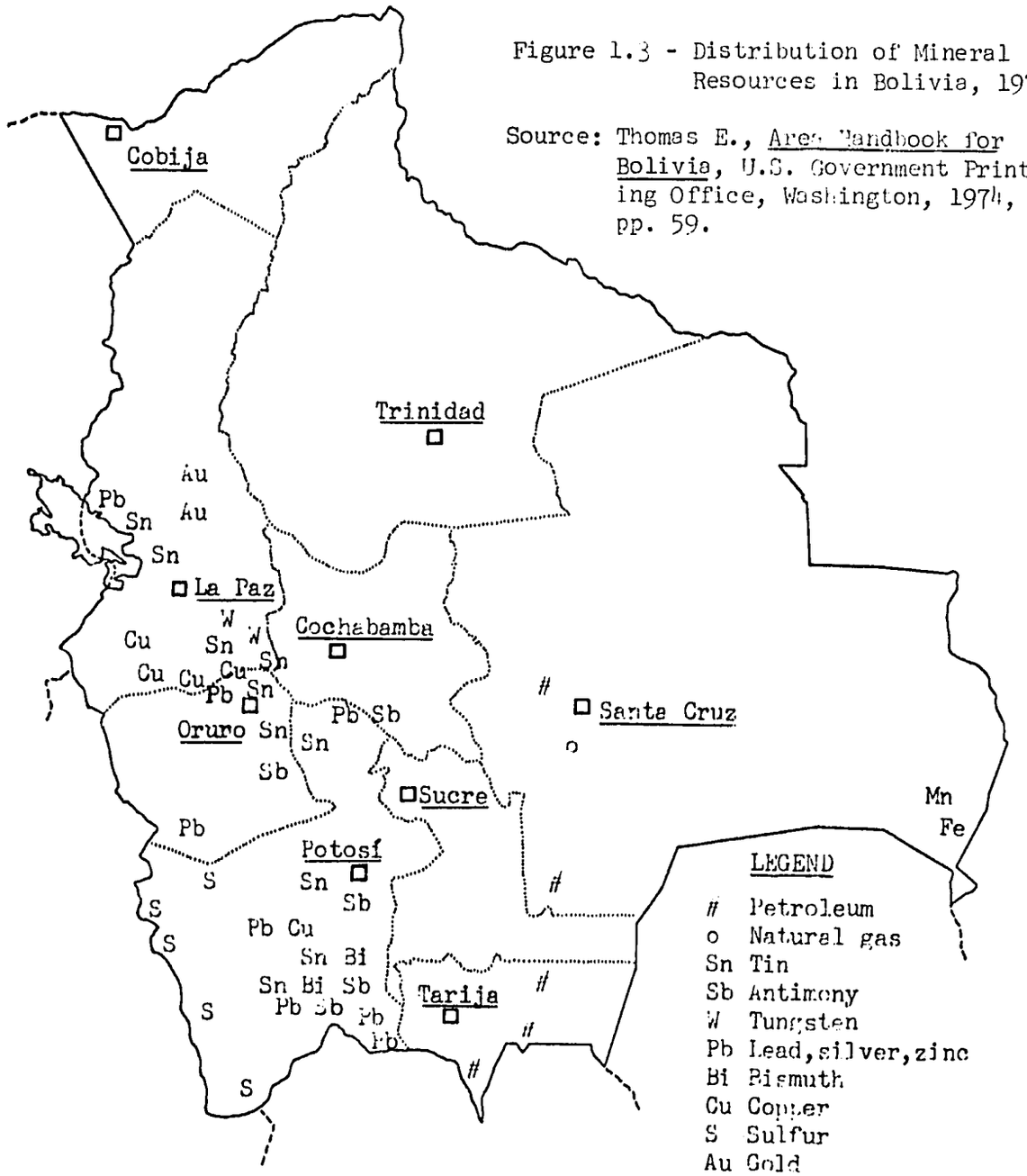


Figure 1.3 - Distribution of Mineral Resources in Bolivia, 1973

Source: Thomas E., Area Handbook for Bolivia, U.S. Government Printing Office, Washington, 1974, pp. 59.

Table 1.2 - Land Use in Bolivia, 1972

Land Use	Number of Hectares (thousand)	Share of Total Land (Percent)
Total Area of Bolivia	109,858	100
Forests	29,526	27
Pastures and ranges	69,391	63
Tropical	(43,073)	(39)
Range and Watershed	(26,318)	(24)
Waste Land[a]	3,094	3
Prime land for crop production[b]	7,847	7
Potential (not used)	(4,271)	(4)
Fallow[c]	(2,502)	(2)
In current use[d]	(1,074)	(1)

[a]Includes lakes, rivers, cities and wasteland (such as the Salar de Uyuni).

[b]This is land thought to have potential for crop production. There is an estimated 6.5 million additional hectares of more marginal land that could be brought into production that is currently classified as pastures, ranges, and forests.

[c]Land currently in the fallow stage of the traditional rotation system.

[d]Estimate from MACAG, División de Comercialización, unpublished data.

Source: Thomas T. Cochrane, Potencial Agrícola del Uso de la Tierra de Bolivia: Un Mapa de Sistemas de Tierra (La Paz: Editorial Don Bosco, 1973).

As present in Agricultural Development in Bolivia, A Sector Assessment, USAID, 1974, pg. 40.

is tentatively classified as agricultural land suitable for crop production. However, no detailed soils studies have been made as a basis for developing a judgment of this productivity potential.

Of the 7.8 million hectares classified as prime agricultural lands, about 54 percent have never been cultivated. Many of these virgin land areas, especially large tracts in the Oriente, have never even been mapped. Another 32 percent of the crop land is in fallow. Only 14 percent of the prime agricultural land is currently being used for crop production, less than one percent of the total land area of the country.

Bolivia has one of the largest reserves of hardwoods in the world. The forest areas are located mainly in the region north of Santa Cruz and in the northern Oriente. The northern reserves are tropical rain forests with high populations of rubber and Brazil nut trees, while the forests near Santa Cruz are sub-tropical, and contain a variety of hardwoods. Accurate estimates of the extent of these forest reserves do not presently exist. While some timber resource exploitation has occured in Santa Cruz Department, lack of access to forests has limited the extent of development of the lumber industry.

Almost two-thirds of Bolivia's land area is in natural ranges and pastures. The natural ranges are located primarily in the higher valleys and Altiplano on the watersheds of the river systems originating in the Andean chain. Some range lands, however, are also found in the Chaco region of the Bolivian Oriente. The ranges and watersheds account for about one-fourth of the total land area in Bolivia. Natural pastures, accounting for almost 40 percent of total land area, are mainly tropical and sub-tropical grass lands located for the most part in the Department of Beni and Santa Cruz.

c. Water resources

Bolivia contains more than 560,000 Km^2 (2,200 mi^2) of major fresh water lakes(7) and more than 30 large rivers which are navigable for an estimated 12,000 miles(8). Like other natural resources, Bolivia's water resources represent considerable potential but are very much underutilized. Commercial fishing, which has an economic as well as nutritional potential, exists on a small scale. These activities are centered in Lake Titicaca and several smaller areas in the Beni, Santa Cruz and Tarija Departments, but serve primarily local markets. Sport fishing, which has economic potential related to tourism, exists on an even smaller scale. The major use of waterways in Bolivia is for transportation. Lake Titicaca provides an important vehicle for commerce with Peru, and rivers are the principal means of communication in the Amazon basin. Periodic

flooding and drought in the Oriente, however, make this means highly inconsistent.

The numerous narrow and deep valleys in the mountains, valley and Yungas regions of the country offer natural conditions for multipurpose dams. At present, several small dams produce electric power for the cities of La Paz, Cochabamba, Oruro and Potosi. Flood control is a secondary by-product of these dams. Bolivia has projected a large multipurpose dam on the Rio Grande south of Santa Cruz and studies for two other sites, one on the Rio Beni south of Rurrenabaque and the other on the Rio Pilcomayo in Chuquisaca. The National Community Development Service has sponsored several irrigation projects, primarily in the Cochabamba valley. The extent of these projects, however, is very limited as compared to the extensive flood-control and irrigation needs of the country. The major problem confronting the utilization of dams, especially in the Andean foothills and valleys, is the serious overgrazing of highland rangeland. This has caused extensive erosion and thus large amounts of sediment in the river systems.

These conditions not only fill up lowland riverbeds and change the courses of rivers, but also present a threat to the effective utilization of dams.

3. Communications and transportation

One of the predominant factors inhibiting socio-economic development in Bolivia is the lack of adequate communications and transportation systems. The country's extreme variations in topography and climate not only create needs for these systems, but also present considerable barriers to developing them. The cost of building roads through the mountains or the jungles, for example, is extremely high. The cost of not having them, however, in terms of untapped resources or the expansion of local markets, is considerably higher. The deficient means of communications and transportation has contributed directly to Bolivia's prevaling regionalism and the government's inability to provide adequate health, education and other services to the majority of the population. In sum, these conditions have significant negative social as well as economic ramifications.

a. Communications

The major means of communications within Bolivia are by radio and the postal service. All major cities and towns are interconnected by a shortwave radio systems managed by the National Enterprise for Telecommunications (ENTEL). A state-owned company, ENTEL also operates the government telegraph system and is presently

installing a national microwave system. Two private companies, SERVAL and Radio Serrano, also provide intercity radio communications. Many government and private agencies, including the Ministry of Health, have their own radio installations which connect the central offices with field stations.

Supplementing these systems are the large number of amateur radio operators. Most major cities have locally controlled telephone systems (cooperatives) which are connected to the radio networks. Three private companies offer international telegraph services and ENTEL provides international telephone connections with all Department capitals except Trinidad and Cobija.(9)

The only means of mass communications in Bolivia is by public and private radio stations. As of 1973, there were 89 stations in operation. Table 1.3 indicates the distribution, almost all of which are located in the capital cities. The utilization of this means for educational and public services purposes has proven quite effective, since almost all campesino homes possess at least a pocket transistor receiver. Several religious organizations have successfully employed radio transmission for literacy and training programs.

Table 1.3 - Number of Radio Stations in Bolivia by Departments, 1973

Department	Number	Percent	Population per Station*
La Paz	26	29.2	66,242
Santa Cruz	15	16.8	36,500
Beni	12	13.5	17,117
Cochabamba	11	12.4	78,418
Potosí	8	9.0	106,925
Tarija	8	9.0	32,613
Oruro	6	6.7	59,833
Chuquisaca	3	3.4	161,200
Total	89	100.0	59,896

* Based on estimated population of the Department, 1973.

Source: Instituto Nacional de Estadistica, unpublished data, 1974.

As of 1973, five daily newspapers were published in La Paz, five in Santa Cruz, two in Cochabamba and one in Oruro. While the major papers (Presencia, El Diario and Los Tiempos) are distributed throughout

the country total circulation was less than 150,000 readers.[10] La Paz, Oruro and Santa Cruz are the only cities with access, on a limited scale, to television at the present time. With the operation of the new microwave system and the installation of receivers in public places (e.g. plazas), television programming could have a considerable educational potential in urban areas. Motion pictures are a popular form of entertainment in the cities and mining centers.

The Bolivian postal service is a government agency with 16 district offices and a total of 418 local post offices.[11] Home deliveries are available in major cities but post office boxes and general delivery stations are the common methods of distribution. In 1972, over 40 percent of all official mail was transported by air.[12] The bulk of intercity mail is thus dependent upon the frequency of airline (LAB) schedules for distribution. Mail delivery to and from provincial post offices is theoretically possible, but very slow and unreliable. All intercity bus lines as well as LAB provide private mail service on a station-to-station basis. Another reliable and frequently used method is by personal carrier.

b. Transportation

The principle means of transportation in Bolivia are roads in the Andean zone and air and river travel in the lowlands. With few exceptions, all systems are subject to climatic conditions which periodically limit utilization. Primarily this involves the flooding of rivers and airstrips and washouts on roads and railroads during the months of December through April. The bulk of traffic, both air and land, occurs among La Paz, Cochabamba and Santa Cruz. The present government has placed high priority on road construction, especially penetration routes in the Department of Santa Cruz and Beni and road improvement projects in the south. Figure 1.4 illustrates the actual and proposed transportation coverage.

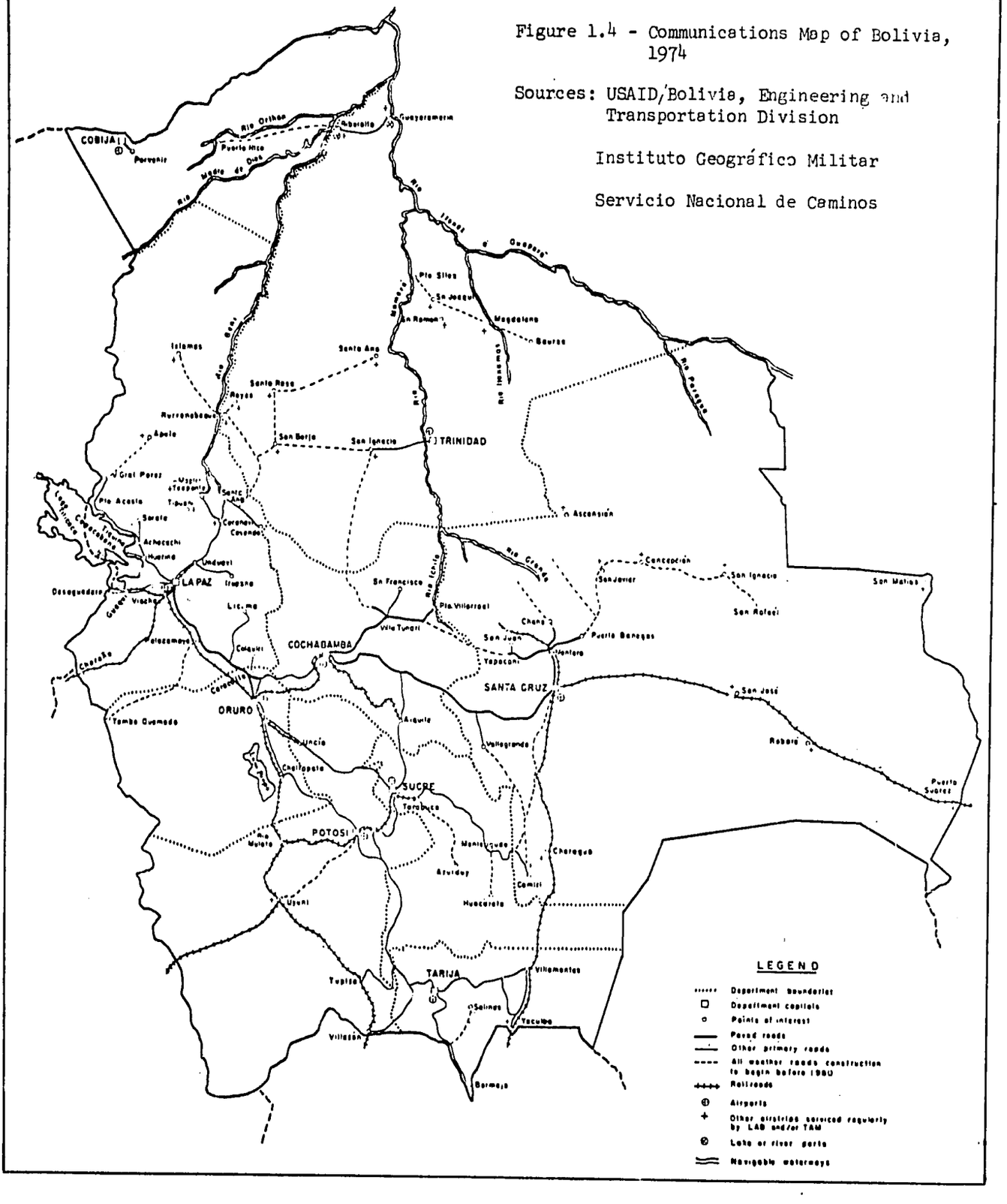
In 1973, there were only 664 miles of paved roads, about 2,400 miles of all-weather improved roads and between 9,000 and 14,500 miles of secondary roads, passable only in dry weather.[13] The government plans to begin construction on and/or improve more than 1,700 miles of all-weather roads by 1980.[14] At present, large areas of the Oriente, with considerable untapped natural resources, lack road connections with the rest of the country. Truck transportation is an important element in the country's marketing system, carrying an estimated 60 percent of domestic freight and, many times, passengers as well. In 1971, over one-fourth (14,000) of the 53,000 registered motor vehicles in Bolivia were heavy trucks, and 2,000 were buses.[15] Numerous private bus companies and cooperatives provide daily service among all major cities.

Figure 1.4 - Communications Map of Bolivia, 1974

Sources: USAID/Bolivia, Engineering and Transportation Division

Instituto Geográfico Militar

Servicio Nacional de Caminos



Railroads are the primary means of moving goods in foreign trade. Ninety-four percent of the total network is controlled by the state-owned National Railway Company. (See Table 1.4). The western system runs the length of the Altiplano with two side routes, Oruro-Cochabamba-Aiquile and Río Mulatos-Potosí-Sucre. This systems also connects Bolivia with ports in Chile and Peru and with Argentina. The eastern system, with its hub in Santa Cruz, links the country with Brazil and Argentina. Railroads also carry a significant percentage of domestic freight and passengers, but these rates are declining.

Table 1.4 - Length of Railways in Bolivia, 1971
(in kilometers)

Specifications	In Use	Suppressed	In Construction
National Railway Company	3,323[c]	65	----
Machacamarca - Uncia (COMIBOL)	105	--	----
Guaqui - La Paz[a]	96	--	----
Santa Cruz - Rio Mamore[b]	--	--	300
Total	3,524	65	300

a Extension of Southern Railroads of Peru

b. Comisión Mixta Argentino-Boliviana; as of 1973, approximately 100 Km. was in use.

c. Western network = 2,101 Km., Eastern network = 1,222 Km.

Source: Instituto Nacional de Estadística, Bolivia en Cifras, 1972, La Paz, 1974, p. 79.

Because of the landlocked position of the country and the absence of surface transportation to many outlying areas, air transportation has been developed extensively. In addition to the quasi-governmental LAB (Lloyd Aereo Boliviano), there were seven unscheduled airlines, thirty-one air taxi companies, and a commercial branch of the armed forces (TAM) which provided domestic service in 1973.(16) LAB carries the bulk of the passenger load, and the other carriers handle mainly domestic freight. Table 1.5 shows the distribution of landings in Bolivia for 1971. Over 40 percent of the air traffic takes place

Table 1.5 - Number of Aircraft Landings in Bolivia by Locality, 1971

Airfield (Department)	Landings	Percent	Average per month
Trinidad (Beni)	11,246	24.5	937
La Paz (La Paz)	8,962	19.6	747
Cochabamba (CBBA)	7,864	17.2	655
Santa Cruz (SCZ)	4,598	10.0	383
Santa Ana (Beni)	2,549	5.6	212
San Borja (Beni)	2,100	4.6	175
Riberalta (Beni)	1,300	2.8	108
Magdalena (Beni)	920	2.0	77
Sucre (Chuquisaca)	780	1.7	65
Camiri (SCZ)	704	1.5	59
Guayaramerin (Beni)	701	1.5	58
Others (16)	4,129	9.0	22*
Total	45,853	100.0	3.821

* Per airfield

Source: Compiled from Bolivia en Cifras, 1972, op. cit. p. 77

in the Beni Department alone. This demonstrates not only the indispensability of air transportation in the lowlands, but also the difficulty of providing air services in the mountainous regions.

Finally, rivers provide a principle means of transportation in the Departments of Beni, Pando and northern portions of Santa Cruz and La Paz. It is estimated that there were more than 12,000 miles of navigable waterways in the country in 1972,(17) but probably only one-third of these are open year around to sizable (freight) vessels. Considerable water transportation is also carried out on Lake Titicaca. As a major link with Peru, the Lake provides passenger and freight services, including the connection of the Peruvian and Bolivian railway systems between Puno and Guaqui.

4. Geography and health

The geography of Bolivia, which would include its physical and climatological features as well as the impact of these characteristics on patterns of human life, has a significant influence on the status of health in the country. Primarily these relationships include i) the effect of the environment on specific disease patterns,

ii) geographic barriers to effective program implementation, iii) the exploitation of natural and human resources and the country's ability to support health interventions, and iv) geopolitical determinants in the health sector. This latter point will be discussed in Chapter IV.

As will be noted in Chapter II, communicable diseases are among the leading causes of death and sickness in Bolivia. Many of these diseases have specific regional limitations. The primary determinants of these limitations are the ecological conditions specific to a given region and the climatic variations which determine or permit differences in human behavior, particularly dress and housing.

Malaria and yellow fever are transmitted by mosquitos. Due to different species, malaria is prevalent throughout the tropical and sub-tropical areas, whereas yellow fever is found primarily in jungle areas. Bolivian hemorrhagic fever is transmitted by a field mouse whose natural habitat at present is limited to areas of the Beni and Santa Cruz. One of the major factors in the transmission of respiratory infections (tuberculosis, influenza, measles, whooping cough, chicken pox, polio, diphtheria, etc.) is crowded housing, which is not particularly limited to any given geographical area. Hookworm is endemic in the lowlands and sustained primarily by not wearing shoes (mainly in children). Typhus and pin worms, on the other hand, are found only in the Altiplano. The transmission of these diseases is closely related to infrequency in bathing and changing clothing.

Man plays different roles in the complex chains of transmission of infectious diseases. Sometimes he is the principal reservoir, as in respiratory diseases; at other times, however, human beings are merely innocent bystanders, as with yellow fever, plague and hemorrhagic fever. Settlement patterns, therefore, significantly influence disease patterns, and vice versa. Settlement patterns in turn are influenced by geographic conditions both directly, in terms of personal preferences, and indirectly, in terms of economic (agricultural and industrial) potential and means of communication. Population distribution, together with regional disease patterns, also affects health status by creating varying demands on health services. (See Section C. below).

The geographic characteristics of Bolivia present considerable barriers to the implementation of health service programs. The design and execution of health programs must be adapted considerably to take into account regional ecological and social differences. This strains the financial, technical and--especially, perhaps-- administrative capabilities of the health agencies. Supervision and supply systems, in addition to having budgetary constraints, are severely hampered by the inadequate transportation and communications systems.

These conditions - added requirements and deficiencies--are directly trnslated into increased costs in terms of program efficiency and effectiveness.

Bolivia's ability to pay for its necessary health services is very limited. Undoubtedly, part of this is due to political/administrative factors, e.g., the percent of resources allocated to health and the utilization of available resources. A substantial increment in resources available for health activities, however, depends on economic development. This would facilitate increased payments from government as well as private (individual) sources. Again, one of the major barriers to the exploitation of natural resources is the lack of adequate transportation and communication systems, exceedingly costly and difficult problems given Bolivia's geographic conditions. These same factors, however, limit the development of the other key ingredient - human resources - which need sources of income, education and, to complete the vicious cycle, health.

The opening up of new areas will without a doubt create more new problems in health. Yellow fever and malaria, which were at one time close to being controlled, present increasing problems in the new areas of colonization, petroleum exploration and the extraction of timber. In addition, it is not known what effect increased human populations will have on the ecological balance in previously uninhabited areas. Hemorrhagic fever was unknown in Bolivia until 1964. It is highly probable that new diseases, as well as an increase in existing problems, will accompany these penetration activities.

C. Demographic characteristics

1. Population distribution

The population of Bolivia is currently estimated at slightly less than five and one half million. All demographic information, however, has been derived by statistical inference based on the national census of 1950. Gross figures as well as computed rates are, therefore, not considered very reliable but these are the best data available.

a. Age and sex distribution

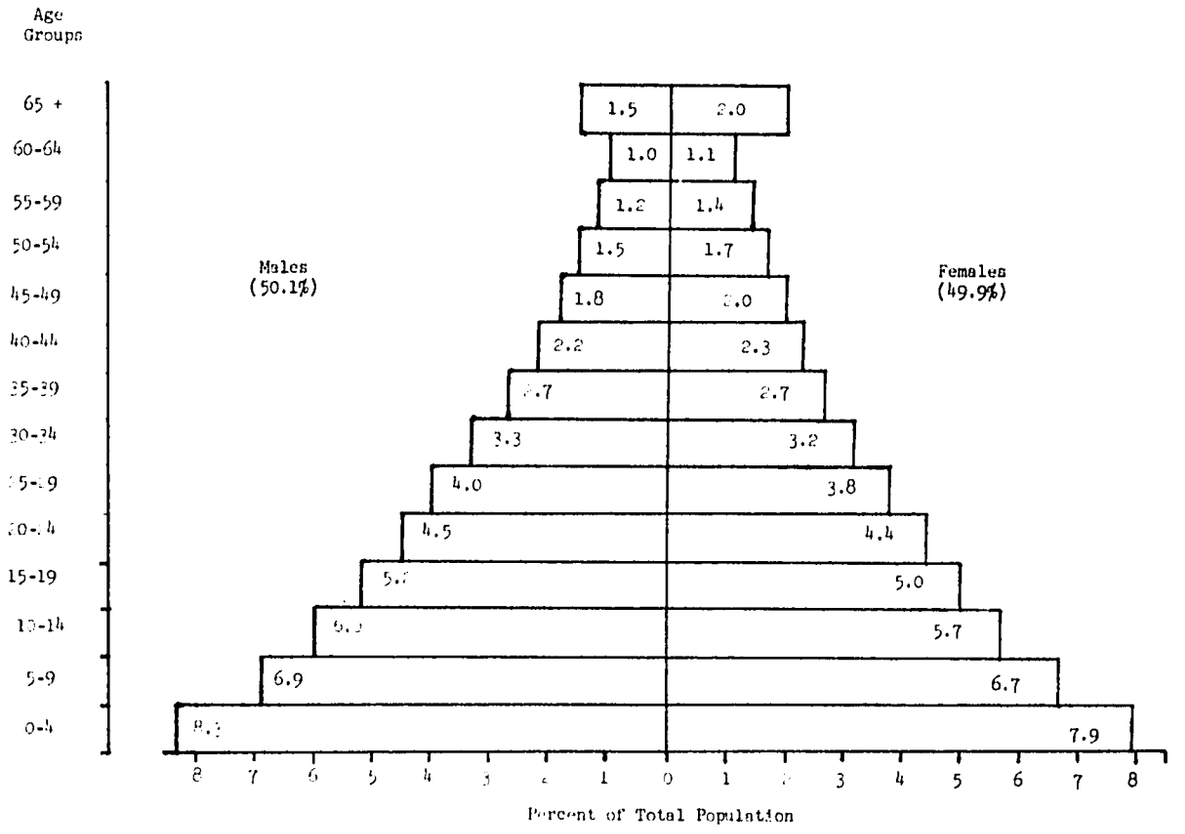
The composition of the population by age and sex is characteristic of developing countries. (See Table 1.6 and Figure 1.5). More than fifty percent is under the age of twenty and less than six percent is over the age of sixty. The male:female ratio is 1.04 for the age group under twenty and .82 for those over fifty. This suggests that male infants are given priority over females and that males die earlier than females, possibly due to occupational conditions. Bolivia's

Table 1.6 - Estimated Population of Bolivia by Age and Sex, 1974

Age Groups	Total Population		Males			Females		
	Number	Percent	Number	Percent Males	Percent Total	Number	Percent Females	Percent Total
Total	5,470,100	100.0	2,738,000	100.0	50.1	2,732,100	100.0	49.9
0 - 4	889,440	16.2	453,860	16.5	8.3	436,580	16.5	7.9
5 - 9	743,390	13.6	378,120	13.8	6.9	365,270	13.4	6.7
10 - 14	641,090	11.7	325,820	11.9	6.0	315,270	11.5	5.7
15 - 19	557,950	10.[illegible]	283,660	10.4	5.2	274,290	10.0	5.0
20 - 24	487,930	8.9	247,790	9.0	4.5	240,140	8.8	4.4
25 - 29	424,480	7.8	216,580	7.9	4.0	207,900	7.6	3.8
30 - 34	355,560	6.5	180,980	6.6	3.3	174,580	6.4	3.2
35 - 39	293,200	5.4	148,400	5.4	2.7	144,800	5.3	2.7
40 - 44	245,060	4.5	121,840	4.5	2.2	123,220	4.5	2.3
45 - 49	208,410	3.8	100,480	3.7	1.8	107,930	3.9	2.0
50 - 54	175,040	3.2	82,140	3.0	1.5	92,900	3.4	1.7
55 - 59	144,410	2.6	65,710	2.4	1.2	78,700	2.9	1.4
60 - 64	113,230	2.1	50,930	1.9	1.0	62,300	2.3	1.1
65 +	190,910	3.5	82,690	3.0	1.5	108,220	4.0	2.0

Source: Consejo Nacional de Economía y Planificación (CONEPLAN), 1974

Figure 1.5 - Estimated Population Pyramid for Bolivia, 1974



Source: Consejo Nacional de Economía y Planificación (CONEPLAN), 1974

dependency ratio* for 1970 was 83.9, which is about average for Latin America (85.7), but higher than Argentina (57.7) and lower than Paraguay (98.8).(179) The ratio for Bolivia in 1974 is 82.0. Roughly, this indicates that the working population supports over 80 percent its number in addition to itself. The existence of non-workers in the age group 15-64, of course, makes this percentage in reality, quite a bit higher.

b. Urban-rural distribution

Estimates of the urban-rural mix of the population depend on the definition of an urban area. By counting all Department capitals as urban centers, 77.5 percent of the country's inhabitants live in rural areas. (See Table 1.7 and Figure 1.6). The United Nations' definition of urban includes all localities with 2,000 or more inhabitants. With this definition, 66.2 percent of Bolivia's population would be classified as rural. The Health Sector Assessment feels that a more realistic definition would include only the six major cities as urban centers.** All other areas satisfy one or both of the following requirements which, in practical terms characterizes a rural environment in Bolivia: i) at least one half of the population is engaged in agriculture or related activities, or ii) at least one half of the local economy stems from agriculture or related activities. At the present time, therefore, the rural sector would include all localities with fewer than 50,000 inhabitants (the largest rural community would be Tarija with a population of about 30,000) and contain 78.5 percent of Bolivia's total population. (See Table 1.8 and Figure 1.7). This breakdown is especially important in terms of the development of rural health delivery systems. Since almost 60 percent of the population is dispersed or living in communities of less than 200 inhabitants, there are considerable difficulties in the delivery of health and other social services.

c. Population density

Overall population density is about five persons per Km^2. However, because of Bolivia's vast forests, ranges and watersheds density is about 38 persons per Km. for arable (and potentially arable) land. Table 1.7 and Figure 1.6 also illustrate the distribution and density of Bolivia's population by departments. Almost one-third of the population lives in the Department of La Paz. This is determined by the high concentrations around Lake Titicaca and the southeastern provinces and the city of La Paz which contain over a half million inhabitants each. Other major concentrations include the valley regions

---

* $\frac{\text{Population (0-14)} + \text{(65 and over)}}{\text{Population (15-64)}} \times 100$

** Sucre, Potosi, Oruro, Santa Cruz, Cochabamba and La Paz.

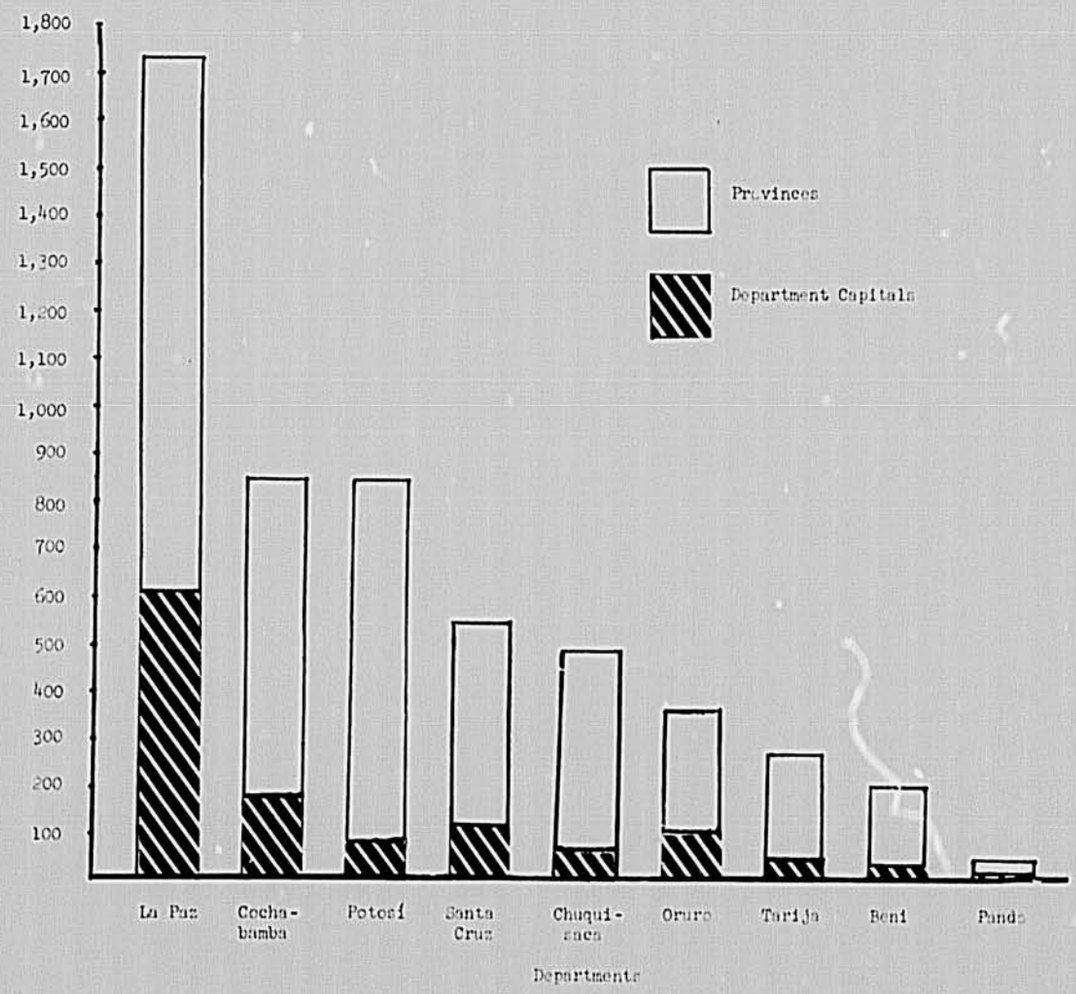
Table 1.7 - Estimated Population Distribution and Density by Department and Urban/Rural Classification, 1973

Department	Total			Urban*			Rural		
	Number	Percent[a]	Density (km^2)	Number	Percent[b]	Density (km^2)	Number	Percent[b]	Density (km^2)
Total	5,330,700	100.0	4.85	1,198,490	22.5	8,322.85	4,132,210	77.5	3.76
La Paz	1,722,300	33.3	12.86	605,200	35.1	11,866.67	1,117,100	64.9	8.34
Cochabamba	862,600	16.2	15.51	169,930	19.7	4,720.28	692,670	80.3	12.46
Potosí	855,400	16.0	7.24	73,840	8.6	10,548.57	781,560	91.4	6.61
Santa Cruz	547,500	10.3	1.48	135,010	24.7	6,136.82	412,490	75.3	1.11
Chuquisaca	483,600	9.1	9.39	54,020	11.2	6,752.50	429,580	88.8	8.34
Oruro	359,000	6.7	6.70	106,590	29.7	10,659.00	252,410	70.3	4.71
Tarija	260,900	4.9	6.93	29,950	11.5	7,487.50	230,950	88.5	6.14
Beni	205,400	3.9	0.96	20,940	10.2	5,235.00	184,460	89.8	0.86
Pando	34,000	0.6	0.53	3,010	8.9	1,505.00	30,990	91.1	0.49

* Department Capitals only
[a] Percent of country total
[b] Percent of Department total

Source: Instituto Nacional de Estadística, CONEPLAN, 1974

Figure 1.6 Estimated Population Distribution by Department and Urban/Rural Classification, 1973



Source: Instituto de Estadística, CONEPLAN, 1974

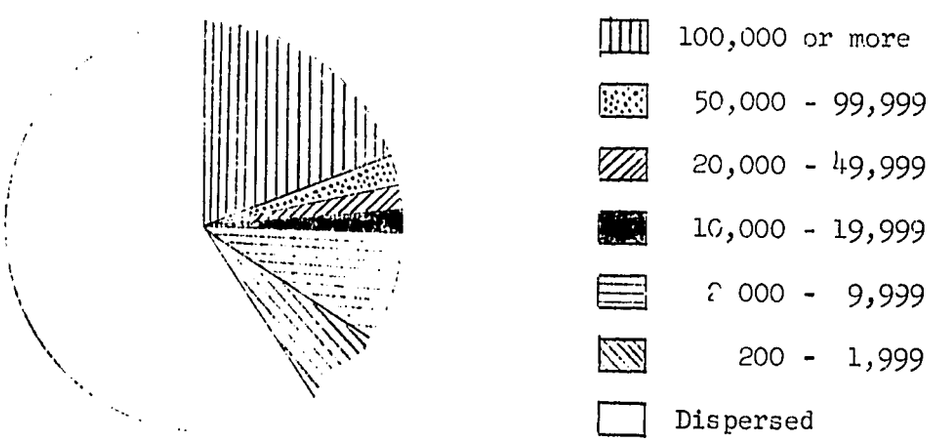
Table 1.8 - Population Distribution by Size of Locality, 1973

Size of Locality	Number of Localities	Estimated Population	Percent of total population
100,000 or more	4[a]	1,016,700	19.1
50,000 - 100,000	2[b]	127,800	2.4
20,000 - 49,999	4[c]	105,000	2.0
10,000 - 19,999	8[d]	96,000	1.8
2,000 - 9,999	91	455,000	8.5
200 - 1,999	469	352,000	6.6
Dispersed population	-	3,178,200	59.6
Total	578	5,330,700	100.0

Source: Instituto Nacional de Estadística, unpublished paper, 1973

a La Paz, Cochabamba, Santa Cruz and Oruro
b Potosí and Sucre
c Tarija, Trinidad, Camiri and Montero
d Quillacollo, Tupiza, Huanuni, Llallagua, Riberalta, Uyuni, Villazón and Viacha

Figure 1.7 - Population Distribution by Size of Locality, 1973



Source: Table 1.8

of Cochabamba, Chuquisaca and northern Potosí. (See Figure 1.8). The potential agricultural area of the lowlands, with the exception of northern Santa Cruz, are extremely underpopulated.

2. Migration patterns

Bolivia's significant migratory patterns are illustrated in Figure 1.9. Both external and internal patterns are complex. Economic considerations are the primary incentives for migration, but socio-cultural and political reasons are also important determinants. These patterns have direct consequences regarding the determination of health problems and the delivery of health services.

a. International migration

As of 1967, approximately seven percent of Bolivia's population had emigrated to other countries.(18) The two major groups involved are i) professional and technical people who go predominately to the United States and Brazil, respectively; and ii) agricultural and blue collar workers who go primarily to Argentina.

The majority of these persons ostensibly travel for a limited purpose, but most remain indefinitely. Table 1.9 shows the distribution of Bolivian residents in other countries for 1967.

Table 1.9 - Bolivian Residents in Other Countries, 1967

Country	Population	Percent
Argentina	212,833	70.0
Chile	53,992	17.8
Peru	12,303	4.0
Brazil	11,820	3.9
U.S.A.	6,220	2.0
Europe	3,918	1.3
Rest of Latin America	2,933	1.0
Total	304,019	100.0
Percent of Total Population	6.9	

Source: Llano S., Luis, Aspectos Demograficos de Bolivia, CENAFA, 1972, p. 39.

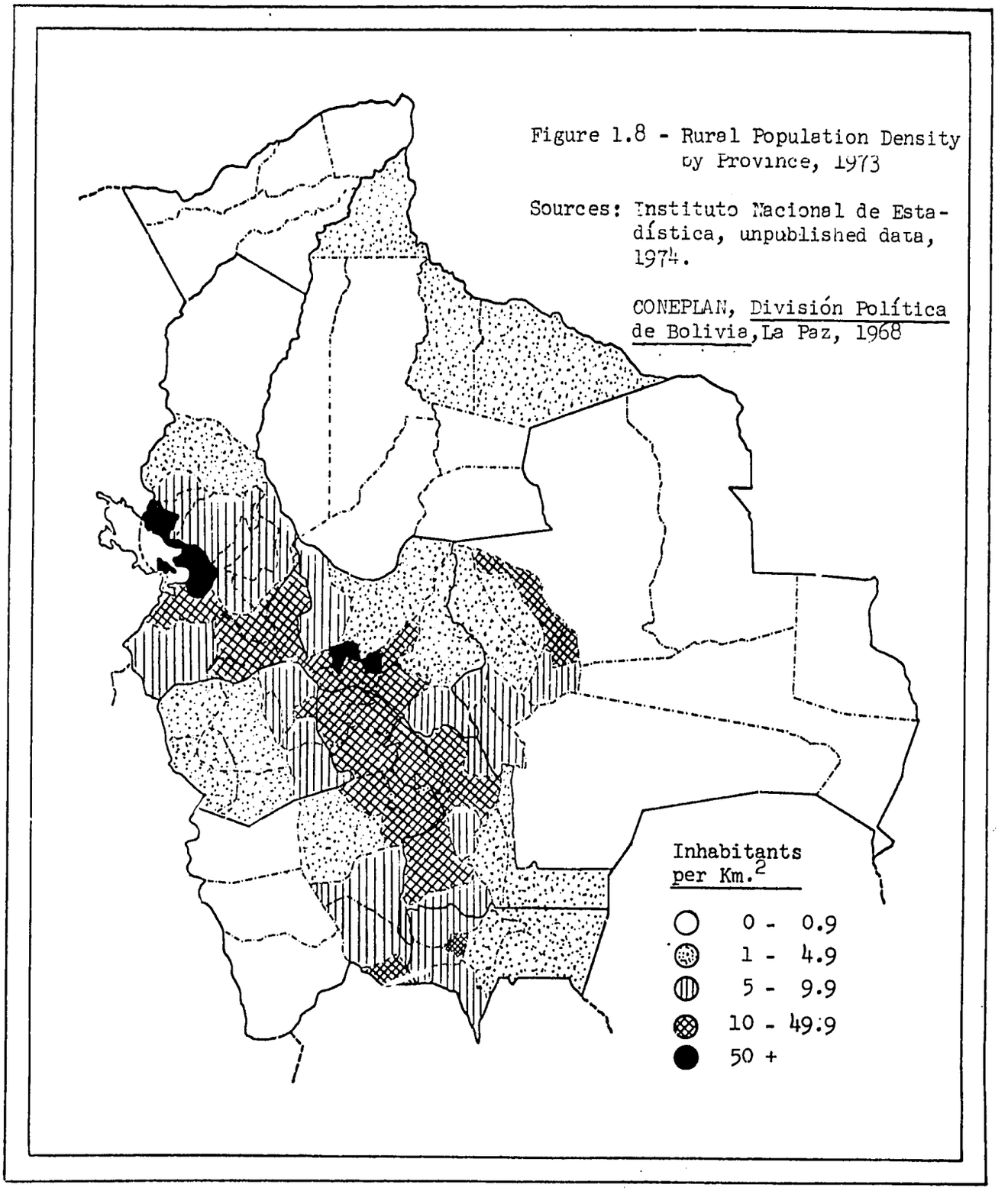


Figure 1.8 - Rural Population Density by Province, 1973

Sources: Instituto Nacional de Estadística, unpublished data, 1974.

CONEPLAN, División Política de Bolivia, La Paz, 1968

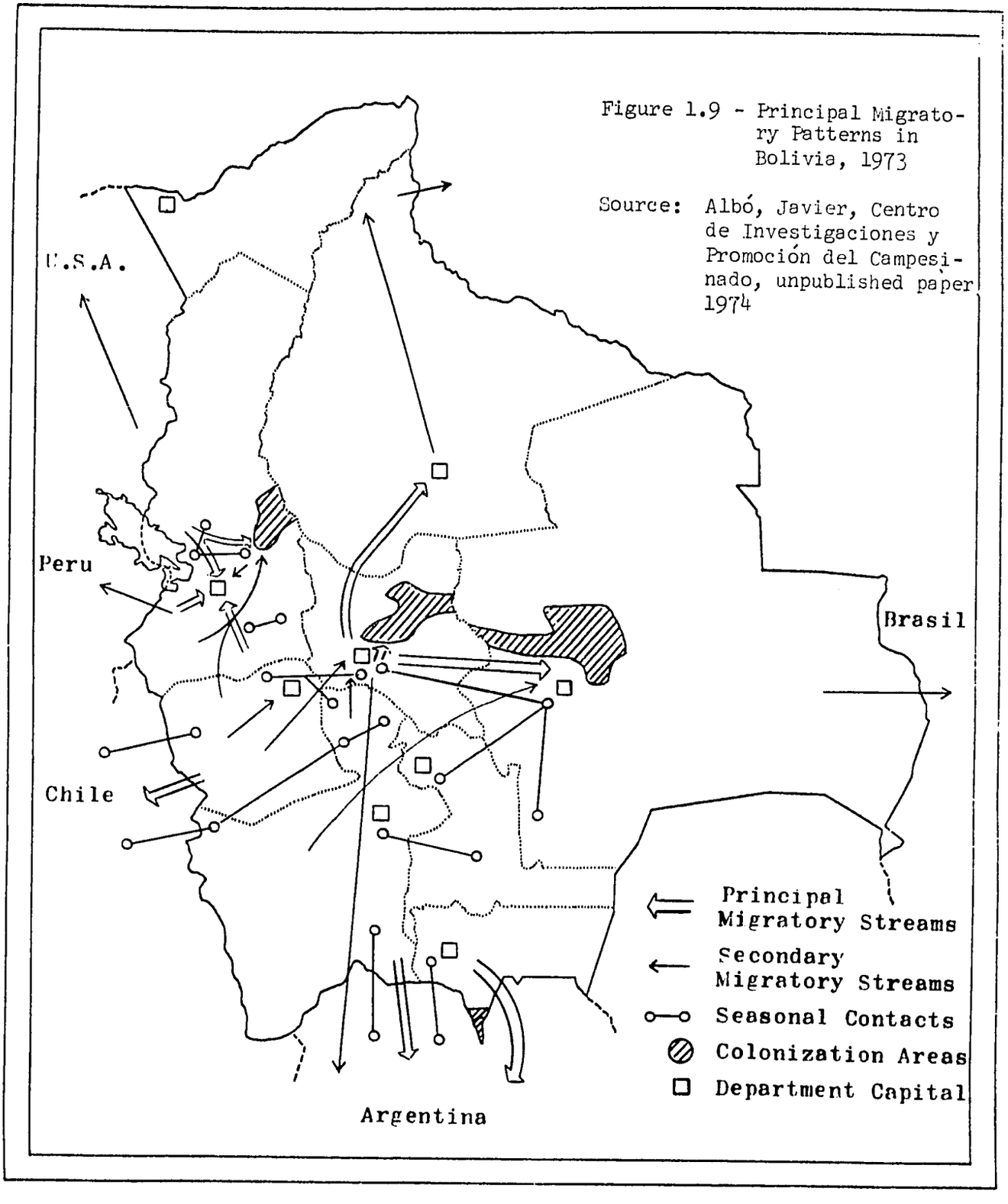


Figure 1.9 - Principal Migratory Patterns in Bolivia, 1973

Source: Albó, Javier, Centro de Investigaciones y Promoción del Campesinado, unpublished paper 1974

It is estimated, that over two-thirds of Bolivia's physicians have left the country. (See Chapter VI.D.). The number of campesinos who annually migrate from the Departments of Tarija, Potosí and Chuquisaca for the harvest in northern Argentina ranges from 10,000 to 30,000, with approximately 65 percent remaining indefinitely in that country.(19,20) One of the oldest migrant streams occurs between the western Provinces of Oruro and the northern coast of Chile. Considerable migration for commercial purposes, including contraband, takes place in this region as well as with Argentina, Peru and Brazil.

Without doubt, the major cause of international migration is economic. This includes the lack of sufficient jobs within Bolivia for professionals as well as skilled workers, low remuneration, and the existence of a large sector of the population which remains outside the money economy. Socio-cultural and political factors, however, also are important. For those that can afford them, superior educational and cultural opportunities exist outside the country. The enhancement of social status also plays a role.

Nomadic traditions, which are oblivious to national boundaries, determine the migrations of the Moratos (Oruro-Chile), forest tribes (Chaco-Argentina, Paraguay and Brazil), and the Callawayas (traveling médicos of the Andean zone).

b. Internal migration

Patterns of internal migration are likewise complex. Both the social and economic freedoms gained with the agrarian reform of 1952 and the development of roads have facilitated this process. The major types of internal migration can be classified as i) commercial, ii) seasonal, iii) urbanization (rural-urban), and iv) colonization (rural-rural). Again, economics is the most important motivating factor. In addition, however, Llano sites three reasons for the rural-urban phenomenon: the concentration of commercial and industrial activities, the concentration of investments and services, and greater educational and cultural opportunitieds.(21)

The major commercial migration occurs along the roads which link Bolivia's principal cities. Activity takes place especially between the cities of La Paz, Cochabamba and Santa Cruz with their respective colonization areas. Similarly there is much air travel between the Beni and La Paz and Cochabamba. The activities are continuous in nature.

Seasonal migration takes three forms. The most important in terms of numbers are the result of the harvests in Santa Cruz and Tarija; these attract a large amount of unskilled labor from the valley

regions between the months of April and October. In 1973 it was reported that 36,000 seasonal workers migrated to Santa Cruz.[22] There are also a significant number who hold and work parcels of land in the lowlands but reside part of time in the highlands. Primarily these patterns are between the northern Altiplano - Yungas/Alto Beni, Cochabamba valleys - Chapare, and to a lesser degree Cochabamba valleys - northern Santa Cruz. The periodic migration of university and high school students comprises the third group.

The growth of urban centers is an increasing phenomenon in Bolivia, though not nearly of the magnitude as seen in other parts of Latin America (e.g., Lima, Rio de Janeiro, Bogotá, etc.). Table 1.10 shows that Santa Cruz is growing at nearly twice the national annual rate of 2.5 percent[23] and Cochabamba and La Paz are increasing over fifty percent faster. Sucre, on the other hand, registers slightly more than half the national rate, which is characteristic of rural areas.

Table 1.10 - Population Growth in the Department Capitals, 1972

City	Annual Growth Rate (per 1000)
Santa Cruz	48.58
Cochabamba	36.19
La Paz	36.09
Trinidad	28.41
Tarija	25.63
Oruro	24.73
Cobija	24.04
Potosí	22.66
Sucre	15.23

Source: Llano S., Luis, Aspectos Demográficos de Bolivia, CENAFA, 1972, p. 42.

Probably the fastest growing locality in Bolivia is Montero, north of Santa Cruz. The hub of the major colonization area, this town of about 25,000 inhabitants has registered an average annual growth rate of over 10 percent over the past ten years, primarily due to the return of dissatisfied colonists to the nearest "urban" area.[24]

The most serious problems of urbanization are found in the rapid growth of marginal areas, particularly around La Paz, Santa Cruz and Cochabamba, to which the local governments have been able to

provide neither social and public services nor adequate sources of employment - thus a paradox, in light of the reasons for migration cited by Llano above. A comparison of population figures for 1968[25] and 1973[26] shows that the percentage of the population living in cities of 100,000 inhabitants or more and those living in communities of less than 2,000 has increased (16.3 to 19.1 and 64.2 to 66.2 respectively); the percentage living in towns of 2,000 to 10,000 and 10,000 to 100,000 inhabitants has decreased (9.9 to 8.5 and 9.6 to 6.2 respectively) over the same five year period.

Colonization activities first began in Bolivia about twenty years ago. They have taken three different forms: i) directed, sponsored by the National Institute of Colonization which, to a limited degree has supplied basic services and infrastructure; ii) spontaneous, settlers who have followed the directed activities to adjacent areas but have not had access to services; and iii) private, composed of foreign immigrants, minorities from Paraguay and Mexico, Japanese, Okinawan and Spanish. Of the major projects, the oldest are the Alto Beni area in La Paz Department and the areas north of Santa Cruz. Later colonization has taken place in the Chapare (Cochabamba) and Bermejo (Tarija) areas. The success of colonization efforts has been varied. Their dual objective has been to reduce population pressures on the Altiplano and in the highland valleys and to develop the agricultural potential of the lowlands; these objectives have not been met substantially thus far. As of 1973, less than five percent of the population was said to be residing in areas of colonization. (See Table 1.11). The provision of adequate backup services and orientation to colonists has been minimal, especially when considered in terms of health protection, technical assistance, marketing facilities and social organization. The changes and adaptations required of colonists are both tremendous and, for the most part, overlooked by sponsors. As a result, it is estimated that from forty[27] to ninety percent[28] of the settlers do not remain long in the colonies. The most successful projects are those carried out by foreign immigrants in Santa Cruz. There has been little interchange, however, between these settlers and their Bolivian neighbors.

3. Family size and housing

The macroanalysis of Bolivia's demographic characteristics presents no severe and generalized problems, such as a population explosion, but offers rather localized problems as to distribution and migrations. The microanalysis at the family level, however, reveals considerable problems, especially regarding a high fertility-infant mortality syndrome, family size and housing. It should be remembered that approximately two-thirds of the population lives in rural areas, without benefit of basic health and other services, and over half the population ekes out a marginal subsistance.

Table 1.11 - Summary of Colonies and Families Settled in Colonization Zones Through June 1973

Zone	Number of Colonies	System	Number of Families	Total Habitants Affected	Origin of Colonists	Estimated Population
Department of La Paz						
Caranavi-Teoponte-Carrasco-Asunta	271	Spontaneous	12,078	120,780	Altiplano	48,312
Alto Beni:						
Area 1 Bella Vista Pto. Linares	1	Directed	550	5,500	Altiplano	2,200
Area 2 Sta. Ana P. Blancos-Remolinos	1	Directed	1,167	14,004	Altiplano	4,672
Area 3 Suapi-Sararia-Mayaya	1	Directed	380	4,560	Altiplano	1,520
Area 4 Suapi-Piquendo-Tieche	57	Spontaneous	1,636	16,360	Altiplano	6,544
Department of Cochabamba						
Chapare	69	Spontaneous	6,462	96,930	Valleys	25,848
Chimoré-Puerto Villarroel	1	Directed	1,308	26,160	Valleys	5,232
Department of Santa Cruz						
Yapacaní-Puerto Grether-Buen Retiro	2	Directed	2,486	124,300	Altiplano & Valleys	9,944
Yapacaní- (Surrounding Areas)	20	Spontaneous	2,136	64,080	Altiplano & Valleys	8,544
(North) Montero-Mineros-4 Ojitos San Pedro	32	Spontaneous	5,513	165,390	Altiplano & Valleys	22,052
Cotoca	1	Directed	48	2,400	Altiplano & Valleys	192
Roboré	24	Spontaneous	1,389	69,450	Plains & Valleys	5,556
Cordillera	35	Spontaneous	2,239	114,450	Plains & Valleys	9,156
San Julian	1	Directed	298	14,900	Plains & Valleys	1,192
Immigrants						
Menonita's Colonies	3	Private	323	44,838	Germany-Russia-Holand	2,887
Okinawa's Colonies (Japanese)	4	Private	700	81,872	Okinawa-Japan	4,658
Empresa Viacambra (Spain)	1	Private		10,000	Spain	
Department of Tarija						
Bermejo-San Telmo	5	Spontaneous	395	4,740	Plains & Valleys	1,580
Uncontrolled Settlements	55	Spontaneous	10,000	100,000	From all the country	40,000
TOTAL	594		49,158	1,080,714		200,089

Source: Instituto Nacional de Colonización, 1974

a. Family size

In 1970 the national Secretariat of Planning reported that the average family size in urban areas was 4.5 and in rural areas 5.5.(29) Based on sample surveys in 1968, Llano found that the average number of live births among females 45-49 years of age ranged from 4.41 to 5.3 for urban areas and from 4.98 to 6.88 for rural areas.(30) This would indicates that half of all the children born die relatively young (See Chapter II). These conditions do not result in extremely large families (on the average) nor in alarming growth rates; however, they do place considerable strain on the family, economically, physically and psychologically. This relationship between high fertility and high infant mortality is direct and self-perpetuating, given (a) the economic aspirations of the family, (b) the lack of a healthful environment and (c) inadequate health services. Parents appear to want a certain number of children, usually 3 or 4, as workers who will contribute to the family income and will assure them security in their old age. Infant and preschool mortality, however, take half the children before they reach the age of five. High fertility rates compensate for these losses, but do so only at great cost.

A series of studies done by Llano in 1968 revealed that birth rates were higher in rural areas than in urban settings and higher in tropical areas than in the Andean zone. (See Table 1.12). Also, there was an inverse relationship between birth rates and levels of education of the mother. (See Table 1.13). Finally, birth rates were lower for Spanish-speaking families than for those speaking indigenous languages. (See Table 1.14). It is considered that these are not direct cause-and-effect relationships. Those factors which lead to high fertility also account for low educational level, especially prevalent in rural areas and among the non-Spanish speaking populations. In sum, they all are indicators of socio-economic status, in this case representing a "syndrome of poverty." (See Section 4. below).

b. Housing

The housing situation in Bolivia is critical, in terms of both quantity and quality. The National Secretariat of Planning reported a deficit of 800,000 housing units in 1970, with three-quarters of this need in rural areas. (See Table 1.15). The majority of houses are of substandard quality. Typical dwellings in the rural areas consist of unplastered adobe walls, thatched roofs (grass on the Altiplano and palm in the tropics), dirt floors and no electricity, water or sewerage connections. These conditions provide natural habitats for insects and other disease vectors. Because of the cold, windows are not common in

Table 1.12 - Number Live Births per Females, 45-49 yrs., 1968*

Department	Urban	Rural
La Paz	4.41	5.45
Cochabamba	4.96	4.98
Santa Cruz	5.30	6.88

Table 1.13 - Average Number of Live Births of Married Interviewees by Level of Education, 1968*

Level of Education	La Paz		Cochabamba		Santa Cruz	
	Urban	Rural	Urban	Rural	Urban	Rural
Total	3.61	4.45	3.95	4.17	3.70	4.06
None	4.72	4.91	6.35	4.60	6.00	5.23
Primary	3.51	3.71	4.39	3.26	3.90	3.77
Secondary	2.64	2.77	3.17	4.00	3.00	5.00
University	2.67	-	2.20	-	3.75	-
Other	2.80	2.73	2.50	4.67	2.20	2.70

Table 1. 14- Average Number of Live Births of Married Interviewees by Principal Language Spoken on the Family, 1968*

Language	La Paz		Cochabamba		Santa Cruz	
	Urban	Rural	Urban	Rural	Urban	Rural
Total	3.61	4.45	3.95	4.17	3.70	4.06
Spanish	3.48	4.28	3.76	3.50	3.72	4.04
Aymara	4.20	4.56	3.00	-	-	6.00
Quechua	-	4.63	5.36	4.25	4.00	4.50
Other	2.00	4.00	5.50	-	1.00	-

*Source: Luis Llano Saavedra, "Aspectos Demográficos de Bolivia", CENAFA, 1972, pp. 31-33.

the highlands. Tropical dwellings are more open, but, due to prohibitive costs, screening is very rare. In larger towns and the marginal areas of major cities, the situation changes very little. In Montero (25,000), for example, over half the dwellings were characteristic of rural areas.(31)

The majority of dwellings consist of one or two rooms, not uncommonly shared with domesticated animals. Crowding therefore is a significant and inevitable result. (See Table 1.15).

Table 1.15 - Housing Factors, Bolivia 1970.*

Zone	Persons per House	Persons per Room	Family Size	Housing Deficit
Urban	4.02	1.5	4.5	200,000
Rural	5.6	2.2	5.5	600,000

* Secretaría Nacional de Planificación

Source: Situación de Salud en Bolivia, Ministry of Health, 1970, Table 10.

Privacy is at a minimum, as are adequate facilities for cooking and recreation. Crowding is also the major factor in the transmission of respiratory disease, e.g., tuberculosis. Furthermore, the reported figures do not take into consideration the social consequences of the extended family (relatives and compadrazgo); the dwelling frequently houses more than just the immediate family, sometimes for extended periods of time.

4. Educational and economic patterns

Health status is closely related to economic status, which in turn depends in part on levels of education. Not only does economic capacity (individually and conjunctively) determine the potential for investments in health services, but human productivity depends in part on the health and educational status of the workers.

a. Educational status

It is estimated that over 60 percent of Bolivia's population is illiterate.(32) As of 1970, over 1.6 million people over 15 years of age cannot read or write.(33) In spite of the fact that between one-fifth and one-third of the national budget goes for educational

purposes,(34) a small percentage of the target population actually benefits. Table 1.16 indicates that less than half of the school age children are registered in school. Many of those are register but never attend. The Education Sector Assessment, for example, estimates that only 37 percent of the children entering first grade finish their primary education and only 18 percent finish high school.(35) The reasons for this are partly economic (the need to work and the relatively high cost of attending school) and partly the failure of the educational system in meeting the practical needs of the population. The situation is much more severe in rural areas than in the cities.

Table 1.16 - Educational Factors - Total Population and Registered in Educational Center by Age Group, 1968

Age Group	Population	Registered	Percent Registered	Not Registered
5 - 14	1,200,500	612,629	51.0	587,871
15 - 19	494,300	122,600	24.8	371,700
20 - 29	761,600	23,736	3.1	737,864

Source: Ministerio de Previsión Social y Salud Pública, "Situación de la Salud en Bolivia", La Paz, 1970, Table 13.

Rural education in Bolivia is in much the same situation as rural health services. In spite of the large numbers of teachers and schools, approximately 14,000 and 7,000 respectively in 1971,(36) the system is not prepared to carry out their required functions. The major problems include insufficient resources, the lack of teaching materials, deficient school facilities, inadequate teacher training, overcentralized and inefficient administration, confused objectives, excessive traditionalism, and inability to overcome language and cultural barriers.(37) Chapter VII analyzes in more depth the role of educational programs in health development.

b. Economic status

The distribution of economic activity and income in Bolivia is extremely inequitable. Table 1.17, 1.18, 1.19 and 1.20 illustrate these aspects. In 1967, only 39.7 percent of the population (1.81 million) were employed. This implied a support ratio of 2.52 people for every worker.(38) In that year, agricultural production accounted for less than one-fourth of the gross domestic product (GDP), but provided livelihood to two-thirds of the population. The annual income for agricultural workers was US$84. The annual income per worker for all other sectors of activity was over the national average of US$224. Industry, which employed 13.5 percent of the labor force with an average annual income of US$629, provided 40 percent of the GDP.

Table 1.17 - Distribution of Gross Domestic Product by Sector of Activity, 1967 and 1971

Sector of Activity	Percent 1967	Percent 1971
Agriculture	24	18.1
Industry		
Manufacturing	12	14.0
Mining	9	10.4
Petroleum	9	3.6[b]
Construction and housing	9	4.0[a]
Energy	1	1.9
Sub-total	40	33.9
Services		
Commerce and Finance	12	14.0
Transportation	8	8.0
Government	9	7.9
Other Services	7	--[c]
Sub-total	36	29.9
Other	--	18.2
Total	100	100.0

[a] Housing included in other

[b] Refining included in manufacturing

[c] Included in other

Source: Adapted from Weil, Thomas E., Area Handbook for Bolivia, U.S. Government Printing Office, Washington, D.C., 1974 p. 277

Table 1.18 - Estimated Size of Labor Force by Sector of Activity, 1967

Sector of Activity	Employment (thousands)	Percent (Including Unemployed	Percent (Excluding Unemployed
Agriculture and related activities	1,205	63.1	66.6
Industry			
Manufacturing	145	7.6	8.0
Mining	49	2.6	2.7
Petroleum	6	0.3	0.3
Construction	40	2.1	2.2
Public Utilities	5	0.3	0.3
Sub-total	245	12.8	13.5
Services			
Commerce and Finance	110	5.8	6.1
Transport and Communications	50	2.7	2.8
Government (Direct Employment)	48	2.5	2.6
Other Services	152	8.0	8.4
Sub-total	360	18.9	19.9
Unemployed	100	5.2	--
Total	1,910	100.0	100.0

Source: Adapted from Ministerio de Planificación y Coordinación, Estrategia Socio Económica del Desarrollo Nacional, 1971 - 1991, La Paz, 1970 p. 507.

As reported in Weil, Thomas E., Area Handbook for Bolivia, U.S. Government Printing Office, Washington, D.C., 1974, p. 71

Table 1.19 - Income Distribution by Sector of Activity, 1967

Sector of Activity	Gross Income[a] ($b)	Employment[b] (thousands)	Annual Income per worker $b.	Annual Income per worker US$.
Agriculture	1,212,000	1,205	1,006	84
Industry				
Manufacturing	755,000	145	5,207	434
Mining and Petroleum	718,000	55	13,054	1,088
Constructing	301,000	40	7,525	627
Public Utilities	76,000	5	15,200	1,267
Sub-total	1,850,000	245	7,551	629
Services				
Commerce and Finance	591,000	110	5,373	448
Transportation	400,000	50	8,000	667
Government and other	801,000	200	4,005	334
Sub-total	1,792,000	360	4,978	415
Total	4,854,000	1,810	2,682	224

[a] Secretaría de Planificación

[b] Plan Nacional de Desarrollo de Recursos Humanos

Source: Ministerio de Previsión Social y Salud Pública, Situación de Salud en Bolivia, 1970, Table 11.

Table 1.20 - Estimated Income Distribution in Bolivia and Latin America

Area	Population (millions)	Percentage Shares of Income		
		Poorest 20%	Middle 60%	Top 20%
Latin America	244.8	4.1	37.9	58.0
Bolivia	5.2	2.5	32.5	65.0

Source: IBRD, "Current Economic Prospects for Bolivia", August, 1972.

Public and private services accounted for 36 percent of the GDP and provided jobs for 19.9 percent of the labor force at an average annual income of US$415. Mining, petroleum and public utilities workers are the highest paid, earning over US$1,000 per year but comprising only 3.3 percent of the labor force.

An analysis of income distribution in Bolivia provides the essence of the "syndrome of poverty" mentioned previously. Almost two-thirds of the wealth is concentrated in the top 20 percent of the population, while 80 percent of the people share only 35 percent of the gross national income. Compounding this maldistribution, five percent of the labor force is unemployed, with the urban rate running a serious 13.2 percent. (See Table 1.21). According to these data, between 300,000 (support ratio = 2.52) and 600,000 (average family size, urban = 4.5, rural = 5.5) people were without sources of income in 1968. These numbers account for between 6.7 and 13.4 percent of the population.

Table 1.21 - Unemployment in Bolivia by Area, 1968.[a]

Zone	Total Population	Population 15-59 yrs.	Unemployment[b]	
			Persons	Percent
Urban	1,216,904	641,000	84,612	13.2
Rural	3,463,496	1,824,400	38,658	2.1
Total	4,680,400	2,465,400	123,270	5.0

a Secretaria Nacional de Planificación.

b Plan Nacional de Desarrollo de los Recursos Humanos.

Source: Situación de Salud en Bolivia, Ministry of Health, 1970, Table 12.

Between the status of this primarily urban sector and the agricultural family which earns US$7 per month, the difference is minimal, except for the higher cost of living in urban areas. Considering that rural families on the average are larger, these two groups together account for over 80 percent of the population.

5. Demography and Health

The demographic characteristics of the country have a direct impact on the health status as well as significant implications regarding health programming. The distribution of the population by age, sex and geography affects the severity of various health problems and thus the demand for health services. Migration patterns present considerable obstacles in terms of program design and the allocation of resources. The low educational levels and ineffectiveness of the education system are serious limitations for health promotion and awareness activities. Economic status and the maldistribution of income directly affect the country's capacity to allocate resources to the health sector

a. Population growth

It is currently estimated that Bolivia's population is increasing at a rate of 2.5 percent per year. This is not alarming in terms of numbers. It is conditioned, however, by a high mortality rate of 19 per 1,000*. (See Chapter II).

Population growth projections are illustrated in Table 1.22 and Figure 1.10. The projection made by the Ministry of Planning (A) assumes no major changes in birth and death rates and estimates populations of about 6.5 million by 1980 and 11.5 million in the year 2,000. The Centro Latinoamericano de Demografía (CELADE) projection (B) is very similar but also considers a negative 1 per 1,000 rate due to external migration, arriving at 6.0 million for 1980 and 11.0 million for the year 2,000.

---

* Based on the mortality and fertility estimates provided in Chapter II, the current estimate for crude death rate is low and the annual growth rate is high. Assuming that i) the crude birth rate of 44/1,000 population is right, ii) the rural infant mortality rate is 200/1,000 live births, iii) the urban infant mortality rate is 100/1,000 live birth, iv) the preschool (1-4) mortality rate is 50/1,000 population, and v) infant and preschools deaths account for half of all deaths, then the crude death rate for Bolivia would be 27/1,000 and not 19/1,000 as reported. The annual growth rate would then be 44 (CBR) less 27 (CDR) less 1 (external migration) or 16/1,000, 1.6% annually. If these assumptions are in fact true, then the present population of Bolivia would be less than 4.5 million and would reach 5.3 million in 1985 and 6.7 million by 2,000.

Table 1.22 - Comparison of Population Growth Projections

Year	A* Ministry of Planning	B* CELADE	C Health Sector Assessment
1950	3,019,000	3,013,000	—
1955	3,389,000	3,322,000	—
1960	3,824,000	3,696,000	—
1965	4,334,000	4,136,000	—
1970	4,931,000	4,658,000	—
1975	5,634,000	5,272,000	5,453,000[a]
1980	6,456,000	6,006,000	6,140,000
1985	7,424,000	6,907,000	6,812,000
1990	8,575,000	8,012,000	7,447,000
1995	9,947,000	9,374,000	8,023,000
2000	11,589,000	11,061,000	8,474,000

A = Assumes slight decline in crude mortality rate; slight decline in crude birth rate; and no effect due to international migration.

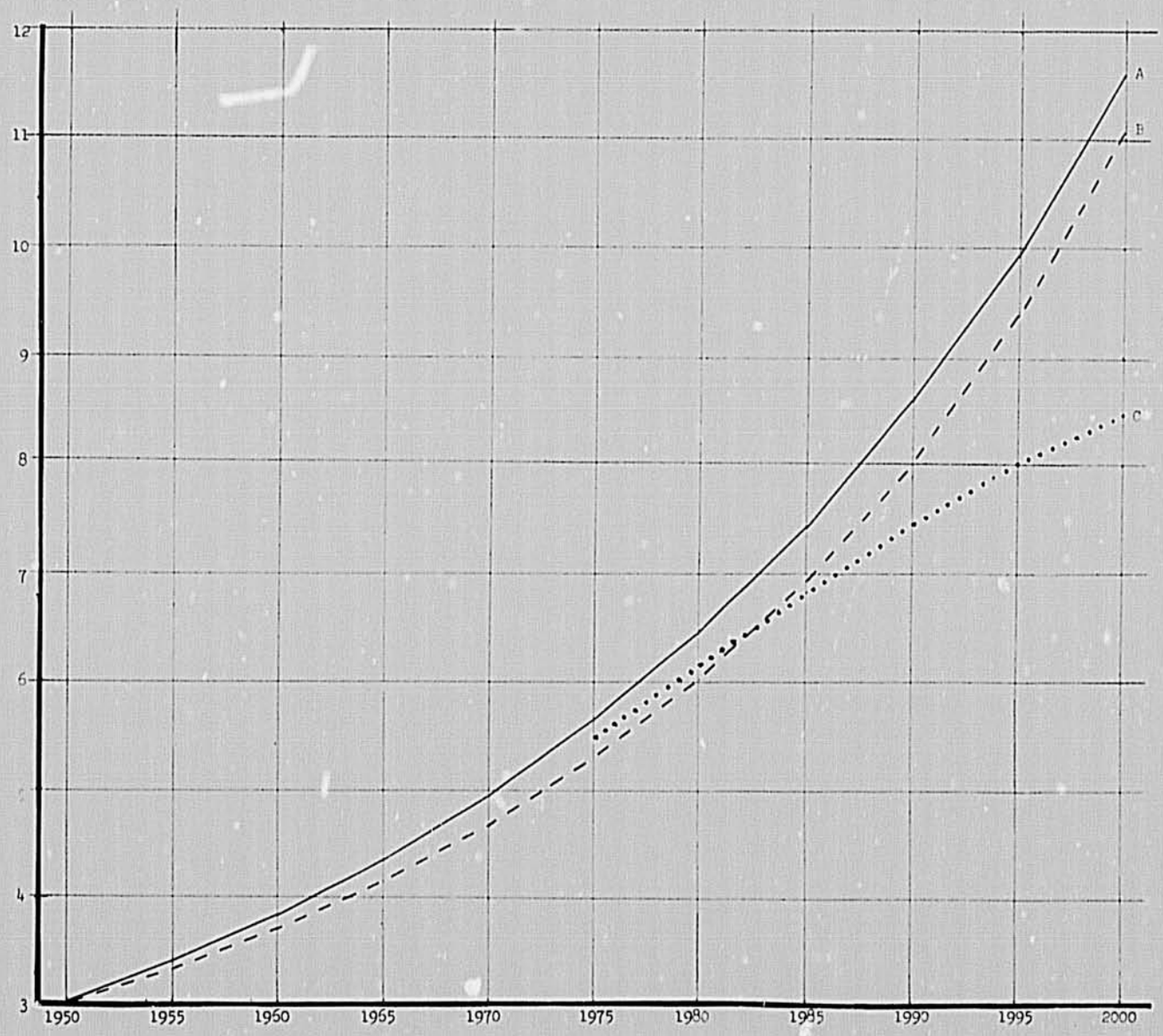
B = Assumes very slight decline in CMR; constant CBR (44/1000); and negative international migration (-1/1000). This pattern coincides with HSA assumption of 50% reduction of infant and preschool mortality every ten years.

C = Assumes "B" plus a 25% reduction in CBR every 10 years.

[a] Average of A and B estimates

*Source: Luis LLano Saavedra, Aspectos Demográficos de Bolivia, CENAFA, 1972

Figure 1.10 - Comparison of Population Growth Projections



Source: Table 2.22

The CELADE projection, however, closely coincides with the Health Sector Assessment's projections which would assume a 50 percent reduction in infant and preschool mortality every ten years. Assuming a 25 percent reduction in the crude birth rate (CBR) every ten years together with the 50 percent reduction in infant and preschool mortality, the Health Sector Assessment estimates populations of about 6 million in 1980 and 8.5 million in 2000. This decrease in CBR could be accomplished through the maternal and child health component of an integrated rural health delivery system. These activities would not begin to take effect until 1985, with the population leveling off around the year 2000.

Inevitably, the current projections have significant consequences, particularly regarding the demand for health and education services. Without drastic measures to reduce infant and preschool mortality, the age distribution of the population would not be significantly altered. Thus by 1985 there would be approximately 3 million children under the age of fifteen as compared to about 2.3 million at present. If present patterns of migration hold, almost two million of these children would be dispersed in rural areas.

b. Population problems: distribution, migration and colonization

Although Bolivia is not currently experiencing a population explosion, there are significant problems related to health in terms of distribution, migration and colonization. In rural areas, the numerical demand for health services is greatest in the Cochabamba valleys and the region around Lake Titicaca. The population density in these areas is more than 50 inhabitants per square kilometer, reaching over 100 in the Provinces of Manco Kapac (Copacabana) in La Paz and Quillacollo and Jordan (Cliza) in Cochabamba. The problem of potential physical accessibility to health services may be reduced in these areas; nevertheless, their highly indigenous populations require special programming considerations. The per capita demand on local resources (particularly land) is also very intense, and reduces the potential for individual contributions for health services.

A similar situation exists in the marginal areas of Bolivia's major cities. The most serious problems are in La Paz and to a lesser degree in Cochabamba. In spite of its rapid growth, Santa Cruz has been spared serious problems to date because of relatively good urban planning, sufficient resources and the extension of water and sewerage systems. The other major cities, however, have not been able to provide their marginal areas with basic public services, including water sewerage and rubbish disposal,

Sources of employment are inadequate, so that in real terms, these are some of the poorest areas in the country. These conditions combine to account for some of the lowest levels of health status, including infant mortality and malnutrition, in the country. In all these areas, the provision of basic health services has not kept pace with the influx of people. It is estimated that well over a half million people currently reside in these marginal areas.

At the other extreme demographically are the lowland and southern Altiplano Provinces with population densities of less than five inhabitants per square kilometer. These Provinces comprise 77 percent of Bolivia's total land area but contain only 16 percent of the population. (See Figure 1.8). Within this enormous extension of land with its diverse ecological characteristics, it is very difficult to design cost/effective health programs to meet the specific needs of the relatively small population. The fact that 60 percent of this population lives in dispersed rural areas (or communities of less than 200 inhabitants), combined with the facts of geographic barriers, inadequate communications and poor transportation systems, it makes very difficult to provide adequate low-cost health coverage to the majority of the sector.

In addition to the urbanization phenomenon, migration in Bolivia affects health coverage in two ways. First, a significant number of health professionals have emigrated to the United States and other more developed countries for educational or economic reasons or have taken positions with such international agencies as the World Health Organization. This emigration signifies a considerable loss not only of professional resources but also of the financial resources spent by the Bolivian government to prepare the Bolivian health professionals whose work benefits other countries.

A second problem with migration refers to difficulties with trying to provide health services to these people, as well as to contain the diseases they may spread. Tuberculosis, for example, is highly prevalent, but latent, on the Altiplano and in the highland valleys. The latent disease becomes very active when highland workers and their families migrate to the tropics; it affects the migrants and, furthermore, has caused high incidences of new cases among the indigenous lowland population. Similarly, malaria control activities in Tarija are hampered by the large number of worker migrating to and from Argentina. In 1971, a severe outbreak of hemorrhagic fever in Cochabamba was caused by persons carrying the disease from the Beni. It is inherently difficult, and at present impossible, to effectively control and provide routine preventive and follow-up care to migrating groups. Vaccination and educational programs are cases in point. On the other hand, the demand for curative medical attention increases tremendously in Santa Cruz during the harvest season, severely straining already limited resources. Hence hospitalization and curative plus follow-up

treatment for migrant people also are almost impossible. Nutrition-related and social adaptations are additional problems for migrating groups.

Colonization efforts face similar problems. The major difference is that colonists are expected to remain in the new areas indefinitely. Adaptation to a new environment, the development of new social patterns, exposure to new diseases, and the adoption of different eating habits present considerable hardships for new colonists. In spite of these problems, systematic orientation programs are almost non-existent. Moreover, very few colonizations projects have been able to provide adequate health and other social services to the population. Other major deficiencies are found in medical screening, vaccinations, health and nutrition education, socio-anthropological planning, and technical and material assistance. With few exceptions, colonists have been left to fend for themselves, extremely susceptible to disease and with almost no access to medical attention. It is no wonder that many become disillusioned and leave the colonies. Recent colonization programs directed by the United Churches Committee in the Department of Santa Cruz have come a long way in rectifying some of these deficiencies though on a limited scale.

c. Population problems: family health

Without a doubt, the most serious population problem in Bolivia occurs at the family level. It is here that the "syndrome of poverty" takes its greatest toll. The problematic interrelationship between high infant mortality and high fertility rates is compounded by low educational levels and inadequate financial resources. High levels of infant and preschool mortality imply high incidences of sickness; these not only require direct expenditures but also consume the time and energy of those of working age. Multiple pregnancies, in addition, are physically debilitating and take the mother out of the labor force. Unwanted children are not uncommon. To avoid them, many women revert to abortion, which is usually accomplished under unsanitary conditions with predictable adverse consequences. It is evident that any attempt to lower infant mortality rates should be accompanied by acceptable family planning options and vice versa.

Two problems closely related to the health status of the family are the high level of illiteracy and the maldistribution of income. Illiteracy has a direct impact on the learning capacity of individuals, regarding health education. Low school attendance rates and other deficiencies greatly limit the potential of the education system for forming appropriate health attitudes and habits in youngsters. Over the long run, these conditions directly affect the earning power of the family and the capacity to improve its standard of living. The current

maldistribution of income is but evidence of this fact. The existence of limited resources for the majority of the population is reflected in poor housing and eating habits and in the inability to accumulate capital for investment purposes. The poor nutrition of the population is a product of deficient educational and economic resources and, conversely, improved nutrition is a prerequisite for accelerated development in social educational and economic spheres.

D. Socio-Cultural Characteristics

1. Ethnic groups and languages

Bolivia is a multi-cultural country. Various indigenous Indian groups constitute an estimated one-half to two-thirds of the population.(40) Linguistically and culturally, moreover, they are very diverse groups. It is estimated, for example, that fewer than 75,000 forest Indians are divided among more than 30 lowland tribes.(41) The other major ethnic origin of the Bolivian people are the white Spanish speakers, who comprise between 10 and 15 percent of the population.(42) The remainder of the population is mestizo. Due to increasing geographic mobility it is difficult to determine precise ethnic boundaries. General areas of influence, however, are illustrated in Figure 1.11. In many cases, increasing geographic and social mobility has caused a worsening of inter-ethnic relations. The concept of race has come to have more of a socio-cultural and economic connotation than the purely biological one. In effect, it is no longer possible to describe Bolivia as having three distinct geo-cultural regions, i.e., Altiplano, valleys and Oriente, especially in terms of generalized social planning.

a. Indigenous Indian groups

The largest Indian populations consist of the Aymara and the speakers of the Quechua language. The Aymara are the oldest groups, dating back to pre-Inca times. Their present numbers range from 750,000 to one million, with about 90 percent residing in the Department of La Paz(43) mostly in the northern Altiplano region. Historically the Aymara communities were self-sufficient, non-cash-oriented societies in which the basic social unit was the nuclear family. Strong extended family and ritual kinship ties contributed to social cohesion, but there was little intracommunity solidarity or mutual aid beyond this. In fact, although each community had a high degree of internal integration, few were truly communal insofar as mutual aid was concerned. Socialization and religious practices, which were a synthesis of Roman Catholic and ancient Indian beliefs, were closely tied to land cultivation. During the Spanish conquest, the Aymara were reduced to the lowest levels of a feudalistic organization. The outward character of the Aymara is seen as the result of five centuries of exploitation by successive waves of

1. Uru-Morato
2. Chipaya
3. Mosetén
4. Mosetén
5. Leco
6. Tacana
7. Chama
8. Araona
9. Chacobo
10. Moré
11. Cavina
12. Reyesano
13. Chimane
14. Mobima
15. Ignaciano
16. Trinitario
17. Sirionó
18. Baure
19. Itonama
20. Jorá
21. Pauserna
22. Guarayo
23. Yuracaré
24. Chiquitano
25. Ayoré
26. Yanaygua
27. Chiriguano
28. Mataco
29. Tapiete
30. Es-seeja

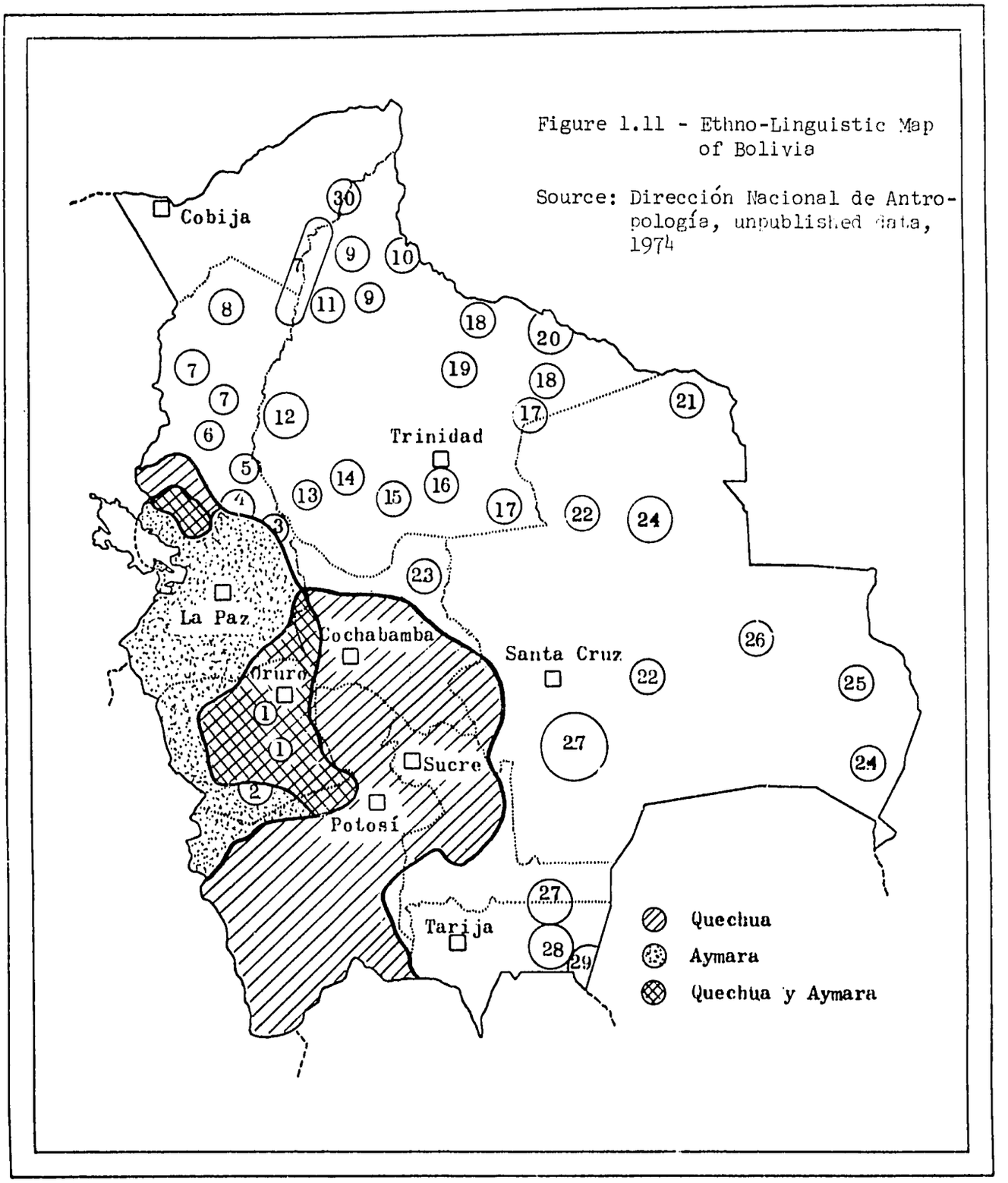


Figure 1.11 - Ethno-Linguistic Map of Bolivia

Source: Dirección Nacional de Antropología, unpublished data, 1974

Inca, Spanish and mestizo overlords. Their closed and hostile attitude toward outsiders has not been found within the communities themselves.

The social impact of the Revolution of 1952 has to some extent replaced mistrust and xenophobia with more openness, self-esteem and status mobility. The Aymara have become more nationally integrated through greater political activity, participation in the sindicatos campesinos and the acceptance of education and the Spanish language. On the other hand, the agrarian reform has done little to break traditional land tenure patterns and to modify the stratification system within the communities. Indigenous communities have become more stable and self-sufficient because of land ownership. The social order has remained reinforced through internal cohesiveness and social criticism of innovation and deviance.

Quechua speakers are the direct descendents of the Incas. They comprise the largest indigenous language group in Bolivia. There are over one million speakers of Quechua in the country; less than half of these speak Spanish. They are composed of many ethnic groups with tremendous geographic, cultural and regional dialect differences. The Quechuas are found throughout the Altiplano and highland valleys of central and southern Bolivia. Their communities are overwhelmingly rural and land is the most vital commodity. As with the Aymara, the basic social unit is the nuclear family, which has been reinforced through extended and ritual kinship ties. Gross mistreatment and exploitation of the Indian populations did not occur in the valleys and southern Bolivia to the extent that it did in the northern Altiplano. The Quechuas of the Cochabamba valleys therefore achieved a degree of integration with the whites and mestizos. On the other hand, those of Chuquisaca and southern Bolivia always were extremely isolated by geography, the lack of transportation and the settlement patterns of the white landlords who remained in the cities; therefore, they became neither integrated nor closed and hostile.

The impact of the agrarian reform upon the Quechua varies considerably between Cochabamba and southern Bolivia. For the most part, the southern regions had an experience based on the intact transfer of lands following the hacienda land tenure patterns, very similar to that among the Aymara. In general, the Indians did not receive title to the land and preexisting inequalities continued. The agrarian reform actually underscored local introversion and self-reliance. Local sindicatos have proven very weak in Chuquisaca and Tarija. In Cochabamba, however, the opposite was true. Because of a relatively fluid social structure, a weak hacienda system and the formation of pre-reform sindicatos.

Cochabamba precipitated the agrarian reform. The Cochabamba area, now characterized by internal flux, social change and a high

degree of politization, is the only area in which the hacienda tradition has not been dominant in the maintenance of social patterns. The sindicatos have been strong and viable, social homogenization between Quechua and mestizo has been accelerated, and literacy and bilingualism is more widespread.

Several smaller ethnic groups of the highlands have survived to the present, but are rapidly becoming extinct. These are the Uru and Chipaya in the Department of Oruro, both speakers of Puquina, and the Callahuaya, who reside in the Province of Saavedra (La Paz). The Uru and the Chipaya historically have lived on the fringes of the Aymara population in the driest and least hospitable portion of the Altiplano. They practice some agriculture, but trading with the Aymara and northern provinces of Chile has been their primary means of subsistence. The Uru were hunted by the pre-Inca Aymara for use in human sacrifice.

The Callahuaya are famous as the travelling curanderos of the Andean region. Historically they are a sub-tribe of the Aymara but consider themselves to be ethnically distinct. They are supposed to have been the court physicians to the Incas and the Callahuaya language may have been the secret language of the royal Inca family. Some members of this group at present speak four languages: Callahuaya, Quechua, Aymara and Spanish. The Callahuaya continue to practice their aboriginal folk medicine, and retain their customs, language and prestigious position despite the advent of modern medicine. Their known herbal remedies number in the thousands and are prepared from plants of both the highlands and the Oriente. The wandering Callahuayas regularly travel the length of the Andes mountains and have been reported to have been as far north as the United States and as far south as Buenos Aires. Their exact numbers are unknown.

The indigenous peoples of Bolivia's eastern lowlands are of extreme linguistic and cultural diversity. At present there are probably fewer than 75,000 forest Indians grouped into more than 30 tribes. They speak distinct dialects which are classified into four identifiable linguistic groups - Panoan, Tacanan, Mojoan (or Arawakan), Guaranian - and one additional unrelated group. The lowland Indians never reached the high levels of technology or sociopolitical organization of their highland counterparts, and at present they have very little contact with the twentieth century. Some of the tribes are sedentary farmers, e.g., the Chiriguano (15,000) of southern Santa Cruz and Tarija, but most are nomadic hunters and gatherers.

b. White and mestizo groups

The white, predominantly Spanish population has always

held the position of an elite and privileged minority. During colonial times, they were the wealthy overlords. At present, it is they who have greatest access to education, lucrative jobs and positions of influence. Although blancos claim descendancy from the original Spanish settlers or later European immigrants, there are few who have no Indian ancestry, especially in the highlands. The blancos of eastern Bolivian are largely of European extraction who came via Paraguay and Argentina and did not intermarry significantly with the indigenous peoples. Blanco status is defined by socio-economic and cultural boundaries rather than by strictly racial criteria. It implies not only wealth, but a European life style, culture and education, and Spanish as the mother tongue.

Since 1952, the society has been in a state of flux which has shaken the traditional basis of white supremacy. Some regions have remained relatively isolated and traditional. Other areas have witnessed increasing fragmentation and confusion of racial stereotypes. Blanco characteristics are still prestigious, but upper-class occupation, wealth, life style, and education are no longer monopolized by whites. Increasing racial tension in certain areas has often been the result of the fluctuation of racial boundaries and in part the bitterness of former patrones.

Mestizos,* comprising up to one-third of the population,(44) geographically constitute the most widely distributed and pervasive of all ethnic groups. Economically and socially their position in Bolivian society is equivocal. In part, the social ambiguity and lack of solidarity within this group stems from the rigid two-class systems of pre-reform days. The Revolution of 1952 broke down some class barriers and opened doors to education and a higher standard of living; but it also increased confusion and animosity between sectors. The mestizo is highly urban-oriented and comprises the bulk of the burgeoning middle class. Traditionally, mestizos have filled middlemen positions and occupations such as clerks, merchants, hacienda overseers, government officials, teachers and transportistas. Spanish is the predominant language of the mestizos, though many are fluent in one or more indian tongues. In their position as cultural go-between, mestizos have managed to introduce and incorporate many features of the indigenous cultures into the national life. The use of Indian folk religion, magic and curing techniques is very prevalent in the highland cities, particularly in the marginal areas.

---

* Mixture of Indian and Spanish descent.

2. Several aspects of social organization

a. The role of women

Women have varying and diverse roles which are primarily associated with socio-economic status. Some changes are beginning to take place, especially among younger women; nevertheless, traditional roles and expectations are still predominant and significantly effect health practices. Upper class women are expected to be the antithesis of male machismo: genteel and ornamental, emphasizing the qualities of passivity, modesty, sacrifice and maternal nature. Since the Revolution, more upper class women are becoming educated as professionals and participate in the national life. In the Oriente, the mayors of Trinidad and Riberalta are women. Lately, these women have demonstrated a genuine concern and dynamic vitality for innovative social action.

Among the middle class, women have maintained their identity more than men. It is they, however, who more often than not control the family purse strings. The cholas* are aggressive and self-assured businesswomen who possess formidable business acumen. They often form unions and strongly exhort education for their children. The role of campesino** women, on the other hand, is clearly subordinate to that of men. Paradoxically, however, within the household the female is generally predominant. Women share in the heaviest labor and often manage the family finances. They are charged with raising the children, but daughters are rarely given the educational opportunities extended to sons. The grandmother is often the predominant figure in the household in terms of health care, and she usual resists the adoption of more modern medical techniques. Some progress has recently been made with the formation of mothers' clubs, used as a vehicle to promote better health and educational facilities, for daughters as well as sons, and general equal participation with men.

b. The effects of the agrarian reform

Socially, the liberation from forced servitude led to a reorganization of social patterns. The campesino was virtually left to fend for himself. Together with the lack of effective government programs to facilitate the transition, the effect was an increasing tendency toward self-dependency and individualism.

---

* Indians who have moved to the urban centers but retain, in varying degrees, their rural customs and dress - cholo (m)

** Indian peseant farmer.

The response has been varied: some campesinos dedicated themselves to working their small plots of land as best they could, with different degrees of success; others sought renewed "security" through employment as unskilled laborers with other land owners, many times under conditions similar to those from which he had recently been "liberated"; still others who couldn't cope with the change sought an escape from reality through such mechanisms as alcohol and vagrancy; finally, a small group has taken advantage of the newly created political vacuum to become funcionaries of agrarian syndicates. In conclusion, however, one can say that "liberation" has merely meant in many cases a transfer from social servitude to an economic servitude. To date, the campesino remains predominately illiterate and still outside the mainstream of national economic and social life. The one exception has been social mobility gained through service in the armed forces.

c. The role of agrarian syndicates

The growth of agrarian syndicates has been a mixed blessing for the campesino. On the one hand, the sindicatos have provided a certain solidarity among its members and a means of expression for social and economic problems. Many campesino leaders have been, at least in part, well-intentioned and relatively effective in securing some benefits for their constituents. At times, however, they have taken advantage of the campesinos' ignorance to obtain political and even personal gain. In other words, the intermediary (syndicate leader) has complicated the dynamic two-way process that was meant to exist between this majority sector and the powers that be.

Nevertheless, agrarian syndicates have succeeded in constructing many schools, secondary roads, health posts (which remain unequipped and without personnel) and some cases the formation of entirely new rural villages, many times without outside assistance. These accomplishments indicate not only attitudes towards felt priorities but also signs of changes in traditional thinking and the potential of syndicates for effective community organization on social issues. Perhaps one of the most significant results of agrarian reform in Bolivia will be the anticipated redistribution of opportunities, still unrealized in practice, but a potential nevertheless.

3. Indigenous health practices

In Bolivia, almost nobody is without access to some kind of health services. While "modern" medicine reaches only about 40 percent of the population, a wide range of traditional health practitioners and remedies are available to the indigenous peoples. They range from household and herbal remedies for minor aflictions to magical-religious treatments for diseases which are seen to stem from supernatural causes. On

the whole, these remedies have withstood the test of time. However, although many afflictions can be "explained" in traditional terms, continued high morbidity and mortality rates in indigenous areas put the effectiveness of many traditional remedies in doubt. Western medicine indeed has much to offer. The real challenge is how to bridge the gap, i.e., to introduce new "western" practices and yet to respect cultural beliefs, hence not to upset related aspects of traditional life.

a. The Rural Andean region

Among ethnic groups of the Andean region, health it seen as the normal balance in the relationships among the individual, his neighbors, the environment and the spirits. Disease results when these relationships become imbalanced. Treatment, therefore, must be specifically related to the affliction in question. The Aymara and Quechua resort to a whole series of specialized practitioners, including curanderos, parteros, (male and female midwives) herbists, divinists, brujos, (witch doctors) and modern physicians, depending on the nature of the illness. Indigenous medicine in general is a mixture of magical-religious beliefs, the result of acculturation, that blend ancient folk practices with the medieval medicine brought by the Spanish conquerers.(45) An extensive knowledge of herb medicine and psychology are very important atributes to its "success".

Within their cosmic view of health and disease, these indigenous groups suscribe to theories of hot and cold. These characteristics apply mainly to food, drink and herbs and have little to do with temperature. Basically, too much of a certain item is unhealthy and the remedy is to apply food or medication of the opposite characteristic to restore health.(46) Many diseases are explained in terms of metaphysical relationships. Among the Aymara, for example, there exists three categories of spirits or almas which complement the physical constitution of the individual.(47) The jacha ajayu leaves the body only upon death; the jiska ajayu leaves the body as a result of accident, disease, fright or witchcraft; and the ánimo or coraje is a spiritual force which at times is identified with shadows and which leaves the body during sleep. Imbalances are restored through a variety of psychomagical therapies. Malnutrition, for example, is often associated with susto (fright) and is therefore difficult to treat with the ingestion of food or the elimination of parasites alone. The challenges to modern medicine are formidable.

b. Urban folk medicine

Urban folk medicine is a curious mixture of indigenous practices and modern medicine. Its perpetuation is attributed to the following reasons: 1) the high cost of modern treatments; ii) the

perceived ineffectiveness of modern practices; and iii) the presence of diseases of supernatural causes.(48) It is sustained by the urban centered mestizo population and the rural-urban migratory process. Special markets exist in all highland cities, especially in La Paz, for these medical purposes.

c. The eastern lowlands

Little is known about the health practices of the forest Indians. Suffice to say that, as in the Andean Groups, health practices exist and are interwoven with all facets of tribal life. Specific information has been obtained regarding fertility, anticonception and abortion practices(49) in isolated instances. More important, however, are the practices of the lowland campesinos. In general, these people are much more open to modern medicine than their highland counterparts. Partly this is due to the lack of a strong ethnic culture. Lowland campesinos (cambas) are primarily of Spanish ancestry and therefore rely on western (European) traditions. Low economic status has forced the campesinos to rely on home remedies almost entirely. The use of parteros and sanitarios (local practitioners who employ modern drugs) is widespread. Herbal medicine is commonly used for minor ailments and even for fractures. Some curanderos also exist in areas colonized by highland immigrants. These groups have brought some of their ethnic practices with them to the new settlements, but the mere fact that they have left their traditional lands implies an openness to new ways of life, including the acceptance of modern medicine where available.

E. Consumer and Provider Attitudes towards Health and Health Programs

1. Health development and behavioral change

The health status of a population is to a great degree determined by individual attitudes toward "accepted" health practices. Other determinants are the existence of public sanitary services (e.g., potable water supply and sewerage systems) and the availability of personal economic resources to pay for goods and services. Attitudes, however, are the primary determinants of personal hygiene practices and the degree of utilization of preventive and curative services. Furthermore, consumer attitudes determine not only current behavioral patterns, but also the effectiveness of any new health programs.

In general, Bolivian health planners concentrate first on the availability of health services. This is expressed in plans for more hospitals, health posts, vaccination campaigns, etc., which is for the most part, the extent of the public sector programs. The problem of ineffective utilization of facilities when addressed, is blamed on the lack of education of the general population. The few

existing activities designed to "educate" the public, however, are limited to the dissemination of knowledge; and little effort is made to determine if this knowledge actually reaches and is assimilated by the intended population groups; let alone if attitudes towards health are changed and desired behavioral patterns are achieved.

It is doubtful that existing "education" activities are effective. The cause and effect relationship between agent and disease, let alone contributing factors and the role of medical interventions (i.e. treatments, vaccinations, etc.), as expressed in modern medical terminology are difficult concepts to comprehend, even for the literate. The problem is compounded by the fact that over 60 percent of the population is illiterate,(50) and that traditional rate-learning methods probably are not adequate in changing health habits and practices. As important is the fact that the Bolivian campesino, who makes up at least two-thirds of the total population and is affected by serious health problems, is very conservative and resistent to change. For the most part he lives a marginal and precarious life. The majority being subsistence farmers who have established a delicate balance between survival and extinction, based on traditional and tested ways. A lost harvest or a bankrupt cooperative could very well mean the life of a child. The campesino's habits and cultural traditions reflect, and satisfy, his needs. He will change only when a pragmatic example shows him that the desired change will almost certainly improve his or her family's life - or at the least will not imperil it.

As will be shown in Chapter V, the major cause of low utilization of health services in Bolivia is a lack of confidence by the consumer coupled with the prevalence of financial, psychological, cultural and physical barriers. Not the least of these barriers is the attitudes of the providers of the services.

Health programs in Bolivia are developed and implemented from the top down. Little consideration is given to the expressed needs and problems as viewed by the consumers. This practice results in professional-oriented programs which may have little bearing on the real situation and the community level. Community participation and support are therefore stifled from the start.

The "education" of providers, towards the development of appropriate attitudes and behavioral patterns, is a vital and perhaps more difficult task in attaining adequate service utilization. Given that majority of common illnesses will pass by themselves(51), a factor which supports traditional practices, and deficiencies of current medical practice in Bolivia, i.e., inadequate diagnosis and treatments, it is small wonder that the campesino does not want to pay cash or lose work time for questionable "benefits", which are often degrading in the process.

2. Selected attitudinal studies

Very few studies have been done in Bolivia to identify attitudes towards health. What we do know has come primarily through the subjective observations of health practices and behavior in isolated instances. Several attempts, however, have been made to determine attitudes on a scientific basis in local areas.

a. The relative importance of health to consumers

Between 1965 and 1970 the Montero Community Health Project undertook a series of three socio-demographic studies in the community of Montero, Department of Santa Cruz.[52] These surveys were conducted on a house-to-house basis with over 90 percent response being obtained. One series of questions asked the head of household to identify the priority needs of his or her family and of the community as a whole.

In terms of family felt needs, education and health ranked fifth and sixth respectively in 1965, with approximately eight percent and six percent of the interviewees responding that these were family priorities. Over 50 percent of the respondents identified jobs as their first concern. The community priorities were paved streets and sewerage systems. Sources of work was third, with health again near the bottom of the list. In 1966, the results were very much the same. Health, however, surpassed education as a family need, obtaining 12 percent of the vote while climbing to fourth place. Jobs remained the first priority with over 40 percent of the respondents.

Upon analysis it was apparent that current issues before the community influenced perceptions of priority needs. Without a doubt, concern for improving economic conditions was very prevalent. With a population growth rate calculated at 15 to 18 percent per year, the availability of jobs was a pressing problem. Also at the time of the surveys, local institutions were heavily promoting street and sewerage projects. The response towards health needs was considered to be a latent one. Significant utilization of subsequent health services which were established over the following years, as well as effective community participation in local health committies, was considered to be more of an indicator of this felt need. The intensive community effort in health program development was also thought to account for the relative increase of the health priority in the 1966 survey.

b. Provider attitudes regarding health services

As part of the health sector assessment a questionnaire was designed by consultant Dr. Robert LeBow and Dr. Alberto Jumiel of

of the Humanitarian Assistance Division to obtain basic information regarding private medical practice in Bolivia.(53) The questionaire was sent to 313 physicians throughout the country, with a total of 101 (30.9) percent) responding. The responses did not contradict previous qualitative observations nor commonly held impressions. While almost two-thirds of the respondents felt that their medical education did not meet the needs of Bolivia, only 26 percent mention the lack of adequate practical training as a negative factor. Furthermore, only 19 percent mentioned public health as an area needing improvement. Either public health was not recognized as a need or they saw no connection between it and the physician's role. Supporting the latter is the fact that 71 percent of the respondents indicated their interest in training auxiliary personnel. In addition 89 percent considered themselves specialists, while only 15 percent of these listed public health as their field of specialization.

While only seven percent of the respondents supported themselves entirely by private practice, 84 percent had at least some private clientel. This is probably due to economic reasons (low government salaries), but also the relatively low status of public health is thought to be a factor. On the other hand, most of the physicians interviewed indicated a measure of social concern in that they treat non-paying patients, claiming that an average of 50 percent of their clientel do not pay.

Finally, three-fourths of the respondents had spent more than six months working at some time in rural areas. This was probably a result of the required año de provincia. When asked what they thought should be done to improve rural health service their responses included: a reorientation towards rural programs, including more health education (25.7 percent); better working conditions, including facilities and higher salaries (10.9 percent); and an extention of rural services, including more facilities and equipment (9.9 percent).

3. Family planning

Family planning in Bolivia is still a controversial issue. On the one hand are the attitudes of Bolivian economic planners, which heavily favor an increased labor force, and an increased population density, and the position of the Catholic Church. Indeed, one of the principle reasons given by the then Government of Bolivia for the expulsion of the Peace Corps in 1971 was its alleged involvement in family planning activities. This action was strongly supported by labor unions. On the other hand, after a recent seminar on population and work sponsored by CEMAFA (December 1973, Coroico), and in a different political climate, the leaders of twelve labor and campesino organizations strongly endorsed family planning, calling for more seminars for workers and

their wives and the provision of family planning services to the working class.

There are strong indications that family planning services are desired by the general population. First, Luis Llano, Bolivia's leading demographer, has reported several studies which indicate consumer attitudes and behavior towards family planning in Bolivia.(54) These surveys were carried out in the urban areas of La Paz, Cochabamba and Santa Cruz. In 1968, the Center for Population Studies sampled 1,225 housewives and found that over 60 percent did not want to increase the size of their families, while more than 65 percent were predisposed to the use of birth control methods. In a later survey by CENAFA in 1970, however, only 22 percent of the 2,570 interviewees actually used such methods. This suggests a latent demand for such services which are presently unavailable.

Second, the high rate of induced abortions in Bolivia. While no comprehensive studies have been done in this area, it has been reported that approximately 60 percent of all gynecological admissions in the general hospital in La Paz in 1968 were due to complications of induced abortions. It is also known that a significant number of physicians in each of Bolivia's major cities devote a good deal of their private practice to this service. Third, is the sale of birth control pills and other devices in private drug stores. The conclusions that may be drawn are that there is a significant desire to limit family size; that one of the principle methods currently employed is abortion; and that birth control is apparently condoned for those who have the money to pay for the goods and/or services used.

4. Community Organization and Health Development

One good indicator of consumer attitudes toward health is the degree to which communities organize themselves to promote health issues and support local health services. The formation of community health organizations is a behavioral response which can be measured quantitatively and which indicates a degree of knowledge about health problems and appropriate attitudes regarding their solution. In spite of little promotion of such activities from national agencies, Bolivia has significant experience at the local level.

As was suggested above, rural inhabitants and to some degree urban marginal dwellers have persisted in utilizing traditional health services and practices. The lack of confidence in "modern" services as well as the perceived (magical-religious) and real (e.g. herb medicine) effectiveness of traditional ways, especially in avoiding cultural deterents, were cited as reasons. Traditional practices, however, also include systems of mutual cooperation, particularly among the Andean

populations. At the local level these include aynis, mink'as and satak' as* by which social prestige is acquired on the basis of voluntary work for community activities. Many valley and Altiplano communities also sanction local vocales, members who represent community interests in such areas as health, education, roads, and farming.(55)

A number of contemporary organizationed structures have also developed in response to health problems. The initiative for these community groups has come from a variety of sources: local professionals (doctors, nurses, school teachers, etc.), religious leaders, spontaneous action by concerned individuals and rarely as a result of government programs. Their purposes are likewise varied and, for the most part, quite specific. The organizations directly involved in health include mothers' clubs, pro-health post and pro-health committees, community development project committees (NCDS), and drug cooperatives. Other community organizations which may be related to or have the potential to become involved in health promotion activities are the Juntas Vecinales, Padres de Familia (schools), consumer and credit and loan cooperatives, other community development project committees (schools, roads, etc.), religious groups, social clubs and of course, the agrarian syndicates.

The main point to be recognized is that there is a significant local experience, based on attitudes which support community cooperation as a means of solving common problems. While regional and cultural variations are of course apparent, the practice is wide-spread. Some form of organization can be found in practically all communities. Not all may be applicable to the development of health programs, but at least there is the potential. Finally, the test of time has proved in general their effectiveness, within the context of limited outside resources and political constraints.

---

* Aymara meaning family, neighborhood, and community cooperation.

Annex 1.1 - Estimated Population, Area and Density by Department and Provinces, 1973.

Summary	Population[a]	Area (Km^2)[b]	Density
Total Republic	5,330,700	1,098,521	4.85
Total Capital Cities	1,198,490	144	8,322.85
Total Provinces	4,132,210	1,098,377	3.76

Department: La Paz			
Total Department	1,722,300	133,925	12.86
Capital City	605,200	51	11,866.67
Total Provinces	1,117,100	133,874	8.34
Murillo	44,620	4,594	9.71
Omasuyos	115,370	2,065	55.87
Pacajes	106,760	12,560	8.50
Camacho	120,370	2,080	57.87
Muñecas	38,370	4,965	7.73
Larecaja	58,270	8,110	7.18
Franz Tamayo	25,960	15,900	1.63
Ingavi	117,460	5,410	21.71
Loayza	52,070	3,370	15.45
Inquisivi	89,050	6,430	13.85
Sud Yungas	45,560	5,770	7.90
Los Andes	91,080	1,658	54.93
Aroma	85,170	4,510	18.88
Nor Yungas	36,800	5,120	7.19
Iturralde	7,990	42,815	0.91
B. Saavedra	19,000	2,525	7.52
Manco Kapac	39,390	367	107.33
G. Villarroel	23,810	1,935	12.30
Lago Titicaca	---	3,690	---

Department: Chuquisaca			
Total Department	483,600	51,524	9.39
Capital City	54,020	8	6,752.50
Total Provinces	429,580	51,516	8.34
Oropeza	59,740	3,935	15.18
Azurduy	29,860	4,185	7.14
Zudañez	44,390	3,738	11.88
Mendoza	47,140	3,947	11.94
H. Siles	26,160	5,473	4.78
Yamparaez	36,240	1,472	24.62
Nor Cinti	103,300	7,983	12.94
P. Boeto	16,510	2,000	8.26
Sud Cinti	37,950	5,484	6.92
Luis Calvo	28,270	13,299	2.13

Department: Oruro			
Total Department	359,000	53,588	6.70
Capital City	106,590	19	10,659.00
Total Provinces	252,410	53,578	4.71
Cercado	46,420	6,112	7.59
Abaroa	52,150	5,987	8.71
Carangas	40,700	9,878	4.12
Sajama	19,200	7,277	2.65
Litoral	4,430	2,894	1.53
Poopó	26,500	3,061	8.66
Dalence	28,250	1,210	23.35
L. Cabrera	15,950	8,818	1.81
Atahuallpa	6,770	6,670	1.01
Saucari	11,980	1,671	7.17

Department: Potosí			
Total Department	855,400	118,218	7.24
Capital City	73,840	7	10,548.57
Total Provinces	781,560	118,211	6.61
Charcas	47,040	2,964	15.87
Nor Chichas	79,010	8,979	9.80
A. Ibañez	36,550	2,170	16.84
Sud Chichas	66,250	8,516	7.78
Linares	77,540	5,136	15.10
Quijarro	62,870	14,890	4.22
Bilbao	15,400	640	24.06
D. Campos	7,700	12,106	0.64
M. Omiste	28,360	2,260	12.55
Nor Lípez	11,720	23,146	0.51
Sud Lípez	4,870	22,355	0.22

Department: Cochabamba	Population[a]	Area (Km^2)[b]	Density
Total Department	862,600	55,631	15.51
Capital City	169,930	36	4,720.28
Total Provinces	692,670	55,595	12.46
Cercado	---	355	---
Campero	40,270	5,550	7.26
Ayopaya	72,350	9,620	7.52
E. Arce	50,850	1,245	40.84
Arani	49,190	2,245	21.91
Arque	47,430	1,490	31.83
Capinota	38,710	1,495	52.89
G. Jordán	40,470	305	132.69
Quillacollo	93,850	720	130.35
Chapare	73,740	12,445	5.93
Tapacarí	33,830	1,500	22.55
Carrasco	49,420	15,045	3.28
Mizque	34,270	2,730	12.55
Punata	68,290	850	80.34

Department: Santa Cruz			
Total Department	547,500	370,621	1.48
Capital City	135,010	22	6,136.82
Total Provinces	412,490	370,599	1.11
Ibañez	33,270	4,799	6.93
Warnes	21,700	1,216	17.85
Velasco	30,230	65,425	0.46
Ichilo	15,610	14,232	1.10
Chiquitos	41,200	52,110	0.79
Sara	26,130	6,886	3.79
Cordillera	75,340	86,245	0.87
Vallegrande	57,400	6,413	8.95
Florida	21,040	4,132	5.09
Santiesteban	43,240	3,673	11.77
Ñuflo Chávez	23,150	81,493	0.28
Sandoval	7,180	41,665	0.17
Caballero	17,000	2,310	7.36

Department: Tarija			
Total Department	260,900	37,623	6.93
Capital City	29,950	4	7,487.50
Total Provinces	230,950	37,619	6.14
Cercado	34,770	2,074	16.76
Arce	26,450	5,205	5.08
Gran Chaco	74,570	17,428	4.28
Avilés	25,960	2,742	9.47
Méndez	46,300	4,861	9.52
O'Connor	22,900	5,309	4.31

Department: Beni			
Total Department	205,400	213,564	0.96
Capital City	20,940	4	5,235.00
Total Provinces	184,460	213,560	0.86
Cercado	5,770	12,272	0.47
Vaca Diez	24,980	22,434	1.11
Ballivián	28,270	40,444	0.70
Yacuma	23,380	34,386	0.68
Moxos	27,070	33,616	0.81
Marban	10,940	15,126	0.72
Mamoré	24,170	18,706	1.29
Iténez	39,880	36,576	1.09

Department: Pando			
Total Department	34,000	63,827	0.53
Capital City	3,010	2	1,505.00
Total Provinces	30,990	63,825	0.49
N. Suárez	8,990	9,817	0.92
Manuripi	8,350	22,461	0.37
Madre de Dios	7,310	10,879	0.67
Abuná	5,210	7,468	0.70
Román	1,130	13,200	0.09

Sources: [a] Instituto Nacional de Estadística, Consejo Nacional de Economía y Planificación, 1973.

[b] División Política de Bolivia, Dirección Nacional de Coordinación y Planeamiento, 1968.

Footnotes

(1) Muñoz Reyes, Jorge, Geografía de Bolivia, Academia Nacional de Ciencias, La Paz, in print.

(2) Osborn, Harold, Bolivia - A land Divided, (3rd. ed. rev.) Royal Institute of International Affairs, London, 1964, p.2.

(3) Brockman, Carlos, Director, Earth Resource Technology Satellite (ERTS) program, Servicio Geológico de Bolivia, personal communication, 1974.

(4) Weil, Thomas E., Area Handbook for Bolivia, U.S. Government Printing Office, Washington, 1974, pp. 58-61.

(5) Ibid.

(6) Extracted from Agricultural Development in Bolivia. A Sector Assessment, USAID, 1974, pp. 39-41

(7) Instituto Nacional de Estadística, Bolivia en Cifras, 1972, La Paz, 1974, p.4.

(8) Weil, op. cit. p.ix.

(9) ENTEL, personal communications, 1974.

(10) Weil, op. cit., p. 212.

(11) Ministry of Transportation and Communications, 1974.

(12) Bolivia en Cifras, 1972, op. cit. p. 95.

(13) Weil, op. cit. p. 323.

(14) USAID/Bolivia, Engineering and Transportation Division, 1974.

(15) Weil, op. cit., pp. 323-324.

(16) Ibid. p. 325.

(17) Ibid. p. 326.

(17) CELADE, Boletín Demográfico, Año IV, N° 8, 1971, pp. 9, 10, 11 and 16.

(18) Llano S., Luis, Aspectos Demográficos de Bolivia, CENAFA, 1972, p. 38.

(19) Informe de Trabajo, Jefe Regional de Braceros, Ministerio de Trabajo, 1973.

(20) Albó, Javier, "Situación Presente de Migraciones en Bolivia", Centro de Investigaciones y Promoción del Campesinado, unpublished paper, 1974.

(21) Llano, op. cit., p. 40.

(22) Ministry of Work, personal communication, 1974.

(23) Ibid., p. 14 (as of 1972).

(24) Montero Community Health Project, "Encuesta Demográfica, Sanitaria y Socio-Económica de la Comunidad de Montero", 1965, 1966, 1969.

(25) Situación de Salud en Bolivia, Ministry of Health, 1970, Table 16.

(26) See Table 1.8.

(27) National Institute of Colonization, personal communication, 1974.

(28) Interamerican Development Bank, Informe Final del Préstamo, La Paz, 1970.

(29) Reported in Situación de Salud en Bolivia, op. cit., Table 10.

(30) Llano, op. cit. p. 31. (See Table 1.12).

(31) "Encuesta Demográfica Sanitaria y Socio-Económica de la Comunidad de Montero", op. cit.

(32) Education in Bolivia: A Preliminary Sector Assessment, USAID/Bolivia, Education Division, 1974, p.III-12; and, Economic and Social Progress in Latin America, Inter-American Development Bank, 1972, p. 138.

(33) National Secretariate of Planning, as reported in Situación de Salud en Bolivia, op. cit. Table 13.

(34) Economic and Social Progress in Latin America, op. cit. p.138.

(35) Education in Bolivia, op. cit. p. 1-16.

(36) Ministerio de Educación, Dirección de Educación Rural, 1974.

(37) Ministerio de Educación y Cultura, Dirección Nacional de Planificación Educativa, Diagnosis Integral de la Educación, 1973-1974. As reported in Education in Bolivia, op. cit. p. IV-1.

(38) Llano, op. cit. p. 12.

(40) Weil, op. cit. p. 77.

(41) Dirección Nacional de Antropología, 1974.

(42) Weil, op. cit. p. 96.

(43) Ibid., pp. 81-82.

(44) Ibid., p. 90.

(45) Fortún, Julia Elena, Consultant Report, USAID/Bolivia, 1974.

(46) Aguirre Beltrán, Gonzalo, "Medicina y Magia", Colección de Antropología Social, Instituto Nacional Indigenista, México, 1963, p. 25.

(47) Tschopik, Harry, "The Aymara of Chucuito Peru", Anthropological Papers of the American Museum of Natural History, Vol. 44, New York, 1951, p. 210.

(48) Fortún, op. cit.

(49) Prost, Marian D., Costumbres, Habilidades y Cuadro de Vida Humana entre los Chacobos, Instituto Linguístico de Verano, Riberalta, 1970.

(50) Economic and Social Progress in Latin America, Inter-American Development Bank, Annual Report, Washington, D.C., 1972, p. 131.

(51) Schrimshaw, Nevin, "Myths and Realities in International Health Planning", American Journal of Public Health, Vol. 64, No. 8 1974, p. 794.

(52) Montero Community Health Project, "Encuesta Demográfica, Sanitaria y Socio-Económica de la Comunidad de Montero", 1965, 1966, 1969.

(53) "Encuesta Sobre Práctica Médica: Questionario para Médicos Bolivianos", R. LeBow and A. Gumiel, Colegio Médico de Bolivia/USAID/HAD, 1974.

(54) Llano Saavedra, Luis, Bolivia: Planificación Familiar, CENAFA, 1971, pp. 6-10.

(55) Fortún, Julia Elena, Consultant Report, USAID/Bolivia, 1974.

CHAPTER II

HEALTH STATUS AND MAJOR PROBLEMS

A. Summary

The health status of the Bolivian population is possibly one of the worst in Latin America. As shown by standard health indicators, which at best are educated estimates due to the lack of a census since 1950 and poor vital statistics, it is currently believed that:

a) the crude death rate is 19/1000, one of the highest in Latin America (see Table 2.1);

b) life expectancy at birth was 46 years in 1971;[1]

c) the infant mortality rate is 154/1000 live births, also very high for Latin America.

It is very likely that the infant mortality rate is underestimated. Some studies in rural areas have reported rates of over 300 per 1000,[2] as compared to reported urban rates for 1972 of 59.4 to 244.1 per 1000 (see Figure 2.1). Also malnutrition, estimated at 40 to 50 percent for pre-school children, and the major causes of morbidity are communicable diseases.

A major factor making mortality data very unreliable is the under registration of deaths. Only about 20 percent of all deaths in Bolivia are registered, and probably only about five percent of all deaths occur in a hospital. Infant deaths are certainly even less often reported, especially in rural areas where there are clandestine cemeteries and accessibility to medical care is limited. Thus, reliable infant mortality figures are difficult to obtain. The net result is that actual death rates are probably much higher than the official estimates. Accurate figures will not be obtained until a more complete registration of deaths is accomplished and the national census is realized. The infant mortality rate is conservatively believed to be about 250 per 1000 live births for most rural areas. It is possible that the official estimated general mortality rate of 19 per 1000 population is also too low (see Chapter I.C.5.).

In general, Bolivia's health problems are still predominantly those of a developing country. Communicable diseases, notably respiratory, gastrointestinal, and parasitic diseases, along with trauma, complications of pregnancy and malnutrition are the major causes of morbidity and

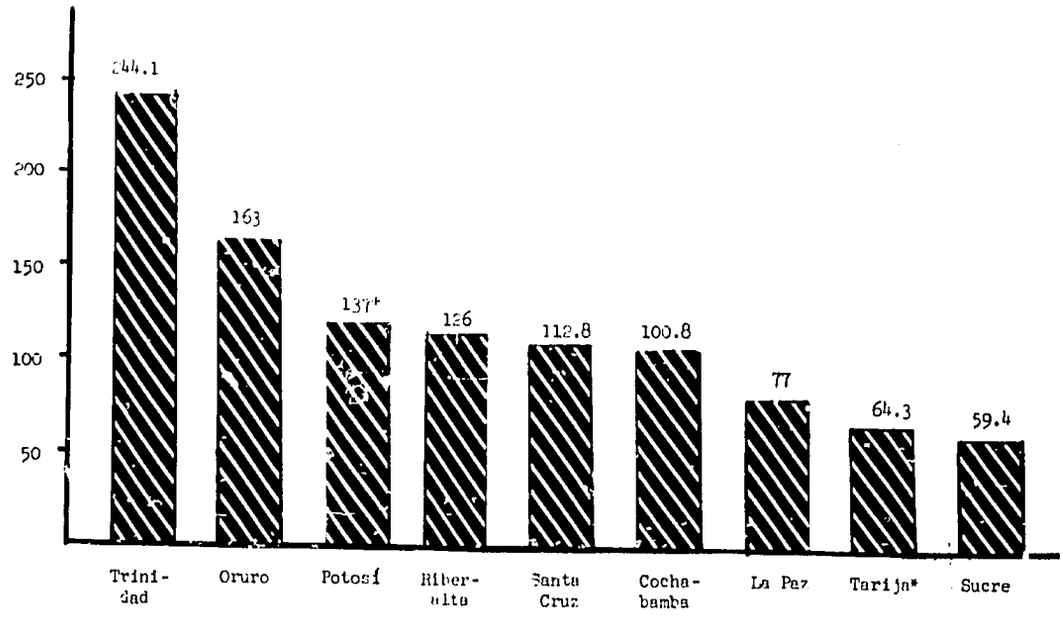
Table 2.1 - Comparison of Vital Statistics in Latin America, 1971

Country	Population (millions)	Births (per thousand)	Deaths (per thousand)	Annual Growth Rate (Percent)	Infant Mortality (per thousand live births)	Population under 15 years old (Percent)	Per Capita Income (dollars)
Bolivia	4.8	44	19	2.4	154*	44	150
Argentina	24.7	22	9	1.5	58	29	820
Brazil	95.7	38	10	2.8	170	43	250
Colombia	22.1	44	11	3.4	78	47	310
Costa Rica	1.9	45	8	3,8	60	48	450
Ecuador	6.3	45	11	3.4	86	48	220
Chile	10.0	34	11	2.3	92	40	480
Paraguay	2.5	45	11	3.4	52	45	230
Perú	14.0	43	11	3.1	62	45	380
Cuba	8.6	27	8	1.9	40	37	310
México	50.5	42	9	3.4	66	46	530
Uruguay	2.9	21	9	1.2	50	28	520
Venezuela	11.1	41	8	3.4	46	46	950

* Other estimates are closer to 250

Source: Population Reference Bureau, 1971

Figure 2.1 - Infant Mortality Rates per 1000 Live Births, by Selected Urban Areas, 1972



* 1973

Source: Ministry of Health, Division of Maternal and Child Health, unpublished data from the Regional Health Offices.

mortality. Most of these problems are susceptible to attack through the implementation of standard public health measures, such as potable water and sewage disposal systems, vaccination campaigns, health education programs, maternal and child health services, adequated housing, etc. All of these problems are more prevalent and severe in rural and marginal urban areas, where public health efforts have had much less impact than in urban areas. In contrast to the communicable diseases, which play such an overwhelming major part in morbidity and mortality in Bolivia, cancer and arteriosclerotic heart disease, so important as causes of mortality in the United States and Europe, have only minor importance in Bolivia, although they will probably become more significant as communicable diseases become less prevalent and life expectancy is prolonged.

Despite the facts that (i) diseases susceptible to public health measures constitute the most significant health problems and (ii) 78.5 percent of the population is rural (see Chapter I.C.1. for definition). the Bolivian health system has concentrated its resources in curative medicine and urban areas. The private system, the Social Security System and the "delegated function" systems (COMIBOL, the National Institute of Colonization, etc.) are almost entirely dedicated to curative medicine. The Ministry of Health traditionally has been assigned the responsibility for administering preventive medicine programs; but most of its resources (both human and financial) in fact go into curative medicine. This is largely because the MOH is responsible for the operation of general hospitals in urban areas. The same situation exists even in rural areas where health personnel are, despite low utilization, usually doing more curative medicine than preventive medicine. Many factors have contributed to this dearth of preventive medicine in both urban and rural areas. Among them are health personnel training inappropriate to the needs of the country, poor supervision, lack of supplies, apparent unresponsiveness of the population, and the general atomization and non-continuity within the health system or "systems".

The Bolivian health system as a whole is fragmented and very inefficient. Multiple health institutions waste scarce economic and human resources in the duplication of administrative and planning functions as well as equipment and bed space. The various institutions have shown only minimum willingness to work with each other. The health system, including the community role in it, approaches anarchy. Major problems need to be solved if the health system is to become effective. These include drug supply, personnel policies, continuity of care, integration of institutional programs and planning, economic policies, supervision, accessibility, efficiency, and integration with the educational and agricultural sectors. There has been some improvement in maternal and child health and communicable disease control programs, but these have been sporadic, non comprehensive and have had only limited impact so far. There has been no significant integration of the various elements necessary to run an effective health system, above all in rural areas.

Rural areas have been comparatively abandoned in contrast to urban areas in the development of the health system. Although the MOH has been given the major task of providing health services to rural areas over 75 percent of its budget for hospital and medical attention in 1971 went into urban areas.(3) The other health institutions (e.g. COMIBOL), with the exception of some religious groups, are essentially urban or semi-urban operations. In rural areas probably only between two percent and ten percent of the actual health needs of rural people are being met, both in curative and preventive medicine. Among the reasons for this situation are the lack of available services, or lack of accessibility (physical, economic, cultural, etc.) to the services, and the low utilization of the existing health facilities by the people. The reasons for the low utilization are multiple. The most important, in addition to inaccessibility, are the inability to deliver effective curative or preventive services and the resulting lack of confidence of the people in the health system. In Bolivia rural people have a distrust and suspicion of "modern medicine" and cling to traditional ways.

The inadequacy of the rural health system in Bolivia is made more difficult to resolve by several factors. First, the rural population in Bolivia is very disperse, with 60 percent of the people living in groups of less than 200 inhabitants. This fact makes basic sanitation services (water and waste disposal) much more difficult and/or costly to implement. As a result, less than five percent of the rural population is supplied with potable water, as compared to about 55 percent of the urban population. Second, the lack of adequate transportation and communications are major problems in rural areas. Any preventive programs (health education, nutrition, vaccinations, etc.) are more difficult to do with a dispersed population. For example, in the city of Santa Cruz, it is estimated that 97 percent of births now occur in the hospital (over 8,000 in 1973),(4) while in most rural areas, only a very small percentage of births occur with the help of a trained health person, let alone in a hospital. Third, rural people are probably much more subject to serious illnesses than their urban counterparts. They are at an increased risk with regard to such things as trauma, snake bite, hookworm, enteric diseases, exposure to cold and rain, Chagas' disease and malaria. They have been less accessible to vaccination campaigns and thus remain more susceptible to such illnesses as diphtheria, whooping cough, and measles. They have less accessibility to prompt health care, and thereby run a higher risk of dying from trauma or illnesses such as tuberculosis.

The urban areas have been able to develop more health programs, especially in maternal and child care and in environmental sanitation. Also, as pointed out above, most health resources, both financial and human, have been put into the cities. About 90 percent of Bolivia's physicians practice in urban areas. With the exception of COMIBOL, most of the autonomous and private sectors are concentrated in the cities. Only recently have the universities become interested in health programs

outside the urban zone. However, the marginal zones of the cities do not differ very much from rural areas in their health problems. Until recently, the marginal urban areas were as abandoned as rural areas. But now many mothers' clubs have spring up in marginal zones, and along with them, more vaccination campaigns, pre-natal programs, and well-baby clinics. Most of the health problems of rural areas are found in these areas, including a predominance of communicable diseases, malnutrition, poor housing, and inadequate water supply.

Malnutrition studies have been few and scattered in Bolivia. But the few studies done indicate that there is between 40 and 50 percent malnutrition, at least among pre-school age children (0-6 years). Most of the malnutrition is Grade I, or not severe. There is a deficit of calories in the food supply, and an even greater deficit of protein. Indications are that these deficits are increasing. Malnutrition is probably worse in rural areas and in tropical areas. Iodine deficiency is also a significant nutritional problem in some areas.

B. Mortality and Morbidity

1. Disease patterns

Disease patterns in Bolivia are closely interrelated with population composition. McDermott[5] has described a "demographic-disease pattern" which is applicable to the existing situation in Bolivia. This interrelationship can be described in terms of a cycle. Approximately 50 percent of Bolivia's population is under 20 years of age (see Table 1.6). With a large young population, there is a lot of illness in the pre-school age group. These illnesses fall mostly within the diarrhea-pneumonia complex which are conditioned by high prevalences of malnutrition, parasitic and other communicable diseases. The severity of these diseases and the almost nonexistence of adequate preventive and curative services leads to high infant and child mortality rates. The desire of families, for economic (work force) and cultural reasons, to have an adequate number of children therefore encourages high fertility rates,[6] in order to compensate for the high mortality. The proportion of young in the population in turn remains high and the cycle is perpetuated.

The diseases that enter the cycle vary for different geographic areas of Bolivia. However, the complex of respiratory diseases, gastroenteritis, and malnutrition are the most significant for infant and child mortality in all parts of Bolivia. These include measles, whooping cough, tuberculosis, and parasitic diseases. In the Altiplano, respiratory diseases and gastroenteritis are most significant. Specific diseases of importance are tuberculosis, typhus, and scabies, as well as silicosis among the miners. The valleys of Bolivia have a similar disease pattern, with an increased importance of some gastrointestinal diseases, some leprosy, and a probably significant amount of Chagas' disease.

The tropical areas of Bolivia have a very distinct pattern of diseases. The three-disease complex is still very important, but the gastrointestinal illnesses and malnutrition have more relative importance, compared to respiratory illnesses. Parasitic diseases, especially hookworm and amoebiasis, have very great importance in terms of morbidity. Malnutrition in the tropical areas is probably more of a problem than it is in the other two areas of Bolivia, despite the fact that these are agricultural areas. Probably, the higher rates of infection with intestinal parasites and enteritis contribute to this problem. Some special diseases with higher morbidity and/or mortality rates are special threats to economic development in the tropical areas, namely malaria, yellow fever and Bolivian hemorrhagic fever. Chagas' disease and leprosy are also problems of substantial significance.

2. Mortality

In Table 2.2 and Figure 2.2, mortality data from the Registro Civil for 1969 are presented by age groups. As mentioned above, there is a large amount of under-registration of deaths. In fact, only about 20 percent of deaths are apparently registered, as the figures for 1969 represent only 22,343 deaths. Furthermore, the accuracy of diagnoses is also questionable, since probably less than five percent of the total deaths occur in the hospital. Finally, the category "poorly defined causes" is a large one. It represents about 30 percent of the total deaths in age groups one to four years and five to 14 years and nearly 50 percent of the total in the age group 15 years and over. This is an indicator of the poor reliability of the data, and is the reason why this data differs from that of the PAHO infant mortality study presented below.

a. Infants less than one year

From the partial data of the Registro Civil the major causes of infant mortality, after the vague category of "Peri-natal illnesses, etc.", are respiratory and gastrointestinal illnesses. Taking into account the unreliability of the "poorly defined" groups, this data is comparable with the mortality data from the PAHO-sponsored study on childhood mortality in La Paz and Viacha in 1968-70 (see Table 2.3). In the PAHO study which is probably more precise, respiratory illnesses accounts for 37.1 percent of deaths in this age group while diarrhea diseases accounts for 21.9 percent.

b. One to four years

The mortality picture in this age group is similar to that of infants. Again, respiratory and diarrhea illnesses account for probably over half of the mortality. In the PAHO study, diarrheal illnesses came out as the most significant cause of death (29.4 percent). Twenty-eight percent of the deaths in this age group were attributed to measles in the

Table 2.2 - Major Causes of Mortality by Age Groups, 1969

(1) Less than 1 Year

Rank	Cause	Number	Percent
1	Perinatal illnesses, illnesses of early infancy	2,377	44.2
2	Respiratory	1,140	21.2
3	Gastrointestinal	478	8.9
4	Whooping cough	404	7.5
5	Poorly defined	364	6.8
6	All other infectious and parasitic diseases	180	3.4
7	Scarlatina	99	1.8
8	Allergic, metabolic nutritional diseases, and anemia	79	1.5
9	Measles	71	1.3
10	Tetanus	49	0.9
	Total	5,241	97.5

(2) 1 - 4 Years

Rank	Cause	Number	Percent
1	Poorly defined	1,322	29.4
2	Respiratory	1,001	22.3
3	Gastrointestinal	652	14.5
4	Whooping cough	346	7.7
5	All other infectious and parasitic diseases	346	7.7
6	Scarlatina	249	5.5
7	Measles	181	4.0
8	Allergic metabolic nutritional diseases, and anemia	146	3.2
9	Tuberculosis	48	1.1
10	Nervous system	30	0.7
	Total	4,321	96.1

(3) 5 - 14 Years

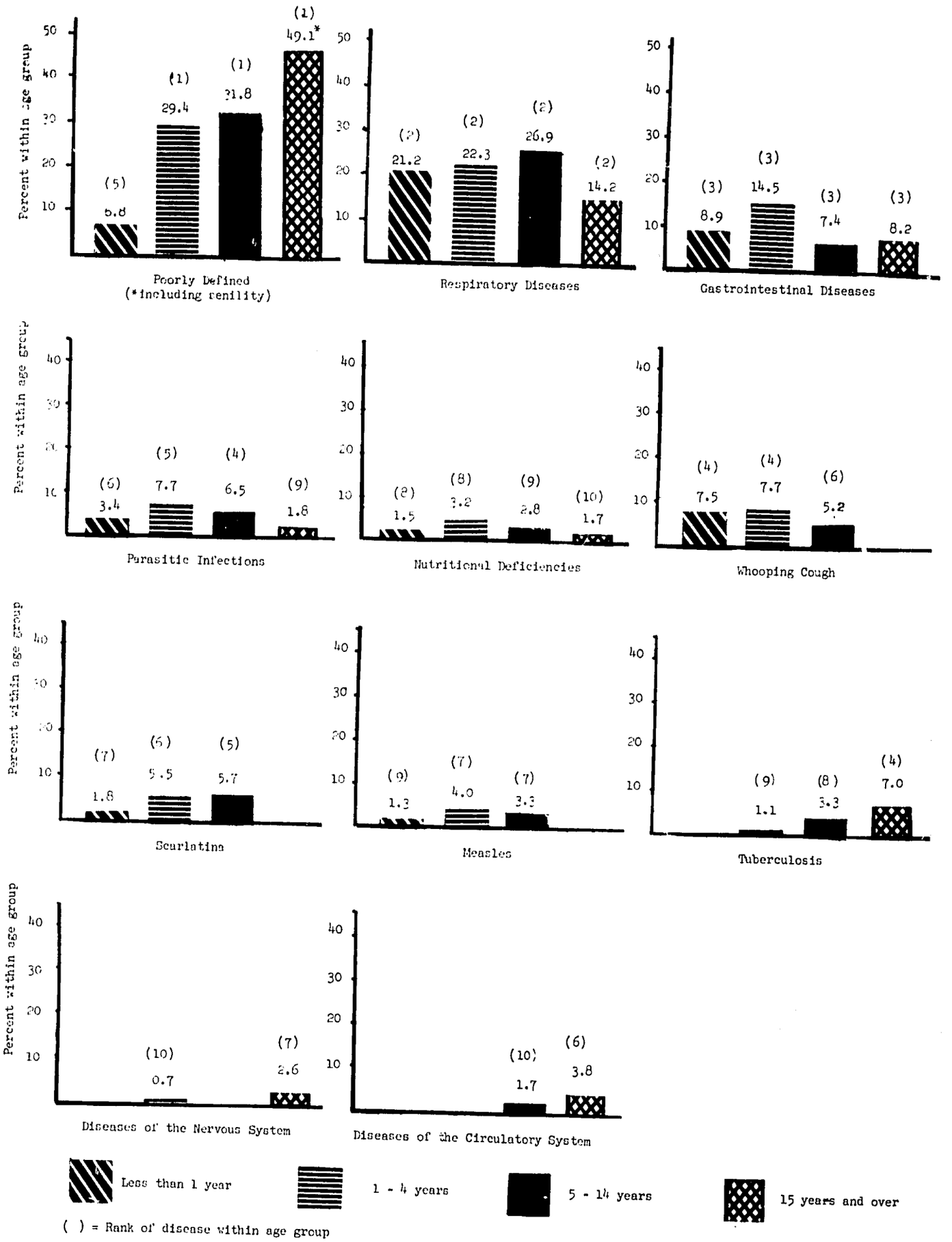
Rank	Cause	Number	Percent
1	Poorly defined	460	31.8
2	Respiratory	389	26.9
3	Gastrointestinal	107	7.4
4	All other infectious and parasitic diseases	94	6.5
5	Scarlatina	82	5.7
6	Whooping cough	75	5.2
7	Measles	48	3.3
8	Tuberculosis	48	3.3
9	Allergic, metabolic, nutritional diseases and anemia	41	2.8
10	Circulatory and Rheumatic fever	17	1.2
	Total	1,161	93.1

(4) 15 Years and Over

Rank	Cause	Number	Percent
1	Senility and poorly defined	4,976	49.1
2	Respiratory	1,436	14.2
3	Gastrointestinal	836	8.2
4	Tuberculosis	706	7.0
5	Associated with pregnancy	505	5.0
6	Circulatory and Rheumatic fever	381	3.8
7	Nervous system	265	2.6
8	Malignant tumors	252	2.5
9	All other infectious and parasitic diseases	186	1.8
10	Allergic, metabolic nutritional diseases and anemia	168	1.7
	Total	9,711	95.9

Source: Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1975-1978, La Paz, 1975, p.20. (Based on data from the Civil Registry for 1969 and representing 22,323 deaths or about 22 percent of the probable deaths in 1969).

igure 2.2 - Selected Causes of Mortality by Relative Importance within Age Group, 1969



( ) = Rank of disease within age group

Source: Table 2.2

Table 2.3 - Childhood Mortality in La Paz a J Viacha, by Age Groups, 1968-1970

(1) Less than 1 Year

Rank	Cause	Number	Percent
1	Respiratory illness	1,035	37.1
2	Diarrheal illness	610	21.9
3	Perinatal causes	577	21.7
4	Measles	162	5.8
5	Other infectious diseases	95	3.4
6	Congenital anomalies	47	1.7
	Other causes	288	8.2
	Total	2,790	99.8

(2) 1 - 4 Years

Rank	Basic Cause	Number	Percent	Rank	Associated Cause	Number	Percent
1	Diarrheal illness	437	29.4	1	Nutritional deficiency	727	34.3
2	Measles	417	28.1	2	Respiratory illness	625	29.5
3	Respiratory illness	334	22.5	3	Diarrheal illness	268	12.6
4	Other infectious diseases	102	6.9	4	Other infectious diseases	46	2.2
5	External causes	55	3.7		Others	453	21.4
6	Nutritional deficiency	34	2.3		Total	2,119	100.0
	Others	107	7.2				
	Total	1,486	100.1				

Source: From Ruth Rice Puffer and Carlos V. Serrano, Características de la Mortalidad en la Niñez, OPS/OMS, 1973

PAHO study. Measles was still a significant cause of mortality in the data of the Registro Civil, but was listed as only causing four percent of deaths, probably due to underreporting. Tuberculosis begins to be a significant cause of death in this age group. One of the most striking results of the PAHO study is that "nutritional deficiency" is listed as the number one associated cause of death. It was listed in about 50 percent of the deaths (727/1486) as an associated cause of death.

c. Youth, five to 14 years

Excluding "poorly defined" causes, respiratory diseases (38.5 percent adjusted) and gastrointestinal diseases (10.9 percent adjusted) again are the major causes of mortality in the five to 14 year age group. Other communicable diseases, streptococcal infections, whooping cough, measles, and tuberculosis are the next most significant diseases causing death.

d. Adults, 15 years and over

Again excluding the "poorly defined" category in adults, the four most significant causes of mortality (percentages adjusted) are respiratory diseases (27.8 percent), gastrointestinal diseases (16.1 percent), tuberculosis (13.7 percent) and problems associated with pregnancy (9.8 percent). In contrast to the mortality picture in the United States, heart and circulatory diseases account for only 7.4 percent (adjusted) of the mortality in adults. Cancer is even less significant. It accounts for only 4.9 percent (adjusted) in this age group.

3. Morbidity - hospital discharge data

Hospital discharge data probably is the most accurate measure of morbidity available in Bolivia. However, since they are limited to inpatient morbidity, they reflect only the major illnesses requiring hospitalization, and thus offer only a partial picture of morbidity. Since even in the general hospitals routine laboratory tests or screening tests are usually not done, many secondary diagnoses are missed and thus do not appear in the data. For example, the prevalence of Chagas' disease or other parasitic diseases is probably greatly underestimated for inpatients. The data referred to below are from the hospitals administered by the Regional Health Offices of the Ministry of Health in all of Bolivia for 1971.

a. Infants less than one year

Gastrointestinal (32.9 percent) and respiratory diseases (23.3 percent) account for more than half of the hospitalizations in this age group (see Table 2.4). The fourth and fifth causes are malnutrition and measles, respectively.

Table 2.4 - Major Causes of Morbidity by Age Groups, 1970
(Hospital Discharges)

(1) Less than 1 Year

Rank	Cause	Number	Percent
1	Gastrointestinal	377	32.9
2	Respiratory	267	23.3
3	Poorly defined	99	8.6
4	Nutritional, etc.	70	6.1
5	Measles	33	2.9
6	Congenital Anomalies	32	2.8
7	Skin diseases	26	2.3
8	Meningitis	24	2.1
9	Trauma, burns	22	1.9
10	Tuberculosis, all kinds	16	1.4
	Total	1,146	84.0

(2) 1 - 4 Years

Rank	Cause	Number	Percent
1	Gastrointestinal	530	22.4
2	Respiratory	436	18.5
3	Poorly defined	232	9.8
4	Measles	215	9.1
5	Nutritional	188	8.0
6	Trauma, burns	158	6.7
7	Tuberculosis, all kinds	69	2.9
8	Skin diseases	60	2.5
9	Genitourinary diseases	58	2.5
10	Whooping cough	50	2.1
	Total	2,36[illegible]	84.5

(3) 5 - 14 Years

Rank	Cause	Number	Percent
1	Trauma, burns	704	20.5
2	Gastrointestinal	360	10.5
3	Respiratory	335	9.8
4	Appendicitis	255	7.4
5	Poorly defined	222	6.5
6	Measles	201	5.9
7	Tuberculosis, all kinds	200	5.9
8	Skin diseases	131	3.8
9	Genitourinary diseases	113	3.3
10	Parasitic	77	2.2
	Total	2,435	75.8

(4) 45 Years and Over

Rank	Cause	Number	Percent
1	Trauma, burns	866	13.2
2	All heart and circulatory disease	745	11.4
3	Respiratory	589	9.0
4	Intestinal obstruction and hernia	494	7.5
5	Tuberculosis, all kinds	475	7.3
6	Gastrointestinal	434	6.6
7	Cholelithiasis and Cholecystitis	384	5.9
8	Poorly defined	348	5.3
9	Genitourinary diseases	338	5.2
10	Malignant tumors	258	3.9
	Total	6,5[illegible]8	75.3

(5) 15 - 44 Years

Rank	Cause	Number	Percent	Percent Excluding Normal Deliveries
1	Normal deliveries	10,084	33.8	-
2	Trauma, burns	2,718	9.1	13.8
3	Abortions	2,007	6.7	10.2
4	Other complications of pregnancy	1,934	6.5	9.8
5	Appendicitis	1,402	4.7	7.1
6	Tuberculosis, all kinds	1,377	4.6	7.0
7	Poorly defined	1,292	4.3	6.6
8	Gastrointestinal	1,086	3.6	5.5
9	Cholecystitis and cholelithiasis	989	3.3	5.0
10	Respiratory	922	3.1	4.7
11	Genitourinary diseases	811	2.7	4.1
12	All heart and circulatory diseases	488	1.6	2.5
13	Skin diseases	426	1.4	2.2
14	Intestinal obstruction and hernia	392	1.3	2.0
15	Psychiatric illness	310	1.0	1.6
16	Benign tumors	237	0.8	1.2
17	Malignant tumors	145	0.5	0.7
	Total including normal deliveries	29,792	89.0	
	Total excluding normal deliveries	19,708		84.0

Source: Ministerio de Previsión Social y Salud Pública, Informe Anual - Estadísticas de Salud, La Paz, 1970.
(Based on data from Regional Health Offices).

b. Children, one to four years

There is little difference in the causes of hospital morbidity between this age group and the previous one, although measles, malnutrition, trauma and tuberculosis have more relative importance.

c. Youth, five to 14 years

Trauma (20.5 percent) becomes the number one cause of hospital morbidity in the five to 14 year age group. Gastrointestinal and respiratory illnesses are still important. Tuberculosis continues to increase in relative importance and appendicitis at 7.4 percent has a questionably high incidence.

d. Adults, 15-44 years

Hospital discharges in the age groups 15-44 years are dominated by pregnancies and the complications thereof, with 46 percent of all discharges in this age group falling into these categories. This age group accounts for more than two-thirds of all the hospital discharges reported. Excluding normal deliveries (which account for 33.8 percent of discharges), complications of pregnancies still account for 20 percent of hospitalizations in this age group. It is estimated about one half of these are related to abortions. Other major causes of morbidity in the 15-44 year age group are trauma, appendicitis, and tuberculosis. Gastrointestinal disorders and respiratory illnesses have relatively less importance. Gall bladder disease ranks eighth as a cause of morbidity and heart and circulatory diseases and cancer are relatively unimportant.

e. Adults, 45 years and over

Significantly, there were less than 25 percent as many hospitalizations in this age group as there were in the 15-44 age group. This reflects, of course, the high incidence of pregnancy-related hospitalizations in the 15-44 age group. It probably also reflects a smaller number of older people in the population and/or a reluctance of older people to use the hospital. Trauma, at 13.2 percent was the number one cause of morbidity, with heart and circulatory disease (11.4 percent) and respiratory illnesses (9.0 percent) following in importance. The only significant communicable disease, other than respiratory illnesses and gastrointestinal disorders, was tuberculosis (7.3 percent) which ranks fifth in this age group. Malignant tumors accounted for only 3.9 percent of hospitalizations.

4. Morbidity - outpatient data

The outpatient diagnoses from the Regional Health Offices (see Table 2.5 and Figure 2.3) again do not give a completely accurate picture

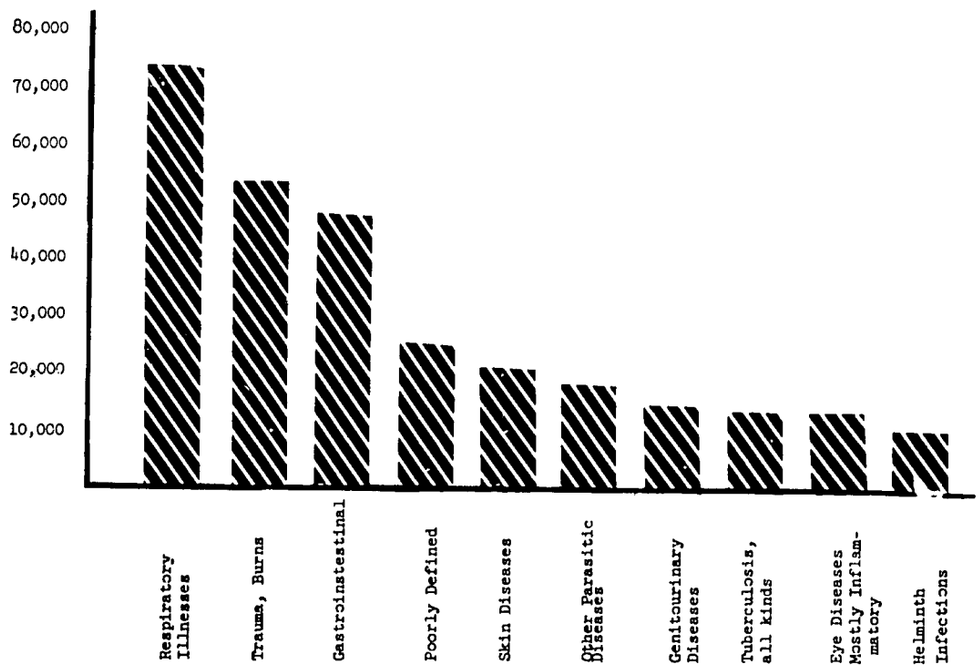
Table 2.5 - Major Causes of Morbidity, All Ages, 1971*
(Outpatient Visits)

Rank	Cause	Number	Percent
1	Respiratory illnesses	74,147	19.4
2	Trauma, burns	53,829	14.1
3	Gastrointestinal problems	48,277	12.6
4	Poorly defined illnesses	24,839	6.5
5	Skin diseases	20,182	5.3
6	All other infectious and parasitic diseases	19,612	5.1
7	Genitourinary diseases	15,930	4.2
8	Tuberculosis, all kinds	15,166	4.0
9	Eye diseases (mostly inflammatory)	15,130	4.0
10	Helmith infections	11,860	3.1
	Total	298,972	78.3

*Total visits, excluding pre-natal and well baby = 383,479

Source: Instituto Nacional de Estadística, Bolivia en Cifras, 1972, La Paz, 1974, pp. 230-236.
(Based on data from Regional Health Offices of the Ministry of Health)

Figure 2.3 - Major Causes of Morbidity, All Ages, 1971*
(Outpatients Visits)



* Total visits excluding pre-natal = 383,479
Source: Table 2.5

of morbidity for the country as a whole. The data is probably about 60 percent urban and thus, the rural areas are under-represented. Although 382,000 patient visits are recorded, this represents less than one tenth of the target population of the MOH. The data reflect only those people who go to the health posts. Some illnesses which cause significant morbidity, but for which few people seek medical attention, are not represented. Among these would be hookworm, amoebiasis, Chagas' disease, malnutrition, etc. Besides these limitations, there is also a greater degree of inaccuracy in outpatient diagnoses, versus inpatient diagnoses.

For all age groups, it is evident that three major disease groups accounted for 46.1 percent of all outpatient morbidity. These were respiratory illnesses (19.4 percent), trauma (14.1 percent) and gastrointestinal problems (12.6 percent). Skin and eye ailments assumed a relatively higher importance in the ambulatory setting, whereas obstetrical visits involving morbidity were much rarer for outpatients than for inpatients. Tuberculosis (4.0 percent) was probably the most significant specific communicable disease for outpatient care. Comparison of this 1971 data for all of Bolivia with 1973 data for provincial Oruro shows a good correlation (see Figure 2.4). The same three major disease groups (respiratory and gastrointestinal illnesses, and trauma) make up 51 percent of the total morbidity for provincial Oruro.

5. Significance of mortality and morbidity data

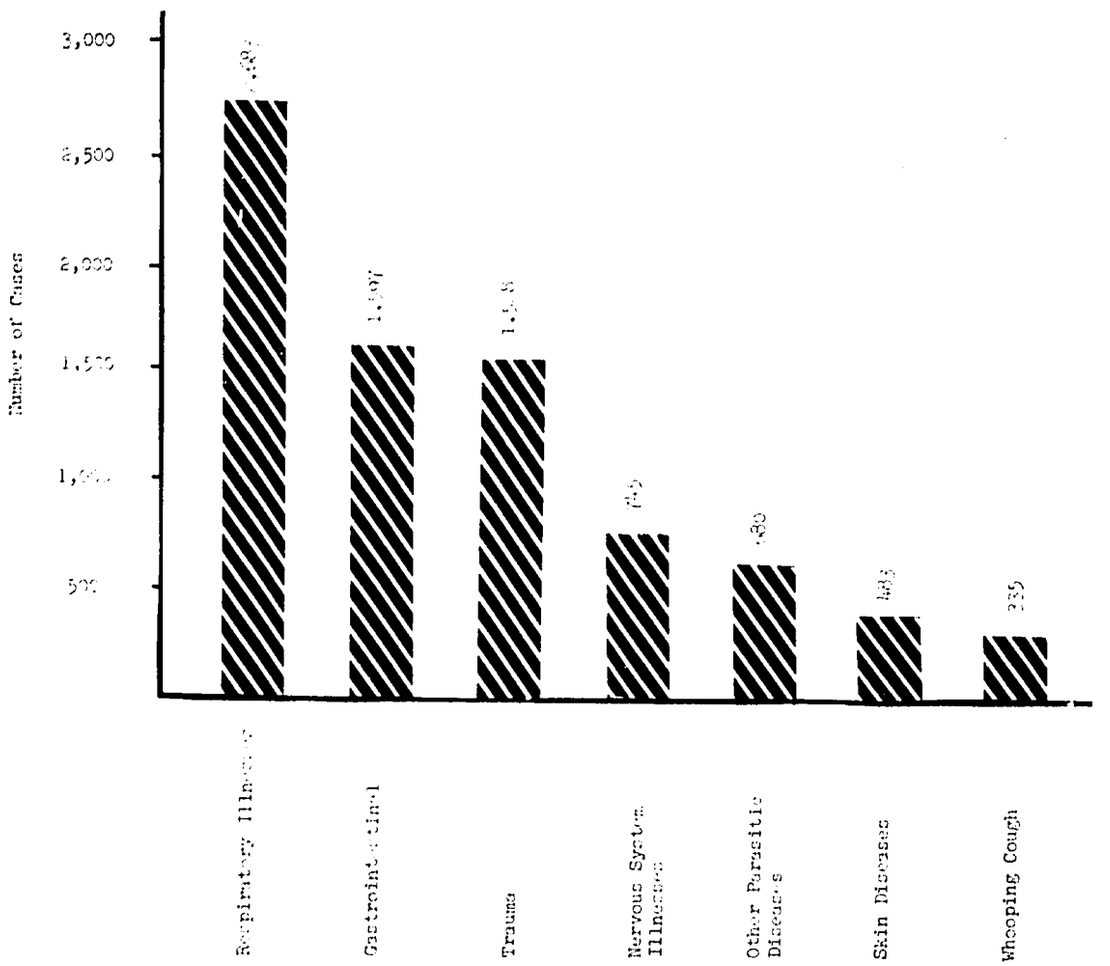
Although the accuracy and representativeness of the data presented above is somewhat questionable, better data is not available. Obviously, it would be extremely valuable to have more reliable and more representative data. There are great inaccuracies and vagueness in the Civil Registry data, which is also very incomplete. If morbidity data were available from institutions other than the MOH, it would give a more accurate picture of the whole population. However, the available data are consistent enough to indicate that communicable diseases, trauma, and the complications of pregnancy constitute the great majority (probably over 75 percent) of the mortality and morbidity problems in Bolivia. All these conditions are most efficiently and effectively subject to attack through preventive measures, rather than curative medicine.

C. Specific Diseases of Importance

1. Malnutrition

Sample studies have shown the prevalence of malnutrition in pre-school children to be about 40 to 50 percent. These studies are summarized in Table 2.6. From a sample of 2,508 pre-school children in seven medium-size rural towns in Bolivia between 1965-68 (Studies one through five), 43.4 percent of the children were found to have malnutrition.(7)

Figure 2.4 - Major Causes of Morbidity, All Ages, 1973*
(Outpatient Visits)



*Total Number of Provincial Outpatients Visits in 1973 = 11,406
Oruro Department (not including city of Oruro)

Source: Ministry of Health, Planning Division, unpublished data from Oruro Regional Health Office

Table 2.6 - Nutritional Status of Children (Study Results 1965-74)

Year	Place	Age Group	Number in Sample	Percent Malnutrition	Grade I	Grade II	Grade III
1965	Tejar y Alto La Paz	Niños	702	41	28.0	12.0	0.4
1967	Santiago de Llallagua, La Paz	"	176	47	42.0	4.0	1.0
1967	3 Rural Areas, La Paz	"	1,338	44	32.7	9.6	1.6
1968	Tarabuco, Chuquisaca	"	138	39	32.0	4.0	3.0
1968	Concepción, Tarija	"	154	48	41.0	6.0	1.0
1972	La Paz	0-6 yrs.	2,777	42	26.0	10.5	5.5
1973	La Paz	"	4,810	52	30.4	16.3	5.3
1974	Mineros, Santa Cruz	"	496	31	22.5	7.4	0.8
1974	Santa Cruz	0-5 yrs.	354	28	24.6	2.8	0.6

Source: Ministry of Health, Nutrition Division, unpublished data, 1974.

Of the total, 32.6 percent were Grade I, 9.4 percent Grade II, and 1.3 percent Grade III. Another study of school children in rural Santa Cruz[8] revealed that 91 percent of the sample were at least 10 percent below normal according to weights and heights, 33 percent were at least 20 percent below normal, and that seven out of every ten children had two or more types of parasites, a common affliction associated with malnutrition in tropical Bolivia. Studies done in 1972 and 1973 of La Paz pre-school children (Studies six and seven in Table 2.6) have shown an even higher prevalence of malnutrition.

Malnutrition also exists among the elderly, but has its greatest effect on mortality and morbidity in the pre-school age group. The significance of malnutrition in the mortality of children under five years of age is supported by data from the PAHO study on mortality in childhood. In this study, as mentioned above, nutritional deficiency was the number one associated cause of mortality. It was judged a related cause in nearly 50 percent of the deaths. Furthermore, disease and malnutrition are intimately related and may set up a viscious cycle of greater mortality and morbidity. Diarrhea, for example, will increase the malabsorption of nutrients and the resulting diminished nutritional status then predisposes to further infections.

The prevalence of malnutrition in Bolivia is highly variable, depending on multiple factors. Two adjacent towns, or different parts of cities, may have very different rates of malnutrition. This may depend on social class, eating habits, and/or the availability of foodstuffs. For example, the rate of malnutrition is thought to be much higher in the town of San Borja than it is in the surrounding countryside where meat is more readily available. To some extent it is regional. This is especially true of the lack of protein in colonization areas. Economics is obviously one of the major factors influencing malnutrition, affecting both the production and consumption of food of high nutritive value. This factor is probably even more important after prices rose steeply this year (1974). People simply cannot afford to buy much food <u>at all</u>, let alone foods with high nutritive value. In rural areas where high-protein foods such as eggs, chicken, and meat are produced, these items are <u>not</u> consumed since their economic value is too great. Likewise production patterns reflect the economic market rather than the nutritional needs of the population. Education, social customs, speculation in commodities, maldistribution of foodstuffs and lack of supply also are among the factors which influence malnutrition.

There is a net deficit of calories and protein in the food supply of the country, and indications are that this deficit is increasing (see Chapter VII.B.). A study done by the Nutrition Division of the MOH in 1969 revealed a 15 percent deficit in calories and 40 percent deficit in proteins in the average Bolivian diet. Adequate calories and, to a greater extent, the proteins are just not being produced. The more subtle

Third Degree Malnutrition
Montero, Santa Cruz
(Eastern Lowlands)

long-term effects of malnutrition, such as reduced intelligence, have not been measured in Bolivia. Regionally, iodine deficiency has had importance in cretinism and endemic goiter. This latter problem is only beginning to be studied. The solution of the malnutrition problem in Bolivia will depend on many sectors. Progress in agriculture, education, distribution systems, health, and the economic status of the people are all key factors if malnutrition is to be dealt with effectively.

2. Communicable diseases

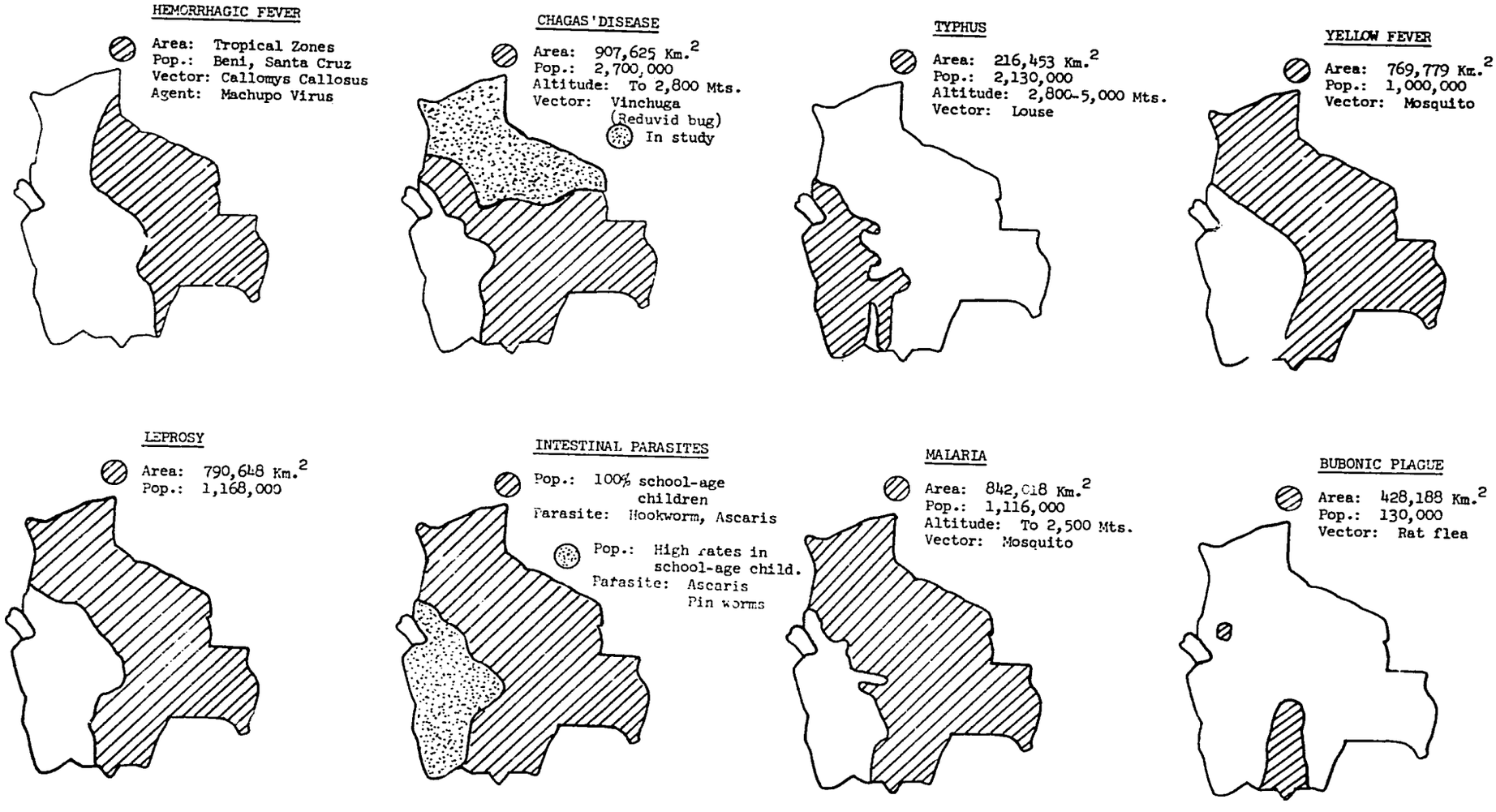
As mentioned above, communicable diseases comprise the major direct causes of mortality and morbidity in Bolivia. The majority of these communicable diseases (in terms of their impact) fall into the categories of respiratory diseases and gastrointestinal, or diarrheal diseases. The specific causes of these two large groups of illnesses has not been well determined in Bolivia. Except within some specialized programs such as malaria and tuberculosis, very little laboratory work is done. Even fever cultures are done. For this reason, casual agents for the various respiratory and diarrheal diseases are rarely identified.

The reporting of communicable diseases is spotty since (i) specific diagnoses are often difficult without laboratory support and (ii) little reporting is done beyond the weekly reports required from health facilities of the MOH. Since these facilities in fact serve only a minority of the population (probably effectively less than ten percent in rural areas) the communicable disease picture gained from the weekly reports is very incomplete. "Epidemics" in rural areas often go uninvestigated or undiagnosed for lack of transportation or accessibility.

Different geographic regions of Bolivia have different communicable disease patterns (see Figure 2.5). The specific diseases of the tropics are malaria, yellow fever, hemorrhagic fever, leprosy, leishmaniasis, hookworm, and Chagas' disease. In the valleys, there are specifically Chagas' disease and leprosy; these areas used to have malaria as well. The Altiplano has specifically typhus and a high prevalence of scabies. Most other communicable diseases, including venereal diseases, respiratory and diarrheal diseases, tuberculosis, and intestinal parasites, other than hookworm, are distributed through all three geographical areas.

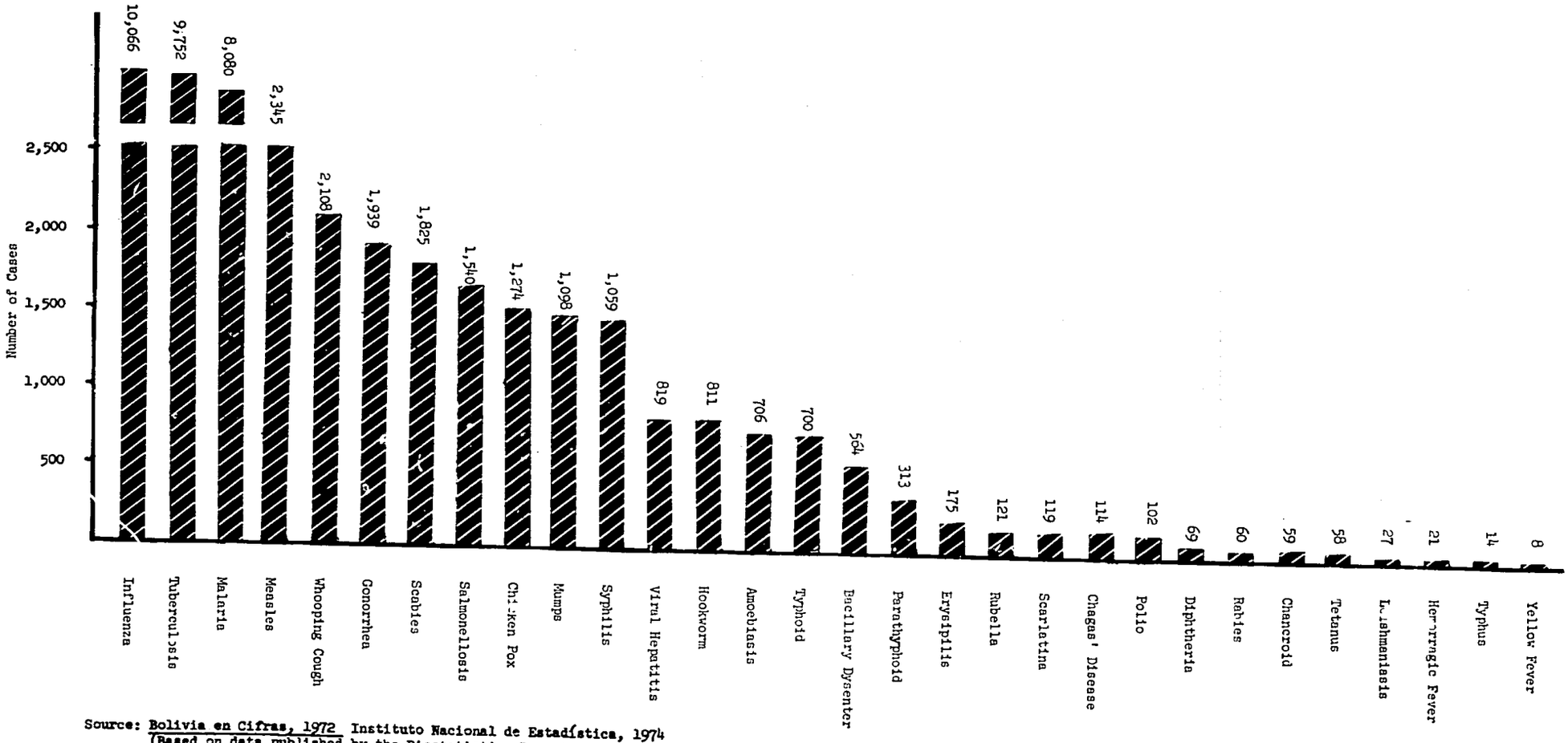
As mentioned above, and shown in Figure 2.6, the reported communicable diseases in 1971 represent a small percentage (possibly only five percent) of the total communicable disease incidence in Bolivia. One factor making this percentage so low is the deletion of some major communicable diseases from the list of reported diseases. Among these are streptococcal infections, viral infections, urinary-renal infections, and diarrheal diseases in general. The most reliable data are probably those for which specific programs exist within Bolivia: tuberculosis, malaria and hemorrhagic fever. On the other hand, the data for which

Figure 2.5 - Epidemiological Maps of Selected Communicable Diseases in Bolivia



Source: Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p.29.

Figure 2.6 - Incidence of Reported Communicable Diseases, 1971



Source: Bolivia en Cifras, 1972 Instituto Nacional de Estadística, 1974
(Based on data published by the Biostatistics Department of the Ministry of Health. Leprosy and Streptococeal infections not included in statistics)

there is undoubtedly extreme underreporting is that for scabies, enteric infections in general, hookworm, Chagas' disease, and amoebiasis. This is largely due to the lack of laboratory means of diagnosis. From the Figure influenza, tuberculosis, and malaria are the three most reported communicable diseases. Enteric diseases as a whole are, of course, significant; the specific diagnosis, however, may be questionable.

a. Respiratory diseases

Respiratory diseases as a whole are extremely important as the number one cause of mortality and morbidity (see Figure 2.3) in Bolivia. The improvement of this situation is most complex. It involves better nutrition, better housing, and more health education with improved accessibility of effective health services for earlier attention. Tuberculosis, with an estimated 80,000 active cases in Bolivia, still represents probably the one most significant communicable disease in terms of mortality and morbidity. Progress has been slow, even barely perceptable, despite the presence of specific control programs. Effectiveness has been especially handicapped by the lack of drugs as well as problems in follow-up. Still only about 20 percent of newborns are being vaccinated with BCG.

b. Diseases preventable by vaccination

Measles is a major cause of mortality in the under five age group (Table 2.3). This is primarily due to complications (usually pneumonia) with malnutrition. Vaccination campaigns for measles are barely being started in most areas. Campaigns for polio vaccination have been going on for two-three years. A polio epidemic of 111 cases occurred in 1970, and there were a relatively high number of polio cases in 1971 (102) and 1972 as well. There have been no cases of smallpox in Bolivia since 1964, but there are still plans to vaccinate one fifth of the population every year. Whooping cough remains a major cause of mortality in children. A major epidemic of diphtheria (involving children and young adults) occured in 1973 in Cochabamba (273 cases). Tetanus is mainly neo-natal, affecting newborns, and probably most cases are unreported. Whooping cough, diphtheria and tetanus are all, of course, preventable through vaccination.

c. Enteric diseases

The enteric diseases, bacterial (typhoid, shigella, etc. and parasitic (amoebiasis, hookworm), remain very significant causes of morbidity and mortality in Bolivia. They are probably much more significant than is reflected by the data in Figure 2.6. These are, of course, most efficiently attacked by good water and waste disposal systems. Hookworm is an especially insidious cause of morbidity in the tropical areas. It causes severe anemia and affects nearly 100 percent of the

rural population in those regions, in all age groups. Amoebiasis has a similar incidence in tropical rural areas and can be debilitating too. The enteric diseases affect all age groups, but probably affect children more severely.

d. Malaria

Malaria again has become a major problem in Bolivia, with over 7,000 cases reported in 1973. After being nearly controlled (only 378 cases reported in 1969), many areas of Bolivia have returned to the "attack" phase for malaria. The Department of Tarija registered about 50 percent of the total cases. This is to a great extent due to international migration patterns and the problem of coordinating disease control between two countries. Malaria also represents a major morbidity, though not mortality, threat for colonization areas. It is attacked principally through environmental and ecological intervention.

e. Yellow fever and Bolivian hemorrhagic fever

Jungle (not urban) yellow fever is a perennial problem, with about 20 deaths occuring in tropical, and mainly colonization areas through the first half of 1974. There is not yet any effective control on people entering potential yellow fever areas to make sure they have been vaccinated. There have been no cases of Bolivian hemorrhagic fever (BHF) since 1972. A new control program, involving trapping of the rodent vector of the disease, has been employed to find and control infected animals and has apparently been effective. Although the case numbers in the past few years for both yellow fever (eight to 30 cases per year) and Bolivian hemorrhagic fever (possibly 300 deaths during the past 10 years) have been small, these diseases are highly significant in that they have a high case fatality rate and therefore are much feared. As such, they could have a significant negative impact on new colonization areas. All documented cases of BHF thus far have their origins in the Beni, although the disease was exported to Cochabamba in 1971. A vaccine for this disease is apparently close to being developed.

f. Chagas' disease

Chagas' disease is much more significant than existing reports indicate. More studies are needed (and planned, to a limited extent) to discover the true prevalence of this disease. Although few active cases are reported (114 in 1971) it is estimated that in endemic areas 18 percent of the population is infected with Chagas' disease. As a chronic and usually fatal disease, it affects morbidity (especially in the middle-aged group) and probably represents one of the major public health challenges in Bolivia. It mostly affects the heart and causes chronic congestive heart failure or arrhythmias. It may be the reason for the high reporting of cardiac disease in Santa Cruz as a cause of death.

g. Other communicable diseases

Sixty cases of rabies were reported in 1971, mostly from dog bites. Dog control or vaccination programs have been very sporadic and have had little effect on the incidence of rabies as they have reached a small percentage of the canine population. Bubonic plague continues to be a sporadic problem in some areas (see map, Figure 2.5). There are occasional outbreaks in the valley and Yungas areas. The last outbreak was north of Coroico in July 1974, with 14 cases reported.

Venereal diseases are on the increase very significantly in Bolivia, as they are elsewhere in the world. The rural areas seem affected as well as the urban. The incidence (hard to determine due to underreporting, although 1,939 cases of gonorrhea and 1,059 cases of syphilis were reported in 1971) of both gonorrhea and syphilis seem to be increasing rapidly. Gonorrhea may become a very substantial problem as there is no standardization of treatment.

Leprosy a potential cause of long-term morbidity, affects a few thousand people in Bolivia. These people are in pockets, mostly around Vallegrande (Santa Cruz) and in the Beni. The treatment is now done mostly on an outpatient basis. The leprosy control program seems to be working fairly well. People seem more motivated to take their treatment than do tuberculosis patients, for example. Skin diseases, notably scabies, are extremely prevalent and often overlooked. They affect a large percentage (perhaps 50 percent) of the population in cold and arid areas (Altiplano) where bathing is not practical. Typhus occurs in these areas too, occurring in clusters of a few cases, but has not been too significant in numbers recently. The last known threats were south-east of La Paz and in Charazani (1974). An experimental typhus vaccination has been tried out in several areas of Bolivia.

h. Improving the attack on communicable diseases

Tuberculosis, polio, diphtheria, whooping cough, tetanus, smallpox, fellow fever, and measles are all subject to control through vaccination. Tuberculosis, measles and whooping cough are among the most important causes of mortality and morbidity in Bolivia. There have recently been more epidemics of polio, diphtheria, and yellow fever. Since 1971 the MOH and other health agencies have jointly operated a vaccine bank to try to deal with these serious preventable diseases through vaccination campaigns. There have been problems which have hampered the effectiveness of the Banco de Vacunas. The coverage of vaccinations has been far from ideal despite claims to the contrary. The reduction in these preventable diseases (with the exception of smallpox) has been spotty and not definitely demonstrated yet. The concept of maintenance of vaccination, although "planned for the future" has been barely touched so far, even in urban areas.

There are several directions which could be taken to improve the health situation with respect to communicable diseases. These would include the wider and more efficient use of laboratory methods to establish diagnosis and disease prevalence. Also, as mentioned above, improved sanitation (water, waste disposal) is essential. Personnel in specialized communicable disease programs could be used in expanded roles. The concept of maintenance must be introduced in practice, not just theory, especially in vaccination programs. Communicable disease programs could be well integrated into the local level as a part of the rural health system in order to complement, and in some cases replace, the present national/vertical programs. Adequate and maintained supplies of pharmaceuticals are crucial to such programs as tuberculosis and leprosy. Standardization of government policies on the treatment of communicable diseases would also be important. Obviously, better supervision and an improved reporting system would be required. The most efficient and effective way of attacking the infectious diseases would be by methods of primary prevention.

3. Non-communicable diseases and problems

Diseases other than communicable diseases which represent significant problems in Bolivia are mainly malnutrition, complications of pregnancy, and trauma. Malnutrition has been discussed above. It is a contributing factor for many diseases and plays a large role in infant mortality, especially entering into the diarrhea-pneumonia complex. It also has a role in anemia, which are common in Bolivia.

a. Complications of pregnancy

Abortions, post-partum hemorrhage, toxemia, puerperal infections, anemia, and unnecessary maternal mortality are all complications which are seen in Bolivia and are largely preventable, with the possible exception of spontaneous abortions. In most areas, most pregnancies and deliveries proceed without consultation with trained medical personnel. The situation is improving slowly but notably, however, with increased maternal and infant care programs such as mothers' clubs. Only about eight percent of the population under the care of the MOH, had their pregnancies attended in a hospital in 1971. In 1973, this figure probably almost doubled, although the changes have been mostly in urban areas.

b. Trauma

Trauma and accidents are a complicated and very significant problems (see Table 2.4) which deserve more analysis. There has been some study by the Institute of Occupational Health of occupationally related accidents, primarily among the mining population. But the trauma resulting from farm accidents, traffic accidents, and violence remains largely unstudied. As Bolivia's number two cause of morbidity, trauma should be

approached with an eye to instituting preventive measures. Some of these measures would probably include improved driver and vehicle safety regulations. Basic health education might also be important in the prevention of accidents and burns in the home. Pesticide control is particularly needed in the Santa Cruz area.

c. Other diseases

Some other non-communicable diseases which are of importance in Bolivia are listed in the tables of mortality and morbidity previously cited. These include gall bladder disease, which has a high incidence in Bolivia and is probably due to chronic enteric infections and/or the diet. Rheumatic heart disease, a consequence to streptococcal infections, is also significant. Its incidence could be reduced if streptococcal infections were recognized and treated adequately. Heart disease and cancer are not very significant in Bolivia yet. One of the most common surgical problems, especially in rural areas and particular to Bolivia, is volvulus, which is likely related to diet but may also have some relation to Chagas' disease. Silicosis is also a disease risk for miners. It is estimated that up to 25.5 percent of miners have silicosis and that 75 percent are exposed to it. Silicosis is predispose to the development of tuberculosis resulting in a syndrome of silico-tuberculosis with a prevalence of approximately 2.0 percent among the mining population.(9)

d Mental health

No good figures are available for mental health in Bolivia, but there is no indication that it is less of a problem than in other similar countries. Outpatient experience indicates that neurosis are fairly common (anxiety, depression). There are a few private mental hospitals in Bolivia, but most seriously ill patients with mental disorders are hospitalized at one of the two national mental hospitals in Sucre. These hospitals, the only ones run by the government in the country, have 447 beds, which are essentially always full, indicating that there is a need for more psychiatric facilities and treatment. A peculiar mental problem for Bolivia is mental retardation secondary to cretinism, induced by iodine deficiency. The incidence of this disease is unknown, but it is probably more prevalent in Bolivia than in other countries and it may be an especially significant problem in some rural areas.

e. Dental health

There is almost no preventive dentistry being done in Bolivia. Some studies in the school age population have shown that 80 to 90 percent of those surveyed were in need of dental care.(10) Ninety percent of the dentists practice in urban areas. There is no flouridation of water in Bolivia and only a minimal amount of flouride treatments.

In rural areas there are few dentists, mostly on their año de provincia. Usually they are unable to do much more than extractions.

D. Problems in the Health System

1. Lack of preventive medicine

Many of the problems in the health system have been discussed in Section "A" above. As can be seen from the above analysis of morbidity and mortality, nutrition, and communicable and non-communicable diseases, much more emphasis needs to be placed on preventive programs. Although the Bolivian planners fully recognize this, the health budget and programs (all institutions included) do not reflect it.

2. Inappropriate training

The universities, too, have been producing personnel ill-trained for the needs of the country. Fortunately, the curricula for health personnel are just starting to be changed to reflect real needs of Bolivia in health. For the first time, it is being seriously questioned whether Bolivia needs to produce 220 doctors a year, and whether the preparation of 40 graduate nurses per year is enough. Para-professional technician training likewise is considered to be extremely inadequate to meet Bolivia's needs.

3. Inadequate supply supervision

The administrative, drug supply, supervision, and maintenance deficiencies are also recongnized, but very little is being done about these problems. In rural areas, the MOH provides essentially salaries and food money and almost nothing else. They provide almost no supervision, few standard administrative procedures, no incentives for continuity of care of financial self-support, almost no equipment or drugs. But they do realize the deficiencies. In some departments, the MOH has begun to give health personnel short courses in public health, and even community organization.

4. Minimal community involvement and confidences

Upon to now, in general, there has been little community interest in health. This is especially so in rural areas where people have little confidence in the health system, not without some good reason. In a few areas, some grassroots efforts are being made to involve the community, even to bring the indigenous healers into the health system. These efforts need encouragement and expansion if the health system is to reach most of the rural people in Bolivia.

5. Integration with other programs and within health sector

If health problems such as nutrition, housing and communicable diseases are to be resolved, there must be integrated efforts with other sector, most notably agriculture and education. Although there exist many agencies doing health-related work, such as the National Community Development Service and various agricultural and educational programs, there has been little successful integration of efforts with the health sector. Another major problem which will need improvement is cooperation between various agencies in the health field itself. The health system has not been able to work in an efficient manner in attacking the major health problems largely because of institutional anarchy within the system.

Footnotes

(1) Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p. 49.

(2) Montero Community Health Project, "Encuesta Demográfica, Sanitaria y Socio-Economica de la Comunidad de Montero", 1965, 1966 y 1969.

(3) Op. cit., Plan Nacional de Salud, 1973-1978, pp. 119-120. Urban costs = $b.32.9 million vs. rural costs = $b.9.1 million.

(4) Ministry of Health, Division of Maternal and Child Health, unpublished data, 1973.

(5) McDermott, Walsh, "Modern Medicine and the Demographic Disease Pattern of Overly Traditional Societies: A Technologic Misfit", Manpower for the World's Health, Association of American Medical Colleges, 1966, pp. 137-161.

(6) The birth rate for 1971 was estimated at 44 per 1000 population. This rate would place Bolivia among the highest in Latin America (see Table 2.1). However, it must be stressed that this is an estimate only. There has been no census in Bolivia since 1950, so the denominator is only a guess. The numerator is likewise only an estimate, as there is a very large underregistration of births.

(7) Results published in Plan Nacional de Salud, 1973-1978, Ministerio de Previsión Social y Salud Pública, La Paz, 1973.

(8) Centro de Rehabilitación de Niños Desnutridos, Estudio Nutricional en Niños Escolares, Montero, 1973.

(9) Seminario Regional de Silicosis, "Tema VI - Epidemiologia de la Silicosis", Organización Panamericana de la Salud, Publicación Científica N° 200, 1970, pp. 56 & 62.

(10) Sociedad Boliviana de Salud Pública, Foro Nacional de Salud Pública La Paz, 1973, p. 101.

CHAPTER III

ROLE OF HEALTH PROGRAMS IN SOCIAL AND ECONOMIC DEVELOPMENT

A. Introduction

Improved modern health services are intimately related both to the social welfare and the economic productivity of developing countries. Although the theoretical "state of the art" and compounding methodological problems have not permitted a concise or quantitative definition of the relationship between health and development, there is a broad consensus among international donor agencies that an acceptable level of health is an essential pre-requisite to socio-economic development. A recent report by the Inter-American Development Bank (IDB)(1) perhaps best summarizes this general understanding:

> "Health does not lend itself to the same statistical analysis as that utilized in demonstrating the quantitative relationship between education and economic productivity, nor can it be claimed that health is the only causal factor in the capacity to become "educable" and to become more productive, but it is long-term economic development". (Emphasis added).

As we approach an understanding of the relationship between an investment in the health sector of Bolivia and its impact on the socio-economic development, it is important that we recognize some of the conceptual and methodological limitations imposed upon us. At the same time it is important that we are as clear as possible in our understanding of the nature of the relationship between the two and, where feasible, the magnitude of any effects.

In organizing this effort we shall examine first (Section B) some of the "costs", both economic and social, of the prevailing health problems in Bolivia. In Section C we shall then explore some of the benefits that one may reasonably expect from an investment in the health sector. In Section D we shall discuss some of the "costs" or potentially negative aspects of an investment in the health sector, especially as they may relate to an alternative investment in other areas of the society. Finally the crucial question of benefit-to-cost analysis, and some conclusions about the ultimate utility of an investment in health in Bolivia, will be examined in Section E.

B. Economic Costs of Current Health Conditions

There can be no question that ill health has a cost to society. While most people will quickly recognize the cost of treating a disease as an inherent drain of resources, in fact there are many other losses to a society, direct and indirect, due to the consequences of illnesses. A recent Office of International Health (OIH) publication(2) provides an outline of the five types of "costs" that one may use to assess the value lost to a community because of a health problem.

1. The direct cost of diagnosis and care.

2. The indirect cost of lost wages and lost productivity.

3. The indirect costs attributed to increased caloric needs of all population working and non-working.

4. The indirect costs attributed to investment in individuals who die as a result of the disease.

5. The indirect costs to the government through social security payments.

We shall try to evaluate each of these costs within the context of the Bolivian situation.

1. The direct cost of diagnosis and care

> "This includes private, governmental, and international expenditures. When no data are available to compute the direct costs for any disease to the various sectors or within any one sector providing care, the only figures which can be used are budget expenditures allocated to categorical disease problems. Although these budget allocations include some prevention funds, they understate the total direct costs as they include other government and private expenditures".(3)

In Bolivia there is no data available for computing the direct costs of diagnosis and care for any given disease. Consequently, one must turn to the more imprecise categorical budget allocations.

From data presented in Chapter VI, C we are able to identify institutional budget components and compute an estimate of the direct cost of diagnosis and care in Bolivia. In Column (1), Table 3.1 below, we may see the 1974 estimated expenditures of the different health service components. For the public sector, these expenditures represent the

budget allocations for health services while the private sector expenditures are estimates of private investment in health services. In Column (2) are listed the amounts of operating budgets which go into curative services or as shown in Column (3) that percent of the private sector dollar which is used for curative services. Finally, in Column (3) is a calculation of the total expenditure for curative services. It may be seen that of a total 1974 health sector expenditure of $52,175,000, $46,922,000 or 89.9 percent was spent for curative services.

Table 3.1 - 1974 Expenditures for Bolivian Health Institutions.

Institutional Components of Delivery	(1) Estimated Expenditures US $ x 000	(2) Percent Curative Services	(3) Total US $ for Curative Services x 000
MOH	11,370	70.0	7,959
SSS	17,605	95.0	16,725
Other	3,200	95.0	3,040
Private			
(a) Modern	15,000	95.0	14,250
(b) Traditional	5,000	99.0	4,950
Total	52,175	89.9	46,922

Source: USAID/Bolivia, Humanitarian Assistance Division, 1974.

We may now examine the urban versus rural distribution of these curative expenditures. Chapters IV and V, provide a discussion of the organization of the health sector and areas of program activities. From this material we may estimate the distribution of expenditures by the different components of the public and private sector and derive an estimated cost of curative services for the rural versus urban areas. In Table 3.2 below we may see in Column (1) the curative expenditure for the different components of health sector. Column (2) contains an estimation of the percent of program activities and expenditures in the Urban Sector. In Column (3) are the calculated expenditures for

curative services in urban areas, Column (2) times Column (1). Finally in Column (4) are the expenditures for curative services in the rural areas.

It may be seen that of a total of $46,922,000 expended for curative services, an estimated 22 percent or $10,101,000 are expended in rural areas as opposed to $36,823 for urban areas.

Table 3.2 - Estimated Cost of Curative Services in Urban versus Rural Areas in 1974

Institutional components of Delivery	(1) Total US$ for Curative Services x 000	(2) Estimated Percent Expenditures in Urban areas	(3) Estimated Expenditures for Curative Urban Services US$ x 000	(4) Estimated Expenditures for Curative Rural Services US$ x 000
Public				
MOH	7,959	75	5,969	1,990
SSS	16,725	90	15,053	1,672
Other	3,040	50	1,520	1,520
Private				
Modern	14,250	95	13,538	712
Traditional	4,950	15	743	4,207
Total	46,922*		36,823*	10,101*
Percent	100		78	22

* Error in rounding account for slight differences in totals

Source: USAID/Bolivia, Humanitarian Assistance Division, 1974

2. <u>The indirect costs of lost wages and lost productivity</u>

> "These estimates recognize that when a worker is ill enough to be reported as a disease case to the health authorities, he is not working and is, therefore, not receiving his normal salary. While it is possible that he receives some payments from insurance by the government, i.e., Social Security, he is not producing, and his lost productivity can be counted in terms of his equivalent lost wages. The many possible costs of lost wages and lost productivity are derived by combining various assumptions regarding the nature of a specific disease and the characteristics of the working population. The assumptions include a minimum daily wage; varying periods of disability; work weeks of five or six days; and a working population discounting female labor or equating female labor".(4)

A recent study by Ohio State University (OSU) (5) may provide us with some basis for estimating the indirect costs of lost wages and productivity in Bolivia due to illness. The OSU team surveyed a number of industries with a set of questionnaires concerning the workers recent health experience. This set of questions attempted to obtain information on the extent of absence due to sickness or accidents over the course of a two month period prior to the date of the interview. It also sought to identify the reason for the absence and the utilization of medical facilities. While not all data collected was useable, some of the conclusions that were possible provide a striking picture of the impact of poor health on Bolivia's industrial labor force.

> "In aggregate terms, somewhat more than 9 percent of the sample of employed persons reported having missed at least one day of work during the two-month reference period. Given the differential risk and exposure of certain groups, there was (as expected) some variation in the proportions of workers reporting days lost from work. For instance, while roughly 8 percent of professional, managerial and clerical workers reported some days of work absence, more than 10 percent production workers reported similar episodes.
>
> There was even a more significant variation in the number of days lost among various occupational groups. The mean number of sick-days of non-production worker, for instance, was roughly 6 days per month, while for production workers

> it was almost 9 days. Of the production workers, moreover, miners who reported sickness tended, on the average, to lose 10 days of work per month.
>
> Despite their inherent methodological limitations, these data demonstrate the high toll that ill health--stemming from a variety of causes--exacts from the national labor force. If one assumes that these figures are representative of the year in which they were obtained, and one further assumes that they are in some sense accurate, they imply that somewhat more than one-third of the total work days per month available to the national non-agricultural labor force for productive purposes are lost due to sickness and accident. (Emphasis added)(6).

Needless to say, this figure seems high, and there were certain methodological problems with the survey. On the one hand, the survey was taken of people who were currently employed thus excluding those who were not active in the work force because of illness. On the other hand, there are questions about the size of the labor force estimates which may overstate the magnitude of absenteeism ratios. But, as is concluded by the authors of the study:

> "Even with the possibility for some error, however, these figures tend to substantiate the need for thinking of the low levels of national health as being a significant constraint on the economic development of Bolivia".(7)

As we approach an understanding of the "indirect cost" of the loss of productivity represented by this study, however, we must recognized that it refers only to the non-agricultural labor force, and we know that 63 percent of the Bolivian labor force (Table 1.18) is involved in agricultural production. We have no studies and information upon which to understand of illness-related lost productivity in the agricultural sector. But perhaps some reasonable estimates may be made, based on the experience with the non-agricultural work force.

First, we must recognize that the lost productivity examined in the OSU study was for absenteeism only. Not considered in that study are the losses to productivity due to inefficient or restrained work effort at the time of illness when the worker comes to the place of work. Surely the worker does not absent himself from

work for every illness. While there is every reason to believe that, due to social security benefits and the salary system, the industrial worker is more likely to take time off from work for a given level of illness than the agricultural worker, there is also reason to believe that losses to agricultural productivity are more likely to suffer most from sub-optimal output at the time of illness. A greater percentage of agricultural laborers would "work" while ill (low-productivity not indicated by absenteeism data), but would work at a less optimal level.

Secondly, we may reason that while an industrial worker may be more likely to be absent from work for a given level of illness, the prevalence of illness - serious illness - is greater among the agricultural labor force than among the industrial sector. (See discussion: Chapter II, Section A.6. Problems in Rural Areas).

Thus, from the above analysis, we may reasonably estimate that losses to production due to illness, in terms of absenteeism and lower productivity, are similar between agricultural and non-agricultural working populations; and that it is conservatively (based only on non-agricultural absenteeism) valued at one third of the total work days per month.

We are now confronted with the problem of placing a value on this lost productive time of workers. To permit this quantification we can refer to Table 3.3 below which outlines the estimated 1974 GDP at factor cost by sector.

Table 3.3 - Bolivian Labor Force Production Estimates by Sector, 1974

Sector	(1) Work Force (x 000,000)	(2) Gross Product (US$ x 000,000)	(3) Per Capita Product (US$)
Agriculture	1.6	325	203
Industry	0.4	500	1,250
Service	0.5	625	1,240
Total	2.5	1,450	580

Source: CONEPLAN, unpublished data, 1974

If we are to apply the findings of the OSU study to this data, we must first recognize that the product of the labor force in Bolivia is accomplished with only two-thirds of the work time available to it; one third of the time is lost due to illness. If we assume that the labor force could be as productive with the extra time available to it - i.e., the time it now loses due to illness - as it is in the time it currently works, we may find the value of this loss productivity. Outlined in Table 3.4 below is a display of the considerations necessary for this quantification. In Column (1) we have the average "ideal" work days per year by sector. In Column (2) we have assumed that one third of the work days available were lost due to sickness, thus leaving us with the actual working days in 1974. The 1974 GDP by sector, that produced by the work days in Column (2) is outlined in Column (3). Column (4) is the anticipated GDP at factor cost, assuming that all available work days would be fully productive (calculated by dividing Column (3) by 0.66). Finally, Column (5) is the value lost, by sector, because of lost workdays due to illness, i.e. (4) - (3). It is noted that in ascending order of importance, the agriculture, industry and service sector incurred losses totaling US$725 million.

Table 3.4 - Estimated Value of Lost Productivity of Bolivian Labor Force due to Illness, 1974

Sector	(1) Work Days Available/year	(2) Days Worked in 1974	(3) 1974 GDP (US$ x 000,000)	(4) GDP without lost days	(5) Lost Product due to illness (US$ x 000,000)
Agriculture	320	213	325	487.5	162.5
Industry	295	197	500	750.0	250.0
Service	295	197	625	937.5	313.5
Total			1,450	2,176.0	725.0

Source: Derived from Table 3.3 data.

With reference to the rural versus urban distribution of this indirect cost, we may tabulate the quantities from the agricultural sector as representative of the expenditures in rural areas, and the industrial and service sector predominantely (if not exclusively) urban. With this assumption we may see that of the US$725 million loss in productivity, US$162.5 million or 22.4 percent is attributed

to the rural sector while US$563.5 million or 77.6 percent is that lost in the urban sector.

As was stated, the foregoing calculations were based on the assumption that the work force, both agricultural and industrial, could be as productive in the extra time available to it as it is in the time it now works. This assumption would be true if given full employment and with no other constraints on factor inputs. This is obviously not the situation that exists in Bolivia. Unemployment is estimated at 13 percent in urban areas. Even more important, is the underemployment or hidden unemployment of the labor force, especially in rural areas. Also the capacity utilization in some of the industrial sector of Bolivia has been estimated as low as 40 percent and in some rural areas (Central and Southern Valleys) limits of land and technology present tremendous constraints on greater agricultural productivity. Within this milieu it is practically impossible to project the increase output, in the aggregate, that might be obtained by utilization of time now lost due to illness. In sum, we may say only that the figures and total used in the consideration of this indirect cost are representative of a theoretical economic state, with the simplest of assumptions. At such time in the future when investigations in Bolivia provide the basis for better assumptions on labor output, these calculations can be easily amended.

3. <u>The indirect costs attributed to increased caloric needs of all the population working and non-working:</u>

> "These cost estimates are derived from the model developed by Sheldon and Pollack for the Institute for Defense Analyses (IDA). The model recognizes that febrile illnesses accelerate the metabolism and thereby exert a caloric demand which must eventually be replaced by increased food consumption. This caloric increment attributable to the disease process consumes food that is essentially wasted. The costs of the caloric increment can be assessed in terms of food in three different ways - the number of persons it could feed if reallocated, the number of working days required for its production, or its value in the market place".(8)

The high prevalence of febrile and diarrheal diseases in Bolivia, both of which add to caloric loss, make this a cost of considerable impact. Yet, only the most complex calculations, coupled with extensive knowledge of the incidence of these symptoms, themselves associated many different diseases. Also, there would need to be estimates of the average caloric intake and the average value of a calorie in Bolivia. In this case we find the necessary information unavailable and we must leave unevaluated the magnitude of this cost. The consequence of the loss, however, should not be underestimated. As has been noted previously, malnutrition and marginal nutritional balance is widely a prevalent problem. Especially in rural areas, the increased caloric demands during illness, is a tax of major proportions.

4. <u>The indirect costs attributed to investment in individuals who die as a result of disease:</u>

"This includes government investment in education, childhood care and other programs identified as directed at children, e.g., school lunch programs, and represents waste investments. Non-governmental and private expenditures for the care, education, and raising of non-productive individuals also should be included. The expected benefits of these expenditures are not realized when premature death occurs. For this reason, these costs are mentioned to illustrate a "waste" of the society's efforts. Because data are usually not available to estimate the magnitude of this investment, these costs are calculated for individual diseases".(9)

As indicated in the discussion above, the untimely death of an individual in whom society has already invested and who has not contributed a full measure in return, is a cost of disease that must be considered. In determining the magnitude of this cost however, there would be required the most sophisticated of data and estimations. First there would be required an estimate of the approximate costs of social services extended to the growing individual, predominately education. Secondly there would be required a comparison of current age-specific death rates in Bolivia with those that might be obtained in an ideal situation (e.g. developed country age-specific death rates). Thirdly, there would be needed some estimation of the marginal productivity of workers during their productive years, discounted for the investment in years past. From such a complex consideration could be derived the cost of the excess deaths in those years before the full investment of society could be returned.

It should be apparent that a data base is unavailable for such a calculation in Bolivia. In view of the lack of this kind of information we may only draw references to those diseases, (e.g. malaria, tuberculosis) which on the one hand are preventable and which on the other hand take their toll among older population groups, particularly the working ages. A high death rate among the population under five years does not incur a high value for this indirect cost, although some public services such as MCH clinic costs may be lost through an untimely death.

As has been pointed out, silicosis and TB among the small but economically important mining population (4 percent of workers who generate 50 percent of Bolivia's foreign exchange earnings) is a serious cause of morbidity and mortality. Is is estimated that the average

miner has a shortened life-span, to about 35 years of age. The loss of these semi-skilled workers, in the prime of their productive life, is a cost of considerable importance to that industry.

Bolivian hemorrhagic fever represents another similar situation. During the decade from 1962-72, this disease had a 25 percent case fatality rate, resulting in 300 to 400 deaths in Beni and cause the razing by fire of about three villages. While there is no valid way in which one can place a quantified value on the economic impact of such loss, one cannot diminish its importance.

5. The indirect costs to the government through Social Security payments:

> "In countries where such a system exists, the Social Security Fund is supported by compulsory contributions from the employees, the employer, and the government. Self-employed persons may choose to contribute. Payments made to the sick through this fund are estimated to illustrate the impact a given disease has upon a specific government organization and upon the workers and the employers who support it. These costs are not included in the totals for the costs of the disease because they represent a portion of the costs of lost wages. Costs of disease to the Social Security Fund are based upon the assumption that the proportion of cases with a disease in the working-age population can be applied to the working-age population with Social Security coverage".(10)

The largest single agency responsible for Social Security payments is the CNSS with disabled miners constituting the greatest pool of beneficiaries. From estimates presented in Chapter VI, we find that the annual expenditures by the CNSS for occupational and professionally related disease and accidents totaled US$8.5 million. In addition to this sum, the CNSS also makes payments for invalidism, old age and death benefits, some of which are a result of work-related accidents. Current record systems, however, make it impossible to estimate the size of these benefits. Thus, for the total social security payments for disease related disability, we may conservatively estimate US$8.5 million per year.

But we are presented with a particularly complex problem in considering the true economic cost of social security payments. Such payments are not properly considered a "cost" in themselves. Rather, economists have recognized that such payments are more properly classified as transfer payments. Derived from the tax system, these funds

are provided by the tax payers and then redistributed to other people in need. Thus, they are not a cost, an expenditure of real resources, in the true sense of the word. However, it must also be recognized that there may be a cost of government transfers to one sector of the economy if they represent a lost opportunity to invest in another sector of the economy where the returns are greater, the cost being the difference in returns from the two investments. Thus, the US 8.5 million dollars expended by the government for the payments to disabled workers incurs an economic cost insofar as there is this lost opportunity for investment in other areas with higher returns.

But we are faced with the insurmountable problem if we truly want to consider the cost of determining the return on investment of all government expenditures. It may be that investment in social security payments has a high return on investment, in which case the costs are low. More probably, however, these payments have very low returns, since they are neither preventive medicine nor curative services. But only after-the-fact maintenance payments, in which case a considerable cost is involved.

Thus we must leave the US$8.5 million in our consideration but only as a financial cost, not a true economic cost, and conclude that we can not truly determine this cost for Bolivia with current data availability.

6. Summary

Summarizing the discussion above, it should be apparent that there are definite methodological problems in properly determining the costs of disease in Bolivia. The lack of necessary data has required numerous reasoned assumptions about the magnitude of such costs. In some cases, simply, no estimates can be made. With this understanding, however, we have compiled the following table (Table 3.5 of the costs of disease in Bolivia). Even with necessary omissions of some categories, we are finally able to estimate that the possible total upper limit costs in disease in Bolivia for 1974 was US$772,924,000.

Table 3.5 - Summary of Estimated Costs of Disease in Bolivia, 1974

(US$ 000)

Cost Category	Urban	Rural	Total
1. The direct cost of diagnosis and care	36,823	10,101	46,924
2. The indirect cost of lost wages and lost productivity	563,500	162,500	725,000
3. The indirect cost attributed to increased caloric needs of all population working and non-working.	-	-	a
4. The indirect costs attributed to investment in individuals who die as a result of disease	-	-	a
5. The indirect cost to the government through Social Security payments	-	-	(8,500)[b]
Total	600,323	172,601	772,924

[a] Insufficient information in Bolivia to make quantitative estimates

[b] Financial cost only, not true economic costs. Not added into total.

Source: USAID/Bolivia, Health Sector Assessment, 1974.

This is obviously an impressive figure and can only generate as much skepticism as concern. This conclusion has required the acceptance of some assumptions that, at another time and place, might be debated at great length. But it is also recognized that this conclusion is "conservative". Of necessity, it has not included a consideration of other recognized but unquantifiable costs, e.g., wasted calories, lost investment. Similarly, using another scheme for organizing our estimation of costs of disease we might have included other such concepts as "the cost of trying to avoid the disease" (all current preventive medicine costs), or we might have placed estimates on some of the social costs of disease. Outside of the purely economic consequences of disease we might have considered costs associated

with the disruption of normal family relations due to illness, disability or mortality. Similarly, there are costs associated with social discontent harbored by those segments of the population aware that basic preventive and curative services are available to some people but not to others. Lastly, there is the difficult area of the economic motivational consequences of prevalent ill-health and high mortality in a community. For instance, when life is "nasty brutish and short", there probably is a reluctance for the community to continence any economic change that may "threaten" an already precarious existance.

A further analysis of this data leads us to some other important observations about the nature of cost of disease in Bolivia. Although we see that there are many ways to demonstrate the cost of disease which is borne by society, we find that there are more indirect costs, both in number and magnitude, than there are direct costs. This has some important consequences which are best summarized in a concluding paragraph from "The Cost of Disease and the Costs of Inaction".

> "The impact of a disease upon a society has traditionally been considered in terms of the number of lives lost as a result of the disease, the number of ill or disabled persons afflicted with the disease, or the degree and length of suffering caused by the disease. While these considerations are essential, they do not identify the full burden place upon the society. They also do not demonstrate the costs of inaction, which are often greater than taking action to control a problem. Disease carries certain economic costs which are borne by the society - the direct costs of prevention and care and certain indirect costs which are often borne without the knowledge of the society. The direct costs can be consciously reduced through decisions to ignore the problem. Indirect costs, however, remain the same or increase if the disease problems are ignored, so that inaction proves more costly than minimal action to contain disease. These costs can be reduced only through prevention of eradication of the disease. (Emphasis added).

Thus the direct cost of disease, while most apparent, lead to a gross underestimation of the total burden of disease to the Bolivian society. Similarly, there may be a desire to reduce these direct costs without cognizance of the impact that such a reduction may have on those more important indirect costs, thereby generating faulty economic investment policies. While the consideration of the costs of disease in Bolivia is necessarily "soft", what few estimates that we have been able to generate indicate the immensity of the costs, direct and indirect, that must be considered in any health investment in the country.

C. Benefits of Health Programs on Socio-Economic Development

1. Introduction

In Section B we explored some of the costs of health ill and disease in Bolivia. We now turn to a discussion of some of the benefits that one may expect from an investment in health programs. Health-the physical, emotional and social well-being of people - is intimately related to numerous factors in the social order; and expenditures in the health sector do make a contribution to that ultimate goal of health. To further elaborated on that contribution we may divide health activities into four categories: i) treatment, ii) prevention, iii) information, and iv) research.

In the short run, treatment can be one of the most effective activities to reduce the duration of morbidity and the impact of mortality. There is no question that several of the leading causes of mortality in Bolivia (e.g., childhood gastrointestinal and respiratory illnesses, tuberculosis) demand considerable attention to treatment. However, in the long run preventive programs are likely to be more effective than treatment in eradicating these diseases. This is not to say that treatment or preventive programs are substitutes for each other, but rather that they are complementary and that a proper mix of program activities is necessary.

Information about health status and available health measures is a necessary complement to both treatment and prevention. It can make both more effective and efficient the utilization of other services. Also, primary health information (e.g., programs on health education) may be seen as an integral part of an activity in a preventive program. Finally, research on the nature of health problems or on the reasons for the inefficient use of health services is a necessary adjunct to the effective application of all other program activities.

In Bolivia, we already have suggested that the current demands for curative services has resulted in a relative over-investment in this category. As was noted above, the effect of these services are immediate and dramatic, but the long run benefits are marginal.

2. Relationship between health status and production

In Section B.2 we have discussed some of the costs of illness due to decreased productivity of workers either through lost time at work or early retirement. In this section we may now examine the other side of this coin or the contribution of a health program to productivity.

In planning its investments in Latin America, the Inter-American Development Bank (IDB)(12) was most cognizant of relation of health and development and clearly stated its understanding in the following manner:

> "To the social benefits which are derived from the improvement of health conditions in Latin America need to be added the ample economic benefits which justify the Bank's involvement in this field. As in the case of education, a demonstrable relationship exists between improved health and economic productivity; both join in the formation and preservation of human capital. It is no accident that in advanced countries, productivity has been increasing at a much faster pace than can be explained alone by inputs of physical capital and additions to the work force. The explanation lies in the increased productive capacity of a work force whose quantitative growth has been aided by improved health, and whose quality has been improved by inputs of health and education... In summary, health is required to maintain and improve the productivity of the work force and to make it possible for the pre-work force population to take efficient advantage of the investment in educational facilities required for their later performance as workers". (Emphasis added).

There may be questions as to the direction of causality: Does better health lead to increased output, or does increased output lead to better health?. Undoubtedly, causality runs in both directions. As was discussed previously, health, economics and welfare are intimately related; and the combination of the three contributes to an upward spiral of social well-being. But such a statement also affirms the effect of health on production.

We may now ask: In what ways can better health lead to increased output? Most directly, healthier workers will be more able are more highly motivated to produce than workers who are debilitated. Healthier workers are more robust in accomplishing a given task; and the utility of their work - the enjoyment of the salary or earnings they expect to receive - are greater than for the less healthy worker. The drive to earn (and enjoy) a pay check in enhanced in the healthy producer. It should be noted that this benefit from increased productivity would be greater, although not exclusively, in labor-intensive industries and especially in the rural agricultural areas. Still, better

health can add to productive capacity in more capital-intensive industries through lower production costs by such mechnisms as lower absenteeism and greater longevity of the work force (e.g., less resources invested in training of new workers).

Health programs can also contribute directly to the development of a nation by opening new areas for economic exploitation. Fertile lands may be virtually uninhabitable because of disease (e.g., malaria, yellow fever) or potential tourist sites may remain unvisited because of unsatisfactory sanitary conditions. In both these areas, health programs may have a special contribution to make to Bolivia. Current efforts at settling areas around Santa Cruz and developing the agricultural and petroleum industries there are being especially hampered by the prevalence of virulent diseases. Malaria, yellow fever, hookworm and tuberculosis all remain a deterent to convincing settlers that this is a desirable area to set forth a new life. Also, Bolivia has a relatively untapped tourist attraction in the ruins of the Inca civilization in the Altiplano. The provision of proper sanitation and the eradication of endemic typhus and TB would contribute to the fuller development of this resource.

3. <u>The relationship between health and other-than-health expenditures</u>

Improvement in health may allow for a more efficient utilization of funds expended for other social services. Health and education appear particularly interdependent in this respect. Studies of the relationship between nutrition and mental development of young infants have most explicitly demonstrated the relationship between health and learning ability. A decrease in the high prevalence of malnutrition in Bolivia must have a significant effect on the efficiency of expenditures for education. In a similar vein, school age children, may fail to attend school or perform inattentively because of poor health. Improvement in health again must add to the benefits derived from school attendance

Finally there is the difficult-to-prove, but much discussed motivational aspects of health services on a developing society. Development, in all its ramifications, necessarily calls for a change in traditional life styles. Health services' technology is not only highly visible and emotionally potent but is many times the first encounter that rural people may have with the developed world. Health centers, along with schools, are the first channels for acceptance of innovation in rural areas. Modern health practitioners, properly placed and trained, can have an impact on social and economic development far beyond the strictly technical limits of the medical services they provide.

Not only can health services in rural Bolivia do much to extend the "future horizon" of the people, through the containment of the ravages of fatal or severely debilitating disease, but it can instill in these people a trust in the potential of a change in their life style vis-a-vis with education, agricultural practices and social customs.

4. Health services and employment expansion

Although we have been evaluating the effect of health services on health and subsequently, the effect of the latter in the development of other spheres of the economy, we must not overlook the direct effects of investment in health as an "industry" in its own right. The health sector of any country is one of high labor-intensity. Especially, in a developing country such as Bolivia, much employment can be created by an expansion of the health sector. Particularly, with the development of a rural health service through the use of para-professionals, auxiliary personnel and lay health workers, there is created a demand for relatively large numbers of semi-skilled workers. This demand has not only a direct employment advantage but also an educational component with other multiplier effects.

Although major benefits are derived from such investment in rural health services, the increased use of para-professionals in the relatively skilled and costly urban health markets can have a similar employment effect, besides increasing the productivity of existing skilled manpower.

It should be apparent that ancillary health activities such as preventive medicine and environmental sanitation are equally labor intensive and their expansion would create much additional employment. These types of services have the added advantage of being comprised of skills which are easily transferable to non-health markets if and when an intensive sector investment is no longer required.

D. The costs of health sector investment

Thus far the emphasis has been on the costs of disease and the benefits of health service investment. We now turn to a critical examination of some of the "costs" of an investment in the health sector of Bolivia.

1. Opportunity costs

There is a common belief that an investment in health is an undisputed good - that any addition to the health status of a

population cannot be faulted on any account. While few can deny that an improvement in health is a worthy goal, it must also be recognized that such gains are made at a cost for lesser developed countries, scarce goods and resources are directed away from other societal goals if they are to be committed to an investment in health services. Economists have called these "social opportunity costs" or the cost of the lost opportunity to invest in some other area of society.

What is the magnitude of these opportunity costs? Unfortunately, this concept of opportunity costs must remain just that - a concept - in Bolivia. Only with the most sophisticated (and costly) kind of manpower and resource data could one begin to make a reasonable estimate of the opportunity costs that might be entailed with a given level of investment in health services. This kind of information is simply not available in Bolivia.

2. Effects of health on population growth

Throughout the developing world and in much academic literature, there is the view that medical care and public health largely are responsible for the so-called "population explosion". Better health services, as the argument goes, will reduce mortality rates, particularly infant mortality, without a concurrent reduction in birth rates resulting in an immediate growth in population. It is recognized, however, that after some indeterminated time of learning, families will see that they need not continue this excessive fertility behavior to achieve the desired number of children. Also, with improved health and development, there is the recognition that children are not necessarily an asset, an insurance for old age, and fertility behavior is reduced. Of course, during this period of "learning" there is a rapid population growth.

However, this argument is not without its critics. Recently Marshall (B) et. al. noted, somewhat sarcastically:

> "Thus, it would seem that the global decline of death rates has been attributed to mass campaigns against malaria which are as yet inconclusive, to drugs which are largely inaccessible, to doctors who are unavailable, and to sanitation programs which do not exist... Death rates began declining before the advent of antibiotics and in spite of the fact that 80 percent of the rural area of this region (Latin America) still has no treated water".

These critics conclude that a general improvement in nutrition has probably been the single most significant factor in explaining the decline in death rates and subsequent population growth in the developing world. But academics aside, this potential problem has significance in Bolivia. Although Bolivia is a sparsely populated country which eventually will need more manpower for settlement and development, a rapid substantial population growth could quickly overtax the economic infrastructure of Bolivia. Malnutrition is even now a serious problem, and it is doubted that the country could support many more people in the near future without dramatic changes in its agricultural productivity and in the redistribution of its population. Thus, the threat of a rapid population growth in Bolivia as a result of an investment in health must be addressed.

One answer might be to seek a stabilization of death rates, but withholding medical technology as a method of population control is clearly unthinkable. A more reasoned approach is to provide for efforts at economic development to support a growing population. Simultaneously, comprehensive health programs could be implemented which integrate acceptable means of limiting conception for those persons desiring them as they come to perceive the economic and social advantages of their use. Good health thus is a prerequisite to effective stabilization of the population at whatever size, that may be desired; individual couples seeking a certain family size must have confidence that the number of children born to them will have a good chance of survival to adulthood.

3. Effects of health on unemployment

It is recognized that Bolivia has a considerable unemployment problem and to an even greater extent an underemployment (hidden unemployment) problem. Under such conditions it may be argued that an improvement in the productivity of workers, as might be facilitated through a health program, would in fact lead to an exacerbation of the "numerical" unemployment that exists. It is assumed, in this argument, that the employer in this situation can now employ fewer "more productive" workers than previously to accomplish the same product or, similarly, that the expansion in the traditional employment market will be slowed by the addition of a newer more productive type worker. This possible consequence must be considered in any health service investment.

There is also reason to believe, however, that this problem is not as severe or significant as some may expect. In the first place, social patterns of labor employment are not quick to respond to evolutionary improvements in the productivity of

workers. Thus the weight of tradition would smooth out the employment patterns that will be generated by this change in productivity. It can be assumed that during this period general socio-economic development will more than provide for new employment opportunities for the presumed displaced workers. And it must be recognized that the increased productivity of workers will contribute to these new opportunities. Increased productivity of workers will ultimately lower the production costs, thereby increasing consumer demand. Although there may be generated windfall profits in some situations, especially in non-competitive markets, it must also be assumed that the holders of capital will eventually invest their increased reserves in other areas of the economy and thereby generate more employment.

In sum, it is difficult to evaluate the ultimate cost (or benefit) of this consideration. Increased productivity of workers appears to be as much a part of increasing unemployment as it is in remedying it.

4. Health services and other potential problems:

One might posit a long list of other problems that might derive from an improvement in the health status of the Bolivian population. With improvements in education there may be generated demands for better employment possibilities or for a more equitable distribution of the national wealth. Also, it is recognized that a level of health services rarely fills a simple demand but rather only generates a demand for more and more sophisticated service. Indeed, rising expectations only cause a demand for more public services or responsiveness of the market. Such a discussion could go on and on, but quickly it must be seen that these are problems of development and not of investment in health services per se. Insofar as health is a mechanism that contributes to development there are also problems of health, but insofar as there is any desire to help Bolivia develop, there are problems that will arise no matter what mechanism is used. As the risk of becoming unduly philosophical, it must be observed that society rarely solves a problem. Rather, problems are substituted for each other and, hopefully, the substitution is of a less severe nature. In a sense we should welcome these types of problems. Indeed, they are indicators of the development that must be sought.

E. Benefit to Cost Analysis: The Value of Health Services Investment in Bolivia

Having tried to examine the costs of ill health in Bolivia, the expected benefits of an investment in the health sector, and some of the costs involved in such an investment, it would be desirable to now evaluate the ultimate benefit or loss that may be expected from a

particular investment in the health sector; or, in simple English "whether an investment in the health sector is worth it".

It should be apparent, however, that the gaps in the data base available in Bolivia does not allow for a benefit to cost analysis in the true sense of the words. The full costs of disease in Bolivia are only suggested by the considerations in Section B. Similarly there is no concrete quantification of all benefits that derive from an investment in health services. Finally, there can be only an intellectual recognition of the concept of opportunity cots in such expenditures. But while there is not enough information (and some might also suggested, methodology) for a true cost benefit analysis, the foregoing analysis has given us some basis for evaluating the costs and benefits that might be considered in contemplating and investment in health services in Bolivia.

In Section B, an estimate was provided of the total yearly (based on 1974 prices) cost of disease in Bolivia, totaling an impressive US$772.9 million. In part this estimate may be misleading as it is a cost that is not totally eradicable. Disease is but part of human existance and all societies must maintain some expenditures for health services. At the same time, some of the particular costs incurred in Bolivia in the health sector can be diminished; many of the diseases experienced in Bolivia can be reduced, if not completely eradicated, by the application of the principles of modern scientific medicine, and particularly preventive medicine. It is not unwarrented, therefore, that we might examine the impact of a preventive health program on some of the costs of these particular diseases.

Immediately we are confronted with the problem of determining to what extent the health problems in Bolivia are reducible. A study of the outpatient populations in Ministry of Health facilities in 1968 provides us with an indication of the nature of the problems encountered at these facilities and the quantity of patients which were seen for diseases that were eradicable or reducible by some preventive program. As summarized in Table 3.6 below, we may see that, in the judgment of the investigators, 32.9 percent of the outpatient visits were for diseases which were either eradicable or reducible by medical (immunizations, health education), environmental sanitation or dental programs. This is not to say that almost one third of diseases seen were avoidable but rather that preventive programs could have made some impact on the experienced patient load.

Table 3.6 - Summary of Outpatient Visits Attended by the Ministry of Health by Category of Disease, 1968

Code	Category of Disease	Cases	Percent
a	Eradicable	4,052	0.2
b	Reducible by health interactions, principally immunizations	148,144	6.2
	Reducible by combined health and other sector interactions:		
c	i) Environmental sanitation	339,410	13.7
	ii) Preventive dentistry	306,873	12.8
	Sub-total	789,469	32.9
d	iii) Other	746,918	31.0
	Irreducible	870,116	36.1
	Total	2,406,513	100.0

[a] - Includes yellow fever, typhus and rickettsia, malaria, rabies and smallpox.

[b] - Includes tuberculosis, syphilis and other venereal diseases, diphtheria, whooping cough, polio and measles.

[c] - Includes intestinal and other parasites, and intestinal and digestive infections.

[d] - Includes pneumonia, accidents, poisoning, violence, allergies, nutritional deficiences, bacterial and respiratory diseases.

Source: Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p. 24.

We are thus brought to the question of what impact preventive programs might have on such problems. As has been indicated, we could not expect all "reducible diseases" to be 100 percent responsive to preventive measures. While some vaccines provide virtually complete immunity (e.g. smallpox, polio, tetanus, measles and yellow fever) others provide only limited protection (TB/BCG and to some extent whooping cough and diphtheria). Similarly environmental sanitation, while necessary to effect improvements are not sufficient to eradicate all diarrheal or parasitic diseases; and, such diseases as malaria and Chagas' can be only incompletely eradicated in all but the most intensive program efforts. Given the spectrum of diseases in Bolivia which are responsive to preventive programs one can reasonably estimate that, in the aggregate, a reduction of 60 percent in the incidence of preventable diseases by preventive health and environmental sanitation programs alone.

Returning to the original estimation of the cost of all disease in Bolivia was US$772.9 million in 1974, we may now estimate the magnitude of the potential benefits that were possible if comprehensive preventive programs were provided. If we say that 32.9 percent of the diseases were reducible by some preventive program and that such programs were 60 percent effective against the diseases they addressed, in the aggregate, then we might conclude that the potential benefits would be close to US$152.5 million annually (772.9 x 0.329 x 0.6), if they effectively reached the total population of Bolivia*. Accordingly, it can be easily observed that if 70 percent of the population were affected by the theoretical comprehensive preventive health program then the potential benefit would approach US$107 million (152.5 x 0.7). Again we may turn to Table 3.5 and with the same calculations as above note that the potential 1974 benefit for the rural areas could have been almost 24 million dollars. (172.6 x 0.329 x 0.6 x 0.7).

From this analysis of the benefits of preventive health in Bolivia we are provided the basis for projecting the magnitude of costs that one could consider for such a program while still returning, in the simplest form, as advantageous benefit to cost ratio. If we anticipate benefits of US$107 million for a comprehensive preventive health (including dental and environmental sanitation) program reaching 70 percent

---

*The unstated assumptions of this estimation are not unreasonable. The magnitude of the benefits possible from a comprehensive preventive health program discussed above assume that the benefits of a preventive health program, i.e., a reduction of the costs, is equally distributed among the preventable diseases; in other words, that the diseases we are reducing with the preventive program are equally distributed among those diseases that consume funds for diagnosis and treatment and that cause losses in productivity for workers.

of the nation then we can be relatively assured that program efforts costing less than this amount would have returns greater than the original investment. Through such analysis we anticipate that programs expecting to reach a smaller portion of the population might expect benefits of a similar proportion; hence, costs could be analysed against these reduced benefits.

In sum, it must be emphasized again that this analysis, while conservative, provides only the crudes form of benefit to cost analysis. Both costs and benefits have been estimated with wide but undefined margins of error. Nevertheless, it does reveal the methodology and considerations that one must undertake in evaluating the benefit flow from preventive health programs. It also shows the considerable economic potentials that are available from an investment in comprehensive preventive health programs in Bolivia.

Footnotes

(1) Inter-American Development Bank, "Policy in the Field of Health" GN-374, a limited distribution document, 14 June 1972, p.2.

(2) U.S. Department of Health, Education and Welfare, "Syncrisis the Dynamic of Health. An Analytic Series on the Inter-actions of Health and Socio-economic Development", Office of International Health, Washington, D.C. 1972, p. 45-47.

(3) Ibid.

(4) Ibid.

(5) Chirikos, Thomas, et.al, "Human Resources in Bolivia, Problems Planning and Policy", Center for Human Resources Research, Ohio State University, Colombia, Ohio, April 1971, p. 128.

(6) Ibid.

(7) Ibid.

(8) "Syncrisis", op.cit. p. 45-47.

(9) Ibid.

(10) Ibid.

(11) Ibid.

(12) "Policy in the Field of Health" op. cit. p. 2.

(13) Marshall, R.E., Brown and Goodrish C.H., "Improved Nutrition vs. Health Services as Major Determinants of World Population Growth" Clinical Pediatric, July 1971, Vol. 10, No. 7, p. 363

CHAPTER IV

THE STRUCTURE OF THE HEALTH SECTOR

A. Summary

The nature of the health sector in Bolivia is conditioned in part by general governmental patterns and the political characteristics of the country. Bolivia's constitutional structure provides for legislative, judicial and executive branches; in effect, however, the country is run by Presidential decree. Decision-making responsibilities are highly centralized, with the nine Departmental governments being sub-units of the national administration. Some effort is currently being made towards the development and implementation of regional programs as a means of diminishing the barriers of a cumbersome and fragmented centralized bureaucracy. Public administration is politicized and particularly deficient in the areas of financial and personnel management, and planning.

Bolivia's basic health legislation provides (a) ample latitude for the development of adequate health systems and (b) the necessary executive institutions. Budgetary restraints, administrative deficiencies and professional orientation toward western and curative medicine have constrained their full potential. In addition, the creation of competing health agencies, for primarily political reasons, has led to fragmentation and inefficiency within the sector. The only areas in which supplementary legislation has been enacted deal with social security, occupational health and professional development.

Bolivia's health sector is characterized by a lack of coordination among the various service agencies, a heavy urban orientation, and the lack of strong sectorial policy planning. There are at present three agencies -- the Ministry of Health, the Social Security System (with ten service affiliates), and the National Social Development Council -- which primarily have health service mandates. There are also three decentralized public agencies which provide health services to their employees and/or service populations: the National Institute of Colonization, the National Road Service and the National Railroad Company. Sixteen agencies -- five national and 11 local -- have responsibility for the planning and execution of water supply and sewerage systems. The National Community Development Service, in addition to promoting water supply projects, is also involved in the construction of health posts and the training of health promoters. Finally, there are eight Departmental Public Works and Development Corporations (or Committees) which are involved to some degree in health development activities. In all, at least 37 government agencies participate in the health sector; many of these have multiple and/or overlapping responsibilities.

Various non-governmental institutions are also involved in health activities. These include the three University Schools of Medicine, four nursing schools and one school for social workers. At least ten religious and voluntary organizations provide health services. Finally, there are eight societies which represent different health professions and numerous institutions which engage in scientific activities related to health. These organizations all work independently, to the extent that little is known of their activities.

All of the above organizations combined effectively reach no more than 50 percent of Bolivia's population. The remainder --primarily the dispersed rural population-- have access only to traditional practitioners. Few studies have been carried out to determine the extent and substance of these practices; it is believed however, that they consist of combinations of magic, religion, herbology and colonial medicine. A wide variety of "specialists" provide these services: they range from witch doctors (brujos) to folk healers (curanderos) and midwives (parteras). Some traditional practitioners are organized and cover extended geographic areas --such as the Callahuayas or "traveling doctors"-- while others practice only locally. The traditional sector has been described in Chapter I.D.

B. Political Framework

The formulation of objectives and plans in the health sector for the most part is carried out on a technical level. The determination of priorities, the adoption of plans, the allocation of resources and the establishment of organizational structures, however, are primarily political decisions. These decisions take into account other than technical considerations. In fact, politics has been pervasive throughout the public administration system. Consumer/community participation is limited and depends largely on the degree of political clout. This political/technical dichotomy in Bolivia is inevitable, being sustained by the high demand for health services, limited resources and politization of public administration.

1. Governmental organization

a. Constitutional structure

Officially the Constitution of 1967 is still in effect. It provides for a democratic Republic, universal suffrage, popular sovereignty and separate but equal legislative, executive and judicial branches. Nevertheless, Bolivia has not had an election since 1966 and the legislature was dismissed indefinitely in 1969. In effect, the country has been run by varying factions of the military for the past five years and present indications are that this trend will continue for some time to come.

Traditionally, the President has been a strong executive. In addition to the normal powers granted to executives, the Bolivian President appoints all local and departmental officials and has the power to declare a state of siege. He also has the authority to enact supreme decrees, which have the force of law. The legislative branch, when functioning, has been characterized as inefficient and weak. Appointments to the judicial system have been primarily political, with low remuneration and surrounded by charges of corruption. While there has been no interest expressed by the military in restoring the legislature, reforms have been promised regarding the judiciary.

Provisions have been written into all constitutions calling for the orderly succession of governments through elections. In practice, however, changes have occured primarily and frequently by revolt. During the almost 150 years since independence (1825) there have been 57 presidents and almost 200 coups d'etat. Until their activities were recently suspended, there were more than 15 registered political parties and an equal number of coalition fronts. These ranged from neo-fascist groups to pro-communist parties, some of which contained less than 20 members.

In addition, the miners, factory workers, university students and the military play strong political roles. The typical pattern has been for coalitions of opposition groups to overthrow the Government in power, often independent of ideological leanings. Once in power splits would occur thereby opening the door for other coalitions. Rarely would the populace be significantly involved in these maneuvers. The price of minority rule and disregard of constitutional reform has resulted in extremely unstable government.

b. Public administration

Public administration in Bolivia is highly centralized, with very few programmatic decisions and directives originating outside of La Paz. All departmental program activities are run as sub-agencies of the national Ministries. The Regional Prefects (governors) have overall authority for military, fiscal and administrative matters. Sub-Prefects, officials vested with the administration of the provinces, and Mayors are appointed by the President, but the corregidores, canton administrators are appointed by the prefects. At present Bolivia is divided into nine departments, which are divided into 99 provinces (see Figure 4.1), and these in turn into 1,277 cantons and 229 sections. In some highland areas the Indians continue to be organized in their traditional community groups which have quasi political-administrative-judicial functions.

The instability of the central Government is reflected in the programmatic activities of the executive agencies. Until recently, Ministers and Sub-Secretaries were primarily political appointees whose

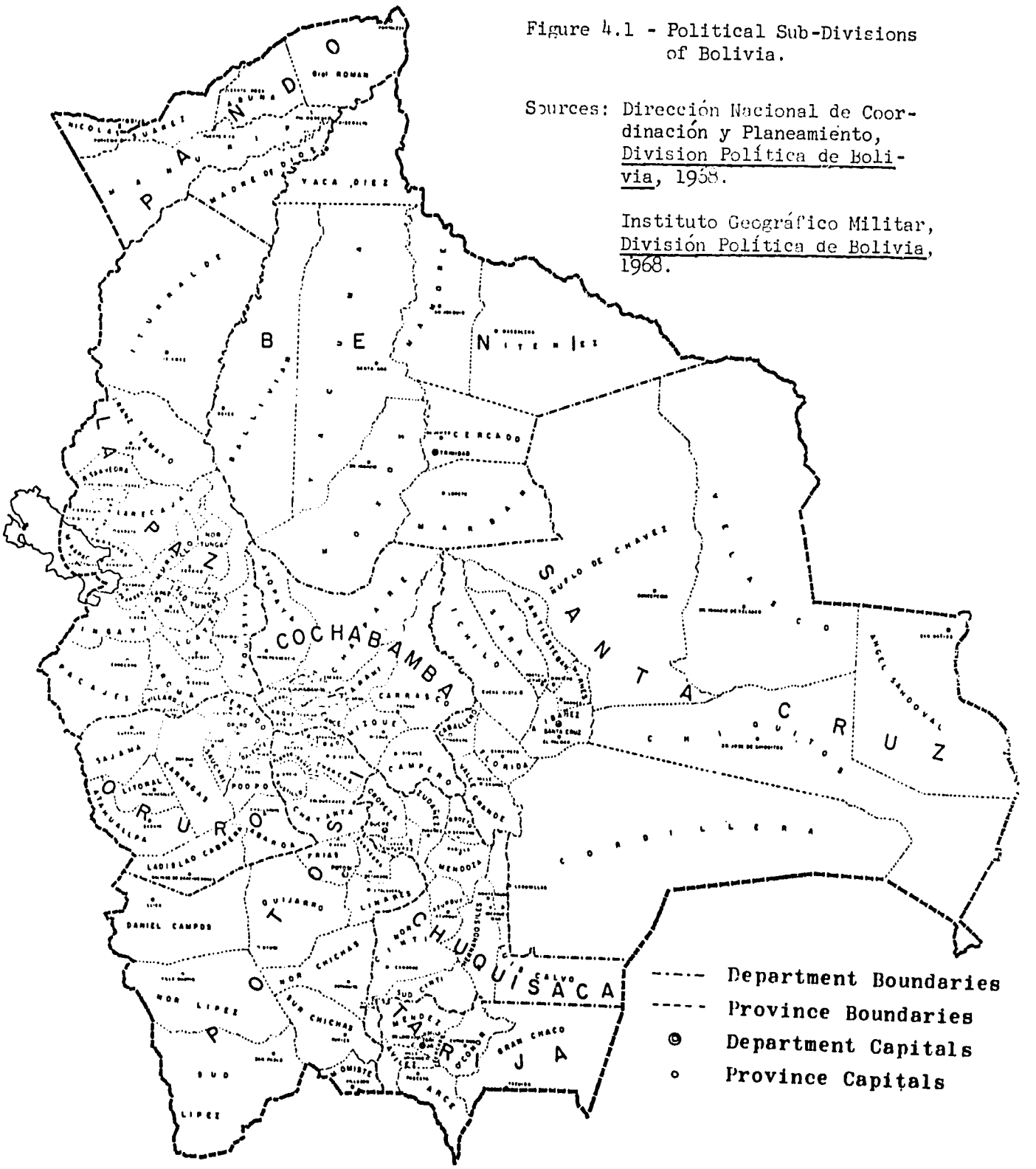


Figure 4.1 - Political Sub-Divisions of Bolivia.

Sources: Dirección Nacional de Coordinación y Planeamiento, Division Política de Bolivia, 1968.

Instituto Geográfico Militar, División Política de Bolivia, 1968.

tenure depended upon the president. As a result there have been 19 Ministers of Health since 1952. (See Table 4.1), including the present military official. Since 1964, there have been 2.2 ministers per president, serving an average term of 9.2 months. Typically, each new minister not only made personnel changes, based on politics rather than merit, but also developed new plans for his ministry, which for the most part were not executed due to the short tenure. Often, however, basic health indicators such as mortality rates were also summarily lowered to show progress.

2. Politics and health

Health planning and the allocation of resources to and within the health sector are inevitably political processes. At present, partisan politics would appear to be a minor factor. However, the decision-making process will continue to include factors which are not always technical and are many times based on personal relationships and demands within the power structure aimed at placating potentially disruptive elements. Economic development in the country will continue to command a high priority in the utilization of resources. The Government's plans and priorities for the health sector will be presented in detail in Chapter VIII.

a. Resource distribution

Without a doubt Bolivia's predominant health problems are preventable in nature and affect the rural segment of society. This is unquestioned by health planners and administrators and is even recognized by high government officials. In spite of these facts, considerable demands have been placed on the government for curative services which are concentrated in urban centers. Not only are these the interests of the politically influential groups, but they are also the services which are most visible. As a result, the available resources have been distributed for urban/curative programs. Figure 4.2 illustrates this paradox. In financial terms, these curative services are extremely costly, leaving precious little for preventive programs (see Chapter VI.C.). The relative importance given to health in general is demonstrated by the low percentage allocated from the national treasury, in spite of the fact that better health is one of the stated objectives of the present government.

b. Geopolitics

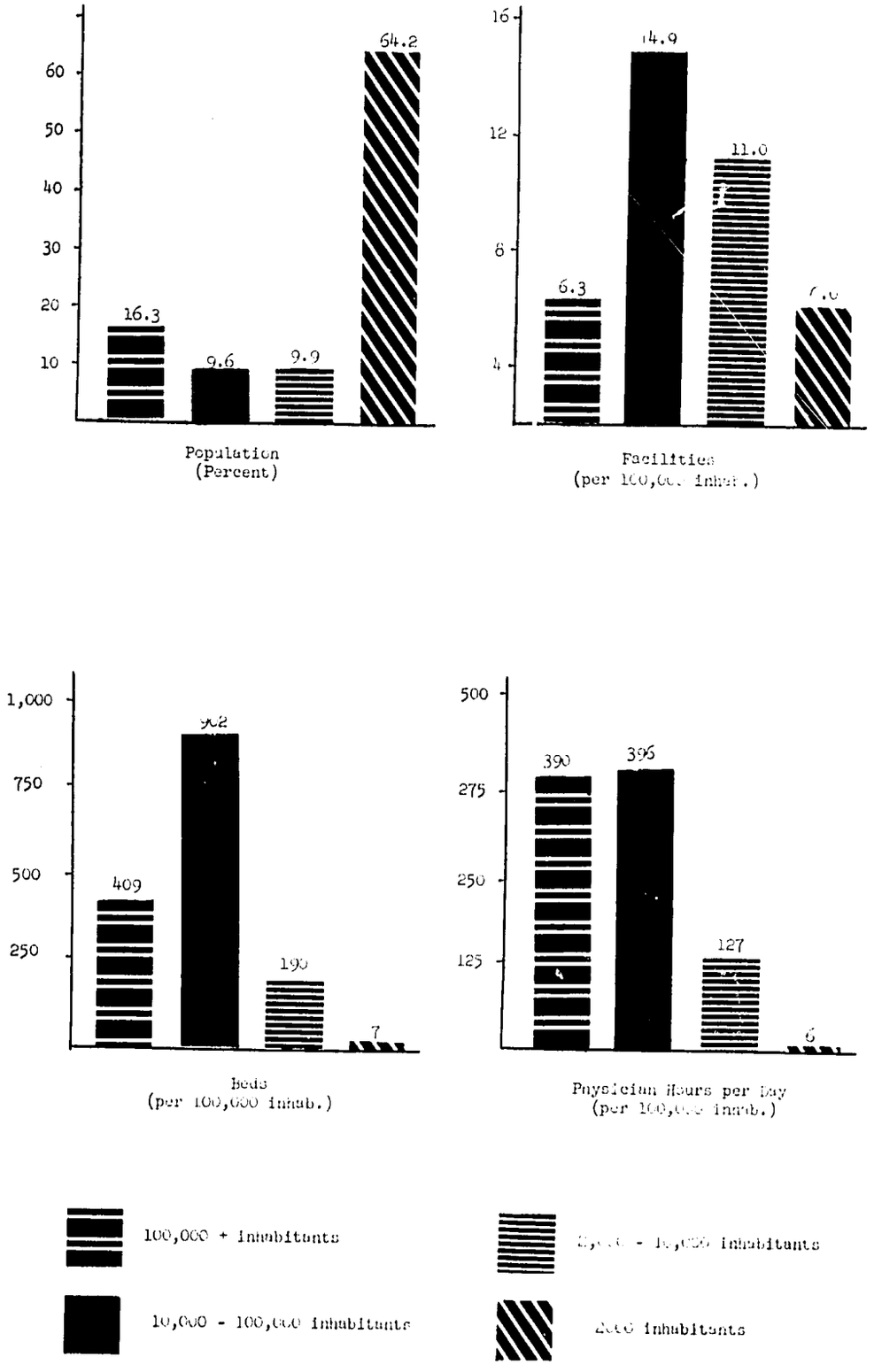
Bolivia's politics have traditionally been closely linked to its geographic situation. Internally this is apparent in the country's strong regionalistic forces. Externally it is a combination of Bolivia's land-locked position and a suspicion regarding her neighbors who have absorbed two-thirds of the country since 1825.(1) These situations have subtle but direct effects on health programming.

Table 4.1 - Historical Summary of Ministers of Health, 1952-1974

Number	Name	Date Took Office	Duration (months)	Approximate Age	Profession	Origin	President
1	Luis Leigue Suarez	May 1973	14	45	Dentist	Santa Cruz	Banzer
2	Carlos Valverde Barbery	August 1971	21	46	Pharmacist	Santa Cruz	Banzer
3	Javier Torrez Goitia	March 1971	5	48	Physician/Ped.	Chuquisaca	Torres
4	Guillermo Aponte Burela	February 1971	1	45	Physician/Surg.	Beni	Torres
5	Javier Ossio Quesada	June 1970	8	43	Physician/Surg.	Potosí	Ovando/Torres
6	Walter Arzabe Fuentelsaz	January 1970	5	45	Physician/Ophthal.	Cochabamba	Ovando
7	Jorge Rojas Tardío	October 1968	15	58	Physician/E.N.T.	Cochabamba	Barrientos/Siles
8	Jaime Galindo Ugarte	August 1968	2	32	Physician/Int.	Cochabamba	Barrientos
9	Juan Asbún Zugbi	March 1968	5	44	Physician/Surg.	Cochabamba	Barrientos
10	Bruno Boheme Vargas	January 1968	2	58	Physician/Surg.	Beni	Barrientos
11	Roque Aguilera Vargas	August 1966	17	58	Physician/Surg.	Santa Cruz	Barrientos
12	Carlos Ardiles	November 1964	21	58	Dentist	Cochabamba	Barrientos
13	Julio Manuel Aramayo	August 1964	3	57	Physician/OB-GYN.	La Paz	Paz Estenssoro
14	Guillermo Jauregui Guachalla	August 1960	48	54	Physician/Int.	La Paz	Paz Estenssoro
15	Jacobo Abularach	March 1959	17	40	Physician/Surg.	Beni	Siles Zuazo
16	Julio Manuel Aramayo	May 1958	10	51	Physician/OB-GYN.	La Paz	Siles Zuazo
17	Gabriel Arce Quiroga	February 1957	15	51	Physician/Surg.	Cochabamba	Siles Zuazo
18	Julio Manuel Aramayo	April 1952	58	45	Physician/OB-GYN.	La Paz	Paz Estenssoro/ Siles

Source: Ministry of Social Welfare and Public Health, unpublished data, July 1974.

Figure 4.2 - Distribution of Health Resources and Population by Size of Localities, 1968



Source: Ministerio de Previsión Social y Salud Pública, Situación de la Salud en Bolivia, 1970 Table 16.

Many political decisions, from appointments to the allocation of resources, have been made on the basis of regionalistic demands. On the other hand, there are at present significant movements to decentralize executive activities to better meet regional programatic needs. This has led to a renewed attempt in some areas to promote a federal form of government. In either case, the planning and administration of health programs would be affected to a considerable degree.

3. Pertinent legislation related to health

a. The organization of health services

Article 158 of the Republic's Fundamental Law of February 2, 1967 states: "The State has the obligation to defend its human capital and protect the population's health; it will assure continued means to safeguard and rehabilitate those persons who are unutilized; it will lean towards the improvement of the living conditions of the family unit".

The Health Code (Código Sanitario) of 1958 proclaimed the duties and rights of the individual in all matters that refer to health protection and recovery from disease. The Code continues in force by Decree Law 07155 of May 8, 1965. Its dispositions regulate the provision of health services and determine standards for the functioning of State health agencies. The Ministry of Public Health is the State agency charged with its application and execution. It establishes the existence of the National Health Service. The Code in many instances is outdated and requires substantial revision.

The Social Security Code, proclaimed in 1956, compels all national or foreign persons, men and women, who work in Bolivia and who perform remunerative services to have health coverage. Its principal objective is to protect and provide compensation for workers and their families in cases of illness, maternity, occupational risks, invalidness, old age, and death; it also provides allowances for marriage, births, lactation, family, and burial. To complement the Code, functional regulations were provided in 1959 through Supreme Decree No. 5315.

The Law of Administrative Organization of the Executive Power was approved by Decree Law No. 10460 in September 1972. In Article 42, it defines the obligations of the Ministry of Social Welfare and Public Health as follows: "It is in charge of formulating, directing, and executing the national health policy, preventive and curative medicine, the rehabilitation of the individual, the promotion of research and campaigns for nutritional betterment, personal hygiene and health education, the regulation and organization of state medical, clinical and hospital services, and the regulation and control of the same granted to persons or private entities".

The Bolivian Institute for Social Security, was created in March 1973 by Decree Law No. 10776, as an autonomous decentralized institution. It is administratively dependent on the Ministry of Health and has responsibility for the direction, planning, organization, protection, and control of social security policy. It is an umbrella agency composed of over 20 independent agencies and social security funds which execute and manage Social Security programs.

b. Health professionals

Supreme Decree No. 03658 of March 1954 establishes one year of compulsory service for doctors with the objective of providing medical attention to rural areas. Satisfactory completion of the año de provincia, which is generally done the year after graduation, is a prerequisite to obtaining a so-called national licentiate. However, as a consequence of the large number of medical graduates together with the lesser number of MOH positions (salaries) in rural areas, this requirement has often been waived. Supreme Decree No. 03907 of December 1954 creates the year of compulsory service for nurses; the practice was extended to dentists in 1965 by Supreme Decree No. 0755.

The Organic Statute and Employed Doctor Statutes, proclaimed by Supreme Decree No. 10419 in August 1972, are the basic documents governing the Bolivian Medical Association (Colegio Médico Boliviano). They promote cultural and scientific betterment and the practice of medicine under ethical standards.

c. Consumer protection

The General Regulation for the Sanitary Control of Foods and Beverages for Public Consumption sets the minimum standards for: food and beverage sanitation and inspection; liquors that are produced, imported, sold or consumed in the country; and the registration, storage, sale, and importation of foods and beverages.

Supreme Decree No. 7411 of December 1954 regulates the pharmaceutical industry and related professional practice. It defines the installation and operational standards of pharmaceutical establishments, as well as for pharmaceutical and industrial laboratories.

d. Occupational health

Legislative action regarding worker protection was initiated in 1952 with the proclamation of the Work Accidents Law. This law based the legal responsibility for an accident on the assumption of employer guilt; it discarded the theory of "objective fault", which was established by the Civil Code and required the worker to demonstrate the employer's fault or negligence to obtain compensation for damages and injuries.

A General Work Law was proclaimed in May 1939 and ratified and complemented in 1943 and 1944. It touches upon almost all aspects of workers' rights. With respect to Occupational Health, it includes important concepts on industrial hygiene and security, workers' housing, and the provision of food commodities to mining camps. The Law does not contain concrete dispositions on the prevention of occupational diseases and industrial accidents; it was supplemented, however, by the Basic Industrial Hygiene and Security Regulations of January 1951 (Decree Law 02348).

C. Institutional Framework

The public health sector is made up of at least 37 national and decentralized government agencies. The Ministry of Social Welfare and Public Health and the Social Security System are the most important in terms of legislative mandate, scope of activities, size of service population and budget allocations. Two other agencies--the National Social Development Council and the National Institute of Colonization--are also engaged in providing health services to limited segments of the general public. The National Community Development Service plays a significant role in the construction of local health facilities. NCDS and the MOH, along with three other national and 11 local agencies, are involved in the construction of water supply and sewerage systems. There are also two decentralized agencies--the National Road Service and the National Railroad Company--which provide health services to their employees, and eight Departmental Public Works and/or Development Committees (or Corporations) which are engaged in health activities as they relate to socio-economic development; three of the latter also sponsor water supply and sewerage projects.

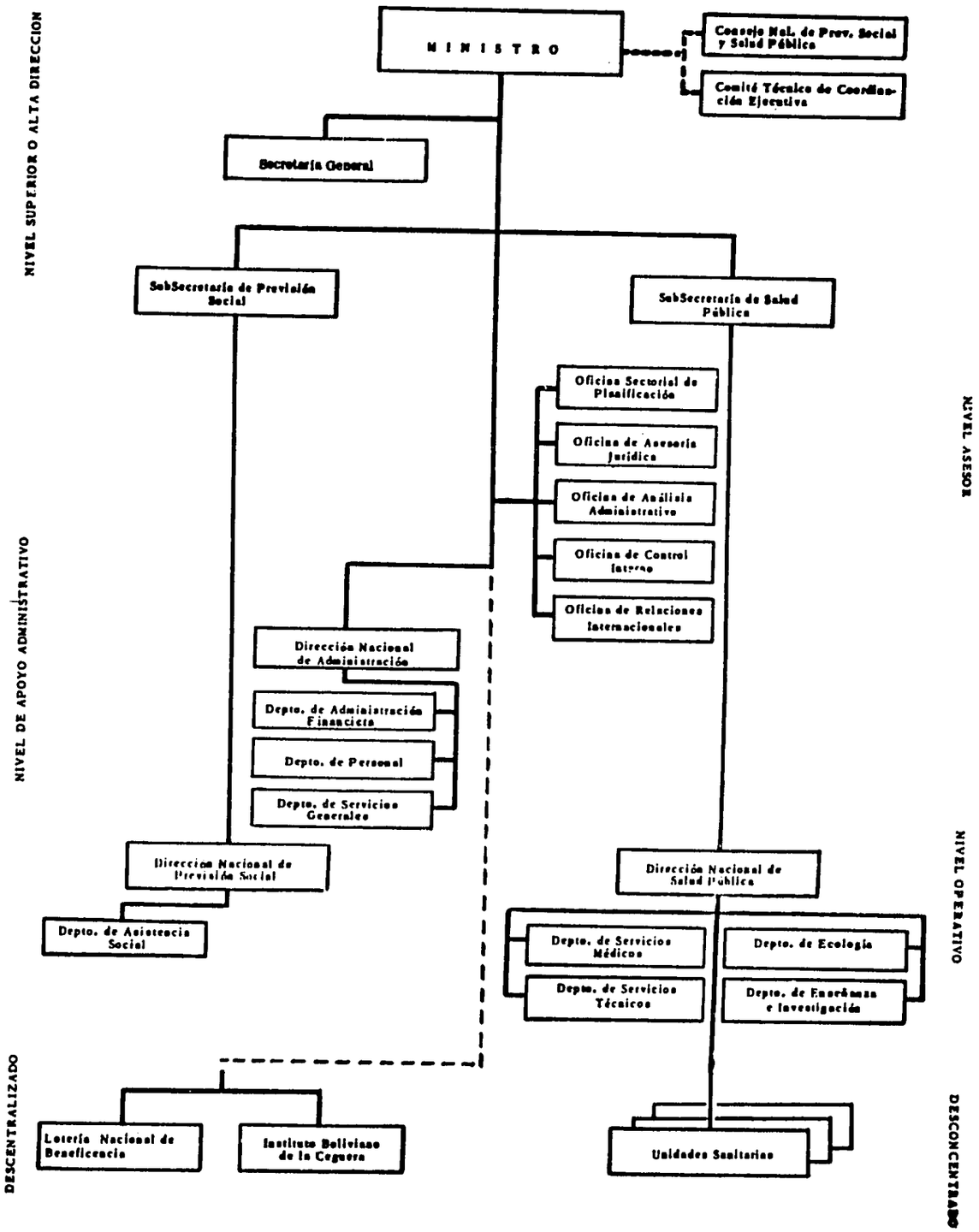
1. Ministry of Social Welfare and Public Health *
Ministerio de Previsión Social y Salud Pública (MPSSP).

The Ministry of Health is a central agency of the government; its mandate has been described in the previous section. At the national level, the MOH is divided into two operational units, each headed by a Sub-Secretary; these separate the functions of public health and social welfare. (See Figure 4.3). The public health unit is managed by the National Directorate of Public Health, which contains four functional Departments:

i) Medical Services - with Divisions of Hospitals, Maternal and Child Health, Nutrition, Pharmacy, and Dentistry;

ii) Ecology - which includes the Division of Environmental Sanitation, the National Institute of Communicable Diseases (INET), the National Institute of Occupational Health (INSO), and the National Institute of Health Laboratories (INLASA);

Figure 4.3 - Organizational Structure of the Ministry of Social Welfare and Public Health, 1974.



Source: Ministerio de Previsión Social y Salud Pública, Oficina Sectorial de Planificacion, 1974.

iii) Technical Services - with Divisions of Nursing, Social Services, Health Education, and Biostatistics; and

iv) Teaching and Research - which includes the School of Public Health, the National Institute of High Altitude Biology (INBA), and the Division of Post-Graduate Education.

The above Departments provide both technical support to field units as well as execute some programs at the national level. Extension activities, with the exception of teaching and research, are carried out through 11 Regional Health Office (Unidades Sanitarias; see Figure 4.4).

The social welfare unit is managed by the National Directorate of Social Welfare. This unit has one Department of Social Assistance which controls and distributes monthly benefit payments primarily to veterans of the Chaco War.

The National Directorate for Administration covers both the Ministry of Health major operational divisions and reports directly to the Minister of Health. It is comprised of Departments of Financial Administration, Personnel, and General Services. The Minister and other high-level officials also receive advisory services from Offices of Planning, Legal Counsel, Administrative Analysis, Internal Control (auditing), and International Relations.

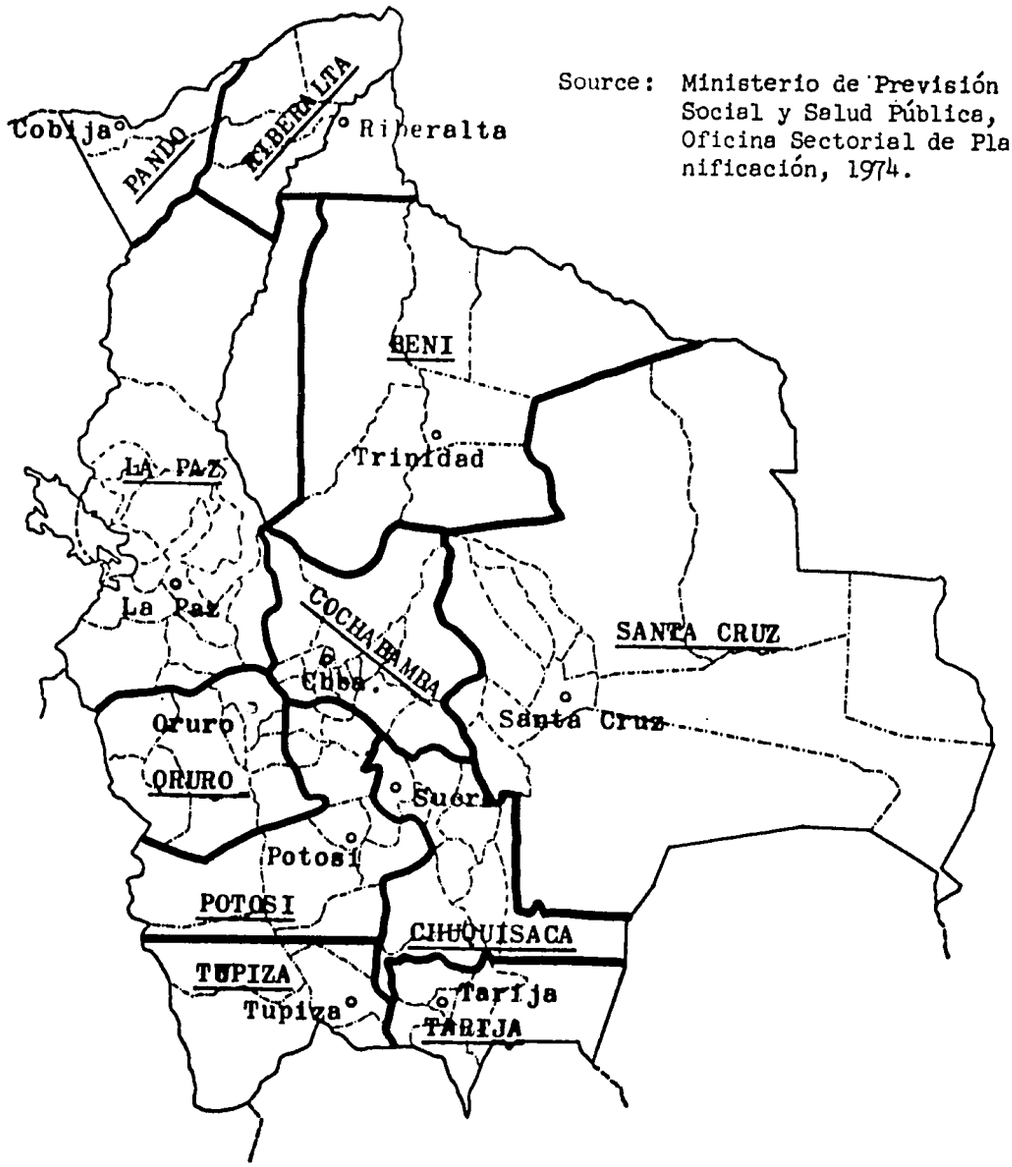
The Ministry of Health oversees four decentralized and administratively independent agencies: the National Lottery; the Bolivian Institute for Blindness; the National Family Center (CENAFA), which does research and provides technical assistance in questions of demography and family planning; and the Bolivian Social Security Institute (IBSS).

2. Bolivian Social Security Institute
Instituto Boliviano de Seguridad Social (IBSS)

The Social Security System (SSS) in Bolivia is coordinated by the Bolivian Social Security Institute, whose specific responsibilities were described earlier in this chapter. This decentralized public agency is supervised by the Ministry of Health and functions as an umbrella organization for the semi-independent social security agencies (or Cajas). It also manages 11 complementary social security funds.

The central office of the IBSS in La Paz is comprised of six Departments: Statistics; Auditing; Actuary and Finances, Medical Planning and Control; Administrative Rationalization; and Social Law. These units are supposed to advise and coordinate the activities of the affiliate Cajas; but most Departments have only two or three technicians who tend to be of a high level.

Figure 4.4 - Regional Health Office and Jurisdictions of the MOH, 1974.



Source: Ministerio de Previsión Social y Salud Pública, Oficina Sectorial de Planificación, 1974.

The IBSS does not offer any services directly to individuals; rather it coordinates and supervises the cajas that do offer such services. It contemplates converting the present fragmented social security system into a national system, gradually extending coverage to portions of the population not presently covered, such as. domestic servants, independent professionals, and artisan groups; it is currently studying plans for the organization of coverage for the rural peasants or Seguro Social Campesino. The present population covered by the entire SSS is approximately one million, including insured and dependents, and mostly in urban areas.

The largest of the IBSS affiliates is the National Social Security Agency (CNSS), which services about 700,000 people. The other Cajas provide varying levels of services to petroleum workers (CPSS), railroad workers (CFSS), chauffeurs (CSSCh), university students (SSU), employees of the Bolivian Development Corporation (SSCBF), employees of the Bolivian Mining Corporation (COMIBOL), bank workers (SSB), and employees of the Bolivian Power Company.

There are three basic types of services offered through the SSS: health services include medical and maternity care; benefit payments cover occupational accidents and diseases, disability, old age, and death; and family subsidies are provided for marriage, lactating women, child support and burial. The different cajas offer varying degrees of these services, depending on the wishes of the affiliates' members and the amount of their contributions. Some organizations have established complementary funds in order to obtain more than the minimum amount of benefits. Finally, some cajas provide only certain types of benefits themselves and contract with the CNSS for medical and maternity services.

3. National Social Development Council;
Junta Nacional de Desarrollo Social (JNDS)

The National Social Development Council was created in September 1971 as a decentralized public agency. It reports directly to the Presidency and is presided over by the President's wife. The mandate of the JNDS is to centralize policy planning and direction in the broad areas of welfare and social development; and it is supposed to coordinate all public agencies working in these fields.

Upon creation, the JNDS incorporate two previously separate agencies: the National Council of Minors (CONAME), and the Social Action of the Presidency. The new National Directorate of Minors executes rehabilitation programs for deaf, dumb and blind children and orphans. It also overseas matters related to child abuse, abandonment and travel of minors. The National Directorate of Social Action has constructed a limited number of multiple service centers in the marginal areas of the major cities. These centers contain pediatric and dental clinics,

mothers' clubs and some vocational training activities. A third Directorate for Social Promotion is presently being formed to concentrate on rural social development programs.

In spite of its mandate to coordinate activities in welfare and social development, the Council has shown little interest in working with existing Ministries, and relies mostly on Presidential decree to implement its programs. Consequently it is looked on by other health agencies as a competitive rather than cooperative agency.

4. National Institute of Colonization;
Instituto Nacional de Colonización (INC)

The National Institute of Colonization was created in June 1965 as a decentralized public agency reporting to the Ministry of Agriculture. Its basic mission is to develop, supervise and provide technical assistance to colonization projects in virgin agricultural lands. Major efforts have taken place in the areas north of Santa Cruz and in the Alto Beni and Chapare; projects of secondary importance are located in Chuquisaca Department and along the Bermejo River in Tarija.

Health and other services are provided only in official colonization areas; the degree of Government assistance to colonists varies: some projects are fully planned and supervised by the INC; limited assistance is offered in other projects; and colonization is spontaneous and undirected in still others. Health services include medical check-ups, some vaccinations against tropical illnesses, and limited services through medical posts and small hospitals. The Methodist Church, Adventist Church, and Franciscan Fathers collaborate with the Institute in running a few small hospitals under agreements in which each party contributes 50 percent of costs. Total medical personnel for all projects is 25, of which 9 are paid for from Institute funds. The remainder are paid by the religious institutions.

5. National Railroad Company;
Empresa Nacional de Ferrocarriles (ENFE)

The National Railroad Company was organized in October 1964 to manage the state-owned railway system. It is a decentralized public corporation supervised by the Ministry of Communication and Transportation. The company treats only railroad employees and their dependents. It sponsors some vaccination campaigns, a tuberculosis control program, and some hospitals and health posts. Medical services are offered in the following locations: La Paz, Cochabamba, Oruro, Sucre, Viacha, Uyuni, Tupiza, and Arque. ENFE hospitals are located in Roboré, San José Rivero, and Yacuiba; a medical post in Guarachi; and a clinic in Santa Cruz; and health posts in Quijarro, Puerto Pailas, Florida, Charagua, and Boyuibe. Within

the near future all medical services of the company will be transferred to the Railroad Social Security Agency (CFSS - an affiliate of the IBSS). which presently administers only retirement, death and other benefits of the railroad workers.

6. National Road Service:
Servicio Nacional de Caminos (SENAC)

The National Road Service was organized in February 1961 to plan, supervise, construct and maintain roads and bridges throughout the country. It is a decentralized public agency reporting to the Ministry of Communication and Transportation. The SENAC does not maintain its own system of clinics for providing medical services to employees and their dependents; rather, it sends patients to private clinics and hospitals as the need arises. The Service does, however, employ a full-time medical staff of five physicians, five nurses and two pharmacists. SENAC is studying the possibility of contracting with the CNSS for these services.

7. National Community Development Service
Servicio Nacional de Desarrollo de Comunidades (SNDC)

The National Community Development Service became a decentralized public agency under the Ministry of Agriculture in July 1967. Its purpose is to implement programs designed to accelerate the integration of rural peasants and their communities into the national economy and social structure. NCDS sponsors self-help projects and training activities which encourage campesinos to identify their own social and economic priorities and to identify local and national resources which may help them attain their goals.

The central office of the NCDS is located in La Paz. At present there are eight regional offices in: Huarina (Lake Titicaca); Patacamaya (Central Altiplano); Oruro (Southern Altiplano); Cochabamba; Potosí, Sucre; Tarija and Santa Cruz. In addition there are four area offices (Caranavi, Villa Tunari, Charagua, and Trinidad) and five regional training centers (Pillapi, La Paz; Paracaya, Cochabamba; Muyurina, Santa Cruz; Zudañez, Chuquisaca, and Ñucchu, Chuquisaca). Present plans for the reorganization of the NCDS call for reducing the regional offices to four (La Paz, Oruro, Cochabamba and Santa Cruz) and increasing the number of zonal offices to 22. (See Chapter VII.C. for details).

The Community Development Service has sponsored projects resulting in some 220 health facilities and water supply systems and over 700 schools. The regional training centers train rural women in first aid, child care, nutrition, midwifery and other similar skills.

The Service operates in communities with populations from 500 to 3,000 inhabitants. The process employed by the NCDC begins with a need perceived in the community. Community level workers, sometimes trained for short periods of time by the Service, help to organize community support and prepare projects for presentation to regional office. The staff then provides technical assistance for planning and construction of the project. Once a project has been identified and proposed for implementation, the community must make a cash and work contribution of at least 50 percent of the total costs. Health facilities built by community efforts are to be equipped and staffed by the Ministry of Health. However, not uncommonly they are empty and unused after completion because of the Ministry's inability to provide personnel and equipment--even in cases where the community has received prior written assurances that the Ministry will follow through.

8. Agencies involved in water supply and sewerage programs

a. National agencies

At the present time five agencies share the responsibility for planning and executing water supply and sewerage programs at the national level. The Division of Urban Engineering of the Ministry of Housing and Urbanism (MUV) oversees urban water supply and sewerage projects and is responsible for developing overall planning policies. The Potable Water and Sewerage Corporation (CORPAGUAS), a decentralized public agency of the MUV, is responsible for the design, construction and financing of water supply and sewerage systems in communities of 500 to 10,000 inhabitants. The Division of Environmental Sanitation (DSA) of the Ministry of Health concentrates on rural water supply and sanitation projects in communities with less than 2,000 inhabitants; the DSA sets policy and provides technical assistance and materials for their projects. The National Community Development Service promotes and assists primarily water supply projects in communities up to 3,000 inhabitants. Finally the Armed Forces Civic Action project of the Ministry of Defense supports water supply projects in rural areas--supposedly in communities of strategic importance, but in reality throughout the Altiplano and along the lowland waterways.

There are no overall policies which govern the water supply and sewerage programs; and the functions of the national agencies are not clearly defined. As a result there is much duplication, overlapping of responsibilities and a lack of coordination among the agencies. As indicated above four of the agencies have similar objectives and are serving essentially the same types of communities. The government is currently studying plans to reorganize and improve the efficiency of the water supply and sewerage sector; these are discussed in Chapter V.D.

b. Local agencies

There are 11 agencies which have water and sewerage responsibility at the local or regional (Departmental) level. The provision of potable water in Bolivia's six largest cities (La Paz, Cochabamba, Santa Cruz, Oruro, Potosí and Sucre) is managed by quasi-public, single-purpose corporations. These agencies are also supposed to handle the construction of sewerage systems, but in four cases (La Paz, Oruro, Sucre and Potosí) this responsibility still lies with the municipal governments. In Tarija and Trinidad these activities are under the responsibility of the Departmental Public Works Committees; and in Santa Cruz, through a contract with the Ministry of Health, the Public Works Committee is constructing water and sewerage systems throughout the Department. These agencies are described more fully in Chapter V.D.

9. Departmental development organizations

All departmental development organizations are decentralized public agencies and are classified as Development Corporations in the budget; in actuality only the following are true corporations:

i) Development Corporation of the Department of La Paz (CORDEPAZ);

ii) Development Corporation of Cochabamba (CORDECO); and

iii) Development Corporation of the Department of Oruro (CODEOR).

Five other development organizations are officially termed comites:

i) Departmental Committee of Development and Public Work of Chuquisaca;

ii) Departmental Committee of Development of Public Works of Potosí (CODEPO);

iii) Public Works Committee of Santa Cruz (C.CO.PP.);

iv) Public Works and Development Committee of the Beni; and

v) Departmental Development Committee of Tarija (CODETAR).

The distinction between a Corporation and a Committee is important in terms of central government supervision: Corporations are supervised by CONEPLAN (now in Ministry of Coordination), while committees are supervised by the Ministry of Urbanism and Housing. A ninth regional development organization is the Regional Development Council of the Northeast (Pando), which is supervised by CONEPLAN.

The Corporations and Committees are charged with the supervision and coordination of all social and economic development activities in their regions. In practice, the Corporations and Committees vary a great deal in terms of their technical capability, their ability to actually coordinate development in the regions, and their susceptibility to political pressures.

The Public Works Committee of Santa Cruz is one of the wealthiest, best run organizations in Bolivia. It is widely known as a "technical" organization; has a sophisticated staff; and is heavily involved in health-related activities. In the past it has promoted water and sewerage systems and has contracted with the MOH to build rural health facilities. The Committee also has approached the MOH offering jointly to sponsor a study for a health plan for the Department. The committees in Chuquisaca and Tarija formally have contracted with the Ministries of Health, Agriculture and Education to develop and implement coordinated multisectorial regional development plans; they are being financed in part by UNICEF (See Chapter VIII.B).

D. Non-Governmental Health Institutions

1. The Bolivian University (U.B.)

The Faculty of Health Sciences of the Bolivian University system offers technical (2-4 yrs.), intermediate (licenciatura, 4-6 yrs.) and professional training for a variety of health careers. Degree programs in medicine, surgery, pathology, public health, dentistry and pharmacology are given in La Paz, Cochabamba and Sucre. The La Paz campus also offers professional programs in nursing and nutrition; and Tarija offers dentistry. The Faculty of Social Sciences offers training for social workers in La Paz and Potosí. In addition to the above campuses, technical and/or intermediate training in nursing is offered at Sucre, Cochabamba and Tarija; for dieticians, physiotherapists and laboratory technicians at La Paz; for x-ray technicians at Sucre and La Paz; and in biochemistry at La Paz, Sucre and Cochabamba. The campuses in Santa Cruz and Trinidad offer programs in the veterinary sciences.

The university system receives operating funds from the national treasury, but has a semi-autonomous status. Due to the lack of a national health manpower policy, little coordination has been achieved between

the need for health workers (both type and quantity) and the supply from the universities. Agreements do exist concerning the utilization of MOH and SSS facilities for practical, but largely unsupervised, training of students. The Departments of Public Health in La Paz and Cochabamba have recently begun programs in community medicine in the Yungas and Valle Alto areas respectively; but coordination with the MOH is nominal.

2. The private sector

It is estimated that there are some 2,400 physicians in Bolivia: of these about 400 do not practice medicine; 1,800 work for the MOH, SSS or other agencies; and 200 maintain only a private practice. Since many of the government physicians also practice privately, it is estimated that there are about 500 full-time physician-equivalents in private practice. About two-thirds of Bolivia's 1,000 dentists and about one-third of the 600 graduate nurses either work privately or for non-governmental organizations. Bolivia also has more than 1,600 registered pharmacists who, with very few exceptions, are engaged in the private sale of pharmaceuticals.

The Ministry of Health had information on 62 private clinics, with more than 1,000 beds, in 1973. Most of these are located in La Paz (25), Cochabamba (13) and Santa Cruz (8). In the same year there were 533 registered pharmacies (drug stores), with 190 in the Department of La Paz. Both private clinics and pharmacies are heavily urban oriented. In 1974 the private pharmacies handled about 60 percent of the drug business in Bolivia; and private doctors about one-third of total out-patient visits. It is estimated (see Chapter VI.C) that the value of these goods and services was over US$18.2 million or 60 percent over and above the MOH health budget and almost two-thirds of the combined MOH and SSS budgets.

Health professionals in Bolivia have formed ten societies to promote the interests of the worker and/or specialty. These organizations represent physicians, dentists, biochemists and pharmacists, gynecologists and obstetricians, gastroenterologists, orthopedists and traumatologists, pediatricians, nurses, social workers, and public health workers. Theoretically the societies have two basic functions: (i) to promote and stimulate the professional growth of its numbers and enforce high standards and ethics of the profession; and (ii) to protect the rights and interests of the profession and individual practitioner regarding working conditions, remuneration, etc. The societies exercise these functions to varying degrees.

3. Religious and voluntary organizations

Bolivia benefits from at least ten religious and voluntary organizations which sponsor and/or run health programs. The number may

be considerably higher, but no registry is kept by the Government regarding such investments or activities. In general their involvement is limited to local or single purpose programs. The various orders of the Catholic Church comprise the largest group.

Most of the activity concerns the support and management of local health facilities. Religious orders own and operate five general hospitals (four Catholic and one Methodist) with a total of almost 300 beds. At the health and medical post and health center hospital levels, the involvement varies from the provision of equipment, drugs and personnel to formal contracts with the MOH for the complete administration of the facility; Methodists, Catholics, Adventists and Baptists have engaged in these types of arrangements. All missions provide some foreign personnel and some of the most innovative approaches in rural areas have come from these programs. The overall impact on the health problems in Bolivia, however, has been very limited from these groups.

Few voluntary agencies have substantial health programs in Bolivia. Catholic Relief Services, through its counterpart CARITAS, oversees and distributes Food for Peace. CARITAS has recently begun using its resources to stimulate local social action projects. CRS and the Mennonite Central Committee (MCC) have duty-free import agreements with the Government; this has allowed them to supply many religious-run health facilities with drugs and equipment. Through its national office in Santa Cruz, MCC also sponsors young volunteers, some of whom are nurses, to work at the community level. The Foster Parents' Plan provides medical attention and child support to poor families in the Villa Fátima Barrio of La Paz. The Bolivian Red Cross has local affiliates in most towns with at least 10,000 inhabitants. Its activities, however, have been very limited, except during Bolivia's periodic disasters (floods). Finally, many local Rotary and Lions' Clubs have received material and financial donations from Sister Clubs in the United States and Canada for community health projects.

Footnote

(1) Bonifaz Ponce, Miguel, "El Medio Geográfico, la Geopolitica y la Politica Externa e Interna de Bolivia", Imprenta de la Universidad Boliviana Tecnica de Oruro, 1973, p.6.

Annex 4.1 - Capital Cities, Dates of Creation and Political Sub-Divisions by Department and Province.

Department	Capital	Creation	Provinces	Cantons	Sections
Chuquisaca	Sucre	23- I-1826	10	118	25
La Paz	La Paz	23- I-1826	18	254	47
Potosí	Potosí	23- I-1826	15	274	30
Santa Cruz	Santa Cruz	23- I-1826	13	115	33
Cochabamba	Cochabamba	26- I-1826	14	167	32
Oruro	Oruro	5- IX-1826	10	104	16
Tarija	Tarija	24-IX-1831	6	149	11
Beni	Trinidad	18-XI-1842	8	47	20
Pando	Cobija	24-IX-1838	5	49	15
Total Republic			99	1,277	229

Department: Chuquisaca

Province	Capital	Creation	Cantons	Municiple Sections
Mendoza	Padilla	23- I-1826	6	5
Nor Cinti	Camargo	23- I-1826	24	2
Hernando Siles	Monteagudo	13- X-1840	7	2
Oropeza	Yotala	18-XI-1912	25	2
Yamparáez	Tarabuco	18-XI-1912	4	2
Azurduy	Azurduy	5-XII-1917	6	2
Zudañez	Zudañez	5-XII-1917	7	4
Belisario Boeto	Villa Serrano	15- X-1943	4	1
Sud Cinti	Villa Abecia	22-II-1944	21	2
Luis Calvo	V. Vaca Guzmán	14-XI-1947	14	3

Department: La Paz

Province	Capital	Creation	Cantons	Sections
Larecaja	Sorata	23- I-1826	26	2
Nor Yungas	Coroico	23- I-1826	19	3
Omasuyos	Achacachi	23- I-1826	4	1
Franz Tamayo	Apolo	23- I-1826	10	2
Muñecas	Chuza	18- X-1826	8	2
Murillo	Palca	8 - I-1838	10	3
Inquisivi	Inquisivi	16-VII-1833	23	4
Aroma	Sicasica	11-XI-1844	36	5
Ingavi	Viacha	29-III-1856	11	4
Pacajes	Corocoro	29-III-1856	24	3
Loayza	Luribay	29- 5-1899	19	3
Sud Yungas	Chulumani	1-VII-1899	16	2
Camacho	Puerto Acosta	5- XI-1908	7	3
Los Andes	Pucarani	24-XI-1917	9	2
Iturralde	Ixiamas	21-XI-1937	8	2
B. Saavedra	Gral. Pérez	17-XI-1948	8	1
Manco Kapac	Copacabana	6 -VI-1951	77	2
G. Villarroel	Curahuara	31-XI-1962	9	3

Department: Potosí

Province	Capital	Creation	Cantons	Sections
Chayanta	Colquechaca	23- I-1826	25	4
Tomas Frias	Gabriel Vera	23- I-1826	9	2
Quijarro	Uyuni	23- I-1826	27	1
Nor Chichas	Cotagaita	25-VI-1863	22	2
Sud Chichas	Tupiza	25-VI-1863	41	2
Nor López	V. Martin	23-XI-1865	18	2
Linares	V. Talavera	8-XII-1869	14	1
Charcas	Buena Vista	3-IX -1880	13	2
Sud López	San Pablo	4-XII-1885	11	1
Bustillos	Uncía	8- X -1908	16	3
A. Ibáñez	Macaca	12-XI-1923	15	3
C. Saavedra	Betanzos	6- XI-1925	18	3
Gral. Bilbao	Arampampa	10-XI-1938	17	2
D. Campos	Llica	26-XI-1949	15	2
M. Omiste	Villazón	8- IX-1958	13	1

Department: Santa Cruz

Province	Capital	Creation	Cantons	Sections
Chiquitos	San José	23- I-1826	12	3
Cordillera	Lagunillas	23- I-1826	19	6
A. Ibañez	Palmar	23- I-1826	10	4
Vallegrande	Vallegrande	23- I-1826	14	2
Velasco	San Ignacio	15-VII-1867	6	2
Sara	Portachuelo	25-IX-1883	7	2
B. Chávez	Concepción	16-IX-1915	10	2
Warnes	Warnes	27-XI-1919	6	1
Florida	Samaipata	15-XII-1924	6	4
Ichilo	Buena Vista	8- IV-1926	4	2
Santiesteban	Montero	2-XII-1941	5	2
A. Sandoval	San Matías	16-XII-1948	5	1
Caballero	Comarapa	4- XI-1960	11	2

Department: Cochabamba

Province	Capital	Creation	Cantons	Sections
Arque	Arque	23- I-1826	7	3
Ayopaya	V. Independencia	23- I-1826	22	2
Cercado	Cala Cala	23- I-1826	6	1
Mizque	Mizque	23- I-1826	13	2
Tapacarí	Tapacarí	23- I-1826	6	1
Chapare	Sacuba	10-VI-1854	20	3
E. Arce	Tarata	4- I-1872	10	2
G. Jordán	Cliza	4- I-1872	9	2
Punata	Punata	4- I-1872	10	3
Carrasco	Totora	24-VI-1876	17	3
Quillacollo	Quillacollo	14-IX-1905	13	4
Capinota	Capinota	1- X-1908	21	2
Arani	Arani	24-XI-1914	6	2

Department: Oruro

Province	Capital	Creation	Cantons	Sections
Carangas	Corque	5- IX-1826	15	2
Cercado	Caracollo	5- IX-1826	9	1
Poopó	Poopó	5- IX-1826	9	2
Abaroa	Challapata	16- X-1903	12	3
L. Cabrera	Mendoza	13- X-1914	7	1
P. Dalence	Huanuni	26-XI-1941	6	1
Litoral	Huachacalla	11-XI-1950	7	2
Sajama	Curahuara	11-XI-1950	12	2
Atahuallpa	Sabaya	26-XII-1959	18	1
Saucari	V. Toledo	8- XI-1963	9	1

Department: Tarija

Province	Capital	Creation	Cantons	Sections
Cercado	Sella Cercado	24-IX-1831	25	1
Méndez	San Lorenzo	24-IX-1831	31	2
B. O'Connor	Entre Rios	10-XI-1832	29	1
Avilés	Uriondo	6-VII-1843	23	2
Gran Chaco	Yacuiba	12-VIII-1876	17	3
A. Arce	Padcaya	8- XI-1894	24	2

Department: Beni

Province	Capital	Creation	Cantons	Sections
Cercado	San Javier	9-VII-1856	3	1
Iténez	Magdalena	9-VII-1856	8	4
Yacuma	Santa Ana	9-VII-1856	4	2
Vaca Diez	Riberalta	19- I-1900	8	3
Gral. Ballivián	Reyes	3-XII-1937	6	4
Marbán	Loreto	3-XII-1937	8	3
Moxos	San Ignacio	3-XII-1937	4	1
Mamoré	San Joaquín	27-XI-1941	6	3

Department: Pando

Province	Capital	Creation	Cantons	Sections
Abuná	Santa Rosa	24-IX-1938	8	3
Madre de Dios	Pto. Moreno	24-IX-1938	10	3
Manuripe	Pto. Rico	24-IX-1938	12	3
N. Suárez	Porvenir	24-IX-1938	10	3
Gral. Román	Portaleza	19- X-1963	9	3

Sources: División Política de Bolivia, Dirección Nacional de Coordinación y Planeamiento, 1968.

División Política de Bolivia, Instituto Geográfico Militar, 1968.

Note: Department and Provinces are listed by date of creation. Where a contradiction occurs between the two sources, the earliest date is indicated.

CHAPTER V

ANALYSIS OF HEALTH PROGRAMS

A. Summary

The Bolivian health system is fragmented. Health programs have come and gone, often started with much enthusiasm but left without adequate resources to survive.

In this chapter, four different groups of programs are discussed: Maternal and Child Health, Communicable Diseases, Environmental Sanitation and Medical and Hospital Attention.* Although the first three groups of programs could have the greatest impact on improving the health status of the Bolivian people, the fourth gets the lion's share of the resources. Preventive programs in all agencies are badly lacking.

Maternal and child health programs have been in existence for over 20 years but still seem to be "starting up". Some new directions are being instituted e.g. training of parteras empíricas and the beginning or organized Family Planning Programs, and there is hope that these activities will be maintained.

Communicable disease programs are suffering badly from lack of adequate finances. Activities are organized vertically with a deficit of participation at the regional and local level. SNEM is in danger of having to discontinue all its activities due to lack of finances and supplies of DDT. The tuberculosis program is operating on a drug budget that satisfies less than one percent of Bolivia's needs. Epidemics go uninvestigated for lack of vehicles. Vaccination programs are poorly organized and incomplete. This scenario is particularly troublesome in view of the fact that infectious diseases are the number one cause of mortality and morbidity in Bolivia.

Although there is a close association between infectious diseases, especially enteric diseases, and environmental sanitation, the environmental sanitation program has little coordination with those of the remainder of the health sector. Water and sewage systems are grossly deficient in both urban and rural areas. Even where water systems exist, they may be contaminated due to lack of proper control and maintenance. Sewage systems are all but non-existent in rural areas.

---

*Discussion of the Nutrition Program activities will be covered in Chapter VII.

Medical and hospital attention illustrates the one constant of the Bolivian health system: they are always changing. Health centers in neighboring towns function in completely different ways with vastly different utilization patterns. Although there appears to be adequate supplies of people, equipment, building and plans, the system does not work and the quality of care is poor. Administration and supervision are inadequate.

B. Maternal and Child Health

1. Overview

Maternal and child health (MCH) is the primary target of most preventive medicine programs. In Bolivia, the MCH group in fact includes 62.9 percent of the population (Table 5.1).

Table 5.1 - Distribution of Maternal and Child Health Population, 1974.

Age Group	Population	Percent of Total Population
<1	175,692	3.2
1-4	713,748	13.0
5-14	1,384,480	25.3
15-49 women	1,164,930	21.4
Total:	3,438,850	62.9

Source: Chapter I, Table 1.6.

According to Registro Civil data of 1969, 44.2 percent of all deaths were in age groups zero to four, but since underreporting is much more frequent in these age groups, the figure is probably closer to 50 percent. Infectious diseases account for about 80 percent of the deaths in ages zero to fourteen years. These are described in more detail in Section C of this chapter. Malnutrition, an important part in this high mortality, has been shown to be an associated cause of mortality in 34.3 percent of the deaths in age groups one to four in the PAHO La Paz-Viacha study of 1968-70.

Figure 2.1 in Chapter II shows the infant mortality rates for selected urban areas in Bolivia, varying from 59.4 in Sucre to 244.1 in Trinidad (per 1,000 live births). Most estimates of infant mortality for the country as a whole run about 250, although the official estimate is 154. The rural areas have a much higher rate, than the urban areas, and combined with underreporting, 250 is probably a conservative estimate. A small study in the areas of Huanuni in the late 1950's showed an infant mortality rate of 550.(1) A six month study in the city of Montero in 1964 showed a rate of 314.(2) In Yapacani Colony in 1971, the infant motality rate was 176.(3)

In Chapter II, it was shown that the prevalence of malnutrition in the pre-school age group was 40 to 50 percent, although it does vary considerably with region and social class. Malnutrtion generally increases right after the child is weaned and reaches its worst at two to three years of age. This is the same time as measles has its highest incidence.

Maternal health also has a large place in Bolivia's health programs. Pregnancies and the complications of pregnancies (abortions. etc.) accounted for over 32 percent of all MOH hospitalizations in 1970. Yet only a small part of births take place in the hospital. There has recently been much growth in urban deliveries in the hospital. It is now estimated that 97 percent of births in the city of Santa Cruz take place in the hospital. The situation is reversed in rural areas. Although in some towns, such as Viacha and Montero, the number of in-hospital deliveries has been increasing rapidly, in general, probably less than five percent of rural deliveries are done in the hospital.

Maternal mortality is difficult to estimate. The figures available for 1972 show maternal mortality varying from 1.5 per 10,000 in the city of Cochabamba to 59.5 per 10,000 for the city of Riberalta. The numbers outside of the largest cities, however, are too small to draw any valid conclusions. For example, the above figures mean that one mother died in Cochabamba in 1972, and probably only one in Riberalta. In the city of La Paz in 1972, the rate was 15.0 per 10,000 which probably represents about six maternal deaths. Whatever the rate for the cities, it is certain that it is higher in rural areas, and especially high when births take place in the home. On a small sample for rural Chuquisaca for 1972, the rate was 32.2 per 10,000 which included only eight deaths.

2. Institutions with MCH programs

The majority of maternal and child health programs in Bolivia are linked to the MOH. Other MCH activities include programs of the National Social Development Council (JNDS), religious organizations, and the autonomous organizations (COMIBOL, etc.).

a. Ministry of Health

MCH programs in the MOH are organized regionally with a program director in La Paz and a director for each Unidad Sanitaria in five Unidades: La Paz, Sucre, Santa Cruz, Cochabamba, Trinidad and Riberalta. There are MCH programs in the other Unidades Sanitarias but at present are without program directors.

The MCH programs have been functioning predominately in the cities, and have only begun to go into the rural areas. There are exceptions,

such as Concepción, Tarija, where a mothers' club has been functioning since 1958.

In each of the four larger cities, the MCH program has a "team" of four people: one M.D. director, another M.D. who does pre-natal, post-partum and family planning exams, a nurse trained in MCH, and a social worker. At the central office in La Paz, three main functions are supposedly done: planning, supervision, and training. Oruro, Potosí, and Tarija all have MCH programs, but it appears that their programs are not yet formally tied in with the La Paz MCH system.

The national MCH program has its objectives outlined in the Plan Quinquenal.(4) In brief, its general objectives are to reduce infant mortality and morbidity, and decrease risks in motherhood. More specifically, the plan aims to decrease maternal mortality by 20 percent through better MCH care. The plan sets as a goal for 1978: 40 percent of deliveries in the hospital, through better health education and the early detection of pregnancy. Also the plan aims at improving the conditions of home deliveries through training 100 parteras empíricas per year. Also, programs are aimed at the detection of cervical cancer, family planning, and training of personnel.

The MOH program has been active in planning and giving cursillos for various levels of health professionals. They have provided three to five-day courses in MCH for physicians; the last one was given in Sorata in June 1974. Also they have given MCH courses for graduate nurses in the urban hospitals. One-week courses have been given for auxiliary nurses. One was given at Ancoraimes in 1973. Also they have sponsored several courses for promotores de salud and parteras empíricas. In August 1974, they completed a 66-hour course for nine parteras empíricas given at the Centro de Salud in La Paz. Similar courses for parteras empíricas were also given in Trinidad and Riberalta, and another is planned for the Centro de Salud El Alto soon.

The MOH programs have been concentrated predominately in urban areas. The supervision of the MCH program for rural areas seems to have been badly neglected. Rural site visits have been made only rarely by the MCH directors in the Unidades Sanitarias. One may estimate that 90 percent of MCH efforts are found in the urban areas.

It is notable that in the evaluation of the Bolivian rural health system performed by USAID consultants in mid-1974, of 66 rural health posts or hospitals evaluated throughout the country, only 22 had functioning MCH programs, 14 had programs planned, and 30 had no program or plans for one. In rural areas, MCH programs are tied to mothers' clubs.

b. JNDS

In 1973 the JNDS began almost simultaneously in all the departmental capitals and 2 rural areas in which health and social development programs were aimed primarily at maternal and infant care. There attention is aimed principally at the marginal areas of cities. In these marginal areas, their programs have 3 parts: medical attention, day-care for children, and vocational training with nutrition education (and subsidized food) for mothers. The day-care centers and the mothers' centers seem very active and well utilized, but the medical attention activities do not seem as well developed.

Although they say they are not engaged in preventive medicine, because it is the job of the MOH, in fact they are doing well-baby exams and are holding classes in nutrition for mothers. They do not conduct vaccination campaigns, but do cooperate with the MOH in its vaccination. There is much enthusiasm in the JNDS. Their rural endeavors in Buena Vista (Santa Cruz) and San Lorenzo (Tarija) do not seem to have been as successful to date. Unfortunately, there is very little communication between the JNDS and other MCH programs.

c. Religious organizations

Most missionary groups in Bolivia have undertaken MCH programs. Iglesia Metodista medical programs have active MCH programs in both the Montero areas, in Ancoraimes, as well as at the Clinica Metodista in La Paz. As a result of the MCH programs, the numbers of in-hospital deliveries done in Ancoraimes and Montero have climbed greatly in the past two to three years.

The Sisters of Charity, which runs the Jorochito Leprosarium, has recently started a succesful well-baby program in Jorochito. At Llallagua's COPOSA cooperative hospital, a community-based MCH program is starting. The Baptist-run health posts in Villa Tunari and Huatajata have not done very much in MCH. The health post at Huatajata has, however, been running a family planning program for eight years. Most religious organizations have recently begun to realize the value of MCH programs and are now becoming more active in the area.

d. Autonomous health organizations

With the exception of COMIBOL, most of the Cajas treat urban populations. In general, the Cajas have given little attention to preventive and MCH programs and have concentrated on curative medicine. Probably a large percentage of Caja beneficiaries do have their babies in the hospital, if for no other reason than because the hospital is accessible to them.

The Catavi COMIBOL hospital has a fairly extensive MCH program including mothers' clubs, home visits, and followed-up well baby visits. There is a four-year nursing school at Catavi and it is the nursing students who do the work of the MCH program. The pediatrician associated with the clinic estimates the infant mortality rate of his patient-group to be 35 to 40 per 1,000 live births. Of course, the housing at Catavi is better than average, and meat, flown in from the Beni, is widely available.

3. Status of maternal and child health activities: An analysis

a. Pre-natal and post-natal care

With some exceptions, pre-natal and post-natal care programs in rural areas are almost non-existent. In cities, the situation is variable. Santa Cruz, Cochabamba, and Potosi have very weak pre-natal programs. The pre-natal programs in Riberalta, Sucre and La Paz seem to have much more active utilization. Table 5.2 shows some of the data available:

Table 5.2 - Number of Pre-Natal Visits and Institutional Deliveries in Selected Areas, 1972.

Institutions	Year	Pre-Natal Visits	Institutional Deliveries	Pre-Natal Visits per Institutional Delivery*
MOH Sucre	1972	1,339	830	1.61
CNSS Sucre	1972	1,927	517	3.73
MOH La Paz	1972	10,143	3,426	2.96
MOH Santa Cruz	1972	3,790	7,774	0.49
All Inst. Oruro	1972	3,135	2,669	1.17
Riberalta	1972	2,160	513	4.21
Methodist Hospital La Paz	1972	1,966	757	2.60
Rural Tarija- (8 centers)	1973	606	349	1.74

Source: LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974.

As mentioned above, most rural posts have a very low number of pre-natal visits. However, those posts which have mothers' clubs seem to have a higher number. Post-natal care is almost unknown in rural areas, and is little done in urban areas.

*The ideal would be about 10 pre-natal visits.

b. Mothers' clubs

Mothers' clubs probably are the most significant organizations, especially in rural and marginal urban areas, by which health education in MCH can be done. The mothers' clubs are based primarily on donated food supplements, but they permit dissemination of MCH information and nutrition education along with the free or inexpensive food.

Mothers' clubs exist or have existed in many rural areas, although they too are more numerous in urban areas. For example, there are 21 mothers' clubs in Sucre, but only six in rural Chuquisaca. A similar situation exists in La Paz, with dozens of mothers' clubs in and around the city, but probably less than 15 in the rest of the department. The Alto Beni is another active area. The number of mothers' clubs receiving Food for Peace is summarized in Table 5.3.

Table 5.3 - Number of Mothers' Clubs and Beneficiaries, August 1974.

Item	Urban	Rural	Total
Mothers' Clubs	145	104	249
Beneficiaries	31,174	21,925	53,099

Source: CARITAS Boliviana, unpublished data, 1974.

There are more mothers' clubs than those listed by CARITAS. If the total number of beneficiaries were 53,099, this would mean that less than three percent of the target population was being reached by the CARITAS program. Of this number, about 40,000 (75 percent) are children. The mothers' clubs offer a point of communication between the health provider and the community. As such, they have a potential use in developing community interest in the health system. For example, in Concepción, Tarija, the mothers' club organized the town to build an addition on to the hospital. On the other hand, in some towns, like Huanuni, there is no link between the mothers' club and the health system. Here, the club is run entirely by the church.

The main forum for health and nutrition education has been the mothers' clubs. It is hard to determine how interested the mothers are, but they are a captive audience if they want to get their free food. Although there have been many health education programs given through mothers' clubs, it is impossible to say if these education programs have been effective. A measure of effectiveness would be to see if mothers'

Mothers' Club at Yamparaez
Health Post
Operated by a Spanish Catholic Order

club members have more pre-natal checks or have more babies in the hospital, or if their children have fewer illnesses. With the CARITAS food supply likely to be diminishing soon, it will be interesting to see what happens to attendance at mothers' clubs. Some clubs are already starting to switch to the cooperative buying of food.

c. Pregnancy and delivery

The overall birth rate for Bolivia is estimated at 44 per 1,000 population. It varies considerably, depending on region and social class. In the Yapacaní colony in 1971 it was calculated to be 69. The rate for the city of Sucre in 1972 was figured at 52. La Paz was calculated at 34.1. However, since there has been no census since 1950, and since there is great underregistration of births in most areas, both the denominators and the numerators are uncertain. The birth rate may be much higher or lower than the reported figure.

In 1972 in the six largest cities in Bolivia, there were about 25,000 deliveries attended in hospitals. At a birth rate of 44, this figure would mean that slightly over 50 percent of urban deliveries in these cities were in hospitals. Potosí probably had the lowest percentage (about 30 percent) and Santa Cruz the highest (close to 100 percent). The figure may be slightly inflated as some rural mothers come to the city for deliveries. The CNSS encourages in-hospital deliveries by giving a cash "bonus" to mothers to cover the costs of the new baby if they also have had pre-natal care and have delivered in the hospital.

In rural areas, there are no good statistics, but the example of provincial Tarija, where there is a MCH program, may serve as a good example. In 1973, 349 or about 3.5 percent of births were in hospitals. The figure is probably high, as this does not include the YPFB hospitals in Bermejo and Sanandita. But rural Tarija has a better MCH program than most rural areas.

If it is assumed that the number of mothers who seek pre-natal care but have home deliveries is about equal to that number of mothers who do not seek pre-natal care but do have their baby in the hospital, then one could estimate that about 50 percent of pregnant women have some pre-natal care in urban areas, as compared to less than five percent in rural areas. The same percentages would apply to in-hospital deliveries. Because of COMIBOL, the rural figures may actually be slightly higher, as the figures from the Catavi and Huanuni COMIBOL hospitals, indicate that at least 65 percent of the COMIBOL beneficiaries have their babies in the hospital.

Table 5.4 shows the estimated percent of deliveries done in the hospital for selected provincial towns and areas. It is of note that the estimates for provincial Chuquisaca and Tarija are 2.1 percent and

Table 5.4 - Estimated Percent of Deliveries done in Institutions by Selected Provincial Towns or Areas in Bolivia, 1973

Town or Area[a]	Population Served	Predicted Births in Year (At 44/1000)	Actual in Hospital Births in Year	Estimated Percent Deliveries in Hospital
Catavi COMIBOL	29,298	1,289	839[b]	65.0
Huanuni COMIBOL	11,760	517	403[b]	78.0
Huanuni CSH	15,000[c]	659	36[d]	5.5
Eucalyptus CSH	12,000[c]	527	36[d]	6.8
Viacha CSH	25,000[c]	1,100	250[d]	22.7
Montero CSH	40,000[c]	1,760	675	38.4
Tarabuco CSH	15,000[c]	659	4[d]	0.6
Yotala CSH	15,000[c]	659	24[d]	3.6
Totora CSH	10,000[c]	440	24[d]	5.5
Yapacaní CSH	10,000[c]	440	36[d]	8.2
Colomi CSH	5,000[c]	220	12[d]	5.5
San Borja CSH	15,000[c]	659	36[d]	5.5
Caranavi CSH	25,000[c]	1,100	30[d]	2.7
All Rural Chuquisaca	429,580	18,900	400[d]	2.1
All Rural Tarija	210,000[e]	9,239	349	3.8

a Towns selected with no readily available alternate health services.

b 1972 Data, Rest is 1973.

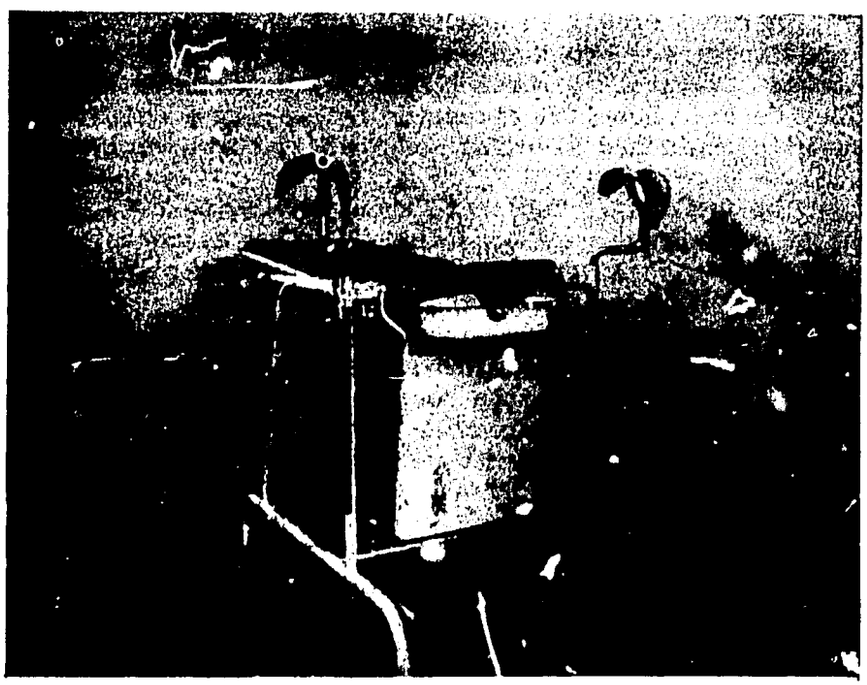
c Estimate, includes entire service area around town, conservatively estimated.

d. Estimate, based on actual site visits and revision of medical records.

e Estimate, to exclude YPFB beneficiaries.

Source: LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974.

Delivery Room at Huatajata
Health Post
Baptist Mission



Delivery Room at Achacachi
Health Center Hospital
Ministry of Health

3.8 percent respectively. Data from Chuquisaca also give some picture of the extent of underregistration in such statistics. In 1972, only 2,482 provincial births were registered, out of over 18,000 predicted, for a registration rate of less than 15 percent.

d. Complications of pregnancy and delivery

Maternal mortality data has been discussed above. The relative frequencies of complicated or abnormal deliveries and abortions are given in Table 5.5.

In cities where most deliveries are done in the hospital, the frequency of abortions compared to deliveries runs about ten percent. Most of these are spontaneous, incomplete abortions where the patient enters the hospital because of bleeding. The ratios are much higher (e.g. 21.7 percent in Potosi) where a lower percentage of deliveries are done in the hospital. This may indicate a fairly constant incidence of spontaneous abortions, which would be expected, as a certain proportion of all pregnancies (usually said to be ten percent) terminate in spontaneous abortion. Usually, most spontaneous abortions do not require hospital attention and are dismissed by the patient as heavy menstrual flow. Continued vaginal bleeding would be a reason to seek hospital attention, if a hospital were accessible. The abortion rate nonetheless seems high, especially in Oruro, Riberalta, and Trinidad. It is possible that the rural populations in these latter three areas are coming to the city for medical attention. A percentage of these abortions are probably induced.

In rural areas, in hospitals where few deliveries are done, it appears that there are about an equal number of deliveries and incomplete abortions. Culturally, rural people prefer to have their babies at home. They do seek hospital attention for either a difficult deliveries or abortions with continued bleeding, but rarely for normal deliveries.

The figures in Table 5.5 show that between 4.2 percent and 15.1 percent of deliveries were abnormal. COMIBOL seems to have a lower percentage of abnormal deliveries, and this may illustrate a better picture of reality, as undoubtedly the other hospitals see a higher percentage of complicated deliveries since people go to the hospital when they are in trouble. On the other hand, COMIBOL beneficiaries probably have nearly all their babies in the hospital. Unfortunately, the only data for Caesarian sections is from the Methodist Hospital in La Paz, where Caesarian sections were deemed necessary in 4.6 percent of deliveries, close to the U.S. figure.

From the data, one could conclude that about five percent of all deliveries in Bolivia are complicated, and about three percent need Caesarian sections. In rural areas, probably over 95 percent of deliveries are not done in a hospital and there is a high risk of maternal

Table 5.5 - Complications of Pregnancy: Abnormal Deliveries and Abortions, 1972.

Institutions	Number of Normal Deliveries	Number of Abnormal Deliveries	Total Number of Deliveries	Number of Cesarean Sections	Percent Abnormal Deliveries	Number of Incomplete Abortions	Number of Incomplete Abortions per 100 Deliveries
Hospital "Santa Barbara", Sucre	750	80	830	--	9.6	90	10.8
Maternity Hospital (CNSS), Sucre	439	78	517	--	15.1	--	--
City of La Paz - All Hospitals	--	--	8,054	--	--	711	8.8
Methodist Hospital - La Paz	757	64	821	38	7.8	95	11.6
MOH Hospital - Trinidad	416	47	463	--	10.2	140	30.2
MOH Hospital - Riberalta	468	45	513	--	8.8	78	15.2
City of Oruro - All Hospitals	--	--	2,669	--	--	471	17.7
City of Potosí - All Hospitals	--	--	955	--	--	208	21.7
MOH Hospital - Santa Cruz	--	--	7,774	--	--	898	11.6
COMIBOL - Catavi	766	73	839	--	8.7	--	--
COMIBOL - Huanuni	386	17	403	--	4.2	--	--
COMIBOL - All Hospitals	3,805	200	4,005	--	5.0	--	--

Source: LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974.

and/or infant mortality. These maternal and/or infant deaths of course go unreported for the most part. The situation is perhaps best illustrated by a case history related by the Navy physician in Tiquina. He was called to see a woman who was several hours walk away in the campo and who had been in labor two days. When he got there, he found an arm presentation. He could not do surgery there (and only with great difficulty at his health post, for that matter), so he internally rotated the baby and delivered it dead. The mother was lucky and did survive.

e. Well-baby programs

With the exception of a few health posts and hospitals, such as Yamparaez, Quillacollo, Ancoraimes, Catavi, and Montero, there are almost no well-baby programs in rural areas. The diagnosis "well-baby" rarely appears in rural record books.

On the other hand, in urban areas, the concept of well-baby exams has been established for several years. These examinations have been carried out mostly at the Centros de Salud in the department capitals. Often "well-baby" clinics are general pediatric clinics. For example, at the Centro de Salud El Alto, 70 percent of all the well-baby visits are sick children. Only 30 percent are really well. There are general pediatric clinics at most Centros de Salud. For example, in Oruro at the Centro de Salud, about 350 children per month are seen at the well-baby clinic and another 350 per month at the general pediatric clinic. In Cochabamba, the Centro de Salud ran five pediatric clinics in 1973 with a total of about 18,000 patients seen. In addition, children are seen in Cochabamba in very active and well-utilized clinics at the Albina Patiño Hospital and at the new pediatric section of the Viedma Hospital. There are active well-baby programs also in La Paz and Santa Cruz.

In the rural area of Tarija, the eight rural hospitals reported a total of 1,063 well-baby visits, or an average of 11 well-baby visits per month per hospital. This compares with an average of 39 sick child visits per month at each hospital. Statistics were kept on pediatric home visits and these averaged 19 per month per hospital.

Recently there has been a trend to turn the well-baby clinics over to the nurse. This has been done in most of the departmental capitals, and has also been done in Portachuelo. Visiting nurses also go out to homes, but still on a very limited basis. The missionary nurses seem to be doing more home visits in marginal urban areas. The JNDS is essentially running a well-baby program combined with day-care in many marginal urban areas, although they deny they have a well-baby program since they claim they do not want to overlap with the MOH.

Immunizations are an integral part of well-baby programs. Often it is not possible to follow a proper schedule for immunizations because of shortages or maldistribution of the vaccines. Up to now, measles vaccination has been in particularly short supply. The maintenance concept of vaccination has not yet been implemented except to a minor degree for some vaccines (such as DPT) at the Centros de Salud. Specific illnesses preventable by vaccination are discussed in Section C on Communicable Diseases. A summary of vaccinations given under the direction of the MOH is in Table 5.6.*

Table 5.6 - Number of Vaccinations Given by the Ministry of Health for DPT, Polio and Measles, 1970-1972.

	DPT				Polio				Measles
Year	1st Dose	2nd Dose	Booster	Total	1st Dose	2nd Dose	Booster	Total	(One Dose)
1970	34,953	21,213	2,142	58,308	115,544	51,862	1,503	168,909	69,205
1971	31,054	15,092	4,543	50,626	12,295	6,817	3,910	23,652	45,817
1972	21,812	8,125	2,220	32,157	17,563	8,892	1,634	28,098	49,471

Source: MOH, Institute of Communicable Diseases, unpublished data, 1974.

The above data illustrate that there are many more first doses given than second doses and boosters. This means that there are many children who have incomplete immunizations and are at risk as much as the unimmunized population. Valuable supplies of vaccines and much effort is wasted this way. In effect, in the three year period 1970-72, it could be said that only 8,905 children were effectively protected against diphtheria, pertussis, and tetanus at the expense of 141,000 doses of vaccine. Likewise, it could be said that lasting immunity to polio has been given to only 7,047 children at the expense of 220,000 doses of vaccine, when it could have theoretically been done with a little over 21,000 doses. There is probably some value to partial protection, but if full protection is desired, then the child who has missed his scheduled dose by more than a reasonable time should be re-started. This inefficiency is a strong argument for maintenance vaccination and delegation of vaccination programs to the local level, as opposed to the campaign approach.

Nutrition is also an integral part of well-baby programs. Nutrition is covered in more detail in Chapters II and VII. The present programs in nutrition function through the mothers' clubs and the schools, but they reach only a small portion of the target population. The school lunch program reaches 200,000 rural schoolchildren and 30,000 urban

*From Communicable Disease Commission Report, 1974.

schoolchildren, but schoolchildren are not in the age group (six months to three years) most susceptible to the effects of malnutrition. The type of malnutrition that affects these children is protein-calorie malnutrition, and it usually begins right after the child is weaned. Through the mothers' clubs, about 42,000 children in the higher risk pre-school age group are theoretically reached, but this only represents about five percent of that population.

Four nutritional studies are now being conducted in Bolivia: (1) anemia in 35,000 women, (2) nutrition in 6,000 children (zero to six years), (3) measurements of 19,000 children (one to four years), and (4) study of goiter in 45,000 people age five to 14.

There are also specific nutritional rehabilitation programs for children. The Hospital de Niños in Montero has an active program, as do some centers in La Paz, where rehabilitation is done on both an inpatient and/or an outpatient basis. The JNDS is especially involved in these rehabilitation programs.

f. Sick child

The illnesses of children have been discussed fairly extensively in Chapter II. Specific infectious diseases are discussed in Section C of this Chapter.

There are specific pediatric clinics run by the MOH in all the departmental capitals. There are only seven specific pediatric hospitals in Bolivia: Montero, Santa Cruz, Albina Patiño and Viedma in Cochabamba, La Paz, Tarija, and Catavi (COMIBOL).

From the tables in Chapter II, it can be seen that pediatric (ero to 14 years) hospitalizations in the MOH system (in 1970) accounted for 16 percent of all hospitalizations. They accounted for 15.5 percent of the hospitalizations in 1972 in the CNSS system. Pediatric outpatient visits did account for 22 percent of all outpatient visits in the CNSS system in 1972. This percentage is probably much higher, as many pediatric visits are classified under general medical visits. Rural areas vary considerably. In some rural towns (e.g. Ravelo, Tarabuco) children are rarely brought to the hospital, whereas in other areas children aged ero to five years comprise over 50 percent of the patients seen.

g. Family planning

Family planning has been practiced on a very limited scale in Bolivia. On an official level, it has political overtones, with one side arguing that Bolivia should discourage family planning since the country is underpopulated. Only recently (1974) did the Bolivian government officially endorse family planning.

There appears to be a great demand for family planning, as the private medical sector (and the indigenous sector too) allegedly have a large business in induced abortions. There are no good figures on induced abortions, but there allegedly are over 20 physicians in Cochabamba and one full-time in Quillacollo who are doing abortions.

In a study done by the Centro de Estudios de Población in 1968, 2,570 women were interviewed in La Paz, Cochabamba and Santa Cruz. They were asked if they wanted to increase the size of their families. Their answers are summarized in Table 5.7.

Table 5.7 - Desire to Increase Family Size by Urban and Rural Areas of Three Departments, 1968.

Desire to Increase Family Size	La Paz		Cochabamba		Santa Cruz	
	Urban	Rural	Urban	Rural	Urban	Rural
Yes	29.3%	21.9%	35.2%	28.7%	40.0%	34.2%
No	70.7%	78.1%	64.8%	71.3%	60.0%	65.8%

Source: Llano Saavedra, Luis, "Bolivia: Planificación Familiar", CENAFA, La Paz, 1971.

Most women did not want to increase the size of their family; the desire to limit family size was even more marked in rural areas than in urban areas.

Up to now, there have been few health education programs in family planning, but even these few have been well attended. Public knowledge of contraception, especially in uneducated and/or rural populations, is minimal. This lack of knowledge was confirmed in a study done by Llano(5) and another done in Mizque.(6)

A few intentionally unpublished programs, widely scattered, have been operating quietly over the past ten years in Bolivia, in both urban and rural. They have involved mostly IUD insertion and have been done by private institutions. In many urban areas, there seems to be growing interest in family planning. PROFAM(7) started two family planning clinics in La Paz in June 1974, and similar projects are to be begun in Cochabamba, Santa Cruz, Riberalta, and Trinidad. Except for a private effort at Huatajata, there are no organized family planning programs in rural areas at present. A mobile van operating out of Ayo-Ayo on the Altiplano under the auspices of CENAFA is eventually to be used for a family planning program.

The MOH has recently developed a family planning program in five district centers: La Paz, Cochabamba, Santa Cruz, Trinidad, and Riberalta. Most of these programs are at an incipient stage and consist only of a MOH assignee to the MCH program in the Unidades Sanitarias. As planned, these persons are to work only part time, conducting family planning clinics at various MCH facilities. The program is too new for any conclusions to be formulated at this time on either its present effectiveness nor potential.

Folk healers and curanderos probably are doing most of the family planning in rural areas at present. They use herbs, and some mechanically induce abortions. This may be part of the reason why so many incomplete abortions are seen in the hospitals, both in rural and urban areas. On an individual basis, there is great need and demand for family planning. Due to the political overtones however, family planning programs are not publicized. In fact, in Bolivia, the programs are referred to as "responsible parenthood" rather than family planning.

4. Summary

Maternal and child health is closely tied in with all preventive medicine programs: vaccinations, nutrition, infectious diseases, environmental sanitation. As such, all these aspects should be dealt with in an integrated way if MCH is to improve.

As has been shown above, MCH programs seem to be progressing fairly well in the urban areas, but have little impact yet in rural areas. There has been some increased effort, especially by the JNDS, to bring MCH programs to the marginal urban areas.

Well-baby visits, pre-natal visits, and in-hospital deliveries seem to be growing in numbers in the urban areas, but are seen in appreciable numbers only in a very few rural hospitals or health posts. Nutrition programs have little overall effect for most rural areas, and are in danger of having even less effect when CARITAS food stops coming to Bolivia. Family planning is still shaky politically, but seems to have progressed. MCH training programs are doing well and need more support to maintain themselves.

C. Communicable Diseases*

1. Overview

Communicable or infectious diseases constitute the one most significant health problem in Bolivia. According to the PAHC study of childhood mortality in La Paz and Viacha done in 1968-70, communicable diseases accounted for 68.2 percent of the mortality in age group one year

*Refer to the figures and tables in Chapter II for mortality and morbidity data, also for communicable diseases reported.

and under, and 86.9 percent of the mortality in age group one to four years. According to Registro Civil data for 1969, when the "poorly defined" category is excluded, infectious diseases account for 85.5 percent of deaths in the age group five to 14 years. They are also very significant in the over 15 age group, probably accounting for over 50 percent of mortality, but the data is not sufficient to give an exact estimate.

From 1970 hospital discharge data, communicable diseases accounted for over 65 percent of the hospitalizations in the under one age group, over 60 percent in the one to four year age group and over 40 percent in the five to 14 year age group.

Most of the communicable diseases are respiratory or gastrointestinal, and most of these are probably viral. What follows that, with a few exceptions, these diseases are then little affected by specific chemotherapeutic agents. They are susceptible to attack mostly through environmental and nutritional interventions and not curative measures.

The single most significant communicable disease in Bolivian children under age five has been measles, which is preventable by vaccination. Beyond age five, tuberculosis is probably the most significant communicable disease in terms of morbidity and mortality. Some diseases are particular potential threats to economic development in the Oriente: these include malaria, hookworm, yellow fever, and Bolivian hemorrhagic fever.

2. Overall structure of communicable disease programs within the MOH

The MOH, through its new Department of Ecology, is in charge of specific communicable disease control programs. The Department of Ecology includes INET (National Institute of Communicable Diseases), SNEM (National Malaria Eradication Service), the Division of Environmental Sanitation, and the National Health Laboratories (INLASA). All activities in communicable disease control have been coordinated through the MOH.

Also coordinated through the Department of Ecology is the Banco de Vacunas, which is responsible for supplying vaccines to the whole country.

Within INET are three specialized agencies for tuberculosis, hemorrhagic fever, and epidemiology. The hemorrhagic fever commission is also in charge of leprosy.

Reporting of communicable diseases, with the exception of malaria, is by weekly reports supposedly sent from each hospital or health post. Since rural health posts see only a small fraction of their target population, there is much underreporting. SNEM, with its own field workers

doing their laboratory tests, has much more accurate case reporting. The general lack of laboratory utilization in rural hospitals adds to the inaccuracy of disease reporting.

There are INET personnel (epidemiologists, TB specialists, etc.) at regional levels in the Unidades Sanitarias who are responsible within their region for specific functions, such as investigating epidemics or running departmental tuberculosis programs. In areas with malaria, there are also departmental SNEM people. The resources, both at the national and the regional level, are very limited. There is insufficient money for necessary drugs, and there are not sufficient vehicles to allow the investigation of epidemics or the supervision of programs in rural areas.

a. Banco de Vacunas

In order to guarantee adequate centralized supplies and distribution of vaccines, the Banco de Vacunas (Vaccine Bank) was organized in 1971. Seventeen organizations involved in health care contributed to it. Many administrative problems are involved in getting the organizations to put in their share, or organizing local campaigns. Also, there are frequently inadequate supplies of vaccine in the field.

b. INLASA

This laboratory, located in La Paz, is supposed to be a national reference laboratory. In fact, it supplies most of the clinical services for the city of La Paz. It is lacking in basic equipment. There is a plan to build a new laboratory and to start a national network of laboratories. A regionalized laboratory system could be used to promote more scientific medicine in rural areas by providing back-up and supervision. But Bolivia is a long way from having such an effective system. INLASA does produce a limited amount of rabies vaccine, and did produce some smallpox vaccine in the past.

3. Specific diseases and programs

a. Tuberculosis

Tuberculosis is by far the greatest communicable disease problem in Bolivia, except perhaps for measles in children. There are estimated to be 80,000 active cases in Bolivia (a prevalence of about 1.4 percent), and about 50 percent of the population has been infected, (has a positive skin test). It is the number three cause of mortality, after respiratory and gastrointestinal infections (excluding "poorly defined"), in the 15 and over age group.

The MOH operates a tuberculosis (TBC) program throughout Bolivia, and has for over seven years. It now includes about 40 percent

of rural hospitals and 15 percent of postas sanitarias, but is most active in the urban areas. It has two main problems: (1) not enough drugs, and (2) patient non-compliance with inadequate resources to do good follow-up. Quantities of TBC drugs sent to rural areas are inadequate or nonexistent. Even in the cities, the drug supply is not sufficient. For example, in Cochabamba about 30 new cases of tuberculosis are being seen per month at the Centro de Salud. Yet they only have enough medications to treat 30 cases a year. Some health authorities feel that it is almost not worth having a program to find new cases if there is nothing that can be done.

The tuberculosis program has three parts: case finding through sputum or (more rarely) X-Ray examinations; treatment of cases with chemotherapy (drugs); and BCG vaccination. The difficulties with securing adequate drugs and doing follow-up for patient non-compliance have been mentioned above. With partial treatment, resistant bacteria have been appearing. In 1974, results from resistance testing at the Instituto del Torax showed that 57.5 percent of the cultures showed some resistance to one to three drugs. BCG vaccination has been done extensively by campaign in various parts of Bolivia, but the coverage does not seem as good as they thought. Less than 10 percent of newborns are being vaccinated.

The 1973 budget for tuberculosis was only $57,800 (or about 1 ¢ per person). The amount in that budget for drugs would only cover about one percent of the cost of needed drugs if the cheapest drugs were used (Tiazina). Obviously, for resistant bacteria, the secondary drugs are very expensive.

Outpatient treatment is being used more now, although there are 408 tuberculosis beds in Bolivia, with 67 percent bed occupancy in 1973. Program supervision is especially difficult, since there are no travel funds and transportation is difficult to find.

In summary, acceptable technical norms are established and implemented in most places, but resources fall very short of demand, both at the national and local levels. Systems for delivering what resources are available are lacking, and adequate supervision and technical support of field operations are inadequate .

b. Malaria

There has been much progress in malaria control in Bolivia, but in 1973 there was an abrupt increase in the number of cases (7,641). Of these cases, 91.8 percent were Vivax and 8.2 percent Falciparum. However, many tropical areas of Bolivia (such as the Alto Beni and the Chapare), which in the late 1950's had close to 100 percent prevalence of malaria, now are malaria-free.

SNEM has been the autonomous agency in charge of malaria control since 1958. But SNEM's resources have been gradually diminishing and SNEM is in trouble now. Their budget is only $430,000; their vehicles and sprayers are old and need replacement; and their supply of DDT is about to be cut off. Argentina has been helping this year because the most significant outbreak of malaria was in Tarija along the Argentine border. In 1974, SNEM considered 55 percent of Bolivia's malaria area to be still in the "attack" phase, with only 45 percent in consolidation. So far in 1974, the incidence of new cases has been running at about half of last year's rate.

There have been suggestions to use SNEM personnel in other health programs, but at present they are barely able to cope with malaria problems. There are 269 SNEM employees of which 204 are in the field. These people are acquainted with and reach the most remote areas of Bolivia. Their principal methods are case finding through blood smears (117,846 samples in 1973) and spraying houses with DDT (91,675 houses in 1973). They also have used chemotherapy and chemoprophylaxis.

Although malaria causes minimal mortality, it causes a high morbidity or potential loss of work. This could be especially crucial in developing areas of colonization in the Oriente. For this reason, malaria control is important but may be difficult if SNEM does not obtain more support soon.

c. Bolivian hemorrhagic fever

Except for one "imported" outbreak of Bolivian hemorrhagic fever (BHF) in Cochabamba in 1971, BHF has been limited to certain areas of the Beni. The first cases were diagnosed in 1964. Although there have been only a total of about 300 deaths from BHF in the past ten years, and the last case was in 1972, the disease is much feared, since the overall case mortality rate has been about 25 percent. In some outbreaks, the case mortality rate has been up to 90 percent.

BHF seems to be fairly well controlled now by a program that includes the trapping of the rodent vector of BHF (Calomys Calosus) in various areas of the Beni. The rodent does not exist outside of the Beni. When infected animals are found, poison is left in all the houses in the area to eliminate the rodents. The BHF field workers, which include four physicians in the Beni, have also started to do field work in leprosy.

Continued vigilance for infected rodents is still warranted, as the Beni is too large and inaccessible to eliminate the particular rodent completely. BHF poses a potential risk for the entire Oriente as the rodents could easily move into Santa Cruz. A vaccine may be available soon. There is no proved therapy for the disease.

d. Influenza and enteric diseases

Although influenza and diarrheal diseases are respectively first and second most reported diseases in Bolivia, there is no programatic effort within any health agency against their control. The prevalence of viral or bacterial etiology of these diseases is unknown at this time. Treatment within a health unit is conducted without adequate diagnostic work upand based on "shot gun" chemotherapies.

It is recognized that environmental sanitation programs are primarily directed at the control of enteric or diarrheal diseases and these are covered below in Section D.

e. Childhood diseases preventable by vaccination

Polio, measles, whooping cough, tetanus, and diphtheria are diseases which are close to 100 percent preventable by vaccination. Thus, with effective vaccination programs, these diseases could be practically eliminated. However, these 5 childhood diseases are still serious problems in Bolivia. In the United States, there are still many cases of measles, but it does not represent the same mortality risk as in Bolivia, where combined with malnutrition, it may at times attain a mortality rate of 25 to 50 percent. The other four diseases are now rare in the United States.

As will be noted below, vaccination campaigns against these diseases are sporadic, ill-organized, and under-funded. Supplies of vaccine are often grossly undersupplied or are damaged and lost in delivery to outlying areas. National campaigns are often on a "hit or miss" basis with little or no follow up to take care of adverse side effect or for second or third boosters.

Polio, a disease caused by enteric viruses of three types, still occurs in outbreaks in Bolivia. In 1970, there were 111 cases of paralytic polio reported, 70 of them in Cochabamba. Most were in the under-five age group. There have been fewer cases reported per year since then, but polio vaccination is of the utmost importance. This is because, paradoxically, as environmental sanitation programs increase, polio increases in incidence too. Usually infants have sub-clinical infectious and thus are protected later, but as the virus is removed from the environment, this natural immunity will decrease, and the child will be at greater risk. This has been shown recently in the United States in an unvaccinated group at a boy's school in Connecticut.

There have been vaccination campaigns for polio over most of Bolivia for the past four years. Often the campaigns were "crisis" oriented, as in the Cochabamba epidemic in 1970. Poor planning often resulted in the wasting of thousands of doses of vaccine. The Banco de Vacunas now seems

to have a fairly good stock of polio vaccine, and polio vaccine was even seen in rural areas. There are serious problems with proper refrigerator and "maintenance" vaccination as opposed to campaigns. It is often difficult to see that the three required doses for vaccination are completed.

Measles is the most serious single illness for children under five years of age. In the PAHO La Paz-Viacha study, it accounted for 5.8 percent of all mortality in the under one age group and 28.1 percent of the mortality in the one to four age group. It could be estimated, using available mortality data and taking into account underregistration of deaths, that in 1968-70 there probably have been over 10,000 deaths per year in Bolivia from measles. Table 5.8 illustrates the importance of measles in the mortality of infants and children.

Table 5.8 - Deaths from all Causes and Measles, La Paz, July 1968-July 1969.

Age Groups	All Causes	Measles	Percent Measles
0-5 months	977	13	1.3
6 mo.-1 yr.	710	148	20.8
2-4 years	226	75	33.2
Total	1,913	236	12.3

Source: Ministry of Health, La Paz Regional Health Office, unpublished data, 1974.

The reason for the high mortality is, of course, associated malnutrition. In fact, the high mortality from measles compared with the low mortality rate in the United States is evidence of the poor nutritional status of children in Bolivia. Measles continues to be a significant cause of mortality (N° 7) in the five to 14 age group.

Measles is particularly susceptible to control by vaccination, as it is a one time vaccination with no required boosters. However, the vaccine is fairly expensive. Vaccination campaigns for measles are barely beginning. The only department which seems to have been fairly well covered is Oruro, and very few cases of measles were reported in Oruro in 1973 (only 44 for the whole department, compared with 587 cases of whooping cough). There was an epidemic of measles in north Potosí in May 1974. During mid-1974, there was a vaccination campaign for measles in Cochabamba Department. Again, with vaccinations being done only in infrequent large campaigns, many children will be missed. More frequent "mini-campaigns" conducted at the local level have been considered, but this type of organization has been underutilized predominately because of the lack of personnel at the local level.

Whooping cough, or pertussis, is another major cause of mortality in children under five. It too, is controllable by vaccination, but requires at least three separate vaccinations for protection. It is usually given in the combined form (DPT: diphtheria, pertussis, tetanus) - called "vacuna triple".

The diagnosis of whooping cough may be missed, or it is confused with croup or another pneumonia, so the statistics are questionable qualitatively as well as quantitatively. But in Registro Civil data, it is listed as causing 7.6 percent of all mortality in children under age five (1969 data). If this were accurate, an extrapolation from the data would indicate that there were about 6,000 deaths in Bolivia from pertussis in 1969.

DPT vaccine is now (mid-1974) fairly well distributed in many rural areas as well as urban areas. Campaigns are planned, but the supplies must be maintained, especially if the full three doses are to be given. An example of the difficulties involved in completing vaccination schedules is given by the campaign during and after the diphtheria epidemic in Cochabamba in 1973. The first dose of DPT was given to 90,000 children in the city and 21,000 children in rural areas. However, only 30,000 in the city (33 percent) and 4,000 in the rural areas (19 percent) got the second dose. Probably even less got the booster dose a year later. The enthusiasm of both the people and the vaccinations seems to be much greater under "crisis" situations.

Since DPT vaccine is tri-valent, the same vaccination program problems apply to diphtheria and tetanus as to pertussis, described above. Diphtheria occurs mostly in sporadic epidemics. In the 1973 epidemic in Cochabamba, between January and June 1973, there were 235 recorded cases, with 13 fatalities. In 1973, 366 cases were reported for all Bolivia, compared with 88 in 1972 and 54 in 1971.

There is probably great underreporting of tetanus cases. Unlike diphtheria, which has had a case mortality rate of between five percent and 25 percent or more (depending on the availability of antitoxin), the mortality rate for tetanus in Bolivia is probably close to 100 percent. It too is country-wide in distribution, but the overwhelming majority of cases are probably in infants under one month of age: neo-natal tetanus. In 1969, 49 of the 63 reported deaths from tetanus were in infants "under one year of age". The rest of the reported cases were scattered over all age groups.

Neo-natal tetanus occurs because of non-sterile techniques and customs at the time of birth, such as cutting the umbilical cord with dirty instruments or rubbing dung on the umbilical cord. The approach to controlling neo-natal tetanus is through the education of parteros and the vaccination of mothers during their pregnancy. These measures are so far

being done only minimally. The vaccination of expectant mothers could certainly be easily done through the mothers' clubs or at the time of prenatal visits, but the percentage of expectant mothers involved in these activities is still very low.

f. Other diseases with available vaccines

Although urban yellow fever no longer exists in Bolivia, jungle yellow fever does. The reservoir is probably in monkeys, and yellow fever is a threat to colonization areas. There are sporadic outbreaks, mostly in new colonization areas. Thus far in 1974, there have been about 20 cases of yellow fever in the Alto Beni and the Yapacaní area. The major problem is that yellow fever carries a high mortality rate, probably over 75 percent.

There is an available vaccine with long-lasting (ten years) protective effect. But there are still administrative problems in Bolivia in insuring adequate supplies of vaccine in areas of colonization. Usually, vaccination campaigns have been organized on a crisis basis after an outbreak has started. There are problems in supplying adequate numbers of doses on this bases. For example, in Santa Cruz this year, 60,000 doses were requested but only 20,000 were received. The control of jungle yellow fever depends on the vaccination of the population at risk.

Epidemic (Exanthematous) Typhus also has been limited to sporadic outbreaks of usually ten to 20 cases each, mostly in the areas of the Altiplano and the Valles. In 1974, there have been two reported outbreaks so far, with a few deaths, in isolated areas of La Paz Department.

Typhus is lice-born, so its control depends on personal hygiene, which is difficult to obtain in cold areas with little water. An experimental vaccine, from the University of Maryland has been tried in Bolivia, but it is not known if it works well. Typhus only occurs in sporadic outbreaks and the areas of vaccination were not the most high risk areas (Huatajata, Yamparaez, e.g.). The Bolivian National Laboratory does have the capability to confirm cases of typhus serologically.

Bubonic plague is endemic in Bolivia in scattered pockets from Tarija to Apolo, mostly in semi-tropical areas bordering the Valles (see map in Chapter II). There are sporadic outbreaks; the last one was in June-July 1974, north of Coroico, with 14 cases and five deaths. There is a plague vaccine, however its effectiveness is still in question. No plague program exists; in fact, the endemic areas of plague has not been well defined as there has been no study done to find out infection rates in reservoir animals.

The last reported case of smallpox in Bolivia was nine years ago. INET has covered most of the country with smallpox vaccine, and its program calls for re-vaccination, in stages, of the entire population every five years. Smallpox vaccination has been the most extensively done campaign. There used to be up to several thousand cases of smallpox a year in Bolivia.

South America has been smallpox free since 1971, when the last case was reported in Brazil. The Bolivian Public Health authorities think that Bolivia should continue smallpox vaccination as they do not think they have the capability to contain an epidemic if one case should be introduced into the country. The argument on the other side would say that only high-risk populations (doctors, nurses, etc.) should be vaccinated and health workers should have an awareness of smallpox to be able to pick-up a new case quickly. It is possible that the resources devoted to smallpox vaccination might be better used in other efforts.

g. Venereal diseases

Venereal diseases seem to have followed the world-wide pattern in Bolivia. Although the incidence dropped soon after the introduction of antibiotics, and in recent years have become much more prevalent again. In 1971, gonorrhea was the sixth most reported communicable disease in Bolivia, with 1,939 cases reported. (It is the most reported infectious disease in the United States). Between 1966 and 1969, the average number of cases per year reported of gonorrhea was 191.5, but between 1970 and 1973 it was 1,691. Similarly, for syphilis (all types), the 1966-69 yearly average was 272.3, compared to 1,113 for 1970-73 (Table 5.9).

Table 5.9 - Reported Cases of Venereal Diseases, Bolivia, 1966-1973.

Year	Cases of Gonorrhea	Cases of Syphilis
1966	182	82
1967	141	103
1968	143	586
1969	300	318
1970	1,212	1,074
1971	1,939	1,059
1972	1,822	1,169
1973	1,791	1,149

Source: Ministry of Health, Institute of Communicable Diseases, unpublished data, 1974.

The only specific venereal disease program done to any extent by the Unidades Sanitarias is the examination of prostitutes. There have

been a few individual efforts in sexual education and in drawing routine VDRL's, but little organized efforts to contain V.D. Treatment is also not standardized.

h. Chagas' disease

Chagas' disease is a chronic parasitic disease caused by the parasite Trypanosoma Cruzi, which is spread through the bite of reduvid (Vinchuca) bugs. It is endemic in all of Bolivia east of the Andes, the Valles and the Oriente. The prevalence of infection in endemic areas is not known, but from the few studies done seems to be about 18 percent. The incidence of the actual disease, in its chronic form, is grossly under-reported (only 114 cases were reported in Bolivia in 1971).

Programs to control Chagas' disease are barely beginning. Some studies on the rate of infection in reduvid bugs have been done in Cochabamba and Santa Cruz, with the finding of up to close to 100 percent of the adult bugs being infected. Tests are available for serological diagnosis of human infections, but up to now they have been fairly expensive, so no extensive investigative programs to determine the incidence of human infections have yet been done. A new latex fixation test may make serological testing more feasible. In fact, serological studies are planned in the near future in Tarija for large sample populations.

Public health measures to decrease the incidence of Chagas' disease depend on better housing and/or the spraying of houses for reduvid bugs. Unfortunately, DDT does not kill the bugs, and fairly expensive insecticides, such as Baygon, are necessary. For this reason, only very limited spraying has been done. Prevention would be the best route to take to control the disease, as no really effective chemotherapeutic agent is yet known. There is an experimental drug which seems to be partially effective, mostly in acute cases. The drug seems to have little effect in chronic or dormant cases.

i. Leprosy

Leprosy is scattered over several endemic areas in Bolivia, most notably with concentrations southwest of Santa Cruz and in pockets in the Beni. It affects all age groups. Leprosy programs are following about 1,500 patient, and there are probably about another 1,500 cases to be discovered.(8) Some of the cases under treatment are in the two leprosariums that are functioning in Bolivia. One is in Candua, near Monteagudo, and the other is a new one at Jorochito, near Santa Cruz. However, most treatment is being done now on an outpatient basis. Patients seem to comply fairly well in taking the necessary long-term medication. There are significant problems in obtaining adequate supplies of drugs, but the case finding and follow-up part of the leprosy program seem to be functioning fairly well.

j. Rabies

Rabies is primarily an infection of animals, but 60 human cases, mostly related to dog bites, were reported in 1971. For all practical purposes, the infection is 100 percent fatal. A rabies vaccine is being produced by INLASA, but only 250 doses were produced in 1973. The main approach to rabies control in preventing human cases is through the vaccination of domestic animals and the elimination of stray animals. These have been done only minimally in Bolivia. There have been about 3,000 dogs a year vaccinated in La Paz and Cochabamba. In 1972, with the help of WHO, about 16,000 dogs were vaccinated in Santa Cruz. Little has been done to eliminate stray animals.

D. Environmental Sanitation*

1. Status of the problem

The environmental sanitation situation in Bolivia would be considered far from adequate by any standard measurement. For example, one may consider the water supply and sewerage service in Bolivia as it compares to other Latin American countries (see Table 5.10). While the number of water supply and sewage disposal facilities, along with the portion of the population served by these facilities, may not be the best indicator of a country's environmental sanitation status, it can certainly be used as a gross indicator of the general magnitude of the problem.

In the urban sector, 37 of 108 communities have water supply facilities. Out of a total urban population of 1,800,000, 80,570 inhabitants (or 44.5 percent) have house connections and 199,550 (or 11.1 percent) have easy access. This gives a total of 1,001,120 people or 55.6 percent of the urban population which have access to a protected water supply facility. While these figures indicate a deficiency in the urban sector, protected water supplies in the rural sector are practically non-existant. Of a rural population of 3,500,000, only 151,300 (or 4.3 percent) have access to a protected water source. In the entire country of Bolivia, only 21.7 percent of the population have access to protected water supply facilities (see Table 5.11).

---

*A large part of the information presented in this section was drawn from: Bolivia Water Supply and Sewerage Sector Study, by the International Bank for Reconstruction and Development, the International Development Association and the World Health Organization, May 1974. This report (hereafter referred to as the IBRD/WHO Report) is very well done and quite comprehensive. Indications are that the Bolivian Government will rely heavily on this report for future policy formation in the environmental sanitation sector.

For this section of the Health Sector Assessment, "urban" will be defined as communities of 2,000 population or greater. The reason is that the 2,000 population division is the one used in the environmental sanitation field in Bolivia as well as in other Latin American countries. Most of the information and data available is broken down in this manner.

Table 5.10- Populations Served with Water Supply and Sewerage for Selected Latin American and Caribbean Countries, 1970[a]

Country	Water Supply[b]						Urban Sewerage[c] Rural Waste Disposal					
	Total Urban		Total Rural		Total Country		Total Urban		Total Urban		Total Country	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
Bolivia	1,000	55	151	4	1,152	22	420	23	112	3	532	10
Chile	5,000	69	250	9	5,250	53	NA	-	NA	-	NA	-
Perú	4,200	60	500	7	4,700	34	3,800	54	1,000	15	4,800	35
Ecuador	1,810	74	244	6	2,054	33	1,383	57	NA	-	1,383	22
Colombia	11,493	88	2,680	31	14,173	65	9,817	75	3,060	35	12,877	59
Paraguay	187	20	81	5	268	11	131	14	NA	-	131	5
Uruguay	2,163	95	60	10	2,223	77	2,135	93	66	11	2,201	76
Costa Rica	657	98	639	55	1,296	71	442	66	467	40	908	50
El Salvador	986	68	436	21	1,422	40	917	64	272	13	1,189	34
Guatemala	1,583	98	425	12	2,008	39	808	50	515	14	1,323	26
Barbados	100	88	138	96	238	93	NA	-	NA	-	NA	-
Haití	616	64	NA	-	616	12	669	70	43	1	712	13

Source: World Health Statistics Report, WHO/Geneva, Vol. 26, No. 11, 1973

[a]All populations are shown in 1,000's by year 1970 for all countries except Bolivia; coverage for Bolivia by 1973

[b]Water supply coverage includes service by house connections and public standpipe or easy access.

[c]Urban sewerage service is house connected public sewerage and individual systems where known rural waste disposal service is individual systems, i.e. septic tank, sanitary latrines, etc.

As reported in: IBRD/WHO Report, Water Supply and Sewerage Sector Study, paragraph 2.47

Table 5.11 - Population Served by Public Water Supplies, 1973

Area	Population	Number of Cities	Population Served					
			House Connections		Easy Access[a]		Total	
			Inhabitants	Percent	Inhabitants	Percent	Inhabitants	Percent
Urban	1,800,000	108	801,570	44.5	199,550	11.1	1,001,120	55.6
Rural	3,500,000	457[b]	53,300	1.5	98,000[c]	2.8	151,300	4.3
Total	5,300,000	565	854,870	16.1	297,550	5.6	1,152,420	21.7

Note: [a] Within 200 to 250 meters of public standpipe and/or protected common wells.

[b] Rural communities with 200 to 2,000 inhabitants each: total population of 700,000. The remaining 2,800,000 rural population reside in population conglomerates of 200 inhabitants or less, and are considered as dispersed.

[c] This population consists of 21,600 inhabitants residing in some communities having easy access to public standpipes; 76,400 inhabitants residing in population conglomerates of 200 inhabitants or less and are served by 730 common wells (protected).

Source: IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, May 1974, App. 6 Table 17.

Table 5.12 - Population Served by Public Sewerage and Sanitation Facilities in Bolivia*, 1973

Area	Population	Number of Cities	Population Served					
			Public Sewerage (Urban)		Sanitation Facilities (Rural)		Total	
			Inhabitants	Percent	Inhabitants	Percent	Inhabitants	Percent
Urban	1,800,000	108	420,000	23.3	--	--	420,000	23.3
Rural	3,500,000	457	--	--	112,000	3.2	112,000	3.2
Total	5,300,000	565	420,000	7.9	112,000	2.1	532,000	10.0

* Based on information obtained from various entities in the sector

Source: IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, May 1974, App. 6 Table 18.

The situation with sewage disposal facilities is much less adequate than with water supply. There are only eight urban communities which have public sewerage systems. These eight systems serve a total population of 420,000 which represents 23.3 percent of the urban population. In the rural sector there are approximately 112,000 persons (3.2 percent) served by individual sewage disposal facilities such as septic tanks or sanitary latrines. Hence there are only 532,000 persons in Bolivia (ten percent of its total population) who have access to sewage disposal facilities (see Table 5.12).

These figures may even imply that the situation is better than it actually is. It is implied that those who have access to the facilities receive adequate service. This is probably far from true. Of all of the urban water supply facilities, only three (La Paz, Sucre and Santa Cruz) employ any type of water treatment or disinfection. Even if the water is potable at the source, without residual protection such as chlorination, the water is likely to become contaminated between its source and its point of use. Neither in the urban areas nor in the rural areas does there exist an effective program for monitoring water quality of these facilities.

Of all of the urban sewerage facilities, only one provides any kind of treatment before discharge. (Santa Cruz provides primary treatment through oxidation ponds). Thus, while the sewage is removed from the house and from the community it undoubtedly presents problems for persons "downstream". It is likely that many of the facilities cited in the statistics provide only convenience rather than any significant health protection.

There is one thing that the statistics on sanitation facilities do indicate: it will be a long time before Bolivia will be able to provide even half of its population with these facilities. Therefore, it will be useful to consider a different type of indicator of environmental sanitation. An ideal indicator would help establish priorities as to which communities most need what facilities. The indicator should also demonstrate how effective the various facilities are. Such an indicator could be the morbidity and mortality rates of the various diseases which are attributable to unsanitary conditions.

Unfortunately, in Bolivia this type of data is both insufficient and inaccurate. The data that does exist indicates that these diseases constitute a serious problem as would be expected. In 1969, "deaths from intestinal and parasitic diseases attributable to insanitary conditions due to lack of safe water supply and inadequate waste disposal, etc. amounted to 12 percent of the total reported deaths".(9) There are parts of Bolivia, such as areas in the Beni, where the incidence of hookworm is probably close to 90 percent. These areas are in critical need of intensive sanitary latrine programs, but without considering the hookworm incidence, such a priority would not be established.

In summary, the environmental sanitation situation in Bolivia is deficient by all measurements. However, the use of coverage with sanitary facilities as an indicator does not accurately reflect the nature of the problem. Only disease morbidity and mortality will indicate the most efficient solution to the problem. This type of indicator will only become useful when more accurate data is available by specific disease and by area or community.

2. Institutional aspects

At present there are a wide variety of entities involved in the delivery of water supply and waste disposal services to the population. Most of these are linked authoritatively to the Ministerio de Urbanismo y Vivienda. Included are the six administratively autonomous agencies which serve the six principal cities of Bolivia.* Also included is CORPAGUAS which is an administratively autonomous agency created with a loan from the Interamerican Development Bank. It is charged with bringing water and sewerage service to communities with populations between 500 and 10,000. The Ministerio de Previsión Social y Salud Pública is in charge of water supply and sewage disposal for communities of 2,000 or less. Desarrollo de la Comunidad and Acción Cívica have minor and diminishing roles in the provision of sanitation facilities. Finally public works committies in some departments are active in the construction of water supply and sewage disposal systems. (For list of agencies see Table 5.13).

The presence of these many uncoordinated agencies working in the field with overlapping responsibilities creates a variety of problems and inefficiencies. There is a lack of comprehensive planning based on national objectives and goals. There is no process by which to establish nation-wide priorities as to which communities most need what services. Such unorganized activities result in significant inefficiencies in financing and in the acquisition and use of material and human resources. These problems are generally recognized and the environmental sanitation sector is in the process of undergoing reorganization based primarily on recommendations made in the IBRD/WHO Report.

*There are six autonomous authorities local in scope created by supreme decrees, among which are several that for financial and/or other reasons are either not operational, or are only partially discharging their responsibilities in administering water supply programmes, sewerage activities having been turned over to respective municipal governments. In such respects, SAGUAPAC in Santa Cruz, although a legally recognized entity, is not in operation, its work being carried out by the Department of Santa Cruz Public Works Committee. AAPOS in Potosí, SAMAPA in La Paz and ELAPAS in Sucre are handling only the public water supply systems in their respective cities, while sewerage services are in charge of the municipal governments. The situation with SEMAPA in Cochabamba is even more acute; the legally created autonomous authority is not autonomous in hardly any of its functions, depending entirely on the municipality in financing water supply and sewerage activities. SELA in Oruro is actually existing in name only, while the Oruro Development Corporation manages the water supply system and sewerage facilities.

Table 5.13 - Resumé of National and Local Agencies Responsible for the Planning and Execution of Water Supply and Sewerage Programs.

Entity	Presently Executed Functions
National in Scope	
Ministry of Housing and Urban Planning, Division of Urban Engineering.	Urban water supply and sewerage; overall planning policy and supervisory activities.
Ministry of Public Health, Divison of Environmental Sanitation.	Rural water supply and sanitation (communities: 2,000 or less); rural planning policy, design, construction, financing and some operations.
CORPAGUAS, Ministry of Housing and Urban Planning.	Water supply and sewerage communities: 500 - 10,000); design, construction, financing.
Ministry of Rural Affairs, National Community Development Service.	Water supply (communities: 5,000 or less); design construction, financing.
Ministry of Defense, Armed Forces Civic Action, autonomous or municipal entities.	Water supply (strategic communities on border frontiers); design, construction, financing.
Local in Scope	
SAMAPA	Water supply (City of La Paz).
Municipal Government, City of La Paz.	Sewerage (City of La Paz).
SEMAPA	Water supply and sewerage (City of Cochabamba)
SAGUAPAC	Water supply and sewerage (City of Santa Cruz); agency formed but not operational.
Public Works Committee, Santa Cruz Department.	Water supply and sewerage (Department and City of Santa Cruz).
SELA	Water supply (City of Oruro).
Municipal Government, City of Oruro.	Sewerage (City of Oruro).
AAPOS	Water supply and sewerage (City of Potosí).
ELAPAS	Water supply and sewerage (City of Sucre).
Public Works Committee, Tarija Department.	Water supply and sewerage, (City of Tarija).
Public Works Committee Beni Department.	Water supply and sewerage, (City of Trinidad).

Source: IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, May 1974, paragraph 2.16.

The new institutional structure will probably be headed by a National Sanitation Council (CONASA) which will be responsible for all sector policy. This council would have representatives from the Ministries of Urbanism and Housing, Public Health, and Finance, and from the National Planning Council (CONEPLAN) as well as from the various autonomous authorities. Below CONASA will be the Housing Bank with its Executive Secretary. (This is located within the Urbanism and Housing Ministry). The Bank will be responsible for coordinating all financing within the sector and the Executive Secretary will be responsible for the coordination and supervision of the activities of the various agencies. From this point the IBRD/WHO Report recommends that reorganization take place in two phases. (See Figure 5.1 and Figure 5.2). The essence of the recommendations is that there will be a semi-autonomous agency (similar to the ones in the six major cities) in each of the departments. These agencies would eventually be in charge of all construction of water supply and sewage disposal facilities in their respective departments. Indications are that these recommendations will be adopted by the Bolivian Government. With the exception of the elimination of the environmental health activities of the Ministry of Public Health. Its jurisdiction will probably be reduced to communities of 500 or less, but probably will not be reduced below that.

The provision of environmental sanitation facilities has been inhibited for lack of organization among the many entities which have been active in the sector. However, reorganization is apparently about to take place. This should alleviate many of the problems. Hopefully the reorganization will include the type of institutional structure which can provide the specialized approach needed in the rural areas.

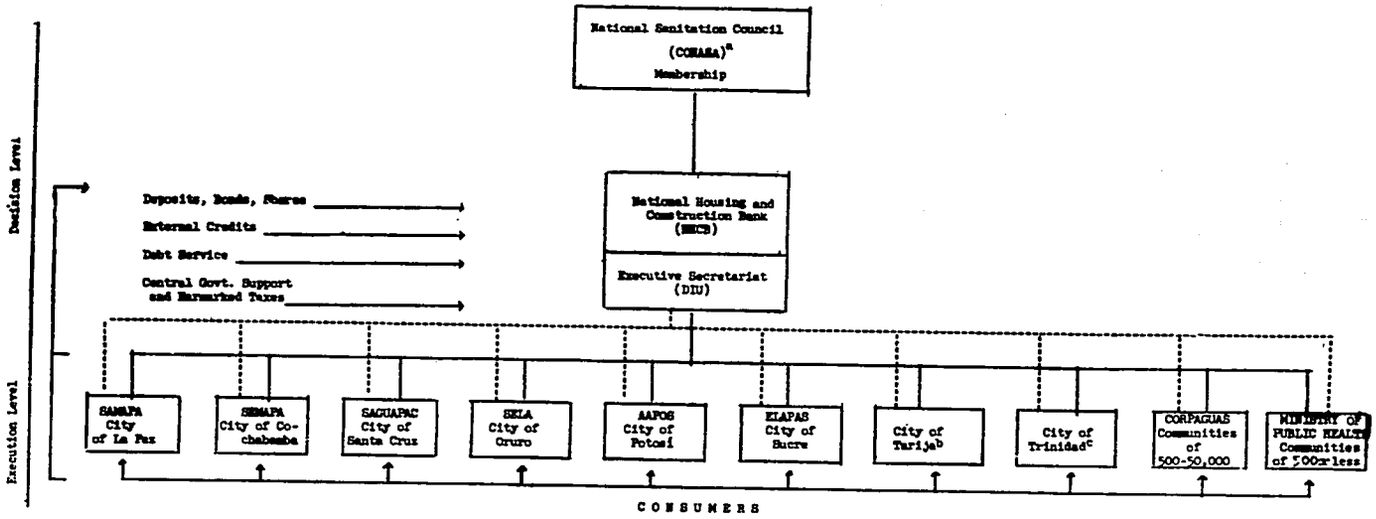
3. Financial aspects

The principal constraining factor in Bolivia's inability to provide for a more adequate level of environmental sanitation is the lack of financial resources available to the sector. There are three general sources of funds available to the sector: 1) funds generated within the sector in the form of tariffs or user charges; 2) funds generated outside of the sector but within the country (in most cases the national government); and 3) funds made available from outside the country (i.e. bilateral and multi-lateral donor/lender agencies).

The IBRD/WHO Report tends to put most of its emphasis on the generation of funds within the sector although it acknowledges that the major portion of the needed finances will have to come from outside of the sector. In most cases the user charges are not even sufficient to cover the operation and maintenance costs. Most tariff policies, in addition to being insufficient, are not rational or well thought out.

Many of the water rates are based on the amount of water used, with no mechanism for measuring that amount. Most of the sewerage charges are

Figure 5.1 - Proposed Organizational Structure of the Water Supply and Sewerage Sector, Phase I.



[a]Delegates or representatives:
Ministry of Housing and Urban Planning
Ministry of Public Health
Ministry of Finance
National Planning Council (COMEPLAN)
Autonomous Agencies

[b]Public Works Committee of the Department of Tarija

[c]Public Works Committee of the Department of Beni

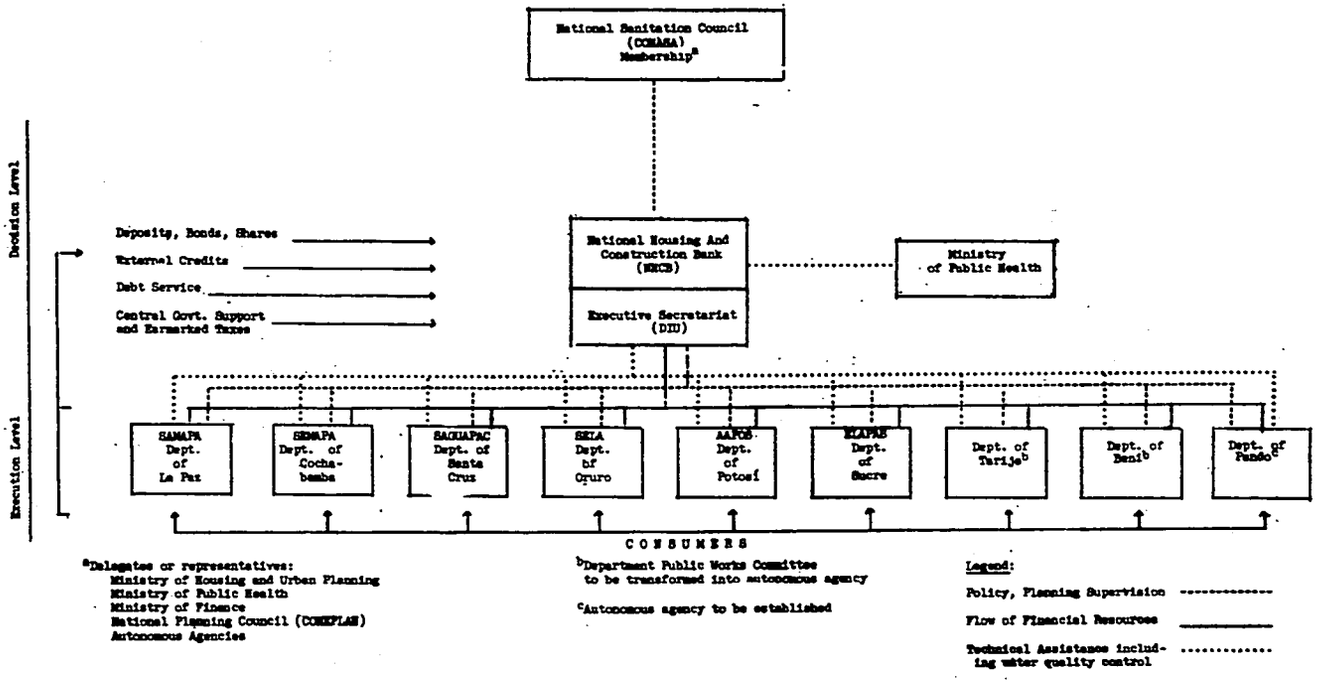
Legend:

Policy, Planning Supervision ----------

Flow of Financial Resources ————————

Source: IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, May 1974, Chart I.

Figure 5.2 - Proposed Organizational Structure of the Water Supply and Sewerage Sector, Phase II.



[a]Delegates or representatives:
Ministry of Housing and Urban Planning
Ministry of Public Health
Ministry of Finance
National Planning Council (COMEPLAN)
Autonomous Agencies

[b]Department Public Works Committee
to be transformed into autonomous agency

[c]Autonomous agency to be established

Legend:

Policy, Planning Supervision ----------

Flow of Financial Resources ————————

Technical Assistance including water quality control .....

Source: IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, May 1974, Chart II

based on property values, with no effective program for evaluating the properties. The problem of tariff structures seems to be generally recognized and various solutions are being considered. The principal solution which is emphasized in the IBRD/WHO Report is the gradual implementation of a program for the installation of meters. There is a question if this solution is desirable for a country which does not have the technical nor financial resources to provide even a quarter of its population with water. It may represent a "developed-country-type" solution being imported to a place where it has little relevance or applicability. Hopefully a solution to the tariff problem will be developed which is more closely related to the specific needs of Bolivia.

The other two types of sources for financing the sector (i.e. those sources from outside the sector) are related to Bolivian financing sources. There seems to be considerable interest on the part of international organizations to support activities which will improve the health and environmental sanitation in Bolivia. However, most of these agencies require some kind of indication of interest and commitment on the part of the Bolivian Government. Usually this requirement is in the form of matching funds. Over the past several years Bolivia has not been able to use all of the international funds that were available because it did not provide the matching support to the sector. CORPAGUAS is an example. Its program is two years behind schedule and in danger of being terminated. The primary reason is that the Bolivian Government did not make available the matching funds and did not approve the increases in personnel needed to stay on schedule, since the funds simply were not available. Other priorities were considered more important for very limited funds.*

In general many of the financial problems of the sector are related to the disorganization of its institutional arrangements. With the planned reorganization providing for coordination of policies and financing throughout the sector, the prospects will be better for obtaining funding sufficient for significant results. The prospects will be in proportion to the priority that the Government places on environmental sanitation.

4. Manpower constraints

There exists a shortage of qualified personnel at all levels within the sector. However, most of this shortage could be alleviated through a program based on long term planning and commitment to the sector. The activity of any one agency is not constant enough to instill a sense of opportunity and job security. The salary structure, especially for professionals, is not competitive with other sectors using personnel with similar training. Potential for most of the needed manpower exists within the country and requires only that the Government develop and use it.

The most critical situation exists with respect to professionals. Upon graduation from the universities many engineers leave Bolivia (often to go to the U.S.) in search of more challenging and better paying jobs

*"The Five Year Development Plan (Plan Quinquenal) 1973-1978" contains no plans in the water supply and sewerage sector. The Plan emphasizes rather such sectors as mining, metallurgy, petroleum, manufacturing industries, etc. (IBRD/WHO Report, paragraph 3.02).

with fewer frustrations. Thus, although a supply of engineers in environmental sanitation is trained and available within Bolivia, these engineers leave the country for lack of incentive to stay.

A related manpower problem in the sector is that most training for professionals is based on concepts and techniques which were developed in the U.S. and Europe. While these concepts may provide valid solutions to most urban sanitation problems, they have little relevance for the rural areas of Bolivia. The universities should begin to develop an environmental sanitation discipline which is custom designed to the specific needs of Bolivia - especially the rural needs. If rural sanitation problems were to become intellectually challenging it might be easier to keep engineers in Bolivia.

For the manpower shortages below the professional level, it would be a fairly simple matter to train the needed personnel. All that is missing is the decision on the type of training, a decision on the number of people to be trained and the commitment that there will be jobs available for those who are trained. The chances for these prerequisites being met should be greatly improved when the institutional reorganization takes place. With one central agency responsible for all policy and planning it could be a relative simple matter to provide for most of Bolivia's manpower needs in environmental sanitation.

5. Material constraints

A large part of the construction materials used in sanitation facilities must be imported but this situation is gradually changing. There are now two plants in La Paz which produce PVC plastic pipe in diameters up to 4". This pipe is gradually replacing the asbestos-cement, cast iron and galvanized pipe which must be imported. Although the PVC tubing is manufactured within the country, it is still necessary to import the fittings. Hence construction can still be delayed if the fittings are not available. All water pipe over 4" diameter must now be imported although a plant for the manufacture of asbestos-cement pipe is being considered in Cochabamba which would produce larger pipe. Clay and concrete pipe for sewer construction is produced in various plants in Bolivia. The cement and aggregate used in concrete structures is produced in the country but the reinforcing steel must be imported. A variety of specialized materials and equipment such as accessories and pumps must be imported.

The reliance on imports for such a large portion of the construction materials, in addition to being costly, often creates lenthy delays. If a pump breaks down and the necessary spare parts are not readily available then service can be interrupted for months. The letting of bids for construction of the larger projects is a complicated and very long process. The contractor is not able to begin to order equipment and materials for the project until the contract has been awarded and signed. As a result

the initiation of construction on some projects can be delayed a year or two from the completion of plans. Clearly there is need to make these materials more readily available if the sector is to operate smoothly and efficiently.

As a solution to this problem the IBRD/WHO Report recommends a step up in the construction materials industry. While any increase in the local production of construction materials is bound to benefit the sector, it will probably be some time before production can be increased in variety and volume sufficiently to have a significant effect. In the interim a national warehouse could be established which would advance, order and stock needed foreign materials. If CONASA is formed to administer national policy and planning for the sector, then it should be able to estimate most of the materials that would be needed over a two or three year planning period. CONASA could also standardize certain types of equipment (e.g. pumps) to be used in order to facilitate maintenance training and to reduce the inventory of spare parts to be stocked. The national warehouse would save money, in addition to time, through economies of buying in quantity.

6. Water resources

Bolivia is divided into three principal watersheds: the rivers that drain into Lake Titicaca; the rivers that flow into the Amazon River, and the rivers that flow into the River Plata. In spite of these extensive surface water resources it seems to be generally felt that groundwater sources are more economical, especially for human water supplies. In many cases this is probably true because of the water born diseases which are endemic in the country and the fact that most sewage is discharged raw to the various waterways. This means that most surface sources of water supply will require high levels of treatment while most ground water sources would be considered to be relatively pure.

In considering water supply systems for a specific area it is helpful to know the quantity and quality of groundwater available at different depths. This type of information is not presently known. When a water system is scheduled for a certain community the tests are made on an "ad hoc" basis. However, there are currently two large scale groundwater surveys in progress. The results from the one on the Altiplano should be available shortly, and the results from the one in the Cochabamba areas should be ready in 1975 or 1976. As this data becomes available it will greatly facilitate attempts at long-range comprehensive planning for water supply systems. Specifically it will facilitate efforts at designing innovative water systems such as wind powered pumps for small wells.

7. Prospects for the future

The IBRD/WHO Report presents a proposed investment program for the development of water supply and sewerage sector during the period 1974-1980. This proposed program is worked out in such detail as to inspire confidence in its feasibility. Included within the proposal is an institutional development program which describes the various steps which must be taken to achieve the recommended institutional reorganization. The manpower requirements are calculated for the period, and the necessary training activities are included in the institutional development program. Detailed cost estimates are made for each element in the whole investment program. The recommended six year program would cost $48 million of which $27.8 million would come from external sources and $20.3 million from within the country. The internal sources are broken down into sector cash generation, sales of bonds and shares, government budgetary contributions, and earmarked taxes, royalties and social security payments.

For the capital investment program three alternative levels of coverage were analized for each of the following areas: urban water supply, urban sewerage, rural water supply, and rural waste disposal. (see Tables 5.14 and 5.15). The medium alternatives were settled upon for urban water supply and sewerage and the maximum alternatives were selected for rural water supply and waste disposal. These proposed capital investment programs by 1980 would provide the urban areas with 65 percent coverage of water supply facilities and 37 percent coverage of sewerage service; and would provide the rural areas with 19 percent coverage in water supply and 15 percent coverage in waste disposal.

The IBRD/WHO mission states that they feel that the proposed investment program is within the capabilities of the Bolivian Government. This may be true, but it will require a serious commitment on the part of the Government to provide the sector with the requisite attention and priority that it has not received in the past. If the proposed goals are achieved, even with minor delays in the target date, it will represent a significant step in the provision of sanitary facilities for the Bolivian people. If the trend were to continue, then Bolivia would gradually begin to compare more favorably with the other countries in Latin America.

The principal problem with the proposed investment program is that little discussion was offered concerning the priorities that were followed in determining which communities or areas are to receive what services. It is interesting to note that, while the rural areas were singled out for top-priority in accordance with Government goals, in fact, the urban area is to receive 80 percent of the proposed expenditures. Nor does the proposal attempt to specify what benefit Bolivia will derive from the scheduled facilities, albeit the benefit is assumed to be self evident.

Table 9.14 - Urban Water and Sewerage Supply, Population Coverage 1974-1980 (figures are shown in 1000's)

Areas of Action and Objectives	Communities	Population 1973	Population 1980	Population served in 1973		Programme Alternatives for Population Coverage					
						Maximum		Medium		Minimum	
				Number	Percent	Number	Percent	Number	Percent	Number	Percent
Urban Water Supply	Urban Population	1,800.0	2,241.6	801.6	44.5	1,727.8	77.0	1,510.9	67.0	999.4	44.6
Water supplies with house connections; population range 50,000 or more	La Paz	620.0	771.9	325.0	52.4	617.5	80.0	540.3	70.0	404.5	52.4
	Cochabamba	165.0	205.4	90.0	54.6	164.3	80.0	143.8	70.0	112.2	54.6
	Santa Cruz	142.0	176.8	126.0	88.7	159.1	90.0	159.1	90.0	156.8	88.7
	Oruro	103.0	128.2	61.0	59.2	115.4	90.0	102.6	80.0	75.9	59.2
	Potosí	75.0	93.4	30.0	40.0	84.1	90.0	74.7	80.0	37.4	40.0
	Sucre	56.2	70.0	41.2	73.3	63.3	90.0	63.3	80.0	51.3	73.3
	Sub-total	1,161.2	1,445.7	673.2	58.0	1,203.4	83.0	1,083.5	75.0	838.1	58.0
Water supplies with house connections in cities; population range 10,000 - 50,000	Tarija	32.5	40.5	19.8	63.0	32.4	80.0	28.4	70.0	25.5	63.0
	Trinidad	20.3	25.3	6.5	32.0	20.2	80.0	17.7	70.0	8.1	32.0
	Camiri	20.5	25.6	13.0	63.4	20.5	80.0	17.9	70.0	16.2	63.3
	Montero	15.0	18.7	13.0	86.7	15.0	80.0	13.1	70.0	16.2	86.6
	Quillacollo	16.5	22.6	1.0	6.1	18.1	80.0	13.6	0.0	1.3	5.8
	Huanuni	12.4	15.5	2.0	16.1	12.4	80.0	9.3	60.0	2.5	16.1
	Llallagua	11.9	14.8	1.5	12.6	11.8	80.0	8.9	0.0	1.9	12.8
	Uyuni	10.0	12.5	7.5	75.0	10.0	80.0	8.8	70.0	9.4	75.2
	Tupiza	14.0	17.5	2.0	14.3	14.0	80.0	10.5	60.0	2.5	14.3
	Villazon	10.0	12.5	2.5	25.0	10.0	80.0	8.8	70.0	3.1	24.8
	Vinchs	11.2	14.0	7.8	69.6	11.2	80.0	11.2	80.0	9.7	69.3
	Riberalta	11.3	14.1	2.0	17.7	11.3	80.0	8.5	60.0	2.5	17.7
	Sub-total	185.6	233.6	78.6	42.0	186.9	80.0	156.7	67.0	98.9	42.3
Water supplies with house connections for cities; population range 2,000 - 10,000	Extension and improvements of existing systems in 19 cities	70.8	88.2	49.8	70.4	70.6	80.0	70.6	80.0	62.1	70.4
	New water supply systems in 50 cities	268.0	33.6	--	0.0	266.9	80.0	200.1	60.0	--	0.0
	21 remaining cities will not be served	114.4	140.5	--	0.0	--	0.0	--	0.0	--	0.0
	Sub-total	453.2	562.3	49.8	11.0	337.5	60.0	270.7	48.0	62.1	11.0
Urban Sewerage	Urban Population	1,800.0	2,241.6	420.0	23.3	1,130.4	50.0	824.8	37.0	589.9	26.3
Provision of sewerage service to cities; population range 50,000 or more	La Paz	620.0	771.9	248.0	40.0	540.3	70.0	386.0	50.0	308.8	40.0
	Cochabamba	165.0	205.4	50.0	30.3	143.8	70.0	102.7	50.0	62.2	30.3
	Santa Cruz	142.0	176.8	35.0	24.7	141.4	80.0	123.8	70.0	106.1	60.0
	Oruro	103.0	128.2	17.0	16.5	89.7	70.0	64.1	50.0	21.2	16.5
	Potosí	75.0	93.4	30.0	40.0	65.4	70.0	46.7	50.0	37.7	40.4
	Sucre	56.2	70.0	15.0	26.7	49.0	70.0	35.0	50.0	18.7	26.7
	Sub-total	1,161.2	1,445.7	395.0	34.0	1,029.6	71.0	758.3	53.0	554.7	47.8
Provision of sewerage service to cities; population range 10,000 - 50,000	Tarija	32.5	40.5	20.0	61.5	32.4	80.0	26.4	70.0	24.3	60.0
	Trinidad	20.3	25.3	--	0.0	15.2	60.0	7.6	30.0	--	0.
	Camiri	20.5	25.6	5.0	24.4	17.9	70.0	12.8	50.0	6.3	24.6
	Montero	15.0	18.7	--	0.0	11.2	60.0	5.6	30.0	--	0.
	Quillacollo	16.5	22.6	--	0.0	13.6	60.0	6.8	30.0	--	0.
	Tupiza	14.0	17.5	--	0.0	10.5	60.0	5.3	30.0	--	0.
	6 cities will not be served	66.8	83.4	--	0.0	--	0.0	--	0.0	--	0.
	Sub-total	185.6	233.6	25.0	13.5	100.8	13.0	66.5	29.0	31.2	13.4
Provision of sewerage service to cities; population range 2,000 - 10,000	Cities in this population range will not be served	453.2	562.3	--	0.0	--	0.0	--	0.0	--	0.
	Sub-total	453.2	562.3	--	0.0	--	0.0	--	0.0	--	0.

Source: IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, May 1974, App. 9, Table A.

Table 5.15 - Rural Water and Sanitation Supply, Population Coverage 1974-1980 (figures are shown in 1000's)

Areas of Action and Objectives	Communities	Population 1973	Population 1980	Population served in 1973		Programme Alternatives for Population Coverage					
						Maximum		Medium		Minimum	
				Number	Percent	Number	Percent	Number	Percent	Number	Percent
Rural Water Supply	Rural Population	3,500.0	4,218.0	151.3	4.3	785.1	19.0	687.0	16.0	552.5	13.1
Water supplies with house connections and easy access in communities; population range 500 - 2,000	Extension and improvements and provision of house connections and public standpipes to existing systems in 63 communities.	94.5	113.9	72.0	76.2	113.9	100.0	102.5	90.0	86.8	76.2
	New water systems with provision for house connections and public standpipes in 80 communities	120.0	144.6	--	0.0	144.6	100.0	130.1	90.0	115.7	80.0
	96 rural communities will not be served	144.0	173.5	--	0.0	--	0.0	--	0.0	--	0.0
	Sub-total	358.5	432.0	72.0	20.1	289.5	60.0	232.6	54.0	202.5	46.9
Water supplies with easy access in rural villages or population conglomerates; population range 500 or less	Improvements and provision of new wells to existing system in 20 communities	85.0	102.4	79.3	93.3	102.4	100.0	102.4	100.0	95.5	93.3
	New water supplies with provision for public standpipes in 200 villages and population conglomerates	100.0	120.5	--	0.0	120.5	100.0	100.0	83.0	72.3	60.0
	New wells and protected springs in population conglomerates	252.0	303.7	--	0.0	(2600)[a] 303.7	100.0	(2100)[a] 252.0	83.3	(1560)[a] 182.2	60.0
	Dispersed rural population that will not be served	2,704.5	3,259.4	--	0.0	--	0.0	--	0.0	--	0.
	Sub-total	3,141.5	3,786.0	79.3	2.5	526.6	14.0	454.4	12.0	350.0	9.2
Rural Sanitation	Rural Population	3,500.0	4,218.0	112.0	3.2	607.5	15.0	527.0	12.5	418.5	9.9
Provision of adequate facilities for inidividual waste disposal facilities in rural communities population range 2,000 or less	Provision of additional sanitation facilities	[illegible]	135.0	112.0	100.0	135.0	100.0	135.0	100.0	135.0	100.0
	Provision of septic tank systems parallel with rural water supply programme	[illegible]	135.0	--	0.0	(1400)[b] 135.0	100.0	(1160)[b] 112.0	83.0	(840)[b] 81.0	60.0
	Provision of sanitary latrines in conjunction with rural water supply programme	[illegible]	[illegible]	--	0.0	(35000)[b] 337.5	100.0	(29000)[b] 280.0	83.0	(21000)[b] 202.5	60.0
	Rural population that will not be served	[illegible]	[illegible]	--	0.0	--	0.0	--	0.0	--	0.0
	Sub-total	[illegible]	4,218.0	112.0	3.2	607.5	15.0	527.0	12.5	418.5	9.9

[a]Number of wells and protected springs

[b]Number of septic tank systems and sanitary latrines

Source: IBRD/IDA/WHO, Bolivia Water [illegible] Coverage Sector Study, [illegible] May 1974, App. [illegible] Table A

The IBRD/WHO Report presents a good description of the facilities that exist in Bolivia as well as the facilities that could be constructed given a certain level of investment. This Report must be consulted in considering any proposed activity in the environmental sanitation sector. However, what is also needed is a study which attempts to elaborate on the effects or benefits to be derived from the construction of sanitation facilities.

E. Medical and Hospital Attention

1. Overview

The medical care system in Bolivia is fragmented, with constrasts and inequities. Although Bolivia is predominantly a rural country, the great majority of the medical resources are concentrated in the urban areas. As a consequence, the majority of the rural health system (if, indeed, it is a system) is inadequate and many of the same organizational and administrative problems exist in the urban areas. Most rural health posts and/or hospitals are grossly underutilized and are without preventive programs, again from lack of resources and supervision.

From Table 5.16 it can be seen that the rural sector has been largely neglected compared to the urban area. The MOH recognizes this deficiency, and the Plan Quinquenal (Five-Year Plan) does include plans for expansion of rural health facilities. The problem is not primarily with the number of facilities, however. There are many rural facilities which are either not being used at all or are grossly underutilized. As long as most of the health budget goes to the urban areas (78.3 percent urban vs. 21.7 percent rural for medical services in 1971), the rural health sector will lack the financial resources necessary to provide for equipment, drugs, maintenance, supervision, and transportation.

Table 5.17 gives an overall view of the comparative utilization of all health care resources in Bolivia. Some of the figures are of necessity estimates. In terms of numbers, the greatest number of outpatient visits is in the realm of folk medicine. The great majority of the rural population depend on primarily folk medicine, for reasons of culture, accessibility, and lack of confidence in modern medicine. These same people will use the "modern" system, too, but usually only when they are gravely ill. For this reason, these rural people are considered served by both the rural health posts and the indigenous healers. A large number of urban people also use both health systems. From information gathered informally in rural areas, it is estimated that people use the folk healers about as often as "western" people would use a physician.

The private sector of medicine probably accounts for about 35 percent of outpatient visits in Bolivia, excluding the folk medicine system and the pharmacists, etc. This is discussed further below. The public sector

Table 5.16- Health Resources: The Urban - Rural Split, Bolivia

Resources	Urban	Rural
Population (1973)	23.8%	76.2%
Ministry of Health - Budget for Health Services (1971)	78.3%	21.7%
Ministry of Health - Hospital Beds (1973)	68.9%	31.1%
Ministry of Health - Number of Hospital Beds (1973)	3,376	1,527
Ministry of Health - Hospital Beds per 1000 People covered (1973)	9.05*	0.69
Ministry of Health - Out-patient Visits (1971)	60.9%	39.1%
Ministry of Health - Patient Days in Hospital (1973) Estimated	(90%)	(10%)
Distribution of All Physicians (Excluding COMIBOL)	92%	8%

*Excluding Population Covered by CNSS, other Cajas

( ) Estimated

Source: LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974.

Table 5.17 - Comparative Utilization Data - All Health Care Sources[a], Bolivia, 1971

Sources	Estimate Population Actually Served[d]	1971 Total Out-Patient Visits	Out-Patient Visits per Beneficiary per Year	Percent of Total[b] Out-Patient Visits	Percent of Total[c] Out-Patient Visits	1971 Number of Beds	Hospital Beds per 1000 Pop.	Percent Total Beds	1971 Total Hospital Discharges	Percent of Total Hospital Discharges
Ministry of Health, Urban[f]	(600,000)	259,348	0.4	2.3	6.6	3,147[g]	5.2[g]	33.3	54,497	35.6
Ministry of Health, Rural[f]	3,700,000[e]	166,536	0.05	1.5	4.2	1,034	0.3	10.9	9,001	5.9
Caja Nacional de Seguridad Social, Total	600,000	919,680	1.5	8.3	23.4	1,538	2.6	16.3	30,990	20.3
COMIBOL, Total	138,000	676,635	4.9	6.1	17.3	1,585	11.5	16.8	20,519	13.4
All Other Cajas, Military	155,000	(500,000)	3.2[h]	4.5	12.7	800	5.2	8.5	(11,000)	7.2
Private Medicine	(300,000)	(1,400,000)	4.7	12.6	35.7	1,350	4.5	14.3	(27,000)	17.6
Folk Healers	(3,000,000)	(6,000,000)	(2.0)	53.9	-	?	?	-		-
Pharmacists, Nurses in Practice	(600,000)	(1,200,000)	(2.0)	10.8	-	-	-	-		-

[a] The JNDS is not included, as it did not begin services until 1972-73
[b] Including Folk Healers, Pharmacists, Nurses in Practice
[c] Excluding Folk Healers, Pharmacists, Nurses in Practice
[d] Some people are served by more than one provider source
[e] The total rural population excluding COMIBOL, not the so-called "accessible" population
[f] The Ministry of Health figures have probably increased somewhat by 1973
[g] Excludes psychiatric beds (429), which serve both urban and rural population
[h] Actual figures for 1972 - CSS choferes: 2.94 Empresa Nacional de FF.CC.:3.09

( ) = Estimates.

Source: LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974 (compiled from pertenent agencies within the sector)

then accounts for about 65 percent of outpatient medicine, with the CNSS and COMIBOL totalling about 63 percent of the visits recorded in this sector.

Including the folk healers and the pharmacists and practicing nurses, the estimates of the distribution of outpatient visits are: 53.9 percent folk healers, 10.8 percent pharmacists, etc., 12.6 percent private physicians, and 22.7 percent the public sector, of which the MOH accounts for only 3.8 percent.

In terms of outpatient visits per beneficiary per year, there are great differences in coverage. The rural beneficiaries of COMIBOL average about 100 as many outpatient visits per year (4.9 each) as the target rural population of the MOH (0.05 each). This latter figure is confirmed in the analysis of rural utilization, which is described more fully below.

The causes of hospitalization for the MOH hospitals are given in Chapter II, Table 2.4: 32 percent of all hospitalizations were related to pregnancy, and 16 percent were pediatric hospitalizations. Causes of hospitalization are not available from the Cajas. Of the various institutions, the MOH has the largest number of hospital beds (4,610 in 1971 including 429 psychiatric beds in Sucre), or about 46.6 percent of the total hospital beds in Bolivia. The MOH accounted for 41.5 percent of the hospital discharges in 1971, compared with 17.6 percent for the private sector, and 40.9 percent for the Cajas and Military. It can be seen that the MOH has a large role in hospital care, but a much smaller role in outpatient care. The MOH is also entrusted with the preventive medicine programs for Bolivia, and thus it seems paradoxical that most of its resources in medical attention go into hospital care.

2. Programs in medical and hospital attention

a. MOH (urban)

Probably over half the population in urban areas is covered by one of the Cajas, mostly the CNSS, but some of these people use the services of the MOH, out of convenience or preference. It is hard to estimate the urban population actually served by the MOH.

Using available population data and subtracting Caja beneficiaries and middle and upper class people who would use the private sector, the estimated number of MOH beneficiaries in urban areas is less than 400,000. But the urban facilities are used by some rural people as well as some Caja beneficiaries. The population for urban areas may also be underestimated. Taking these factors into account, it might be estimated that the MOH facilities (especially the hospital facilities) actually serve about 600,000 people.

There is a general hospital in each departmental capital (plus Tupiza and Riberalta) run by the MOH. In addition, the MOH runs some specialized urban hospitals: tuberculosis hospitals in La Paz (2), Cochabamba (1), and Potosí (1); children's hospitals in La Paz and Cochabamba; and 2 psychiatric hospitals in Sucre.

The MOH also has a Centro de Salud in each Unidad Sanitaria in the urban areas (La Paz has 3). In addition, La Paz and Santa Cruz each have three puestos perifericos, or health posts in marginal areas of the cities. These latter posts (Centros de Salud and Puestos Periféricos) are outpatient clinics which supplement the outpatient services offered at the General Hospitals. Their function is largely in Maternal and Child Health (MCH), vaccinations, and primary care. They also have limited outreach services. Most Centros de Salud have in addition a special outpatient service for patients with tuberculosis. The utilization, limitations, and problems of the MOH urban system are described below.

b. MOH (Rural)

The MOH's rural system consists of 88 Centros de Salud Hospital (CSH), 50 Puestos Médicos (PM), and 304 Postas Sanitarias (PS), as of 1973, spread over the entire country. The distribution of the rural health posts, as well as urban hospitals and facilities of all other institutions outside the MOH, is shown in Table 5.18. With the exception of COMIBOL and a few missionary groups, the MOH is the only organization supposed to be providing health services in the rural areas. For reasons described below, the services are minimal. Although there has been constant growth in the number of health posts (the number of Postas Sanitarias grew by 80 percent, from 169 to 304 between 1970 and 1973), the low utilization and low quality of care has not changed much in general. MCH services have barely begun, and little is done in other preventive programs. The efficiency of the rural posts, as with the urban hospitals, is low.

Some of the factors involved in rural posts are shown in Figure 5.3. These factors were examined in a non-random sample of 66 rural health posts. The sample reflects, in fact, a higher proportion of health posts with high utilization. As can be seen from the Figures (5.3 and 5.4):

(i) facilities were for the most part adequate.

(ii) equipment was generally fair but inadequate or poor in only 27 percent of the sample.

(iii) drugs were poor or nearly absent in 53 percent of the posts (in reality this is higher, but the sample is biased toward better supplied health posts).

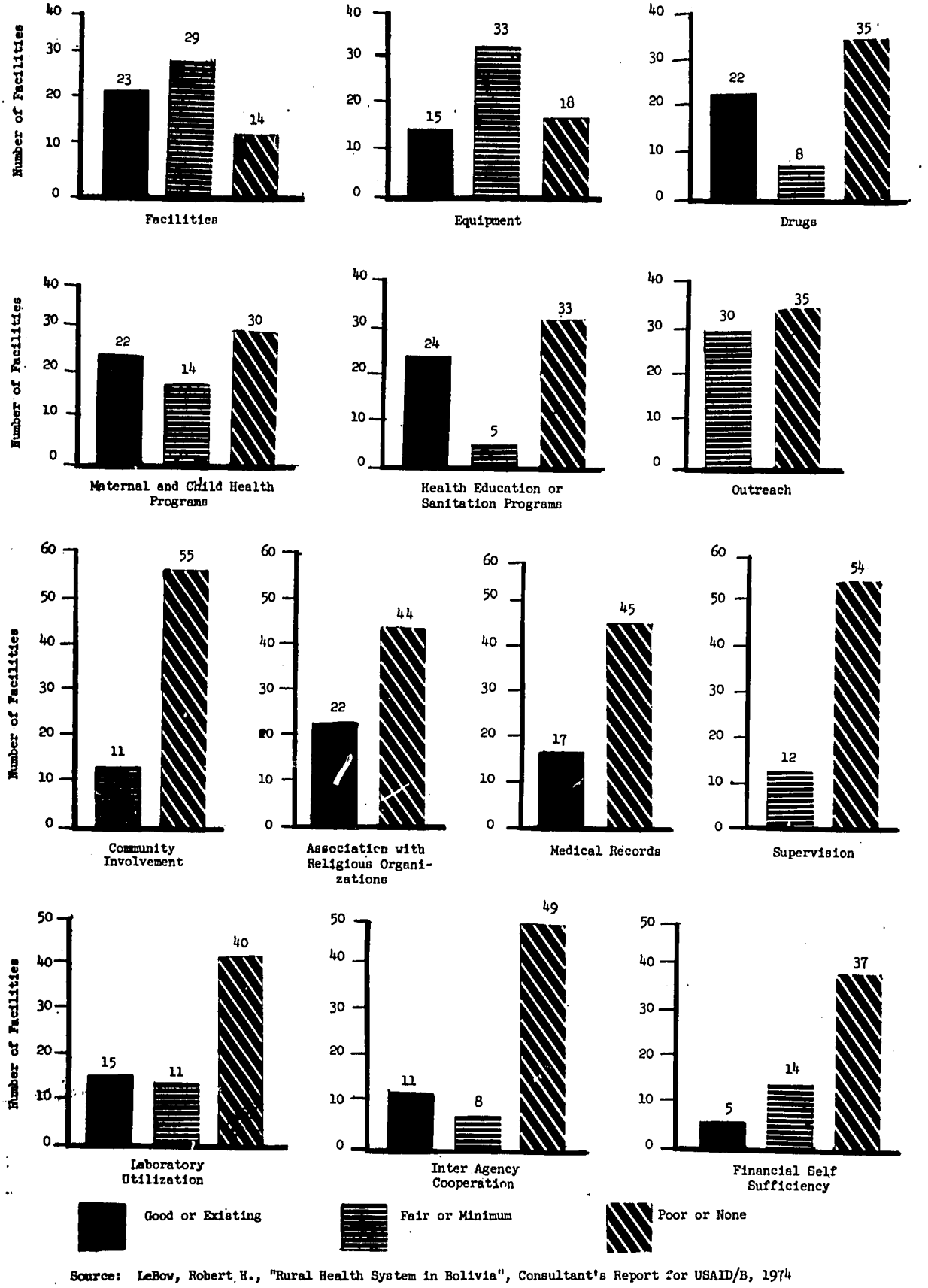
Table 5.18- Distribution of Health Facilities in Bolivia, 1973

Health Districts	Ministry of Health					Other Institutions*					
	Hospitals	Health Centers	Health Center Hospital	Medical Post	Sanitary Post	COMIBOL Hospitals	CNSS Hospitals	Military Hospitals	Raildroad workers Hospitals	Petroleum workers Hospitals	Other Including Private Hospitals
La Paz	5	6	25	4	40	3	8	1	2	-	25
Chuquisaca	4	1	12	6	33	-	2	-	-	-	6
Cochabamba	3	1	13	7	16	-	4	1	1	-	14
Santa Cruz	4	4	14	17	71	-	-	3	3	1	10
Tarija	2	1	4	4	15	-	1	1	2	3	1
Potosí	2	1	3	7	35	5	3	-	2	-	4
Oruro	1	1	8	1	29	13	4	-	1	-	6
Beni - Riberalta	3	2	5	2	38	-	-	1	-	-	1
Pando	1	1	1	2	9	-	-	1	-	-	-
Tupiza	1	1	3	0	18	-	2	-	1	-	4
Total	26	19	88	50	304	21	24	8	12	4	71

*Does not include Health Posts of COMIBOL (there are 41), the Instituto Nacional de Colonización, missionaries, the military, or the Caja Nacional de Seguridad Social.

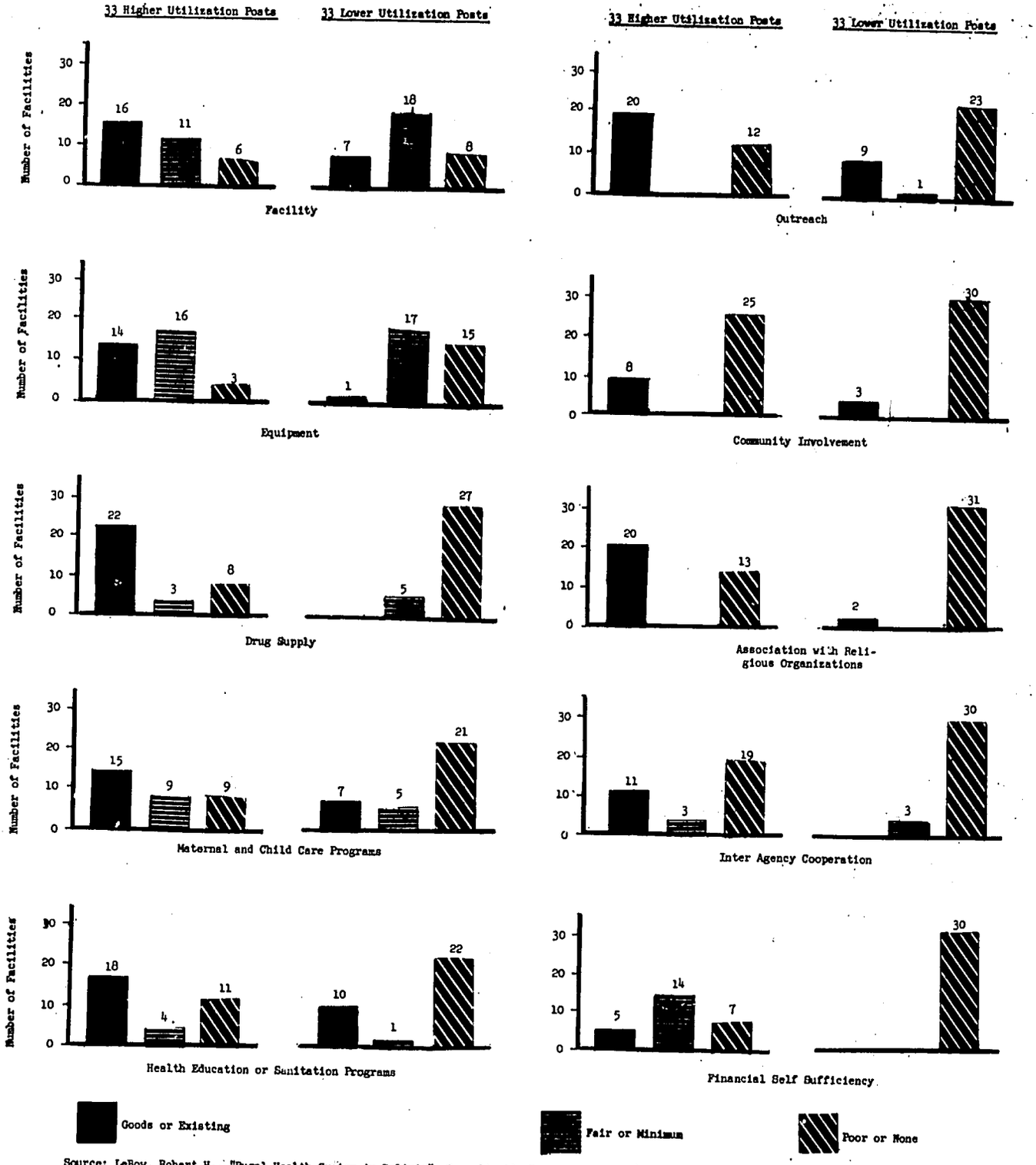
Source: LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974.

Figure 5.3 - Evaluation of Sixty-Six Rural Health Centers, by Thirteen Criteria, 1974



Source: LeBow, Robert H., "Rural Health System in Bolivia", Consultant's Report for USAID/B, 1974

Figure 5.4 - Evaluation of Sixty-Six Rural Health Centers by Criteria and Higher versus Lower Utilization, 1974



Source: LeBov, Robert H., "Rural Health System in Bolivia", Consultant's Report for USAID/B, 1974

(iv) MCH and Health Education programs were functioning in less than half of the health posts.

(v) outreach was done in less than half of the health posts.

(vi) significant community involvement was seen in only 17 percent of the health posts.

(vii) one third of the health posts had some association with religious organizations, and even less had some kind of inter-agency cooperation.

(viii) there was no supervision in 82 percent of the health posts.

(ix) no lab work was done in 61 percent of the posts.

(x) medical records were considered inadequate at 73 percent of the posts.

(xi) only nine percent of the health posts were considered to be potentially capable of financial self-sufficiency.

The health posts in the study are mostly dependent on the MOH, but some are run by the CNSS, COMIBOL, the INC, and religious groups.

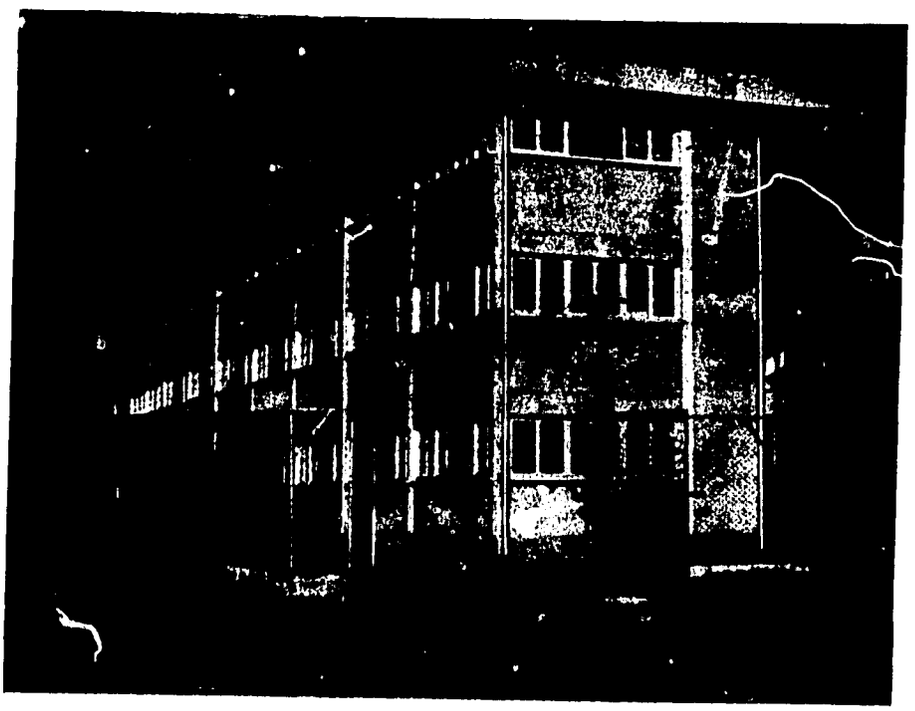
c. Caja Nacional de Seguridad Social

The Caja Nacional de Seguridad Social (CNSS) is a primarily urban organization which provides comprehensive health services to about 630,000 people (1972) who are insured in the system through their place of work. The CNSS does have a few rural hospitals, outpatient clinics and postas sanitarias, such as in Uncia, Punata and Quillacollo.

The Caja has hospitals in all major cities. Most of these are wards rented in the general hospitals of the MOH. Almost half of the hospitals are specialty centers, e.g. maternity, pediatrics and broncopulmonar. It operates essentially independently of the MOH, except in vaccination campaigns. It is a large employer of health personnel, including over 550 physicians and 880 nurses.

The services delivered are almost entirely curative medicine. The resources of the CNSS are actually not so great: their budget averages about $10 per year per beneficiary as compared to less than $2 per year for the target population of the MOH. For this reason, there are many inefficiencies in the functioning of the CNSS system, and often CNSS eligible patients use other medical services, such as those of the MOH or the private sector. The CNSS does provide all medical services, including drugs, to its beneficiaries free of charge.

Maternity and Pediatric Hospital at Huanuni
(Northern Potosí)
Owned and operated by the Ministry of Health



Children's Hospital at Catavi
(Northern Potosí)
Owned and operated by COMIBOL

The Bolivian Social Security Institute (IBSS) (the parent organization of all the Cajas) has pending a program, Seguro Social Campesino, which would extend a CNSS type medical system to the rural areas. It would involve each family paying $b.30.00 a month to cover the cost of health care. In the plan the SSC would replace the MOH in being responsible for rural health care. It has not yet been approved, but could be put into effect at any time. If this plan were instituted, it could change radically the situation of rural medicine. (See Chapter VIII-B.2. for more discussion).

d. COMIBOL

The Mining Corporation of Bolivia (COMIBOL), has 21 hospitals ranging in size from 44 beds to 365 beds. The larger hospitals (Catavi, Quechisla, Huanuni, Colquiri, and the hospitals in Potosi and Oruro) are between 114 and 365 beds, and are well equipped and well run. The four largest hospitals are in fact in rural areas, but since they serve only a limited (and geographically concentrated) population, they are more like urban hospitals. They each have a full staff of specialists and extensive diagnostic equipment and laboratories. COMIBOL also runs 41 postas sanitarias, tied into the hospital system.

With a few exceptions, the services are purely curative. Drugs are free and there appear to be no shortages. COMIBOL has about 2-1/2 times as much money to spend per patient than does the CNSS. The COMIBOL hospitals occasionally will see a non-beneficiary, especially for emergencies but at a high price and only with reluctance. Catavi has its own pediatric hospital, its own four-year nursing school, and also a 24-bed neuro-surgical unit which takes referrals from other areas. There is probably a great amount of overutilization of services, especially hospitalization.

e. Other Cajas and Military

The other cajas and the military run their medical services much like the CNSS: outpatient and inpatient curative medicine. The largest of the other cajas are the Caja Petrolera, which, since the opening of its new expensive hospital in Santa Cruz this year, now has 4 hospitals with 206 beds; and the Railroad Companies, which have 12 hospitals with 312 beds. The military has 8 hospitals with 276 beds, but they are constructing a new 400-bed military hospital in La Paz at an estimated cost of $9,000,000. The smaller cajas either have small hospitals or rent space in a larger hospital. They all have their own outpatient clinics which are nearly all located in urban areas.

f. The JNDS

The National Social Development Council (JNDS) also would like to be in charge of Bolivia's rural health program. The JNDS was created in 1971. In 1973, the JNDS opened almost simultaneously clinics in the marginal

urban areas of every large city or departmental capital in Bolivia. Combined with the clinics are day-care centers and mothers' centers which have nutrition and occupational programs. Essentially the JNDS has a MCH program with some medical attention. Their utilization so far has been variable, but they have barely started.

The JNDS has many other medical programs which are probably better described under "more specialized care" below. They have a sizeable budget, but are involved in many different areas. Unfortunately, they have no significant relations with other health providers.

g. The INC

The Instituto Nacional de Colonización runs Centros de Salud Hospitales and postas sanitarias in colonization areas in the Alto Beni and the Chapare. They also have some health personnel assigned to Santa Cruz in the colonization areas, in coordination with Obra Metodista. There is coordination with religious groups, who provide administrative help, in the Alto Beni. The INC has very little resources budgeted for health. As a consequence, in the Chapare, where there is no coordination with other groups, their medical program is very deficient.

h. The private sector

With the exception of the folk medicine and/or informal health system, the private sector is the part of the health system which is least well known. The private sector serves mostly urban areas, although there are about 40 physicians in Bolivia in full-time private practice in rural areas. Over 75 percent of Bolivian physicians who are active in medicine are in private practice. And it is estimated that over 90 percent of these physicians are in part-time private practice and hold a salaried job with one of the health institutions, too.* In essence, except for retired physicians or physicians in administrative or public health positions, nearly every Bolivian physician is in part-time private practice along with a salaried job. Even most año de provincia physicians do part-time private practice.

The magnitude of the private practice sector is difficult to estimate, but it is likely that it accounts for about 35 percent of all outpatient visits* and about 17 percent of all hospitalizations (see Table 5.17). Its impact is, of course, almost entirely urban, with the exception of a few missionary hospitals or clinics that are not a part of the MOH system, such as Ancoraimes, Clinica Betesda (Chapare), Huatajata, Camargo, and several clinics run by missionaries in marginal urban areas. Their target population, with the exception of the larger urban hospitals (Seton Hospital, Methodist Hospital), is the poor in rural and marginal urban areas. In this respect, they are more akin to the rural and marginal urban programs of the MOH or the JNDS.

*These impressions are supported by the results of a sample survey of Bolivian physicians conducted in mid-1974 by the Colegio Medico and USAID.

There are several private clinics in each larger city. These are usually run by the physician(s) as a proprietary hospital, and some of them are very well equipped, even to the point of having fairly good operating rooms. The total number of beds in the private clinics in La Paz is about 400, for the whole country about 1,350. This represents about 14 percent of the hospital beds in Bolivia.

i. Folk healers

Folk healers as a group probably see more "patients" than all other health providers combined in Bolivia. There are various kinds of folk healers in Bolivia, and they use different approaches to "therapy". Basically, herbal medicine, magic, and witchcraft are the three means they use. Sometimes these are used in combination with modern medicines. The authentic folk healers who use herbal medicine do not usually speak Spanish and are rural people. The other extreme is the charlatan or quack (p'ajpaku) who speaks Spanish, and is the "medicine man" at the fairs. Curandero is a general term used for the folk healers; it connotes more of the medicine man, however. There are specific folk healers who work only with witchcraft. Then there is a whole other group of parteros empíricos, or "granny midwives", who assist women in deliveries. Actually the parteros are as often men as women, as the curanderos also are as often women as men. There are no particular sex distinctions for the most part.

People seem to consult the folk healers for ailments about as often as any sick person might consult a doctor. The folk healers receive payment for their services, usually not in money. Since the folk healers too have "specialists", certain types of healers will be consulted for certain illnesses. If one is bewitched, one goes to a witch to get cured.

It is difficult to ascertain how many folk healers there are, but very roughly calculated (by personal communication), a guess would be about one folk healer per 500-1,000 population in rural areas. Folk healers are of course in the urban areas too, but probably not quite as plentiful. Folk healers do have "inpatient" services in places, and they recently had a convention not far from La Paz. With their wide distribution in rural areas and their knowledge of rural people, the folk healers would be an invaluable resource to integrate into the development of a rural health program. From experience so far, it appears the parteras empiricas are the most likely people to work with first, and several training courses for these people have been given with apparent enthusiastic acceptance on the part of the parteras.

j. Pharmacists, nurses in practice

The pharmacists practice most in urban areas but to some extent in rural towns too. Many of them act as primary care practitioners, and people use them as such. Since nearly all drugs can be sold without

a prescription, the pharmacist is fairly well free to prescribe whatever he likes. They appear to be quite readily utilized in the role of practitioner. The nurse in practice, besides prescribing or dispensing medicine, also does some examining. There are 70 nurses who essentially practice medicine in Santa Cruz alone. They have a nurses' union, and many have walk-in store front operations. It is probably that both these groups of "practitioners" do refer seriously ill patients to physicians.

3. Outpatient utilization

Yearly totals on outpatient utilization for the different groups of providers are presented in Table 5.17. The MOH outpatient utilization in the urban area is quite low (only 0.4 visit per year per person served), as the private sector seems to be much more active in urban areas. Caja outpatient utilizations in urban areas is variable, but often very high, despite the 1971 overall average for the CNSS of only 1.5 visits per year per beneficiary (in 1972 it was closer to 2.0). For example, in Oruro, the average was 1.25 visits per year, compared with 3.52 for Sucre. At the Milluni CNSS clinic, each beneficiary is seen about nine times a year, and at the Manaco clinic in Cochabamba, the average is ten. In the last case, it is suspected that people are visiting the clinic to get free drugs which they can then re-sell.

COMIBOL also shows a picture of high outpatient utilization, an average of 5.6 visits per beneficiary in 1972. In Potosí, the number was ten, and in La Paz 11.6, the probable peak of utilization. At the opposite extreme are the rural health services of the MOH, which are operating at about one percent of the utilization rate of COMIBOL. Table 5.19 summarizes the outpatient utilization picture for all the MOH rural health posts in Bolivia for 1970 and for what data is available for 1973. The average number of visits per month is given for each type of health post in each Unidad Sanitaria. The utilization is very low, with the CSH's in 1973 running an average (by Unidad Sanitaria) of between 56 and 172 visits a month, or two to six patients a day. The PM's were even less utilized, one to two patients a day as an overall average, and the PS's fared even worse. Santa Cruz, whose 1973 figures were not available yet, probably has the highest utilization rate of any rural area. It can be noted from the data that there has not really been any appreciable change in utilization rates between 1970 and 1973, although there were 80 percent more Postas Sanitarias in 1973.

Tables 5.20, 5.21, 5.22, and 5.23 present more detailed utilization data for the Unidades Sanitarias of Chuquisaca, La Paz, Cochabamba, and Oruro for 1973 or 1974. It can be seen from this data that there is great variability in outpatient utilization. Yamparaez and Tarabuco are 50 minutes apart; both are the only health facilities in their towns. Yet Yamparaez averaged 300 patients a month and Tarabuco only 17 a month in 1973.

Table 5.19 - Average Number of Outpatient Visits per Month Reported, by Type of Facility and Health District, Rural Areas, 1970[a] and 1973[b]

Health District	Health Center Hospitals				Medical Post				Sanitary Post			
	1970		1973		1970		1973		1970		1973	
Pando	(1)	180	(1)		(1)	21	(2)		(5)	0.8	(9)	
Beni - Riberalta	(5)	71	(5)		(3)	72	(2)		(20)	29	(38)	
Tupiza	(3)	98	(3)		(0)	-	(0)		(4)	55	(18)	
Tarija	(4)	157	(4)	172*	(4)	41	(4)	72*	(14)	10	(15)	20*
Santa Cruz	(13)	227	(14)		(15)	90	(17)		(56)	70	(71)	
Potosí	(3)	105	(3)	80*	(5)	97	(7)	51*	(11)	30	(35)*	35*
Oruro	(5)	68	(8)	74*	(3)	149	(1)	30*	(9)	45	(29)	22*
Cochabamba	(12)	53	(13)	56	(10)	59	(7)	63	(9)	30	(16)	39
La Paz	(22)	65	(25)	108	-		(4)	30	(20)	29	(40)	39
Chuquisaca	(14)	46	(12)	73	(3)	27	(6)	23	(21)	22	(33)	31

( ) = Number of facilities

* = Estimates

Sources: [a]"Informe Anual Estadísticas de Salud", MPSSP, 1970

[b]Health District reports and personal communications.

Table 5.20 - Selected Outpatient and Inpatient Utilization Data for Rural Chuquisaca Department, 1973

Health Center Hospital	Outpatient visits per month	Visits per physician hour	Number of beds	Patients Hospitalized	Bed occupancy (Percent)	Average length of stay (days)
Montesagudo	178	1.5	16	194 (6 mo.)	35	6
Muyupampa	55	0.8	6	37 (11 mo.)	5	3
Tarabuco	17	0.3	6	11	1	8
San Lucas	27	0.4	6	23 (11 mo.)	8	7
Huacareta	15	0.2	6	4	1	4
Culpina	26	0.4	11	7 (5 mo.)	2	5
Villa Serrano	49	0.8	4	33 (10 mo.)	7	7
Padilla	143	2.2	8	72	8	4
Camargo	113	1.7	10	144	27	6
Zudañez	63	1.0	10	49 (11 mo.)	6	4
Yotala	143	2.2	22	203 (11 mo.)	20	8
Villa Abecia	28	0.4	3	12	3	3
Yamparaez	297	NA	6	117 (7 mo.)	28	3
Camargo-San Clemente	(300)	NA	50	1089	70	10

Medical Posts	Outpatient Visits per Month	Health Posts	Outpatient Visits per Month
Puesto	20	El Villar	124
Sopachuy	36	La Palma	53
Azurduy	22	Alcala	42
Mojocoya	11	Soto Mayor	38
Poroma	30	Ticucha	29
Tomina	19	Cachimayo	28
		26 other P.S.'s	7- 25

* - Personal Communication

Source: Ministry of Health, Chuquisaca Regional Health Office, unpublished data, 1974

Table 5.21 - Selected Outpatient and Inpatient Utilization Data for Rural Cochabamba Department, 1973

Health Center Hospital	Outpatient visits per month	Visits per Physician hour	Number of Beds	Patients Hospitalized	Percent Bed Occupancy	Deaths
Aiquile	41	0.66	17	71	8.2	0
Anocaraire	3	0.05	6	0	0	0
Arani	49	0.8	22	21 (4 mo.)	3.5	1
Capinota	14	0.2	10	19	3.8	2
Cliza	71	1.1	13	123	23.1	0
Colomi	23	0.4	6	23	2.9	0
Punata	291	2.3	40	488	21.8	5
Sacaba	30	0.5	4	71 (8 mo.)	22.0	0
Tarata	67	1.0	6	70	16.4	1
Tiraque	12	0.2	6	4	1.0	0
Totora	24	0.4	8	16	5.0	0
Ibuelo	100	1.6	4	42	12.0	1
Todos Santos	22	0.4	11	6	1.0	1
Pocona			No Physician in 1973			
Total	747		153	944	12.0	11

Medical Posts	Outpatient visits per month	Health Posts	Outpatient visits per month
Arque	8	Santiñez	[illegible]
Independencia	41	San Miguel	[illegible]
Quillacollo	169	Chipiriri	[illegible]
Sipe-Sipe	107	San Benito	51
Tapacari	24	14 de Sept. Km. 11	46
Vinto	18	Villa Rivero	46
Villa Tunari	74	Ucureña	42
Misque	Not reported	11 other P.S.'s	11-4[illegible]

Source: Ministry of Health, Cochabamba Regional Health Office, unpublished data, 1974.

Table 5.22 - Selected Outpatient and Inpatient Utilization Data for Rural La Paz, Department, 1973

Health Center Hospital	Outpatient Visits per month	Number of Beds	Patients Hospitalized	Bed Occupancy (Percent)	Average length of stay (days)
Achacachi	60	5	0	0	-
Ancoraimes	540	22	(360)	(30)	?
Batallas	41	4	3	0	1
Caranavi	370	20	(300)	30	7
Coroico	193	10	65	17	9
Coripata*	56	10	15	2	4
Copacabana	31	7	19	1	2
Chulumani	186	20	118 (4 mo.)	24	5
Caquiaviri	44	10	5	1	6
Desaguadero	19	8	2	1	10
Guaqui	16	10	0	0	-
Km 73 -BOHG*	(240)	12	(300)	50	?
Irupana	167	19	175	10	4
Moco Moco	34	4	0	0	-
Pucarani	28	7	4	0	1
Puerto Acosta	33	4	0	0	-
Pillapi	49	2	0	0	-
San Borja	50	9	109	30	9
Santa Rosa	62	10	138	18	5
Sica Sica	66	12	0	0	-
Viacha	316	34	788	34	5
Reyes	35	6	49	7	3
Rurrenabaque	37	8	3	0	4
Sorata	204	10	73	7	3
Berco Hospital	101	4	0	0	-
Tipuani	70	8	16	6	6
Colquiri	431	25	386	17	4

( ) Estimate

* Personal Communication

Source: Ministry of Health, La Paz Regional Health Office, unpublished data, 1974.

Table 5.23 - Selected Outpatient Utilization Data for Rural Oruro Department, 1974 (January-May)

Health Center - Hospitals Outpatient Visits per Month		Health Posts Outpatient Visits per Month	
Challapata	47	Corque	95
Eucaliptus	82	Cacachaca	56
Huachacalla	28	Toledo	47
Huallamarca	151	Pazna	44
Huanuni	75	Venta y Media	39
Poopo	83	Ucamasi	34
Uncia	27	Choro	34
Curacollo	30	23 other PS's	5-33

Source: Ministry of Health, Oruro Regional Health Office unpublished data, 1974.

Similarly Ancoraimes and Achacachi are 40 minutes apart; both are without competition. And nine times as many patients (540 per month) were seen in Ancoraimes as in Achacachi. It is hard to imagine that utilization can be so low in some places. For example, at the 26 lowest utilized postas sanitarias in Chuquisaca, the auxiliar or sanitario has to wait, on the average, two days to take care of one patient. At Unduavi, the auxiliary nurse, who completed a ten-month course at the School of Public Health in 1973, passed the whole month of May 1974 without seeing a single patient.

If one assumes that the target population of the MOH system is the entire rural population, then the calculated number of patient-visits per year per person covered comes out to 0.06 for Chuquisaca, 0.05 for La Paz, 0.03 for Cochabamba, 0.07 for Oruro, and 0.07 for Tarija (all for 1973, except Oruro, which is 1974). If one assumes that the appropriate number of visits per year for rural Bolivia is the COMIBOL average of 5.6 per person, then less than one percent of the outpatient needs are being met in the rural areas by the MOH system. To be sure, some rural patients go to urban areas, but probably more for hospitalization. As an exception, Santa Cruz probably has a considerably higher rate, but still not more than eight percent of the needs are being met there.

There are several reasons for the low utilization of rural health posts in general. The few highly utilized health posts in rural areas help point out the problems with the low utilization posts. Basically, the low utilization is due to three general factors: (1) the lack of confidence of the rural people in the rural "modern" health centers, (2) the inability of the rural health center to deliver effective care, and (3) the inaccessibility of the health post to the rural people, in a general and specific sense: geographic, economic, cultural. The ineffective care is a result of the lack of drugs, supplies, equipment, stability, supervision, personnel, transportation, and administration as well as inappropriate training and indifferent attitudes. The indifferent attitude of the providers comes from frustration, lack of incentives, and lack of supervision and direction. This results in absenteeism, no desire to seek out the community, and poor quality care. In turn, the inability to deliver effective care leads to a lack of confidence on the part of the community, and they do not use the health services. It has been observed that when effective care is being delivered, rural people utilize the system. And when effective care is combined with a positive provider attitude, the services are even more utilized. The cultural and economic barriers seem to become less crucial when these criteria are met.

Some of the more specific factors involved in the utilization of rural health posts are brought out in a 1974 study of 66 Bolivian rural health posts.(10) A few of these factors are shown in Figure 5.4. The health posts have been divided into two groups: the 33 with the highest utilization vs. the 33 with the lowest utilization.

It can be seen from the figures that the seemingly most crucial factors in determining utilization are (1) the presence of an adequate drug supply and (2) association with religious orders or inter-agency cooperation. Nearly all the other factors have some direct relation to utilization as well, but to a lesser degree. For example, the quality of the facility and health education programs seem to have less correlation. The reason for the drug supply being important is obvious. Without drugs, effective care is not possible. The association with religious orders probably provides two key factors: good administration and a positive attitude. Community involvement seems related to good utilization, too but the number of rural health posts considered to have significant community involvement was only 11 out of 66, so the numbers are too small to draw any conclusions.

Costs of health services does not seem to be such a significant barrier if good services are being provided. When there was a general rise in prices (including hospital charges) in early 1974, utilization did drop off up to 50 percent, but within one to two months it was back to where it had been again. This was seen at Viacha, Llallagua, and the Hospital Metodista (and probably everywhere else within the money economy). People seem willing to pay for drugs, and even outpatient care, but are not as willing to pay for hospitalization.

The geographic barrier are very real in all of Bolivia, especially in the Oriente where there are few roads. The cultural barriers are there, but are perhaps easier to deal with. After all, the beneficiaries of COMIBOL, most of whom were probably campesinos a generation ago, use the health services of COMIBOL an average of 5.6 times a year per person.

4. Emergency care

Most large cities do have an emergency care system on paper called "Asistencia Pública". The system usually operates from the general hospital, which sometimes has a specific "emergency room". Most of the problems involved in emergency care are probably administrative. There is usually a nurse on duty, but it can be a problem to find the doctor, despite a call list. The utilization of emergency rooms, even in the largest Bolivian cities, is not high. In Oruro, "Asistencia Pública" has been seeing about 400 patients a month, or 13 a day. In Cochabamba, less than ten patients a day are being seen in the emergency room of the general hospital. The demand is probably not high because people feel the service is not there.

In the Cajas, the emergency system seems to be informal. The CNSS seems to have an over-adequate supply of ambulances, which seemed to be used most in the transportation of employees. There is little data from the CNSS on the utilization of emergency services, as these are not

separated from outpatient services. In the case of rural areas, rural hospitals do not keep data on emergencies either. But then few rural hospitals are even equipped to take care of real emergencies. Generally there are no emergency drugs; the doctor is often absent; and there is usually no means to transport a patient to a larger hospital. With the exception of a few hospitals, emergency services are near non-existent in rural areas, and mostly on an informal basis in urban areas.

5. Home visits

Home visits are incorporated into most medical care systems in Bolivia in theory. However, in practice, a very limited number of home visits are made. In urban areas, visiting nurses working with the MCH programs in the Centros de Salud go out on home visits. But their numbers are few. In La Paz, there are about ten nurses who do home visits from the Centros de Salud. Home visiting programs seem to do better when they are associated with a nursing school, such as in Catavi or Cochabamba. However, once the nurses graduate, they usually work in hospitals.

The CNSS report for 1972 lists home visits as 4.9 percent of all outpatient visits. These were thought to be mostly visits to homes to check on why people had not come to work, however.

In rural areas, home visits seem to be done in less than half the health posts.(11) Some nurses do keep data on home visits. For example, in Huatajata there were 474 home visits recorded in 1973. In Macha, the nurse makes about ten home visits a month, compared to about 30 visits at the health post. In rural Tarija, MCH-related home visits are also recorded: in 1973, the eight CSH's and PM's recorded a total of 1,837 pediatric home visits and 291 obstetric home visits, or about 19 pediatric home visits per month per post and three obstetric home visits per month per post. Home visits were also recorded in provincial Cochabamba in 1973. For those rural health posts reporting home visits, (19/39), they averaged 0.5 to 30 visits a month, averaging overall 10 a month per post. This figures are low, but at least some visits are being accomplished. The physicians also make home visits to see sick patients, but these visits are usually on the physician's private practice time, and he is directly reimbursed by the patient.

6. Inpatient utilization

As is shown above, the MOH has the major share of inpatient care in Bolivia (41.5 percent of hospitalizations, 86 percent of these in urban areas). The other 58.5 percent of inpatient care is almost evenly divided between the CNSS, the private and voluntary sector, and all the other cajas (see Table 5.17).

Relative utilization rates for the MOH (urban and rural), the CNSS, and COMIBOL are shown in Table 5.24. As can be seen, the hospital utilization rate for COMIBOL is over 100 times that of the MOH in rural areas (1,934 bed-days per 1,000 population per year vs. 15 for the MOH in rural areas). For companion, the U.S.A. rate is about 1,000, but reflects a large number of elderly patients.

COMIBOL has much overutilization of beds; patients stay longer than necessary and are often treated as inpatients when they could be outpatients. Since the beds are available and the budget is not very limited, COMIBOL can afford to do this. Another possible motivation is to keep the bed occupancy rate as high as possible so that their health system does not get integrated into a general rural health system. If their beds only had 30 percent occupancy, the hospitals would be a tempting target to integrate into a rural health system more than just COMIBOL beneficiaries.

The CNSS and the urban services of the MOH are also overutilized in one respect. The average length of stay is very long (13.9 days and 15 days, respectively) because of inefficiencies within the hospital systems. Patients will wait days to get diagnostic work done such as lab tests or X-Rays. In some cases they can wait days for their physician to come. Illnesses are prolonged because of the inability of the patient to buy drugs, or even just to find someone who can go out and buy the drugs for him.

In contrast, similar to outpatient utilization, there is much underutilization of rural hospital services: only 15 bed-days per 1,000 population per year, with only 12 percent bed occupancy, compared to 55 percent in urban areas, 57 percent for COMIBOL and 72 percent for the CNSS. The same factors influencing low outpatient utilization in rural areas apply to inpatient utilization. For sure there is no need of more hospital beds in rural areas.

Table 5.25 presents some more specific data for urban hospital inpatient utilization, and representative data for rural inpatient utilization in 1973 is presented in Tables 5.20, 5.21, and 5.22. As can be seen, the urban hospitals run 50 to 65 percent bed occupancy with an average of about 14 days stay, despite the fact that deliveries and abortions (which could be one to three day hospitalizations) account one third of all hospitalizations. COMIBOL and the CNSS run a slightly high bed occupancy rate.

In the rural areas, there is greater variability on the bed occupancy rate, but it runs from zero percent to 70 percent. Many hospitals simply do not hospitalize patients, others rarely do. Only 26 percent of the 54 rural hospitals listed in La Paz, Cochabamba, and Chuquisaca had bed

Table 5.24 - Hospital Utilization by Agency, Bolivia, 1972-3

Institution	Bed Days Per 1000 Population per Year	Average Stay (Days)	Percent Bed Occupancy
COMIBOL (1972)[a]	1,934	9.3	54
Caja Nacional de Seguridad Social (1972)[a]	696	13.9	72
Ministry of Health (urban areas, 1973)[b]	770*	15	55
Ministry of Health (rural areas, 1973)[b]	15	5	12

Sources: a - Urioste, Francisco, "La Atención Médica en la Seguridad Social Boliviana", unpublished report, 1974.

b - Ministry of Health, Regional Health Offices for La Paz, Cochabamba, Chuquisaca and Oruro, unpublished data, 1974.

* Assuming that one-half of the urban population is being served by the Ministry of Health.

Table 5.25 - Selected Urban Hospital Utilization, Bolivia, 1972-3

Hospital[a]	Number of Beds	Patients Hospitalized	Average Length of Stay (Days)	Percent Bed Occupancy
H. Bracamonte, Potosí	150	2,200	12	50
H. Viedma, Cochabamba	364	4,167	15	50
Maternidad, Cochabamba	73	4,099	(4)	62
H. Santa Bárbara, Sucre	250	4,396	12	63
H. General, Oruro	185	(4,400)	8	52
H. de Clínicas, La Paz	561	8,911	15	65
H. de Broncopulmonares, La Paz	102	275	80	59
H. del Torax, La Paz	154	(782)	57	80
Catavi, COMIBOL	365	5,382	15	68
Huanuni, COMIBOL	134	2,450	8	65
7 COMIBOL Hospitals[b]	1,184	23,335	9.3	52
All Caja Nacional de Seguridad Social Hospitals	1,667	31,669	13.9	72

( ) Estimate

[a]Ministry of Health data for 1973, COMIBOL and Caja Nacional de Seguridad Social data for 1972

[b]Statistics based on 1184 beds out of total of 1585 in COMIBOL system. Not all COMIBOL hospitals reported their statistics.

Source: Ministry of Health, Regional Health Offices for La Paz, Oruro, Cochabamba, Chuquisaca and Potosí, unpublished data, 1974.

Urioste, Francisco, "La Atención Médica en la Seguridad Social Boliviana", unpublished report, 1974.

occupancy rates of over 20 percent. And 48 percent of the 54 hospitals had bed occupancy rates of five percent or under. The average length of stay in rural hospitals is much shorter than in urban areas; it averages five to six days. This shorter stay is probably related to the dislike rural people have of staying in the hospital and to the unavailability of diagnostic tests. It is notable that in provincial Cochabamba in 1973, only 11 people died in rural hospitals (see Table 5.22, this would be less than 0.1 percent of the expected total deaths). This might indicate that the often-heard maximum that "rural people don't go to the hospital until they are about to die" is not really true. A few of them may have been referred on to the urban hospital, but most of them stayed at home and died without medical attention.

7. Tertiary care and dental care

a. Psychiatric care

Psychiatric care is woefully inadequate in Bolivia. The MOH has only two facilities in Bolivia for inpatient psychiatric care. Both are in the city of Sucre (nearly in the center of the city, so there is not much room). One is a hospital for women, the other for men, and the total number of beds is 447. The occupancy rate of the hospitals is about 100 percent. In 1973, there were only 84 admissions to the women's hospital and 92 admissions to the men's hospital. Thus, the turnover is extremely slow, and there are many people waiting in various parts of Bolivia for admission. Some of these people are in the general hospitals in urban areas, as there is no other place for them. At the general hospitals they barely receive custodial care. In Sucre, the care is little better than custodial, but there is some minimal occupational therapy.

The CNSS does hospitalize some of its patients in Sucre, but also has its own psychiatric hospital of 39 beds in La Paz. In 1972, there were 253 discharges with a 63.5 percent bed occupancy rate and an average stay of 35.8 days. The CNSS offers some outpatient psychiatric services in La Paz, Cochabamba, Sucre, and Santa Cruz. In 1972, there were a total of 8,912 outpatient psychiatric visits in the four cities through the CNSS.

The private sector also provides psychiatric services, though minimally. These services are exclusively in urban areas. There are a few small private psychiatric hospitals in La Paz, Cochabamba, and Santa Cruz.

b. Dental care

Dental care has been covered briefly in Chapter II. There were 903 dentists in Bolivia in 1970. Probably only about ten percent of the dentists are in rural areas, most of them on their año de provincia,

which is also required for dentists. The CNSS employs 114 dentists. There are no training programs for dental technicians in Bolivia.

Dental care is near 100 percent curative. Rarely are flouride treatments done, although there is some dental education through the schools. There is no flouridation of water supplies. In rural areas, people are essentially without dental care and go to see the año de provincia dentist mainly to have extractions, which is usually all that can be done in many places. There needs to be more training of auxiliaries in both preventive and curative dentistry, so that dental health can reach rural areas.

c. "Specialist" care

The quantities of physicians in the different specialties will be covered in the section on human resources (Chapter VI). Most specialists are in urban areas or COMIBOL. Bolivia has a full range of specialists from neurosurgeons to cardiovascular surgeons to oncologists. Most ultra-specialists are not really well-utilized as the demand is not there. For example, there are cobalt bombs in four cities: La Paz, Sucre, Cochabamba, and Santa Cruz. There are teams of surgeons in both La Paz and Cochabamba who do open-heart surgery. Neither of these teams does enough surgery to keep in practice. Yet there is even a special building for cardio-vascular surgery in Cochabamba. In La Paz, this type of surgery is done at the Instituto de Torax. There are special eye hospitals in La Paz and Cochabamba. And there are about twice as many general surgeons as there are pediatricians and internists combined. There is more "glamour" in the super-specialties than there is in primary care and public health, and there is no doubt that the specialists are necessary to a certain extent. It would make sense if primary care and preventive medicine were in as good shape as the super-specialties.

d. Rehabilitation

Most existing rehabilitation programs are aimed at children. There are nutritional rehabilitation programs run by some voluntary (religious) agencies, e.g., the Hospital de Niños in Montero, and by the JNDS in several places. The JNDS probably is the main agency working in the rehabilitation of children in several ways: the JNDS deals not only with nutritional rehabilitation, but also with handicapped children and with orphans. Unfortunately, nearly all the rehabilitation activities are in urban areas.

e. Long-term pulmonary care

With tuberculosis being a major problem in Bolivia, there are several hospitals which are dedicated primarily to the long-term care of tuberculosis. The largest and most advanced of these is the Instituto del Torax in La Paz. There are Hospitales Broncopulmonares in La Paz, Cochabamba and Potosí, and most other large hospitals have special wards for patients with tuberculosis. The CNSS and COMIBOL also have special wards

for tuberculosis patients. As can be seen . Table 5.25, the average stay of patients is usually a few months, and they are usually fairly sick. Tuberculosis patients are usually very reluctant to stay in a hospital. If they stay beyond a few weeks, when they would normally be feeling better if they were improving, then their tuberculosis probably is far advanced. For example, the Cochabamba Hospital Broncopulmonar has 40 beds; they had 172 admissions in 1973 and 37 deaths.

Most tuberculosis treatment is being done on an outpatient basis - when treatment is done. Unfortunately, most cases of tuberculosis do not receive adequate treatment due to inadequate drug supplies and difficulty in follow-up. The problems with tuberculosis treatment are further discussed in the infectious disease section above.

8. Ancillary services

a. Laboratories

In urban areas, most laboratories analyses are done by private laboratories, which are usually better equipped than the laboratories associated with the general hospitals. The laboratories in the general hospitals do limited lab work with very limited hours and limited equipment. Often the physician's attitude toward lab work is that "he does not need it". Some physicians almost are macho about using their diagnostic acumen without laboratory help. This type of attitude is seen in many rural areas where, although there may be an equipped lab, it is not used.

In urban areas, the private labs are probably quite happy that the hospital lab is so inefficient and limited, since they can then do most of the lab work. Often a hospital has an expensive piece of lab equipment which could expand their capability appreciably, but they fail to use it because they are missing some minor part. Actually, the vested interests of the private labs may have had some little influence in seeing to it that the hospital lab does not do too much. The same kinds of vested interests probably have some influence in seeing to it that new diagnostic equipment, such as X-Ray machines and EKC's, are not obtained too quickly by the general hospitals, or that not too many outpatients are seen at the urban general hospital, either.

Laboratory training for medical students has been neglected up to now, with a very few exceptions (e.g. the UMSS interns trained at the Sèton Hospital). The rural doctor is usually waiting for a lab technician to be assigned to his hospital to do maybe two or three lab tests a day. Many rural posts have been equipped with UNICEF lab equipment, but it has been infrequently used. The failure to use the lab has come both from lack of training and from an attitude that the lab is not necessary.

There are exceptions, of course. The labs at Viacha and Montero are excellent, and there are some outstanding research labs in La Paz. But most small hospitals need just very basic lab work, not even that often. It makes more sense to train people such as auxiliaries to do lab work as one part of their job. This has been done with success in Chulumani and Ancoraimes, and it is an example which could be followed elsewhere. The CNSS and COMIBOL of course have labs which are fairly well utilized in their hospitals.

b. X-Ray

The X-Ray situation is not much different than that of the labs. Usually the general hospitals have old equipment which breaks down with regularity, or they run out of film or reagents. Private radiologists probably do most of the X-Rays in urban areas. For example, the X-Ray unit in the general hospital in Oruro is used only about seven times a day. In well-utilized medium sized rural hospitals, such as Viacha or Montero, usually two to four X-Ray exams are done per day. COMIBOL and the CNSS do more X-Ray exams. The policlinicos of the CNSS average one X-Ray exam for every seven patients seen, and the Catavi Hospital of COMIBOL does over 60 exams a day. Catavi has five X-Ray machines, two of which are huge 1000 mA units with moving tables, etc.

There is a scattering of X-Ray machines in rural areas. Most of these were donated, and most are broken, do not work because the electricity is insufficient, or are not used because there are no reagents to develop the film. Some better planning in the distribution of expensive equipment such as X-Ray machines might assure their better utilization, especially in rural areas. There were also some mobile units to take screening X-Rays which apparently have now been taken apart.

c. Pharmacy

Problems with drug supply have been covered more thoroughly elsewhere. Drug supply is a major problem which again is influenced by vested interests. The urban hospitals usually have only a limited supply of samples. This means that patients (or their relatives) must be sent out of the hospital with a prescription to get any necessary drugs. The result is delay in treatment, often non-treatment, if the patient or his family cannot pay for or find the drugs. This is perhaps the most frustrating single barrier to the practice of good medicine. The hospital building can be beautiful, the operating table expensive and magnificent, but without drugs, the system is crippled.

Drugs are the same problem, probably even worse, in rural areas, since there are few pharmacies. The physician in rural areas must usually buy drugs in the city and resell them himself at his health post.

Fortunately some rural hospitals do have good pharmacies, thanks to good planning (usually with the involvement of religious groups) or to drug cooperatives. Unless the problem of drug supply is solved for both urban and rural areas - and that means making basic drugs available and cheap - there will be little advance in the quality of medicine.

d. Social workers

There are not many social workers in Bolivia, and only about 20 a year are being graduated. They are hired primarily by the general hospitals in urban areas, and have little or no functions in rural areas. They seem to have gone to rural areas while they were studying (UMSA social work students were in the Alto Beni and Llallagua), but after graduation, like other professionals, they will probably stay in the cities, where there is enough work to do. The challenges and problems are so great that it is hard to imagine the social worker really accomplishing very much, except on an individual basis.

9. Conclusions

The medical care system in Bolivia is grossly unequal in terms of urban vs. rural medicine. Although the country is primarily rural, the investment in health is almost exclusively urban. There is also minimal coordination within the medical care system itself. Each institution delivering care is a "republic" onto itself, with little desire to yield any of its autonomy by integrating resources. The MOH, with minimal resources, has the largest share in urban hospitalization and nearly total responsibility for the rural area. Given the minimal resources, the political and administrative instability of the MOH, it simply is not able to do what it is supposed to do. The result is an unstable health system which is not capable of giving efficient or good quality medical care, especially in rural areas.

Most health posts in rural areas have low utilization for the reasons mentioned earlier. However, even for the few patients seen within the system, the quality of care is usually poor. Without drugs, equipment, or supervision, the quality of care is mediocre at best. As continuing education and supervision are barely done, the health worker's knowledge and motivation fades away, and the best care is not always given to the patient. Drugs are often given inappropriately and in inadequate doses, sometimes because the health worker does not know any better, and sometimes because the drug supply is severely limited.

The indigenous practitioners are still responsible for the bulk of health care in the rural areas. There have been a few small efforts to incorporate some of them (the parteros) into the "modern" system. In urban areas, outside of the Cajas, the private sector is taking care of

most ambulatory medicine. The MOH and the JNDS are doing MCH programs in urban and marginal urban areas, but most sick patients must seek medical attention from the private sector because the public sector does not provide adequate outpatient care in urban areas (again, except for the Cajas, and often it is doubtful if their urban outpatient care is adequate). The ratio of ambulatory patients seen to patients hospitalized is 4.8:1 for the MOH urban programs. In other words for every patient hospitalized in the MOH system, less than five outpatients are seen in the same system. And most of these were seen in urban MCH programs. In contrast, the ratio is 30:1 for the CNSS and probably better than 50:1 for the private sector.

Since it is the private doctors who are seeing the patient at the MOH hospitals, it is probably not too far fetched to suggest that the private doctors may have arranged the ambulatory care situation in urban areas to ensure that most ambulatory patients will be seen in their private consultorios rather than at the hospital. Except for some of the pediatric hospitals, outpatient services are almost non-existent at urban hospitals of the MOH because of short hours, long waits, insufficient staffing, etc. This leaves the sick patient in the urban area almost no choice except to seek out a private physician (unless he is covered by a Caja, and even then some of the same barriers to care lead him to seek care elsewhere). Thus, there exists a symbiosis in the cities: the private sector sees a great share of the outpatients, and the MOH takes care of the hospitalizations. Traditionally, in both urban and rural areas, the hospitalization part has been the money-losing part.

Only a very small part of rural health needs are being met by the "modern" medical system; the low utilization despite the presence of facilities, beds, and personnel has usually been blamed on the consumer and his back-ward customs, his reluctance to spend money, his faith in curanderos, etc. Yet it has been shown that when good medical services are provided, the campesino will use them, and pay for them (examples: Camargo, Viacha, Ancoraimes, Chulumani, Montero, Llallagua, all COMIBOL hospitals). For COMIBOL beneficiaries there is no fee to pay. But then the INC also offers free services to colonists in the Chapare, and the patients would rather pay and go somewhere else for their care because the INC hospitals cannot deliver effective care (they have no drugs). The campesino (and the urban dweller, too) will take advantage of what he perceives to be effective medical care; he probably will continue going to his curandero too for the types of illnesses that he feels the indigenous healer is able to handle better. It is not really a question of competition between traditional and western medicine. Culturally, the campesino has been accustomed for hundreds of years to integrating the two cultures and using part of each in his life. For health planners, the point to be made is to make integration, not competition, the goal.

A major observation of the Bolivian medical care-system is that many resources exist which are not being used efficiently. Rather than

asking for new hospitals, new equipment, new personnel, etc., the present resources should be more effectively organized and utilized. This includes lab material, X-Ray machines, operating tables, hospital beds, and trained personnel, who are often utilized to less than ten percent of their capability. Better supervisors and administration are needed even more than more financial resources, although one cannot deny that the financial resources are meager for rural health.

F. Integrated Intrasectorial Programs

1. Summary

There is minimal integration of medical or preventive programs within the health sector, although in the cases where integration exists, the health programs seem much more effective. Attitudes toward integration vary from pro-integration (usually on the part of those who have a lack of resources, such as the INC or the MOH) to vehemently anti-integration (usually by those who have sufficient resources, such as COMIBOL and some private organizations). The threat of control by some other organization or the fear of losing autonomy is a barrier to the integration of health agencies. This is especially true of any integration plans with the MOH.

In a study of rural health centers conducted in 1974,(12) it was demonstrated that rural health posts which had association with religious organizations or inter-agency cooperation were significantly much more utilized than those without these associations.

Intersectorial integration (e.g. between agriculture and health or education and health) are discussed in Chapter VII.

2. The programs

a. The cajas

The CNSS has cooperated with the MOH in the sharing of hospital facilities and the construction of hospitals in larger cities. Usually the CNSS has "rented" space or a building within the MOH general hospital. Sometimes there have been disagreements, such as in Tarija, where the MOH complained that the CNSS had not paid its rent for three years. The CNSS and the MOH have pooled funds to build hospitals in Sucre, Trinidad, and Vallegrande, and there is a proposal to build a joint "Hospital Unico" in Tarija. If the Seguro Social Campesino (SSC) is passed, then some kind of integration (if not absorption) will have to occur between the IBSS's new SSC and the MOH's rural system.

The Cajas are technically tied together by the IBSS (Instituto Boliviano de Seguro Social), but in fact the IBSS has little leverage

over the "*repúblicas independientes*". Not even all the *cajas* submit reports to the IBSS. COMIBOL does sub-contract to deliver care to some other groups of workers, but is very reluctant to enter any relationship with the MOH. The COMIBOL hospitals in rural areas do attend non-COMIBOL emergencies but only reluctantly and at a high price. COMIBOL is so much against integration that they even gave money to help build a CNSS hospital in Uncía and the COPOSA cooperative hospital in Llallagua so that the COMIBOL Catavi hospital would not be bothered by non-beneficiaries.

b. Religious organizations

Most religious organizations have integrated their efforts to coordinate with Bolivian official or semi-autonomous health agencies. Some, like the hospitals in Camargo and Villa Tunari (*Clinica Betesda*) are not integrated, do not depend on the MOH for anything. Many of the Maryknoll projects are independent, too, such as their outpatient clinics in marginal urban areas of Cochabamba and Santa Cruz. On the other hand, the general hospital in Riberalta, which had been run independently by the Maryknolls, was recently turned over to MOH management. The Seventh Day Adventists did the same in Chulumani in 1971. The Adventists left the Chulumani hospital after being there about 30 years, but three Spanish nuns are now collaborating there to run administration and the pharmacy.

Methodist Church has had several projects in Bolivia: the *Hospital Metodista* in La Paz, the Montero CSH with its rural project, and the Ancoraimes CSH. There was also a nursing school at the *Hospital Metodista* in La Paz; this was transferred to UMSA a few years ago, and has suffered therefrom. In Montero, there is coordination between *Obra Metodista*, the MOH (which provides a few salaries), and the UMSS of Cochabamba (medical students and interns are sent to Montero and the rural projects). This has been one of the more successful examples of inter-agency cooperation.

There are several religious organizations in health care in the Chapare, with little cooperation between them. There are even two different groups of Franciscan priests (from two different provinces in Italy), who have little integration between their health projects. The Baptists have their own hospital in Villa Tunari, and operate their own river boat clinic from Todos Santos. Most religious organizations are hesitant to cooperate with the MOH because they have not seen benefits come from their cooperation. An example is that of the Seton Nursing School in Cochabamba, which cooperated with the *Unidad Sanitaria* for the nursing public health course. The experience was particularly frustrating and turned the nurses away from public health. Another cooperative effort involving the Seton nursing school (a health survey in Canata, a *barrio* of Cochabamba) turned into a political struggle, and the nursing school withdrew.

Often missionary nurses combine with physicians assigned by the MOH to run health posts. Since the missionaries do the administration and supply some equipment, including vehicles, as well as a positive attitude, these situations have usually worked well. Such arrangements exist in Colquiri, Irupana, Viacha, Chulumani, and Yotala. In the case of Llallagua, a missionary physician works with a MOH assigned physician. All of these posts have good utilization. Occasionally, as in Popoy (Alto Beni), the missionary nurse and the año de provincia physicians do not get along.

The INC has used arrangements with religious organizations to make its health programs in colonization areas work. As a result, in the Alto Beni and Yapacani, when the religious organizations are doing administration and/or drug supply, the programs are functioning, but in the Chapare, where there is no religious affiliation with the INC, the INC medical program is a disaster.

c. The Viacha CSH

Viacha is a special example of good coordination between three organizations: the MOH, the Empresa Nacional de Ferrocarriles (E.N.FF.CC.), and a religious organization with a base in Viacha and support from the U.S.A. As a result, the MOH and the E.N.FF.CC. jointly built a new hospital in Viacha. Excellent equipment came from the U.S.A. with the help of the religious order. The hospital is shared by the MOH and the E.N.FF.CC. The nuns do administration, nursing, outreach and community organization as well as supplying emergency transportation. Two physicians are assigned by the MOH, and one by the E.N.FF.CC. The community's confidence in the hospital is growing.

d. The Banco de Vacunas

The Banco de Vacunas is a special example, elaborated on more in the section on infectious diseases. Seventeen organizations in Bolivia agreed to pool resources to have a central supply of vaccines, under the control of the Department of Ecology in the MOH. Although there have been problems with the Banco de Vacunas, it does represent a cooperative effort.

e. The universities

The universities have had a relationship with the MOH general hospitals in La Paz, Cochabamba, and Sucre, for a long time so that they could use the hospitals for teaching purposes. Recently, university convenios have been extended to other hospitals as well: Seton Hospital, the Albina Patiño Hospital, and the Montero CSH.

Besides the Montero agreement, which is with the MOH, the Montero hospital and UMSS, there is now another three-part agreement for

the training of medical students. This is the convenio between UMSA (La Paz), the MOH, and the INC for a rural community medicine program for medical students (and other health personnel) in Caranavi and the Alto Beni. This was started in 1973, and has had its problems, but continues to operate. USAID gave matching funds to the university to support this program.

f. Other organizations

The armed forces have also put some effort into health projects, such as the Hospital Ship on Lake Titicaca and the construction of health posts in Anko Amaya and Huarina. Like Desarrollo de Comunidades, they depended on the MOH to supply personnel for the health posts, and the MOH in the above cases has complied to some extent. In Santa Cruz, Tarija, and Chuquisaca, the Public Works Committees have collaborated in health projects. In Santa Cruz, the Committee is building mini-hospitals and water supplies. In Tarija and Chuquisaca, the committees are working with UNICEF in a plan for social and economic development that includes health.

Formed with the object of coordinating health projects on the Altiplano, COIMSA (Comité Impulsor de Salud del Altiplano) has had internal battles, but seems to have some promise in coordinating efforts.

3. Conclusions

There exists a minimal amount of cooperation between health agencies, largely related with religious groups, but more recently with some input from the universities. The university participation hopefully will grow: they have functioning cooperative programs in Montero and the Alto Beni, with plans to implement another program in the Valle Alto of Cochabamba. Often the MOH is slow to participate in cooperative programs because of administrative and political hang ups, as well as financial limitations. For this reason, agencies cooperating with the MOH, such as the armed forces, the universities, or foreign missionary organizations often become important. Some organizations, such as COMIBOL and the JNDS often refuse to even consider working with the MOH because of its inefficiency and lack of resources.

The MOH does not presently have the stable leadership or the resources to encourage cooperation and be successful. If integration of efforts in the medical field is to become a reality, there needs to be some incentive to do it. There needs to be a change in attitudes, and some trust that integration will lead to improvement rather than decay.

Footnotes

(1) Gumiel, Dr. Alberto, USAID/Bolivia/HAD, personal communication, 1974.

(2) Montero Community Health Project, "Encuesta Demográfica, Sanitaria y Socio-Económica de la Comunidad de Montero", 1965.

(3) Consejo de Salud de Yapacaní, "Encuesta de Salud en la Colonia de Yapacaní, Santa Cruz", 1971.

(4) Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-78, La Paz, 1973, p. 80.

(5) Llano Saavedra, Luís, "Fecundidad Diferencial y Anticoncepción en el Area Urbana de La Paz", CENAFA-CEP, La Paz, 1971.

(6) Universidad Mayor de San Simón (UMSS), Departamento de Salud Pública, unpublished study, Cochabamba.

(7) Asociación Boliviana de Protección a la Familia (PROFAM). A private non-profit Bolivian organization founded in 1973.

(8) Mercado, Dr. Rodolfo, National Institute of Communicable Diseases, personal communication, 1974.

(9) IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, May 1974, paragraph 2.12.

(10) LeBow, Robert H., "The Rural Health System in Bolivia", Consultant Report, USAID/Bolivia, 1974.

(11) Ibid.

(12) Ibid.

CHAPTER VI

ANALYSIS OF THE INFRASTRUCTURE

A. Summary

This Chapter focuses on the factors that enter into the production of health services and on the systems that supply those factors. Basic sections deal with financing, manpower, facilities and equipment, and biochemical products; these are the most important material factors. In addition, administrative, planning and information inputs are studied. Two major purposes underly this effort: to establish which factors limit the production of health services, and to examine the appropriateness of their distribution.

First, it is probable that the GOB's lack of continued, clear health policy directives is the root cause of many problems of the health sector. Lacking clear policies, the GOB has made decisions as to the investment in health resources on the basis of expediency.

Secondly, the health system is inefficient in its use of resources. The solution to this problem, once an appropriate policy environment is established, must be an improved administrative system. Focus must be on the local level, and on the detailed administration of every-day activities in the provision of health services. Regional and nation-wide administrative reforms should be adapted to the requirements of improved administration at the point of delivery.

The financing of public health services is now inadequate, in terms both of estimated absolute requirements for Bolivia's development and of comparisons with Latin American norms and averages. A significant increase in financing seems inappropriate, however, without prior and substantial improvement in the present efficiency of public health services. Improved efficiency and extended health benefits, in fact, should significantly simplify the process of obtaining increased revenues in the future.

The investment in health manpower is now biased toward the professional and specialist. To increase efficiency, professional training should be reduced, but intermediate and primary level health workers should be trained in greater numbers. Additional training requirements are for managerial personnel, maintenance personnel, and a few critically needed senior technical planning personnel. To effect these reforms, a new manpower planning system is required.

Facilities are in short supply by international standards. They would suffice, however, if used efficiently to provide more service and much greater coverage of the population. It therefore appears unwise to invest in new facilities or equipment until significant improvement has been made in the efficient use of what exists. Again, significant reforms are required in the system for planning, acquiring and maintaining facilities and equipment.

For 80 percent of the population, drugs and vaccines either are simply not available or are not adequately accessible. This basic bottleneck must be resolved if the health care system is to work effectively.

Thus, investment at this time ought to be directed at health planning development, administrative reform, middle-level manpower training, and better delivery of biochemical products. These investments in infrastructure are, of course, an integral part of program development.

Currently, the resources available for public health are utilized primarily for curative medicine. This is clear from the patterns of financing, facilities (hospital value greatly exceeds the value of outpatient facilities), and staffing (physicians and hospital auxiliaries greatly outnumber the personnel for preventive medicine). In fact, it appears that benefit/cost ratios are higher for preventive services than for curative services. Future efforts should aim to redirect factors into preventive services.

The present distribution pattern of public health resources greatly favors the Social Security systems' beneficiaries, as compared to the rest of the population; Social Security expenditures are reaching levels of decreasing marginal returns. It also greatly favors the urban population as compared to the rural. A number of basic health problems, rather inexpensive to prevent or ameliorate, are much more prevalent in rural than in urban areas. There is a need to redirect factors toward rural and other disadvantaged populations.

These points are supported in detail in the six following sections of this Chapter.

B. Program Administration

The following survey relies on information and opinions obtained from a variety of sources: documents, reports, Bolivian officials, and foreign advisors. The administrative problems noted below are to be found, in one degree or another, throughout the health sector, but special emphasis is placed here upon the Ministry of Health, which has the principal mandate to organize and coordinate the nation's health programs.

1. Financial administration*

Financial management, apart from insuring the proper use of public funds, should provide information upon which policy decisions may be made. The ability of an organization to provide such information may be rated according to a series of steps based on differing levels of capability. These steps might include:

Step 1: An accurate general record of funds expended by the organization. (How much is being spent?)

Step 2: An accurate record of funds expended by each unit of the organization. (Who is spending it?)

Step 3: A clear idea of what services or activities each unit within the organization is providing with the funds expended. (What is it being spent for?)

Step 4: Systematic evaluation of how well each organizational unit is carrying out its activities. (What are the results--intended and observable--of the activity and expenditures?)

The increasing ability of the organization to provide helpful information should be accompanied by a corresponding increase in legislative and executive ability to make thoughful, intelligent policy decisions.

With respect to its internal system, the Ministry of Health (MOH) appears to be advancing. MOH has not completely fulfilled the requirements of Step 1, but it is progressing well on Step 2. However, defects in the central budgeting system of the GOB limit the prospects for improvements in budgeting within the Ministry.

At present, the Government of Bolivia, through its Ministry of Finance, is struggling with Step 1. The general situation is clearly identified in the latest Public Administration Service (PAS) Annual Report. The PAS advisory group has been working in the field of Bolivian financial management since the mid-1960's.

---

* The USAID-supported Public Administration Service (PAS) advisory group on fiscal reform in Bolivia contributed insights and data for this discussion.

The Report states:

> "The principal problem for reform of financial management in the Bolivian government is still that of budgeting.
>
> "A budget is expected to convey a government's policies and decisions, expressed as a plan of operations but the Bolivian government's budget does not satisfy that expectation. A budget is expected to express a government's financial plan also, but this government's budget does not satisfy that expectation. And a national government's budget is expected to express governmental intentions regarding the national economy, and this one is not adequate in that respect either.
>
> "The budget is not prepared systematically or produced at a suitable time. It does not include all necessary aspects of the central government's activities and financial operations. The budget is not informative as to the content and purposes of those activities. The budget is based on unreliable estimates of resources. The budget contains no useful comparisons of proposed spending authorizations or actual past expenditure experience. The budget is not supported by evaluations of ongoing or prior activities. The appropriation structure is excessively detailed, and it needs to be simplified. Moreover, the detail describes merely what the government will be buying with the funds appropriated; but it does not describe what work will be performed or what results will be achieved thanks to the expenditures authorized.
>
> "The present budgeting process simply is not adequate to any of the requirements that properly should be imposed upon it."(1)

Major problems in budgeting and accounting systems related to the Ministry of Health include:

a. The approved budget does not appear until well into the period which it is to control

For example, the complete 1973 budget did not appear until late August or early September of that year. A small resumé

of the 1974 budget appeared in February, but the complete document has not yet been published.

b. The budget is overly complicated and detailed

The official 1973 budget for the Ministry of Health covers 122 pages (PAS has recommended a clearer and simpler format one-tenth as long). The budget is organized according to the following classification system:

Level 1: Ministry - Public Health

Level 2: Programs - example, Program 04: Departmental Health Services

(Note: programs, sub-programs, and activities refer to levels of organizational structure.)

Level 3: Sub-programs - example, Sub-program 01: Unidad Sanitaria Regional de La Paz

Level 4: Activities - example, Activity 02: Centro de Salud La Paz

Level 5: Object of Expenditure - example, 117 - salaries

There are some 110 objects of expenditure to which funds are appropriated in the budget (PAS proposed using only the half-dozen major objects as bases for appropriation).

c. The official budget classification system is not used for budget control by the Ministry of Finance

For control purposes, records at the Ministry of Finance are kept only according to the categories of "Ministry" and "Object of Expenditure." Thus, at any given time, the Ministry of Finance has record of expenditures in the Ministry of Health under the Object of Expenditure category No. 275.51 (laundry, cleaning and hygiene), but no record of where or in support of what activities the expenditures were incurred.

The recent creation of an Accounting Systems Division (upon recommendation of PAS) in the Ministry of Finance is a sign that the GOB intends to further systematize and simplify its accounting, and ultimately its budget, procedure.*

* See also ISAP, El Sistema de Presupuesto (October 1973), for conclusions of a seminar of high-level Ministry of Finance officials regarding budget problems.

d. The budget and accounting system utilized in the Ministry of Health does not provide the information necessary for informed policy decisions

At the end of 1974, the Financial Administration Department of the Ministry hoped to have, for the first time in the Ministry's history, a reasonably accurate record of expenditires by organizational unit and object of expenditure.

This new system stems from suggestions by Pan American Health Organization (PAHO) advisors in 1972, which found support among Ministry officials. A structural change which led to the accounting change: formerly separate accounting and budget units were consolidated into a new Department of Financial Administration. The department has difficulty in obtaining accurate information on the collection and expenditure of fondos propios (money collected on-site for services) from the Regional Health offices, but appears to be making progress.

At present, there is no systematic reporting on/or investigation of the results of program expenditures. Thus, Ministry policy makers have no accurate way of evaluating possible alternative uses of funds under their control.

However, it is important that progress is taking place. For the first time, Ministry officials will have an accurate record of who is spending what. The next steps, logically, will be to extend the analysis to what they are doing and how well they are doing it.

e. GOB budget estimates of income are consistently higher than can realistically be expected

This problem of the central GOB financial management makes it difficult or impossible for the Ministry to plan its affairs with assurance. It is not uncommon for calls for retrenchment during a fiscal year, because income is not keeping pace with the optimistic projections. Therefore, the Ministry suffers heavy budgetary reductions. A high percentage of a ministerial budget is reserved to pay staff personnel. The cuts of course are made in the already low appropriations for supplies, travel, etc. Towards the end of the year, it may become virtually impossible to buy even such things as pencils and paper.

f. Operational units in the Ministry have very little input into budget formulation

The budget is primarily the product of discussions between programmers from the Ministry of Finance and high level Ministry officials in La Paz. There is no systematic effort to solicit proposals or estimates from field units. Indeed, such input is feared in some

quarters. One official noted that, if field units were to be asked to submit proposals, they (the field units) would feel the proposal represented a definite commitment by the Ministry; this would result in unpleasant misunderstandings.

Thus, few field administrators have the experience of implementing, with a known and assuredly available amount of money, a program they have assisted in designing. Lack of program and budget responsibility does not encourage executives realistically to evaluate the performance of their subordinates.

2. Personnel administration

It will come as no surprise that public personnel systems in Bolivia are heavily influenced by political and societal values. At the general management level, possibly honest admiration for the comparatively abstract concept of merit in hiring, promoting, etc., is usually overwhelmed by the more immediate, tangible and compelling pressures of loyalties to friends, relatives, and political colleagues. In Bolivia, politicians have not yet learned how to satisfy both "merit" requirements and other mundane considerations simultaneously, a lesson that successful city "bosses" in the U.S. learned long ago.

In the semi-autonomous agencies, one is more apt to find both appreciation and application of merit concepts. Indeed, as noted in Chapter V, one prime reason for the proliferation of semi-autonomous agencies may be to free certain services from the highly political atmosphere of the Ministries.

Among the important features of the personnel system are:

a. Recruitment

Recruitment into the public service is facilitated by friendship, family and political networks. (For example, between mid-1971 and mid-1974, the various Ministries were "allotted" to the various political parties for patronage purposes. The Ministry of Health "pertained" to the Falangista Party).

Political recruitment is the order of the day even in positions demanding a high level of technical skills. (A case in point is the recently-created Accounting Systems Division of the Ministry of Finance. This unit is to spearhead accounting reform throughout the government. Six new posts for governmental accountants were created within this unit. During recent years, Public Administration Service and ISAP have trained some 300 Bolivians in governmental accounting. Nevertheless, none of the six candidates chosen for the posts had extensive accounting experience and none had training in governmental accounting).

Once entry into the Ministry has been successfully negotiated, tenure may be relatively secure. It is not secure for high-level positions; these are widely understood to be political--sub-secretaries, some national program directors, and directors of the Regional Health offices. Nor is it secure for persons at lower echelons who are too overtly and actively partisan in office. However, it is difficult to generalize. Some directors with reputation as "técnicos" have long tenure in office. Within any given organization, it is usually generally understood who are "técnicos" and who are "políticos."

b. In-service training

This practice becomes especially important in view of the predominantly political recruitment patterns. Training activities for health-related personnel are conducted primarily by the following three organizations:

i. The Superio Institute of Public Administration (ISAP): Located in a spacious new building and supported by an expanding library, ISAP provides an attractive setting for training activities of a general administrative character as well as problem-oriented conferences.

ii. School of Public Health: This school is operated by the Ministry of Health. It concentrates on technical training. During the period 1962 to 1972, the school graduated the following specialists:

Specialty	Number of Graduates
- Public Health Nurses	14
- Nursing Instructors	10
- Auxiliary Nurses	408
- Environmental Sanitation Technicians	160
- X-Ray Technicians	26
- Laboratory Technicians	28
- Statistical Technicians	98
- Auxiliary Dieticians	10
- Health Educators	12
- Auxiliary Health Planners	28
- Epidemiology (1 month seminar)	20
- Hospital Administration for Medical Directors (1-1/2 month seminar)	29

Most of the courses lasted nine months.

iii. Regional Training Centers of the National Community Development Service (NCDS), a branch of the Ministry of Rural Affairs and Agriculture. NCDS has an impressive training program for community leaders. Training is offered at individual communities and in regional centers. Training includes health-related subjects, such as nutrition, first aid, and environmental sanitation.

Other training activity is conducted periodically. For example, the Regional Health office recently initiated a series of conferences for its año de provincia doctors. The idea is to bring them together periodically for a few days to exchange ideas and to combat feelings of professional isolation.

c. Supervision and evaluation

Supervision and evaluation of personnel are haphazard at best but often are completely lacking. The problem is most severe in rural areas. Almost the entire Ministry budget is consumed by personnel payments. Very little remains for travel, per diems, gasoline, and the purchase of vehicles with which supervisors (located in urban centers) could effectively supervise and evaluate the work of rural health personnel in centros de salud, hospitals, puestos médicos, and Regional Health offices. Vehicles are not properly maintained and they rapidly deteriorate. The per diem funds are always paid retroactively, usually months after claims are made. Supervisory personnel are thus forced either to ignore the personnel in the field or to finance supervisory visits out of their own pockets. Naturally, the choice is often the former, and personnel in the field are left largely to their own devices.

Consequently, the año de provincia is often a deadening, extremely negative experience for the young medical school graduate. Professional isolation, lack of equipment and medicines, cultural barriers between himself and his prospective patients, and lack of sources of advise and counsel all serve to reinforce his probable initial inclination to locate permanently in an urban area.

d. Special problems in rural services

In rural areas, a sort of vicious cycle is likely to develop: most rural people have more confidence in local curanderos and parteros than in representatives of the Ministry of Health. When forced to a rural health center by an emergency, the rural patient is likely to confront medical personnel poorly prepared by language, experience or education to deal sympathetically with his problem. Even the well-intentioned practitioner is handicapped by

lack of medicines, drugs, equipment, language, and rural experience. Overall, there is a high probability that this initial encounter with modern medicine will be negative for the patient, hence will reinforce his original disinclination to entrust himself to the Ministry of Health system.

Additional problems in rural medical service are occasioned by the difficulty an año de provincia physician encounters if he wants to stay in the area beyond the initial year. Because of overproduction of physicians, competition for an attractive job on the public payroll is keen. Consequently, some of the año de provincia positions are highly sought. Apparently even MOH officials feel that, because of the great demand for the positions, it is not equitable to carry a person beyond his initial year in a rural area.

Therefore, even if the año de provincia physician enjoys his assignment and proves to be competent, it is extremely difficult for him to retain it. If he manages to stay, furthermore, he continues at the same salary level as a newly named graduate, despite his experience and possible supervisory responsibility.

3. Maintenance and supply

The concept of maintenance is little practiced in the health sector. This is partly due to lack of budgets for this purpose and partly the result of pressures on the limited budgets for expanding program activities. There is also, however, a pervailing lack of awareness or concern for the concept of preventive maintenance in general. Thus, facilities are generally in poor condition after several years of operation and equipment may not be used due to the lack of some minor but essential part. There is also a pausity of qualified maintenance personnel, although most major hospitals have authorized positions. Adequate supplies, replacement parts and tools are almost non-existent. Private and religious facilities have, for the most part, recognized and responded to these needs. Some government facilities have been able to correct pressing maintenance problems with locally-generated funds.

Supply systems are also very inefficient, although the most limiting factor is the lack of supplies to administer. The Ministry of Health, for example, often does not receive reports from the field because sub-units do not have sufficient reporting forms. The provision of pharmaceuticals is a major problem. The MOH has very limited supplies and distribution is not equitable nor, in many cases, timely. The Caja Nacional de Seguridad Social, on the other hand, purchases large amounts of drugs. It is estimated, however, that up to 50 percent of these are lost in transit.

4. Organizational structure

Chapter IV contains a discussion of organizational characteristics of the Bolivian Health Sector. Among the most important are:

i. Fragmentation of agencies. A wide variety of agencies operate in the sector; spheres of responsibility are ambiguous and little coordination is evident.

ii. The growth of "técnico" agencies. A proliferation of semi-autonomous, decentralized public institutions has taken place, possibly stimulated by a desire to remove certain services and activities from the highly political atmosphere of the Ministries.

iii. Uncertainty concerning future division of labor between the MOH and IBSS. In late 1974, the IBSS was transferred back to the MOH. Thus for the move has done nothing to change the relationship between the two systems, but there is potential for better coordination.

iv. Lack of strong sectorial policy planning. The MOH has been kept weak by the fragmentation of the sector, a high turn-over rate among its top policy makers and a lack of information and data from operating programs. Meaningful consistent planning and evaluation therefore have been lacking.

v. Highly centralized administrative functions. The centralization of administrative decision-making has caused serious bottlenecks to the effective implementation of programs. It also limits participation and flexibility at the regional and local levels. This is compounded by deficient communications and information systems.

C. Health Financing

1. Summary

The following analysis of health sector financing begins by identifying what is conventionally included or excluded in an accounting of health sector expenditures. The conclusion is offered that accounting conventions are necessarily arbitrary at the margin where the health sector overlaps with other economic sectors. With this reservation in mind, the analysis proceeds to public and private sector health expenditures: the former include principally the health

expenditures of the MOH and of the Social Security Systems (SSS). The analysis of private health expenditures is largely hypothetical because of a scarcity of information. Finally, the analysis relates these two basic problems: (1) present inefficiency in the utilization of health sector resources and (2) the resource increases that may be required for the sector.

Public health sector expenditures account for approximately two percent of Gross Domestic Product (GDP), which is low in comparison with other countries at Bolivia's level of development. Together, the MOH, SSS and all other public health sector expenditures in 1974 total about $b.640 million (US$32 million). This amounts to about US$6 per capita. The total expenditure is about half of what might be required to provide minimally adequate health services for the Bolivian people. Private health expenditures (about which little is known) are estimated at about $b.460 million (US$23 million), including both modern and indigenous health services. Thus, total health sector expenditures may be about US$55 million, slightly less than US$10 per capita. Health expenditures are very unevenly distributed, however, about 20 percent of the population receive about 80 percent of the health benefits.

It is obvious to conclude that Bolivia does not provide-- and undoubtedly cannot efford to provide-- all her people with minimally adequate health services. The unequal distribution of health services, however, as well as considerable inefficiencies in their utilization, suggest the general nature of interventions required to improve and expand health services delivery. If additional resources are made available to the health sector, their allocation should be contingent on an improvement in the present low level of efficiency of health services delivery. It is important to avoid an expansion of many wasteful and ineffective health service practices that now exist. Finally, it is noted that most health sector expenditures currently are for curative services, whereas it would seem that a greater proportion of resources should be invested to renovate and equip existing physical facilities and to expand environmental and other preventive health activities.

2. Definition of health sector expenditures

The calculation of health sector expenditures requires, first, a definition of the health sector. The Bolivian health sector includes three principal sources of expenditures, namely, the Ministry of Health (MOH), the Social Security System (SSS), and private medicine. The health sector definition also encompasses expenditures for health services by other ministries of the national government, and by semi-autonomous and decentralized government agencies.

The definition of "health services" includes both curative and preventive measures; however, arbitrary distinctions of what is included and what is excluded are inevitably necessary. Conventionally, the definition of curative services includes all public and private expenditures on medical services and medicines. Other than medical and medicinal measures that have curative qualities, except for nutrition, are ignored in an accounting of health expenditures. Nutrition expenditures, moreover, are included only for those segments of the population suffering from undernourishment.

The decision as to what preventive health services to include in an accounting of total health sector expenditures is even more arbitrary. Included are direct anti-disease measures and indirect measures, primarily involving environmental sanitation. The latter, however, are counted as health expenditures only in small towns and rural areas*, and they include only potable water and sewage disposal, but not improved housing, roads, etc. Specific health education expenditures also are included, but general education (including the formal education of health practitioners) is not, inasmuch as the latter is included in education sector expenditures.

Finally, in accounting for private health expenditures, one typically includes only payments for curative and directly preventive measures. Consumer expenditures for indirect preventive measures, particularly for environmental sanitation, are not usually included, even when they represent required community contributions to public sector interventions.

In short, the health sector definition and resultant expenditure accounting are necessarily arbitrary because it is virtually impossible clearly to distinguish health services from health-related measures in other sectors. One should recognize that health-effective expenditures undoubtedly are greater than those included in an accounting of health sector expenditures. Moreover, it even is likely that many expenditures outside the health sector are more health-effective than some expenditures within the sector.

---

* Obviously water and sewerage programs in urban areas have health benefits. These activities, however, do not fall under the jurisdiction of any health sector agency. They are commonly considered as public works or engineering projects which in Bolivia are sponsored by CORPAGUAS or semi-autonomous local agencies.

3. Total public Health sector expenditures in Bolivia

Bolivian public health sector expenditures of the MOH and the SSS, together, were budgeted as $b.427 million in 1973 and $b.579 million in 1974. Of this total, 39 percent represented the MOH share and 61 percent the SSS share (Table 6.1). At the official exchange rate (20:1), health sector expenditures planned by the two principal sources thus were about US$21 million in 1973 and US$29 million in 1974. It would be misleading, however, to conclude that health budgets therefore increased in 1974 by about 37 percent: during 1973, the rate of inflation was approximately 60 percent; taking that inflation into full account, planned health expenditures could have declined by about 18 percent in 1974 over 1973. As a proportion of estimated GDP, however, budget health sector expenditures are roughly the same in 1974 as they were in 1973 (approximately two percent).

If there was a real increase in GDP in 1974 over 1973, it would follow that health sector expenditures also increased in real terms. However, the possibility would remain that inflation affected the cost of health services significantly more than is suggested by the general increase in the cost of living index. There is no health-specific inflation index; it is therefore impossible to calculate the real increase (or possible real decrease) in the health sector's expenditures between 1973 and 1974.

There is little doubt, however, that the health sector's planned expenditures for those two years represent a smaller share of GDP than was the case in the three preceding years (Table 6.2). From 1970 to 1972, the combined budgets of the MOH and SSS represented between 2.25 and 2.43 percent of GDP. In 1973 and 1974, their proportion of GDP declined to about 2 percent. The proportional decline is due solely to a sharp relative drop in SSS expenditures as a proportion both of GDP and of public health sector expenditures during this period. This relative decline in recent health sector expenditures is too large either to be ignored or to be explained as falling within a reasonable margin of error in the available data.

The proportion of GDP accounted for by the public health sector is also low as judged by comparing Bolivia with other nations. In other countries at roughly comparable levels of development, up to three percent of GDP is accounted for by the public health sector; in more advanced countries, the proportion is up to twice as large. On a per capita basis, Bolivia spends about US$6 on all its public health services (see below). By rough estimate, this is about half the per capita expenditure required to provide minimally adequate public health services for the country.

Table 6.1 - Bolivian Public Health Sector Expenditures, 1970 - 74
(In millions of current pesos)

Year	Total Sector Expenditures[a]		Ministry of Health[b]		Social Security System[c]	
	Total	Percent	Total	Percent	Total	Percent
1970	274.1	100	75.6	27.6	198.5	72.4
1971	310.9	100	84.8	27.3	226.1	72.7
1972	345.9	100	85.3	24.7	260.6	75.3
1973	426.8	100	125.9	29.5	300.9	70.5
1974	579.3	100	227.2	39.2	352.1[d]	60.8

Sources: MPSSP, Dirección Nacional de Administración; IBSS, Departamento Actuarial y Financiero, unpublished data, 1974.

[a]The two major components of the public health sector are the Ministry of Social Welfare and Public Health (MPSSP), and the Social Security System (SSS). In 1973, they jointly accounted for approximately 90 percent of the total health sector expenditures. The remaining 10 percent include health expenditures by Ministries and semi-autonomous government agencies.

[b]Excluding the "Sector de Previsión Social" (Social Welfare) of the Ministry, which in 1974 accounts for 56 percent of the total ministry budget, and which accounts largely for pensions to Bolivian war veterans and their dependents.

[c]Total of 10 social security programs listed in Table 6.6 below.

[d]Unofficial estimate, arrived at by increasing 1973 budget by average annual percentage (17%) of 1970-73 increases.

Table 6.2 - Public Health Sector Expenditures As a Proportion of Gross Domestic Product, 1970-74
(In millions of current pesos)

Year	Gross Domestic Product Total	Gross Domestic Product Percent	MOH and SSS Total	MOH and SSS Percent	Ministry of Health Total	Ministry of Health Percent	Social Security System Total	Social Security System Percent
1970	12,183	100	274.1	2.25	75.6	0.62	198.5	1.63
1971	12,783	100	310.9	2.43	84.8	0.66	226.1	1.77
1972	15,271	100	345.9	2.27	85.3	0.56	260.6	1.71
1973	(21,500)	100	426.8	1.99	125.9	0.59	300.9	1.40
1974	(28,600)	100	579.3	2.02	227.2	0.79	(352.1)*	1.23

Sources: GDP from USAID/ECOM.
MOH and SSS, see Table 6.1
( ) Estimates
* See note d, Table 6.1

If Bolivia should undertake to double per capita public health expenditures by 1980, that would require an increase from 2.2 percent to about 3.7 percent of public health sector expenditures as a proportion of GDP (assuming a GDP real growth rate of about 6 percent annually)*. It is conceivable that much of this increase in budgeted public health sector expenditures might occur outside the MOH and present SSS framework. Currently, these two sources account for about 90 percent of total public health sector expenditures. The remaining 10 percent are budgeted in several other Ministries and decentralized government agencies. The government currently anticipates that responsibility for environmental sanitation investments in rural communities with over 500 inhabitants will be assigned to a semi-autonomous agency (CORPAGUAS); a new social security agency for campesinos is also being considered. It is likely that, in the future, these new agencies will account for substantial proportion of public health sector expenditures outside the MOH and the SSS budgets.

---

* Assuming population coverage in 1974:

MOH		SSS		Private	
Urban	600,000	Urban	800,000	Urban	160,000
Rural	400,000	Rural	100,000	Rural	40,000
Total	1,000,000 (18%)	Total	900,000 (17%)	Total	200,000 (5%)

Total population: 2,100,000 (40%)

Assuming in 1980:

Doubling population coverage to 80 percent by doubling expenditures;

Plus 25 percent increase in efficiency to cover total population;

Plus 17 percent increase (1974-1980) to account for population growth (at constant rate of 2.6 percent per year).

(continued following page)

4. MOH health sector expenditures

The MOH is responsible for two major expenditure categories, public health and social welfare. The latter, which accounts for 56 percent of the total Ministry budget of $b.515.7 million in 1974, pays for pensions and family subsidies of Bolivian war veterans and is not considered part of the health sector.

The Ministry's health sector allocation in 1974 is $b.227.2 million, 44 percent of its total budget. The Ministry health total represents 1.29 percent of the Consolidated National Budget (CNB), which includes all public entities of the national government level; it represents 4.33 percent of the Central Government Budget (CGB), which includes only the 16 Ministries of the national government (Table 6.3). As a percentage of the CNB, the Ministry's health budget has remained virtually unchanged over the past five years. Within the CGB, however, the MOH health budget share has increased proportionally by over one-third in the past two years, compared with the period 1970-72. The Ministry cites this percentage increase as an indication of the government's growing commitment to public

---

Therefore; growth projection of expenditures (in constant values, i.e., not counting inflation):

(1) GDP at 6 percent annual increase,
$b.28,600 million in 1974
$b.40,600 million in 1980

(2) Total public health sector (MOH + SSS + other),
$b.640 million in 1974 (2.2 percent GDP)
$b.1,280 million (i.e., doubled) plus 17 percent (population growth) = $b.1,500 million in 1980 (3.7 percent GDP) = US$12 per capita

(3) Public health sector net increase (1974-1980),
$b.1,500 million minus $b.640 million = $b.860 million or US$43 million, of which MOH's share is 35 percent or US$15 million

(4) MOH's deficit = US$10.2 million,
needed - US$11.4 million + US$15 million = US$26.4 million,
expected rute - US$ 11.4 million at 6 percent annual increase = US$16.2 million.

Table 6.3 - Health Budget of the Ministry of Health (MOH) as a Proportion of the Consolidated and Central Government Budgets, 1970-74*

(In million of current pesos)

Year	(A) Consolidated National Budget		(B) Central Govt. Budget		MOH Health Budget		
	Total	Percent	Total	Percent	Total	As Percent of (A)	As Percent of (B)
1970	5,956.5	100	2,509.8	100	75.6	1.27	3.01
1971	5,606.7	100	2,678.2	100	84.8	1.51	3.16
1972	6,482.6	100	3,119.4	100	85.3	1.32	2.73
1973	12,520.4	100	2,917.0	100	125.9	1.00	4.32
1974	17,556.1	100	5,246.6	100	227.2	1.29	4.33

* See note b, Table 6.1
(A) Includes Ministries and all other national government agencies.
(B) Includes only the 16 Ministries of the central government.

Source: MOH, Dirección Nacional de Administración, unpublished data, 1974.

health. As a proportion of GDP, however, the MOH health budget remained roughly the same (0.6 percent) from 1970 to 1973, with a significant increase to 0.8 percent noted only in 1974.

Of the MOH total health budget, over 90 percent usually goes to operating expenditures (Table 6.4). Investment expenditures have averaged about eight percent, except for 1973 when a US$500,000 UNICEF grant increased the proportion to 14 percent. In fact, since 1971, investment expenditures have largely come from external sources, channeled through the President's emergency (Plan de Emergencia) fund and Program for Economic and Social Take-off (PADES). Within the Ministry's investment budget, about four-fifths of the total are spent for equipment, with only about one-fifth allocated for construction, including the renovation of existing facilities. Visible evidence suggests that the Ministry's investment budget is seriously deficient, particularly for the renovation of facilities and for equipment purchases.

Although the MOH has had virtually no funds to invest in new construction, others have constructed a significant number of rural health facilities over the past few years. The principal government source of funding has been the National Community Development Service (NCDS) of the Ministry of Agriculture; during the past two years, NCDS has helped communities build 220 units. Civic organizations have financed the construction of many such units in cities and smaller towns.

The MOH usually is expected to finance the operation of the new facilities built by others (although the Ministry is not always consulted about the location, the design or even the need for the new facilities). The Ministry's health budget has not been sufficient to finance the operation of all such installations. Therefore, a substantial proportion of both rural and urban health facilities remain altogether unutilized.

On the average, salaries account for about 70 percent of the total MOH operating budget, maintenance for less than ten percent, and supplies for about 20 percent (Table 6.5). The supply category includes payments for meals for staff and patients in health centers; very little is left for other medical supplies. This is perhaps the only obvious item in the MOH health budget that might be reallocated to a higher priority use.

Viewed from another perspective, the MOH health budget allocates about 64 percent (1973 data) to the regional (Departmental) health service units (Unidades Sanitarias) which administer the predominantly curative health services of the Ministry. Seven percent goes to vertically organized national health programs, which are

Table 6.4 - Operating and Investment expenditures, Ministry of Social Welfare and Public Health, 1970 - 74
(In million of current pesos)

Year	Total Budget		Operating Expenditures		Investment Expenditures	
	Total	Percent	Total	Percent	Total	Percent
1970	75.6	100	70.4	93.1	5.2	6.9
1971	84.8	100	76.6	90.3	8.2	9.7
1972	85.3	100	79.8	93.5	5.5	6.5
1973	125.9	100	108.3	86.0	17.6	14.0
1974	227.2	100	209.5	92.2	17.7	7.8

Source: MPSSP, Dirección Nacional de Administración, unpublished data, 1974

Table 6.5 - Health Operating Budget by Categories, Ministry of Social Welfare and Public Health, 1970-74
(In millions of current pesos)

Year	Total Health Operating Budget		Personal Services [a]		Maintenance [b]		Supplies [c]		Transfers	
	Total	Percent	Total	Percent	Total	Percent	Total	Percent		
1970	70.4	100	47.1	67.0	9.0	12.7	13.3	18.9	1.0	1.4
1971	76.6	100	55.2	72.1	8.3	10.9	12.9	16.8	0.1	0.2
1972	79.8	100	60.1	75.3	7.0	8.7	12.5	15.7	0.2	0.3
1973	108.3	100	72.3	66.7	12.2	11.3	22.6	20.8	1.3	1.2
1974	209.5	100	151.3	72.2	11.9	5.7	43.9	20.9	2.4	1.2

Source: MPSSP, Dirección Nacional de Administración, unpublished data, 1974

[a] Includes salaries of medical and support personnel of the Public Health Service

[b] Includes costs of maintenance, travel, telephone, etc.

[c] Includes costs of meals for medical and support personnel in the field and for hospitalized patients (about one half of the total), and medical supplies (about one half of total)

Totals may not add exactly due to rounding of components.

responsible for specific preventive health campaigns, 16 percent for investment, and 13 percent for central administration at the Ministry. There are other administrative expenditures at each Unidad Sanitaria as well as for the health campaign and investment programs. Therefore, perhaps as much as one-third of the MOH health budget is spent on administration, a proportion which would appear to be unnecessarily high.

It need not be concluded that the MOH is over-administered, however. The more pertinent observation is that the investment and operational functions of the Ministry are seriously underfinanced. The further implication is that the MOH management should be able to administer increased investment funds and operations in the future without significantly increasing the expenditures for administrative purposes.

Unfortunately, a breakdown of the MOH health budget by programs is not available. For program planning and development purposes, it will be necessary to know what is spent for the Ministry's activities in each area, such as maternal and child care, nutrition, communicable diseases, environmental sanitation, and rural medical care. The five areas mentioned are identified as priorities in the five-year national health plan (1973-77). The plan states quantitative goals for program improvements in these five areas and even estimates their costs. It is now impossible, however, to convert these cost estimates into expenditure projections that conform with the Ministry's established budgetary categories.

The national health plan's cost projections, moreover, are incomplete, cost in terms of 1972 constant pesos, and variously listed as incremental and total program budgets. At this time, there is no complete and formally endorsed set of health sector targets; it therefore seems pointless now to calculate detailed expenditure projections for the MOH. To compute specific expenditure projections, it would be necessary, first, to determine each agency's functional responsibilities for the entire public health sector; second, to define health services deficiencies by program area (involving a combination of economic demand and biological need criteria); and third, to agree upon attainable targets and priorities (attainable both in terms of the projected availability of funds and of absorptive capacity within the sector).

5. SSS health sector expenditures

Bolivia's Social Security System (SSS) provides employed workers and their families with health and life insurance and with old age pensions for employees. It operates its own health services.

The "system" is one in conceptual and legal terms only. In fact, it consists of about a dozen uncoordinated agencies that provide different levels and types of insurance and payments.

The Caja Nacional de Seguridad Social (CNSS), created in 1956, initially was supposed to cover all wage earners. However, several powerful economic sectors, such as mining, transportation, and banking, refused to join the CNSS. Instead, each created its own caja or insurance agency. The recently-created Instituto Boliviano de Seguridad Social (IBSS) is intended to be a planning and coordinating umbrella agency for all of the SSS cajas; statistics cited below were supplied by IBSS.

The SSS reportedly covers approximately 900,000 wage earners, dependents, and pensioners, roughly equivalent to the urbanized and relatively modern segment of the Bolivian economy and society. Available data account for most but not all of the SSS coverage (Table 6.6) and of the system's health expenditures (Table 6.7). In 1973, the largest caja, CNSS, accounted for approximately 80 percent of all persons reported to receive SSS coverage, but CNSS expenditures were only 55 percent of the reported total of SSS health services expenditures. Average annual per capita costs vary greatly among agencies, ranging from a low of $b.234 for CNSS members to $b.1,207 for members of the insurance agency that covers chauffeurs.

The average annual SSS cost per capita is $b.296. This amount is about twice the average annual per capita cost of MOH health services, assuming that the MOH effectively serves no more people than does the SSS. In 1971, however, the SSS reported over three times as many medical consultations as did the MOH. This would make the average cost of each MOH consultation about twice that of the average SSS consultation. Such comparisons are sometimes cited in Bolivia in the inevitable competition and conflicts of interest between the MOH and the SSS, but they are neither proper, meaningful, nor statistically accurate.

It is probably valid to say, however, that the SSS provides relatively adequate service, but also relatively very expensive medical service. The exception is CNSS; CNSS facilities and services are, in many cases, ignored by covered employees, who prefer to use private medical services. Employees are required to contribute 3.5 percent of their wages to their insurance agency; their employers have to pay 15 percent of their total wage bills to the agency. These apparently high contributions create an incentive for both employees and employers to expect ample and high-quality medical services as well as the medicines which the SSS typically also provides. As a result, SSS facilities and services (CNSS aside)

Table 6.6 - Population Covered by Social Security System *

Agencies	Year	Employees	Pensioners	Dependents	Total
1. Caja Nacional de Seguridad Social	1973	142.288	58.179	500.797	701.264
2. Caja Petrolera de Seguro Social	1973	8.072	781	23.063	31.916
3. Caja Ferroviaria de Seguro Social	1972	136	2.655	4.083	6.874
4. Caja de Seguro Social de Choferes	1973	2.750	-	6.325	9.075
5. Seguro Social Universitario	1973	1.500	70	2.560	4.130
6. Seguro Social de C.B.F.	1973	1.800	-	5.600	7.400
7. Corporación Minera de Bolivia	1972	22.775	-	76.525	99.300
8. Empresa Nal. de Ferrocarriles (RedO.)	1972	4.744	-	12.097	16.841
9. Ferrocarril Guaqui La Paz	1972	529	-	1.217	1.746
10. Bolivian Power Co.	1973	680	-	1.564	2.244
Totals		185.274	61.685	633.831	880.790

Source: IBSS, Departamento Actuarial y Financiero, unpublished data, 1974

* Health insurance only (i.e., excluding pensions, etc.)

Table 6.7 - Health Services Expenditures of the Social Security System, 1970-73
(In millions of current pesos)

Agencies	1970	1971	1972	1973
1. Caja Nacional de Seguridad Social	114.5	128.6	140.8	164.2
2. Caja Petrolera de Seguro Social	4.6	5.3	10.4	(12.5)
3. Caja Ferroviaria de Seguro Social	3.1	3.5	5.1	(6.1)
4. Caja de Seguro Social de Choferes	(7.9)	(9.3)	110.0	11.0
5. Seguro Social Universitario	1.2	1.3	1.5	2.6
6. Seguro Social de la C.B.F.	(4.8)	(5.7)	6.7	55.7
7. Corporación Minera de Bolivia	51.1	60.4	69.6	(80.0)
8. Empresa Nal. de Ferrocarriles (Red Occid.)	8.9	9.2	12.5	(15.0)
9. Ferrocarril Guaqui - La Paz	0.7	0.9	1.0	(1.2)
10. Bolivian Power Co.	(1.6)	(1.9)	2.2	2.9
Totals	198.5	226.1	260.6	300.9

Source: IBSS, Departamento Actuarial y Financiero, unpublished data, 1974

( ) = Estimates

Note: Totals may not add correctly due to rounding.

are frequently better than adequate, but they also probably are used with unnecessary frequency by the beneficiaries.

Bolivia cannot afford high or wasteful health expenditures, but there would appear to be some excesses in SSS operations. The SSS health services budget has, for several years, operated with a deficit (23 percent in 1973); deficits have been financed out of the reserves of the SSS pension and death benefit funds. In part, deficits are due to incomplete payments by employers and employees. Through the IBSS, the SSS is attempting to reduce and eliminate its deficit. The methods chosen are: (a) better collection of contributors' payments and (b) a rate hike. The cajas are not seriously considering either increases in operating efficiencies or reductions in services, however, reportedly because of assumed institutional and political obstacles.

The pension and death benefit funds have been used to finance the health services expenditure deficits. Therefore, the SSS has not been able to expand facilities and equipment, in which some of those funds are usually invested. Certain payments from the pension and death benefits funds, however, also represent direct costs for morbidity and mortality. In 1974, for example, it is estimated that the CNSS made payments totaling US$8.5 million to disabled workers for occupationally - related disease and accidents.

Thus, the SSS is a heavily financed system with a budget over twice as large as that of the MOH (during 1970-73); nevertheless, it is currently in an unstable financial condition. Perhaps as a result of its shortage of investment funds, the CNSS, for the first time, recently entered into agreements with the MOH involving jointly financed and operated hospitals (in Vallegrande, Trinidad, and Tarija). Even within the SSS, however, the various insurance companies (cajas) in many cases often prefer not to operate joint services. Instead, they construct separate facilities, sometimes in close proximity to one another (e.g., in Santa Cruz). It would appear that such duplication should be both avoided and eliminated, particularly where health services and facilities are underutilized.

6. Other public health sector expenditures

The MOH and SSS together account for about 90 percent of total public health sector expenditures. The remaining 10 percent of the expenditures are made by a number of diverse institutions. Some provide health services for their own employees as part of their specialized functions, e.g., the Servicio Nacional de Caminos (highway department) and the Empresa Nacional de Ferrocarriles (national railroad).

Others provide health services for the public sector at large. It proved impossible for the present to identify all such expenditures in detail, but ten percent seems a good estimate.

Over the past three years, the most important expenditures for the public health sector at large have been the investments made by the National Community Development Service (NCDS) in rural health centers, and by CORPAGUAS in environmental sanitation (principally potable water systems). Both agencies have depended largely on external sources of investment financing. It is important to note, however, that over half of total project costs have been contributed in the form of materials and labor by the recipient communities. As noted above, these contributions typically are not included in data sources on health sector financing.

Principal problems in the financing of environmental sanitation, identified by a recent WHO/IBRD report, include: (a) insufficient direct revenues to cover operating costs and (b) the government has not matched the already-available external funds in accordance with existing loan agreements. Even among the major urban centers, only La Paz and Santa Cruz have self-supporting sources of financing.

About 80 percent of Bolivia's total population have no access to potable water and 90 percent lack sanitary sewerage facilities. The WHO/IBRD report recommends assigning priority to urban areas, and suggests these targets: increase access to potable water in urban areas from 55 percent in 1973 to 65 in 1980; and increase access in the rural areas (including communities with fewer than 2,000 inhabitants) from 4.5 percent in 1973 to 19 percent in 1980. The recommended sewerage targets are to increase urban coverage from 24 to 37 percent, and to increase rural coverage from 3.2 to 15 percent by 1980. The investment estimated totals US$48 million, including US$28 external and US$20 internal funding, with 80 percent of the total allocated to urban areas.

Finally, the National Social Development Council (JNDS), a dependency of the President's Office, operates certain types of curative health services as part of a larger social service program. The JNDS budget increased from $b.26.9 million in 1973 to $b.57.0 million in 1974. Unfortunately, the JNDS was not able to identify the proportion of its total budget spent on health services.

7. Public health sector sources of revenue

The problem of insufficient public health sector coverage can be traced to two problems: one, to be discussed in section 9 below, is inefficient utilization of the existing resources; the other is the insufficiency of those resources.

The MOH in 1974 received 86 percent of its budget from the National Treasury, seven percent from program income (mostly fees for service and sales of medicines), and five percent from external sources (Table 6.8). In 1974, the proportion of the Ministry's budget from the Treasury is significantly higher than in earlier years, due to a more than doubled allocation of funds (in current pesos). As was noted above (Table 6.3), the Ministry's share of the CGB increased sharply in 1973, but in 1974 its share remained the same as in 1973. Thus, the 1974 Treasury allocation to the MOH is in fact not as significant an increase as would at first appear.

The Ministry's internally-generated program income, moreover, has declined significantly. This should be a cause for concern in any analysis of MOH revenues, especially since a downward trend is discernable since 1971. Aside from international assistance, already referred to, the Ministry has no other sources of significant revenues. In 1973, the GOB received $b.1.3 million from the National Lottery, which transmits 60 percent of its income to the Ministry. There was no other significant source of revenue.

The SSS has no source of revenue other than the required subscriptions by employers and employees of 15 percent and 3.5 percent, respectively, of the total wage bill and of individual wages. The contemplated increase in these levies, likely to be strongly opposed by employers and workers alike, in fact does not seem justifiable in view of reported misuses and underutilization of services. An increase, however, would offset the decline of the SSS budget as a proportion of GNP, noted above.

Among autonomous agencies (e.g., road and railroads), health service expenditures apparently are financed principally through internally generated funds, but this matter needs further investigation. The NCDS and CORPAGUAS have relied heavily on external funding, although total project costs always require Bolivian counterpart funding from both national and community sources. Finally, 83 percent of the JNDS budget in 1974 is funded by the National Treasury; the balance is derived from fees for service.

8. Private health sector expenditures

There are practically no data on private health sector expenditures. The following hypothetical calculation is therefore subject to a substantial margin of error. It is known, however, that there is a private market for medical services in Bolivia, and that the private market is used by all strata of the population.

Table 6.8 - Sources of Health Budget, Ministry of Health, 1970-74
(In millions of current pesos)

Year	Total Income		Allocation from Treasury		Internal Transfers		Program Income		Carry-over from Previous Budgets		International Assistance	
	Total	Percent	Total	Percent	Total	Percent	Total	Percent	Total	Percent	Total	Percent
1970	75.6	100	61.2	80.9	3.3	4.3	8.1	10.7	N.A.		3.0	4.1
1971	84.8	100	57.1	67.4	1.7	2.0	21.3	25.1	N.A.		3.7	5.5
1972	85.3	100	64.4	75.4	1.1	1.3	14.8	17.4	N.A.		5.0	5.9
1973	125.9	100	93.2	74.0	3.2	2.5	17.7	14.1	1.1	0.9	10.7	8.5
1974	227.2	100	195.0	85.8	3.0	1.3	16.1	7.1	1.8	0.8	11.3	5.0

Source: (MOH), Dirección Nacional de Administración, unpublished data, 1974.

N.A. = not available.

Private market transactions range from modern medical to traditional, herbal and ceremonial, treatments of illness. Most such transactions involve exchanges of health services for payment in money, goods, or other kinds of services. The modern and traditional private markets for health services coexist, with considerable overlap of the margin, particularly in smaller towns and rural areas. Providers of services include trained medical practitioners and numerous traditional curanderos (healers) and parteros (midwives) of both sexes; they also include pharmacists and untrained dispensers of medicines and drugs, who frequently are the first or the only ones consulted about a cure for some self-perceived illness, and are other important providers of service.

Given certain assumptions, detailed below,* it may be estimated that the private market for modern medicine accounts for at least US$18 million (about US$3 per capita), or about half

---

* Estimate of the private market for medical services in 1974.

Outpatient visits:
(A) 500 private, full-time equivalent doctors,
(B) who work 240 days per year, and
(C) who work six hours per day, and
(D) who see two patients per hour, and
(E) who charge $b.50 per patient visit, but
(F) who collect from only 50 percent of patients
Income estimate = (A)(B)(C)(D)(E)(F) = $b.36 million or US$1.8 million

Hospitalization:
(A) 1,350 private beds, which average
(B) 20 patients per bed per year, who remain
(C) 7 days, at
(D) $b.160 per day
Total = (A)(B)(C)(D) = $b.30.2 million or US$1.5 million

Surgery:
(A) 8,000 major operations, at
(B) $b.3,000 each
Total = (A)(B) = $b.24 million or US$1.2 million

Deliveries:
(A) 5,000 deliveries, at
(B) $b.2,000 each
Total = (A)(B) = $b.10 million or US$0.5 million

(continued following page)

the total of public health sector expenditures. If it is further assumed that about US$5 million more are spent on traditional medicine, private health sector expenditures may total US$23 million, or about US$4 per capita. Private expenditures thus would represent two-thirds the amount of public health sector expenditures. The country's total health sector expenditures then would total about $b.1 billion, equivalent to US$50 million, or about 3.5 percent of the estimated GDP for 1974.

Several cross checks enhance the credibility of the above estimates. First, the US$5 million estimate for traditional medicine represents between one and two percent (or about US$1 per capita) of traditional sector income. The US$18 million estimate for modern medicine represents between five and eight percent (or about US$30 per capita) of modern sector income. These average private propensities to consume health services appear reasonable in the light of international comparisons. Another comparison is the following: of US$50 million total health sector expenditures, about US$40 million benefit the modern sector, while only about US$10 million benefit the traditional sector; this distribution of health expenditures roughly parallels the country's income distribution. Finally, all assumptions purposely involve low estimates of the variables, so that the resultant overall estimate of private health sector expenditures turns out to be "reasonable" in the sense that it is conservative.

Laboratory and X-ray:
(A) 240,000 procedures, at
(B) $b.100 each
Total = (A)(B) = $b.24 million or US$1.2 million

Drugs and medications:
(A) $b.400 million in imports (after profits and expenses) of which
(B) 60 percent is for private consumption (40 percent for SSS)
Total = (A)(B) = $b.240 million or US$12 million

Total estimated expenditures:

Outpatient visits	US$ 1.8 million
Hospitalization	1.5 "
Surgery	1.2 "
Deliveries	0.5 "
Laboratory and X-ray	1.2 "
Drug and medications	12.0 "
Total	US$18.2 million

9. Efficiency of the public health sector

The low level of efficiency with which resources are being utilized in the public health sector is a problem equal in importance to the parallel problem of insufficient revenues available to the sector. Inefficient resources utilization can have two causes. One cause might be that the necessary factor inputs in the production of health services are available in the right combination but are not being fully utilized. A second (and more likely) cause could be that the necessary inputs are not available in the right combination, and that available inputs remain under-utilized because of the insufficient availability of complementary inputs.

Three types of solutions suggest themselves to the problem of inefficiency, as just defined. If the first cause prevails, the solution is to increase overall factor efficiency, typically through some kind of incentive. If the second cause prevails, one solution would be to add to those inputs in short supply; the other solution would be to change the production function, i.e., to alter the combination of factors (inputs) required for any particular health service. An important implication of all three types of solutions is that they all require allocations of additional resources in order to increase the level of efficiency.

It is possible, of course, and indeed typical, to increase resources without increasing the level of efficiency. The inverse, as just observed, in all likelihood is not possible. However, given the scarcety of resources available to the public health sector in Bolivia, it obviously is important to make an increase in efficiency a condition of any increase in resource allocation. This simple model of efficiency considerations is amply supported by substantive descriptions of inefficient health sector behavior elsewhere in this Assessment. A few examples should suffice to illustrate the model's validity.

Example: The hourly wage for a physician is roughly the same (about $b.1,000 per month) in the MOH and SSS health services, regardless of the physician's experience, specialty or location (i.e., urban/rural). This clearly represents a disincentive to work at an optimal level of output, unless one assumes that all physicians are equally qualified. The solution would be to pay physicians in accordance with an experience scale and expect the more experienced ones to be more productive than the others.

Example: The average number of patient visits per hour in MOH health services is 1.7, compared to about 3.5 in the SSS (1971). Considering that many physicians work for both health services, and that optimal productivity therefore should be roughly identical, the lower efficiency of MOH health services suggests that complementary factors of production (e.g., ancillary personnel. equipment, supplies, etc.) are

insufficient to attain optimal output. The solution is to increase complementary inputs, or to consider the solution indicated in the following example.

Example: In the rural areas of Bolivia, trained auxiliary medical personnel as well as indigenous health practitioners provide medical services that in modern medical practice would be provided by physicians. It can be argued, however, that auxiliary and indigenous health practitioners, if properly trained, can perform many medical services just as well as physicians. This suggests that, in rural areas, health services should be provided with a different production function (i.e., combination of inputs) than in urban areas (which, in practice, is the case already). The solution here is to work with different production functions in the rural and urban areas, respectively, and to train auxiliary and indigenous medical practitioners in the required functions.

In short, there are numerous ways in which efficiency could be increased in health services delivery, but in most cases such interventions would require increased resource allocations as well. Also, in many situations, the combinations of health service inputs (production functions) could be altered to utilize available resources (i.e., inputs or factors) more efficiently, as well as to reduce the quantity of scarce resources required.

D. Health Manpower

1. Current situation

Bolivia's health manpower is scarce by Latin American standards, and very scarce compared with the needs for medical care. The problem is compounded by the fact that intermediate level personnel are in shorter supply than physicians, implying inefficient utilization of personnel. Health manpower is concentrated in urban areas and provides preferential care to specific groups of the population. Projections of supply indicate that this situation will continue, unless significant changes are made in the training system. The current health personnel educational system is fragmented, and responsive to student demand rather than to national manpower requirements. It is inefficient and produces personnel that vary on a continuum from average to very poor.

Table 6.9 contains estimates of the number of health workers in Bolivia, their institutional affiliations, and some Latin American norms. Such figures should be treated with great caution. For example, estimates of the number of physicians vary by as much as 50 percent. It has not been possible to reconcile all differences,

Table 6.9 - Estimated Number of Health Workers In Bolivia

Type	Total[a] (1970)	Ministry of Health[b] (1974)	Social Security System[c] (1973)	Total Professionals per 10,000 Population[a]	Recommendations of Minister of Health Personnel/10,000[d]
Doctors	2143	674	1055	4.35	8
Dentists	903	91	195	1.83	2.0
Sanitary Engrs.	7	12	1	.01	
Veterinarians	250	92		.51	
Pharmacists	1600	28	195	3.20	
Dieticians or Nutritionists	24	35	13	.05	
Health Educators	12	10		.02	
Social Workers	296	40	38	.60	
Graduate Nurses	542	354	1116	1.10	4.5
Auxilliary Nurses	1264	1066		2.56	14.5
Nutrition Auxilliary	8	4		.02	
X-Ray Technicians	9	30	46	.02	
Lab. Technicians		74	180		
Medical Technicians		2			3
Health Inspectors	74	248		.15	

Sources: [a]Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p. 38.
[b]Comisión Interministerial del Sector Salud, Informe de la Comisión de Recursos Humanos, 1974
[c]Urioste, Francisco, "Atención Médica en la Seguridad Social Boliviana", unpublished paper, 1974
[d]Organización Panamericana de Salud, Plan Decimal de Salud para las Américas, REMSA 3/30 (Esp), Santiago, Chile, Octubre, 1972, p. III-7.

Table 6.10 - Distribution of Professional Health Workers by Specialization, 1970

Category	Number	Per 1000 Persons
Doctors	2143	4.35
General Medicine	876	1.78
Specialists	1234	2.5
Public Health Physicians with special training	33	.06
Dentists	903	1.83
Working in public health	91	.18
Special training in public health	5	.01
Engineers		
Working in public health	7	.01
Sanitary engineers	1	
Graduate Nurses	542	1.30
Post graduate training in Public Health	49	.10

Source: Aguirre, Alfredo "Regionalización de Area de Influencia de las Facultades de Ciencias de la Salud de Bolivia", Publicación Final, Primer Seminario Nacional de Facultades de Ciencias de la Salud, Cochabamba, 1973

even within this section of the Assessment. However, manpower problems are so gross that the inaccurancies are not significant in the judgment of the overall situation and priorities.

Analysis of the data in Table 6.9 indicates that there are few physicians, even fewer nurses and nursing auxiliaries. Dentists and pharmacists are probably in adequate supply, but there is a critical deficiency of other allied medical personnel. The overall pattern shown is one in which professional training (doctors, graduate nurses, dentists, pharmacists) has been stressed far more than paramedical training. This is costly both at the operational level and at the training level. It is consonant with a general social phenomenon in Bolivia: the majority of the "socially elite" secondary school graduates demand and obtain university training; the results are inadequate supplies of middle manpower and an oversupply of "educated" persons looking for meaningful employment.(2)

Table 6.10 illustrates the specialization of professional health workers. The fact that 57 percent of physicians describe themselves as specialists is especially indicative of the inappropriateness of this medical structure for the Bolivian situation. The shortage of professionals in public health to perform key planning and administration tasks at national and regional levels is of great importance for the operation of the sector.

Another grave problem in manpower supply is the lack of well trained maintenance and administrative personnel. In a 1966 survey of establishments reporting difficulty in hiring personnel, mechanics and repairmen, electrical workers and electrical technicians were the first, second and fourth most mentioned skill categories. Economists (for administrative tasks) and office workers were fifth and sixth respectively. Managerial skills were not noted by the managers questioned.(3)

In addition to the modern health workers, there are also a variety of traditional practitioners. No statistics have been located relative to these practitioners; neither their number, the size of their practice, nor their income is known. However, it is believed that they attend not only the great majority of needs of the rural population but also a significant portion of those of the urban population. Every city and town has markets selling traditional medications, as well as its own traditional practitioners. Most indigenous groups have autochthonous medical practitioners. Their practice represents a combination of: (a) precolombian Indian and (b) Spanish colonical medical concepts and practices, with a strong element of mysticism and magic. Finally, there are sanitarios, persons with less than medical training, who prescribe and sell modern medicines. Some travel from one feria to another, providing the campesino with an important source of medication.

Table 6.9 indicates that physicians work preferentially for the Social Security organizations. Care in these organizations is even more physician-intensive than in the country as a whole. Physicians typically are contracted by public agencies for either three or six hours per day, six days per week. Three-hour contracts are probably twice as frequent as six-hour contracts. Thus all physicians can enter private practice, and perhaps as much as 50 percent of all physicians' working time is available for private practice. Since private practice can not absorb this manpower, there is considerable underemployment among physicians. This situation was the cause of the formation of a Union of Unemployed Physicians. It is also a significant factor in the migration of physicians to other countries and their transfer to other occupations.

Table 6.11 contains an approximation of the distribution of physicians among Bolivia's geographic areas. Urban areas are relatively well provided for in all parts of the country; the rural supply of physicians varies from poor to dismal. Their low availability in the rural areas, coupled with poor efficiency, results in the abysmally low coverage of rural medical needs previously noted.

The efficiency of medical manpower can be judged by the number of patients seen per physician hour. High-quality general medical care can be maintained with four visits per hour. In situations where morbidity is highly concentrated in a few common categories, and where the quality of medical care is otherwise severely limited by lack of diagnostic aids and secondary care, yields of six to eight visits per doctor/hour can be maintained.

The current yields in selected agencies in Bolivia are:(4)

Ministry of Health-Urban	2.09 visits per hour
Ministry of Health-Rural	1.31 " " "
CNSS	3.5 " " "
COMIBOL	3.6 " " "
Caja Petrolera	3.9 " " "
Railroad workers	2.5 " " "

From these data, it may be concluded that physician supply exceeds demand in the urban areas, and that a significant increase in demand could be accommodated by increasing efficiency of physician utilization. One way to improve efficiency could be to utilize additional auxiliary personnel. In the rural areas, there are very few physicians, and there is a very low yield per physician. The reasons for this situation are explored in Chapter V, where analysis suggests that, for primary care, traditional practitioners as well as physicians in the rural areas can be supplanted by trained intermediate-level personnel.

Table 6.11 - Estimated Availability of Physicians by MOH Regional Health office and Rural/Urban Location, 1974

Regional Health Office	URBAN			RURAL*			
	Number Physicians[a]	1974 Population[b]	Population per Physician	Physician[a] MOH	Physician[a] Total	1974 Population[b]	Population per Physician
La Paz	(800)	633,100	791	30	35	1,115,525	31,872
Potosí	70	70,230	1,003	8	11	725,565	65,960
Cochabamba	220	192,440	875	20	41	696,260	16,982
Santa Cruz	(150)	139,030	927	20	(37)	379,370	10,253
Chuquisaca	102	52,560	515	22	24	460,040	19,168
Oruro	110	101,370	922	6	6	279,630	46,605
Tarija	50	25,690	514	10	11	204,010	18,546
Beni	20	19,940	997	5	(15)	140,229	9,349
Pando	-	-	-	5	5	25,080	5,016
Tupiza	15	14,701	980	4	6	157,804	26,301
Riberalta	(10)	13,071	1,307	2	(2)	25,455	12,728
Total	1,547	1,262,132	816	132	193	4,208,968	21,808

* Estimates exclude physicians employed by the Social Security System affiliates in the rural area.

Source: [a]Le Bow, Robert H., Consultant Report, USAID/Bolivia, 1974.
[b]Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p. 12.

2. Manpower projections

The expected numbers of professional school graduates in Bolivia for the decade 1970-1980 are shown in Table 6.12. The actual graduates for the period 1956 through 1966 is shown in Table 6.13. It is clear that production is expanding faster for physicians than for other health-related professions. By the end of the decade, the number of doctors graduated per year will exceed the combined total of dentists, pharmacists, social workers and veterinarians. Figures 6.1 and 6.2 contain projections for 1970-1980 of: (a) the total of available physicians and (b) the population per physician. If all of the new graduates stay in Bolivia, by the end of the decade Bolivia would reach the Minister of Health's goal of 1,250 persons per physician. If emigration remains high, then physician supply will remain low. It would appear likely that, in the absence of major counter-acting programs, the results of emigration would be that urban physician-to-patient ratios will remain constant and that rural services will remain unmanned by physicians. This judgment is confirmed by the projections in Table 6.14 on the assumption of no major change in the structure of health services.

The question of emigration of skilled manpower obviously is very serious. The medical school in Cochabamba estimates that 80 percent of medical graduates from 1962 to 1972 left Bolivia. Table 6.15 contains somewhat outdated but still pertinent information; there is no indication that the situation has improved. If only half of the "semi-permanent" visas (for study, family moves, etc.) resulted in permanent departure of the professional involved, then the emigration percentages would have been 68.5 percent for doctors, 24.6 percent for dentists, and 35.3 percent for nurses. As seen in Table 6.16, occupational rather than geographic migration also may be an important factor in the loss of health professionals in Bolivia. The samples represented were small; nevertheless, it appears that large numbers of pharmacists and significant numbers of other health professionals do not practice these occupations.

The projection of manpower for the nursing professions is made very difficult by the fragmentation of training programs. At least six nursing schools exist, but only three provided information. There are schools for training auxiliary nurses, but various other institutions, such as the Regional Health offices of the MOH, occasionally offer their own courses. Furthermore, after ten years of practical experience in health services, an otherwise untrained practicante can apply for and receive the title of enfermera empírica. The volume of production is uncertain. Moreover, there are no adequate studies to show how long nursing workers practice their professions nor what the drop-out rate might be.

It appears that nursing schools are graduating approximately 70 licensed professional nurses per year. If this trend continues,

Table 6.12 - Estimated Numbers of Graduates from Health Professional Training Programs

Year	Doctors	Dentists	Pharmacists	Social Workers	Veterinarians
1970	233	83	69	12	26
1971	245	87	72	12	27
1972	258	91	76	13	28
1973	267	95	79	13	29
1974	280	99	83	14	30
1975	294	104	87	14	32
1976	309	109	91	15	34
1977	325	114	95	16	36
1978	341	119	99	16	38
1979	358	124	103	17	40

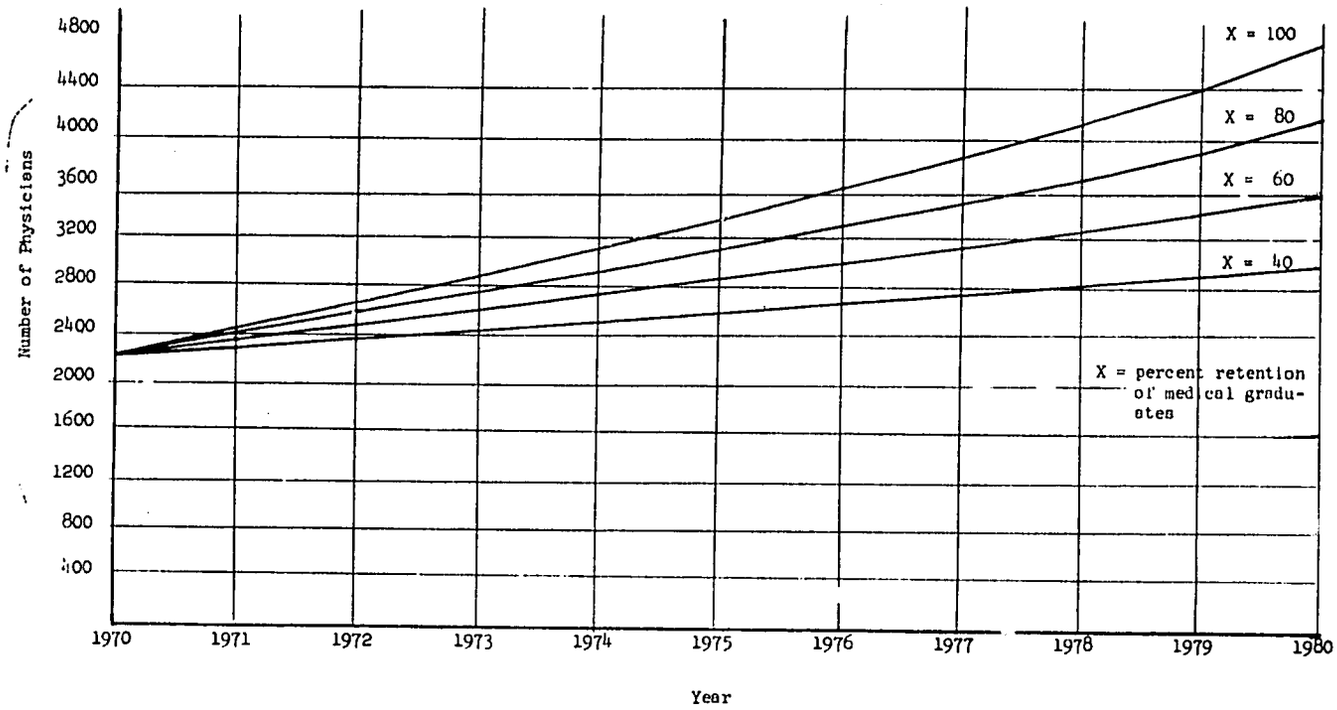
Source: Comisión Interministerial del Sector Salud, Informe de la Comisión de Recursos Humanos, 1974

Table 6.13 - Professional Health Graduates (Egresados) from Universities in Bolivia 1956-1966

Year	Doctors	Dentists	Pharmacists and Biochemists	Social Workers	Veterinarians
1956	59	28	30	13	2
1957	60	37	33	10	3
1958	77	29	43	18	1
1959	75	44	61	19	2
1960	70	28	50	2	2
1961	61	57	67	10	2
1962	105	53	33	11	5
1963	91	51	57	16	6
1964	107	77	51	19	6
1965	130	54	67	8	13
1966	120	71	58	13	16

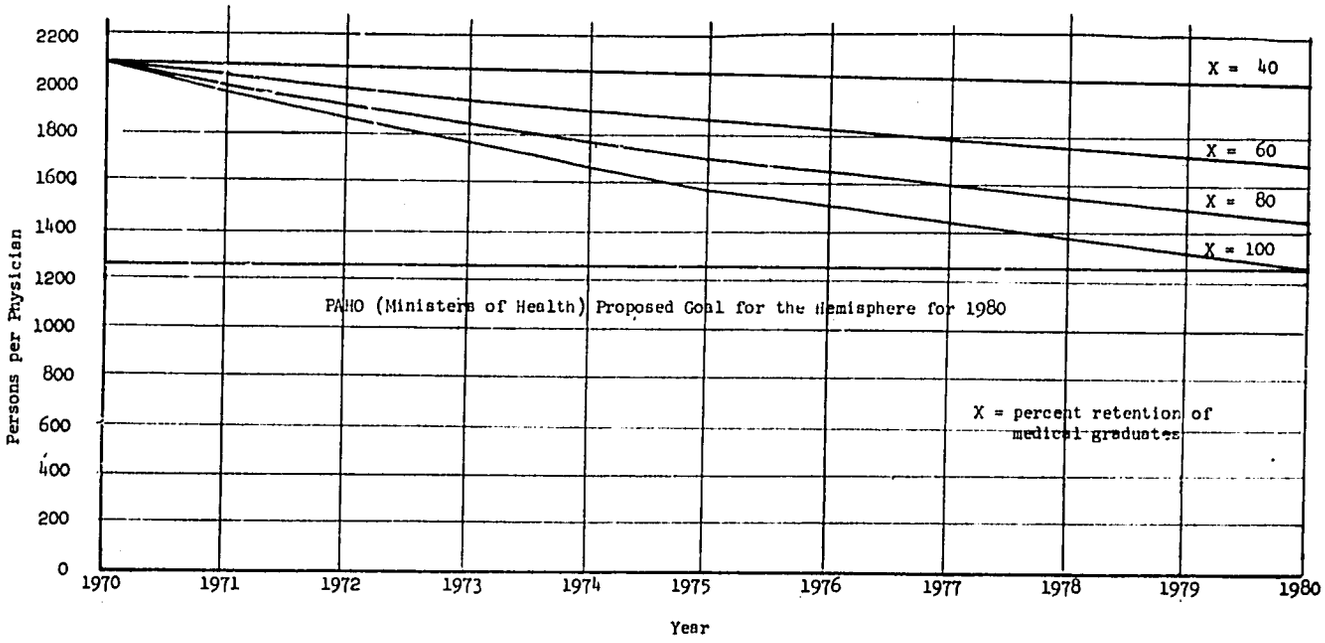
Source: Chirikos, et al, Human Resources in Bolivia, Center for Human Resources Research, Ohio State University, Columbus, Ohio, April 1971, p.216

Figure 6.1 - Projected Supply of Physician Graduating from Bolivian Universities by Retention Rates, 1970-1980



Source: Daly, John, Consultant Report, USAID/Bolivia, 1974

Figure 6.2 - Projected Persons per Physician Ratio by Retention Rates, 1970-1980



Source: Daly, John, Consultant Report, USAID/Bolivia, 1974

Table 6.14 - Estimated Professional Market, Schools of Health Sciencies

Career	Employed 1973	Annual Requirements. 1974	1975	1976	1977	1978	1979	1980
Graduates								
General Medicine	1660	111	151	165	183	183	197	212
General Surgery	807	50	69	75	83	83	89	96
Internal Medicine	271	17	23	25	28	28	30	32
Gynecology	150	10	14	15	17	17	18	19
Pediatrics	178	11	15	17	18	19	20	21
Radiology	35	2	3	3	4	4	4	4
Radiotherapy	16	1	1	1	2	2	2	2
Urology	32	2	3	3	3	3	4	4
Traumatology	50	3	5	5	6	6	6	6
Cancerology	14	1	1	1	1	1	2	2
Anestheology	36	2	4	4	4	4	5	5
Cardiovascular surgery	10	1	2	2	2	2	2	2
Pediatric surgery	34	3	4	4	5	5	6	6
Plastic surgery	7	1	1	1	1	1	1	1
Dermatology	12	1	1	1	1	1	1	1
Psychiatry	37	2	3	4	4	4	4	5
Pathologic Anatomy	25	3	4	5	5	5	6	6
Cardiology	52	3	4	5	5	5	6	6
General Nursing	1881	121	166	175	201	201	216	233
Public Health Nursing	29	2	2	3	3	3	3	3
Pediatric Nursing	7	1	1	1	1	1	1	1
Veterinarian	106	8	17	12	13	13	14	15
Neumology	23	1	2	2	2	2	3	3
Neurosurgery	6	1	1	1	1	1	1	1
Neurology	24	2	2	2	3	3	3	3
Gastrointernology	13	1	1	2	2	2	2	2
Otorrinolaringology	36	2	3	3	4	4	4	4
Oftalmology	48	3	4	5	5	5	5	6
Odontology	715	44	61	66	74	73	79	85
Pharmacy	380	24	33	37	40	40	43	47
Biochemist	386	24	33	36	40	40	43	46
Sub-Total	7080	458	628	681	761	761	820	879
Superior Technicians								
X-Ray	50	3	4	5	5	5	6	6
Clinic Laboratory	85	5	7	8	9	9	10	10
Dietetics and Nutrition	23	2	2	2	3	3	3	3
Veterinary	63	5	7	8	9	9	9	10
Sub-Total	7301	473	648	704	787	787	848	908
Middle Level Technicians								
Auxilliary nurse	904	57	78	86	95	95	102	110
Total per Year	8205	530	726	790	882	882	950	1018

Source: Consejo Nacional de Educación Superior, "Encuesta sobre el Mercado Profesional", 1973

Table 6.15 - Migration of Medical Manpower from Bolivia, 1975

Type of Personnel	Average yearly Number Graduated 1956-1966	Exit Visas 1965				Average Visas 1958-1965
		Permanent	Semi-Permanent	Temporary	Total Visas	
Physicians	95,5	24	83	97	211	104
Dentists, etc.	52,9	6	14	28	48	34
Nurses	35,4	4	17	13	74	46

Source: Chirikos, et. al., Human Resources in Bolivia, Center for Human Resources Research, Ohio State University, Columbus, Ohio, April 1971, pp. 82, 83, 88 and 92.

Table 6.16 - Occupational Migration of Medical Manpower in Bolivia, 1967

Type of Personnel	Work in Occupation for which trained		Professional Technical		Other Occupation	
	Number	Percent	Number	Percent	Number	Percent
Doctors	37	92.5	1	2.5	2	5.0
Dentists	25	86.2	3	10.3	1	3.5
Nurses	3	11.5	20	77.0	3	11.5
Pharmacists	37	75.5	-	-	12	24.5

Source: Chirikos, et. al., Human Resources in Bolivia, Center for Human Resources Research, Ohio State University, Columbus, Ohio, April 1971, pp. 109-110.

augmented only by the rate of about four percent per year, and if 75 percent of these professionals stay in Bolivia, and if no more than two percent of the current staff retire per year, there should be some 1,069 nurses by 1980. Moreover, three of the six nursing schools have been created within the last 10 years; enrollment therefore may increase somewhat faster than projected. In any case, the number of nurses should approximate one-fourth to one-half the number of doctors in 1980. The supply in 1980 therefore will be insufficient.

3. Implications of manpower projections and distribution

In 1966, 33 percent of all students enrolled in universities in Bolivia were enrolled in health sciences; 19 percent were enrolled in medicine. By constrast, engineering and agronomy had a combined enrollment of only 23 percent of the students. There was no formal university program in administration. In terms of the long-term economic health of the country, this pattern should be questioned. Good health of the population does contribute to economic development, but there is little evidence that physicians contribute notably to the health status of the population. It may reasonably be suggested that investment in training MD's is essentially investment in a luxury consumer good for high income groups, and that it should be deemphasized in favor of training professionals who contribute relatively more to economic development. Such arguments also hold true in large part for dentists, professional nurses and pharmacists.

To illustrate and reemphasize this point, a manpower plan appropriate to a new health system, emphasizing a low-cost delivery system for the rural areas, is shown in Table 6.17. Two new manpower categories are included: Medex (or physician's assistant) and dental auxiliary. The plan is based on the assumption of somewhat deficient training for all professionals. To achieve the required manpower for such a system, professional training essentially would be frozen (too late now, of course, since physicians graduating before 1980 are already enrolled). Changes in curricula would be made to prepare forthcoming professionals to work in the new system. New programs for Medex and dental auxiliary training would be developed quickly, and pressed as fast as possible. The number of nursing auxiliaries would be tripled as compared to 1970; this would require training several hundred auxiliary nurses per year. Finally, thousands of additional non-paid health promotors and community health leaders would be trained through programs in their community. The School of Public Health could easily train the required additional sanitarians and laboratory or X-Ray technicians.

Table 6.18 contains data on the enrollment of men and women in the various university schools. Lacking specific figures on the

Table 6.17 - Estimated Manpower needs for 1980, Assuming the Development of a Low Cost Delivery System

Personnel Type	Urban [a]		Rural [b] New System		Rural [c] Old System		Total Requirements 1980
	Number per 1000	Number for 1980	per 1000	Total 1980	per 1000	Total 1980	
Doctors	1	1600	.12	192	.05	160	1952
Nurses	.5	800	.07	112	.01	32	944
Nursing Aux.	1.5	2400	.08	128	.20	640	3168
Medex	--	--	.5	800	--	--	800
Dentists	.5	800	.05	80	.05	160	1040
Dental Aux.	.2	320	.2	320	--	--	640
Sanitarians	.1	160	.1	160	.02	64	384
Diagnostic Auxilliaries	.1	160	.1	160	.01	32	362
Promoters & Leaders	--	--	5	8000	.30	960	8960

[a]Assuming urban population of 1.600,000 for 1980

[b]Assuming 1/3 coverage of rural population of 4,800,000 by 1980

[c]Assuming 2/3 of rural population uses existing system

Source: Daly, John, Consultant Report, USAID/Bolivia, 1974

Table 6.18 - Enrollment in Bolivian Universities by Faculty and Sex-1966

Faculty	Men	Women
Law	1,601	248
Economics	1,962	403
Engineering	1,670	34
Agronomy	444	15
Geology	353	1
Architecture	374	90
Medicine	1,836	184
Pharmacy/Biochemistry	101	398
Dentistry	463	273
Nursing	-	229
Veterinary Medicine	98	1
Philosophy & Letters	50	48
Social Work	1	73
Total	8,953	1,997

Source: Chirikos, Thomas N., et.al., Human Resources in Bolivia, Center for Human Resource Research, Ohio State University, Columbus, 1971, p. 211.

employment of men and women, respectively, in the public sector, these enrollment data are used here as surrogates. Women have only made a partial impact in the medical profession in Bolivia, but completely dominate nursing and social work, and surprisingly represent the majority of pharmacists. Women comprise about one third of Bolivia's dentists. Analysis of three groups of graduates of the School of Public Health indicates that 19 percent of the nursing auxiliaries graduated were men, 48 percent of statistical clerks and officers were men, and 93 percent of hospital administrators were men. This last figure must be dealt with cautiously, however, since much of the actual administrative responsibility within hospitals is the responsibility of nurses.

The expansion of the current health system would continue to utilize women in what is, by Latin American standards, a strong social and economic participation. The type of system outlined in Table 6.17 could and should provide considerable additional opportunity for women in the middle brackets. Thus the Medexes probably should be drawn from the ranks of the current nursing auxiliaries, providing advancement

for these workers, the majority of whom are women. Similarly, dental auxiliaries should be drawn from both sexes, and therefore a new career should be opened to both men and women. Health promotors and community health leaders obviously may be drawn from both sexes, and such positions may be used to enhance the prestige of women within the community.

Clearly, employment in the health sector will not itself seriously modify the role of women in the society or even in the economy. The creation of a few thousand new jobs for women in a population of five million cannot have such a grandiose impact. Nevertheless, further equalization of the role of women in the provision of health services could form a part of a total social movement in that direction; combined with parallel efforts in the educational and agricultural sectors, it could be an important stimulant.

4. The Educational system for health manpower

Educational programs for training health workers are conducted by a number of separate institutions. They are relatively uncoordinated. Educational institutions *per se* respond primarily to student demands. Health service institutions also enter the educational arena, developing basic training for low and intermediate levels of manpower as well as in-service training. These latter programs, of course, are very sensitive to the specific needs of the sponsoring institutions, and seldom take full cognizance of the overall health situation nor the competing needs of the society. The overall lack of coordination and planning, of course, is responsible for the problems in manpower structure previously noted.

University programs in the health sciences are shown in Table 6.19. All of the nine universities in Bolivia are coordinated formally through the Council for Higher Education. In addition to the two nursing programs shown in the Universities, professional nurses are trained in three other institutes: Elizabeth Seton (Cochabamba); Montero (Santa Cruz); and the COMIBOL school at Catavi (Potosí). Nursing auxiliaries have been trained in numbers at the School of Public Health (408 from 1962 to 1972), as well as in a special school at the *Hospital Metodista*. The National Community Development Service and various Maryknoll missionary centers have also trained auxiliaries. All of the Regional Health offices (MOH), with the exception of La Paz, have run courses for auxiliaries within the past few years, and have trained several hundred in that time.

In theory, the School of Public Health should coordinate such courses, and should provide normative guidance on curriculum. Such is not the case. Additional courses taught by the School of Public Health are:

Table 6.19 - University Health Science Programs Authorized to Grant Degrees*

University (location)	Professional Degrees						Technical Degree			
	Nursing	Pharmacy & Biochemistry	Medicine	Dentistry	Veterinary Medicine	Clinical Psychology	Nursing	Radiology	Nutrition	Veterinary
UB San Francisco (Sucre)	x	x	x	x			x	x		
UB San Andres (La Paz)	x	x	x	x				x	x	
UB San Simon (Cochabamba)		x	x	x						
UB René Moreno (Santa Cruz)					x					x
UB José Ballivian (Trinidad)					x					x
U Católica Boliviana (Cochabamba)						x				

* Note 3 Universities have no Health Science Degrees

Source: Consejo Nacional de Educación Superior, Universidad Boliviana Catálogo General, 1973, pp. 61-63.

- Public Health Nursing, 9 months, 14 students in 10 years;
- Nurse Instructors, 6 months, 10 students in 10 years;
- Sanitarians, 9 months, 160 students in 10 years;
- X-Ray Technicians, 9 months, 26 students in 10 years;
- Lab Technicians, 9 months, 28 students in 10 years;
- Statistics Technicians, 4-1/2 months, 98 students in 10 years;
- Dietician Auxiliaries, 2 years, 10 students in 10 years;
- Health Educators, 9 months, 12 students in 10 years;
- Health Planning Educators, 1-1/2 months, 29 students in 10 years;
- Epidemiology, 1 month, 10 students in 10 years; and
- Hospital Administrators for Hospital Directors, 1-1/2 months, 29 students in 10 years.

The record of the School is not as even as this table would indicate. From a high of 131 graduates from six courses in 1963, production dropped to ten graduates from one course in 1967. Enrollment and activity have recovered significantly since that time, but the school is still handicapped by poor facilities and a small budget.

Many Bolivian physicians take specialized training in other countries; the specializations are not available in Bolivia. A survey of 74 doctors in 1967 indicated that 32 (43 percent) had studied abroad (as compared with five percent of other professionals).(5)

The efficiency of the educational system is determined largely by the efficiency of the professional training programs, due to their high costs per year per student, the relatively large number of enrollees, and the relatively long term of study for professional education. A first approximation to the efficiency of the system can be made by comparing the number of man-years of course work with the number of graduates. In a stable educational system of high efficiency, this rate should be nearly equal to the number of years in the required course. While enrollments were growing in Bolivia during the period, biasing such values upward, the data shown in Table 6.20 indicate that these ratios are nearly twice their optimal values. Further, the high migration of professionals to other countries and to other occupations indicates that the yield per peso invested in education is still lower.

The average cost per year per student in the university system in Bolivia in 1971 was US$375.(6) Medicine is more expensive than many other courses (by a multiplier of 2.09 as compared with the least expensive). Assume that the average yearly cost in Medicine is US$500. Given the losses due to drop-outs in the university, courses repeated, and migration of physicians, the average educational cost per physician entering practice in Bolivia may be estimated to be equal to that of 30 man-years of university education: i.e., 30 x 500 = US$15,000. Alternatively, the fact that 110 doctors per year go to other countries at 15 years' equivalent training per doctor, at US$500 per year, may be

Table 6.20 - Ratio of Graduates (Egresados) to Enrolled Student in Professional Health Faculties, 1960 and 1966.

Course	1960 Enrolled	1960 Graduated	1960 Ratio	1966 Enrolled	1966 Graduated	1966 Ratio
Medicine	1330	70	19.0	2020	120	16.8
Pharmacy	538	50	10.7	499	58	8.6
Dentistry	543	28	19.4	736	71	10.0
Nursing	134	30	4.5	229	39	5.9
Veterinary	36	2	18.0	99	16	6.2
Social Work	56	2	28.0	74	13 1	5.7

Source: Chirikos et al, Human Resources in Bolivia, Center for Human Resources Research, Ohio State University, Columbus, Ohio, April 1971, p. 210

viewed as a subsidy of U~$825,000 per year given by Bolivia to foreign medical practice. In either accounting, the medical educational system appears to be lacking in efficiency.

Quality of education is judged to be average in terms of the materials covered. The problem that has been noted repeatedly, however, is that education is not tailored to the problems of Bolivian health. Health professionals are trained in programs that mirror U.S. universities. Public Health Departments have been created in all of the Medical schools and (with USAID help) those schools are trying to develop community health programs. However, physicians still flock to and give priority to clinical specialties rather than to public health and community medicine. The situation is so serious that officials of both the MOH and the IBSS have talked of starting post-graduate but pre-employment training for the physicians they hire. More practical, perhaps, is a recent initiative of the Ministry of Health to give physicians an orientation seminar on rural practice and public health before they begin their obligatory "provincial year."

5. Conclusions

The medical manpower structure in Bolivia is top heavy: too many professionals per middle level worker. It provides care to an urban elite, and does so at the expense of virtually ignoring the campesino and the rural poor. Educational programs are expensive for the output of professionals that work in the country. Professionals are poorly trained for the problems and conditions of Bolivia.

These problems result in large part from the lack of a human resources policy and comprehensive planning in the health sector. Even with such policy and planning, it would be difficult for the health sector to influence the educational system in oposition to the expressed demand of the students and the urban elite from which the students come. Without such planning, however, the situation is not at all hopeful. To encourage planning, it has been suggested that an office of human resources be established within the Ministry of Health, preferentially reporting to the Director of Planning. Such an office, well-staffed and funded, could inventory available manpower and produce a serious plan for health manpower development for the country.

Manpower development for the future must be tied into the requirements of an overall program to develop low-cost delivery systems. To this end, production functions must be altered, supplementing for many activities the physician with more auxiliary personnel in the urban areas, and replacing many of the physician and traditional functions with trained intermediate personnel in the rural areas. Training of professionals needs to be deemphasized, lest professional personnel absorb all additional financing for health.

The new professional categories have been suggested: a Medex and dental auxiliary. In fact, nursing auxiliaries are now performing tasks like those proposed for the Medex. The new title* selected could simplify some interpersonal relations in starting the new program, to differentiate the Medex training from current training for auxiliaries (auxiliaries' training does not prepare them for independent practice), and extend the career ladder for auxiliaries, etc. The dental auxiliaries also could be trained for simple independent practice.

In addition to these two new para-professionals, emphasis might be given to increasing the number of trained auxiliary nurses, health promotors, and community leaders. Secondary efforts would be required to increase other auxiliary personnel. The problem of training adequate middle management and maintenance personnel will be particularly difficult.

The problem of allied professional personnel (health economists, sanitary engineers, hospital architects, maintenance engineers, etc.) has not been addressed. This is in part due to the fact that so few of these are needed compared to those involved in direct delivery of care. However, they are in minimum supply now, and their continued absence will jeopardize any effort to significantly improve planning or to make infrastructure reforms.

E. Facilities and Equipment

Physical facilities in Bolivia are scarce by Latin American standards. Their low level of utilization, however, indicates that scarcity is not the critical limiting factor in terms of either coverage or efficiency of service. Poor maintenance of facilities and equipment seriously reduces overall service efficiency. The system by which facilities are constructed and equipped is highly fragmented and lacking in adequate technical capacity. Decisions of facility construction are essentially political and highly centralized in La Paz; but very decentralized among unccordinated and sometimes competing agencies. New construction does not appear to be a matter than merits high priority at present.

1. Availability of facilities

The estimated number and distribution of medical facilities in Bolivia are shown in Tables 6.21 and 6.22**. The term hospital is

---

* Spanish title appropriate to such a person might be: "técnico médico", "practicante", "practicante médico", "licenciado médico", etc.

** These figures and all similar figures must be taken as approximate. There has been no real census of such facilities, and there is no control office with complete information. Estimates of numbers of hospital beds vary by as much as 20 percent.

Table 6.21 - Distribution of Health Facilities by Health District and Agency, 1973

Health District	Ministry of Health					Other Hospitals					
	Hospitals	Health Center or Satellite Post	Health Center Hospital	Medical Post	Sanitary Post	COMIBOL	CNSS	Military	Railway	Petroleum	Other Including Private
La Paz	5	6	25	4	40	3	8	1	2	--	25
Chuquisaca	4	1	12	6	33	--	2	--	--	--	6
Cochabamba	2	1	13	7	16	--	4	1	1	--	14
Santa Cruz	4	4	14	17	71	--	--	3	3	1	10
Tarija	2	1	4	4	15	--	1	1	2	3	1
Potosi	2	1	3	7	35	5	3	--	2	--	4
Oruro	1	1	8	1	29	13	4	--	1	--	6
Beni-Riberalta	3	2	5	2	38	--	--	1	--	--	1
Pando	1	1	1	2	9	--	--	1	--	--	--
Tupiza	1	1	3	0	18	--	2	--	1	--	4
Total	25	19	88	50	304	21	24	8	12	4	71

Source: Lebow, Robert H., Consultant Report, USAID/Bolivia, 1974

Table 6.22 - Distribution of Hospital Beds by Department and Agency, 1973.

Department	Ministry of Health			Other Institutions				All Beds Total	Population Served (000's)	Beds per 1000 Population
	Urban	Rural	Total	COMIBOL	C.N.S.S.	Other[a]	Total			
La Paz	936	219	1,155	306	848	735	1,889	3,044	1,722.3	1.77
Chuquisaca	705[b]	120	825	---	85	125	210	1,035[b]	483.6	2.14
Cochabamba	473	152	625	---	239	312	551	1,176	862.6	1.36
Santa Cruz	565	285	850	---	89	494	583	1,433	547.5	2.62
Oruro	220	60	280	404	111	136	651	931	359.0	2.59
Tarija	205	89	294	---	45	153	198	492	260.9	1.89
Potosi	160	238	398	892	243	162	1,297	1,695	855.4	1.98
Pando	---	42	42	---	---	10	10	52	34.0	1.53
Beni	112	322	434	---	12	27	39	473	205.4	2.30
Total Beds	3,376	1,527	4,903	1,602	1,672	2,154	5,428	10,331	---	---
Population Served (000's)	373.0[c]	3,931.9	4,304.9	142.2	631.3	252.3[d]	1,025.8	---	5,330.7	---
Beds per 1000 Population	9.05	0.39	1.14	11.27	2.65	8.54	5.29	---	---	1.94

[a] Includes other Institutions of the Social Security System and the private sector
[b] Includes 447 psychiatric beds
[c] In reality the MPSSP attends a larger population made up of overflow CNSS beneficiaries
[d] Based on estimates of a 145,000 private sector market (125,000 urban; 20,000 rural)

Sources: Biostatistics Department, Planning Office, and Regional Health Offices of the Ministry of Health, unpublished data, 1974.

somewhat misleading: it is used to include a large number of very small facilities, expecially in the private and Social Security sectors; however, its use does not include the Health Center Hospital or Medical Post with beds. Thus, of 285 facilities with beds, only 176 are classified as hospitals (or clinics).

The total number of beds is 10,333. The indicated availability of beds is 1.94 per 1,000 population for the country as whole. The average for Latin American in 1969 was three beds per 1,000 inhabitants.

The distribution of beds is uneven: for example, 2.62 beds per 1,000 in the Department of Santa Cruz vs. 1.36 beds per 1,000 in the Department of Cochabamba. The vast majority of the beds are in urban centers, with significant concentration in mining areas. There are 1,290 private beds, serving an estimated five percent of the population; 3,990 beds belong to the Social Security system, serving approximately 20 percent of the population. Bed availability is somewhat similar for these two sub-populations.

The public hospitals' 4,903 beds, in theory, serve the remaining 75 percent of the population. In reality, a large portion of the population does not receive medical care. It is therefore impossible to accurately judge the distribution of facility availability for the entire population. The population presumably served per rural medical facility varies by geographic area from 1,697 to 18,943; the nationwide average is 9,316 persons per facility (Table 6.23). The lower populations per facility are in areas (Riberalta, Pando, Santa Cruz, Beni) where population densities are low and where travel can be especially difficult.

The problem of construction and location of rural facilities is complicated by the dispersed pattern of rural living. The MOH estimates that 65.5 percent of the total population live in isolated houses or in localities with fewer than 500 persons. Such small population concentrations tend not to justify the construction of medical posts (nor, of course, other public facilities). The problem could be solved in part by building facilities on the sites of weekly ferias. Such sites may be visited by as many as 3,000 persons on the day of the feria and be completely empty the rest of the week. Long-term plans of the government (now under discussion) may encourage the development of rural towns; that would both identify the location and provide an additional motive for the construction of new rural health facilities.

2. New investment

Facilities construction continues, of course, and total facilities in the country will increase. Thus, in 1973, the MOH was engaged in 26 separate projects which would provide 1,245 additional

Table 6.23 - Distribution and Demand for MOH Rural Health Facilities by Health District, 1973

Health District	Health Centers - Hospitals, Medical Posts and Sanitary Posts[a]	Rural Population[b] 1973	Rural Population per Facility
La Paz	69	1,101,155	15,959
Cochabamba	36	681,940	18,943
Santa Cruz	102	372,840	3,655
Chuquisaca	51	448,050	8,785
Potosí	45	706,837	15,707
Oruro	38	272,390	7,168
Tarija	23	198,760	8,642
Beni & Riberalta	45	161,471	3,588
Pando	12	20,373	1,697
Tupiza	21	153,751	7,321
Total	442	4,117,567	9,316

Sources: [a]Le Bow, Robert H., Consultant Report, USAID/Bolivia, 1974.
[b]Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p. 12.

Table 6.24 - Proposed Facilities Investments Ministry of Health, 1974-1978

(In Bolivian Pesos)

Type of Investments	1974	1975	1976	1977	1978
River Fleet Health Service Barges	280,000	140,000	140,000	-	-
Construction (Total)	61,016,466	59,756,266	62,109,600	47,014,400	47,554,400
Urban (in construction)	10,599,266	7,410,266	6,610,000	2,000,000	-
Urban (proposed construction)	40,156,000	42,656,000	46,136,000	35,916,000	36,416,000
Rural	10,261,200	9,690,000	9,363,600	9,098,400	11,138,400
Equipment (Total)	3,502,648	3,847,830	3,016,711	4,148,442	4,813,290
Urban Establishments	2,278,840	2,586,000	1,823,480	3,250,500	3,544,780
Rural Establishments	1,165,140	1,218,828	1,165,895	870,606	1,256,270
Radiocommunication Network	58,668	43,002	27,336	27,336	12,240

Source: Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, pp. 161-167.

beds and 10 new outpatient facilities. The Ministry has prepared an ambitious overall construction plan for the next five years (Table 6.24). The actual budget for 1974, however, was only six million pesos (US$300,000), far less than was required simply to maintain the proposed construction rate in the ongoing, urban projects.

Additional construction under the sponsorship of the Santa Cruz Public Works Committee, the National Social Development Council and other public agencies of the government will further add to the Ministry's facilities. In this connection, the donation in 1974 of ten emergency field hospitals of 200 beds each to Bolivia by USAID was of particular importance. The net effect of all such constructions is to augment hospital and urban facilities, but it does little to correct the existing imbalance in the distribution of services.

The Social Security System, similarly, is continuing to invest in facilities. It recently obtained a loan from the Central Bank to purchase five million dollars worth of hospital equipment to replace unusable equipment and to add new services, primarily in its urban hospital system.

3. Quality and condition of facilities

Of the 285 facilities with beds in Bolivia, 175 (61 percent) have 20 or fewer beds. Only 23 facilities have more than 100 beds. This pattern of size suggests inefficiency and/or sub-optimal quality. In the urban areas several small hospitals, rather than fewer larger hospitals, are often built. Fewer but larger hospitals might provide economies of scale. Thus, for example, five hospitals have been built on essentially the same site in Santa Cruz but they share no facilities, nor do they offer better access to the population than would five similar size hospitals distributed throughout the city.

The size of facilities varies among the several segments of the medical care system (Table 6.25). Private hospitals are invariably small: only three religious hospitals have more than 50 beds; 70 percent have fewer than 20 beds. The decentralized and Social Security hospitals, on the other hand, are principally large or middle-sized. Public facilities tend to be small in rural areas, and large or medium size in the cities.

Hospitals tend to be archaic in design, and the pavillion style still is very common in Bolivia. Even within hospitals, there tends to be a duplication of such facilities as laboratories and X-Ray equipment. Distances are great between wards and service centers. Maintenance and supply services are poor, especially with respect to equipment, and hospital service breakdowns are frequent due to inoperative equipment or to lack of supplies (X-Ray film, laboratory reagents, etc.).

Table 6.25 - Distribution of Inpatients Facilities by Number of Beds and Agency, 1973

Number of Beds	Ministry of Health	Social Security and other Decentralized Agencies	Religious and Private	Total
1 to 20	103	24	48	175
21 to 100	29	37	21	87
101 or more	13	10	--	23

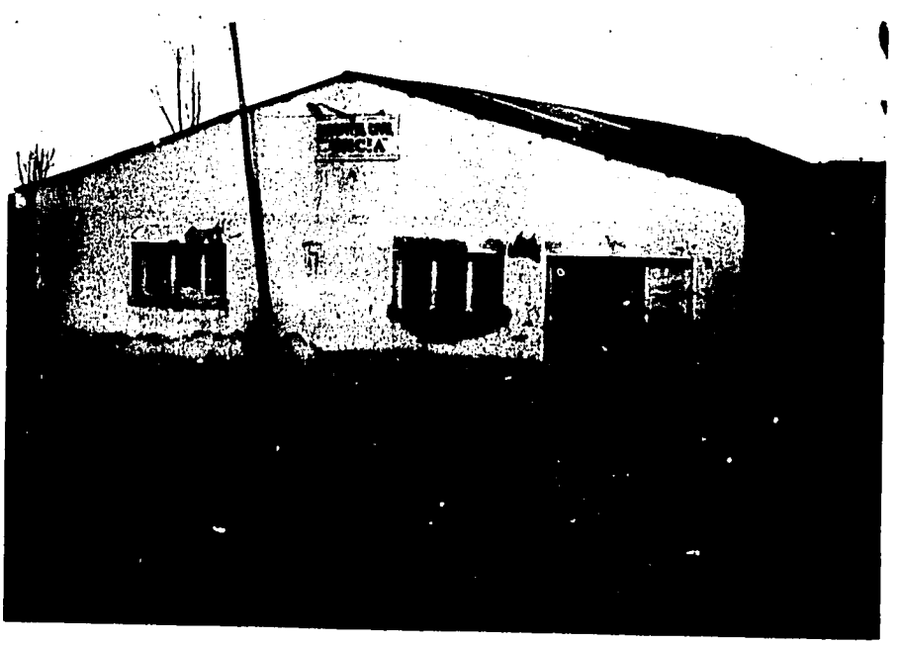
Source LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974

Table 6.26 - Status of Buildings, Equipment and Drug Supplies for Sixty-six Rural Medical Facilities, 1974

Criteria	Good		Fair		Poor	
	Number	Percent	Number	Percent	Number	Percent
Buildings	23	35	29	44	14	21
Equipment	15	23	33	40	18	27
Drugs	22	34	8	12	35	54

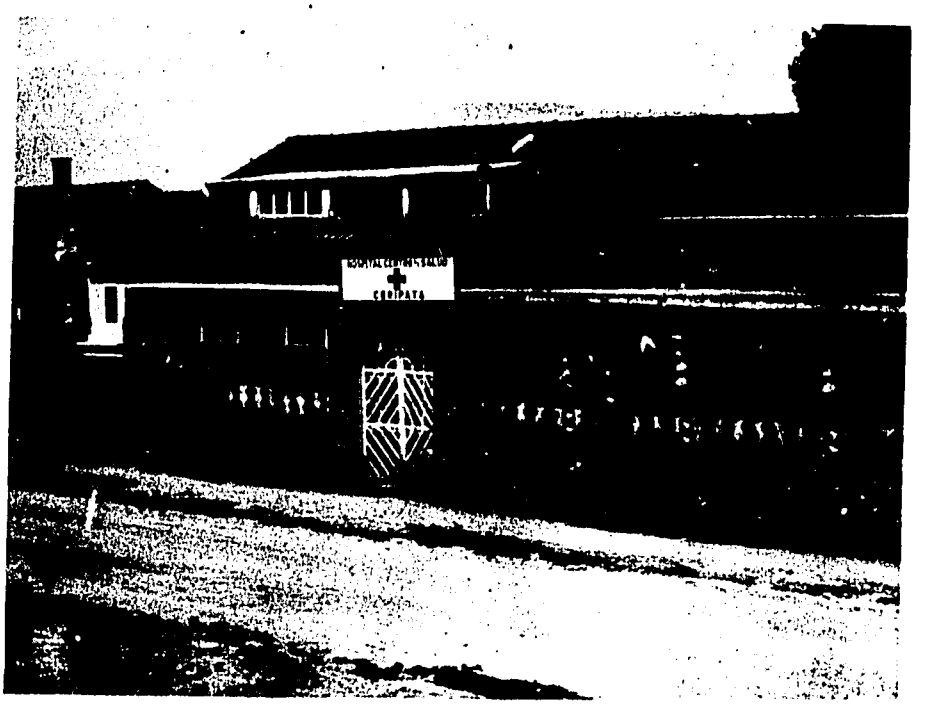
Source: LeBow, Robert H., Consultant Report, USAID/Bolivia, 1974

Health Center Hospital at Batallas
(Northern Altiplano)
Ministry of Health

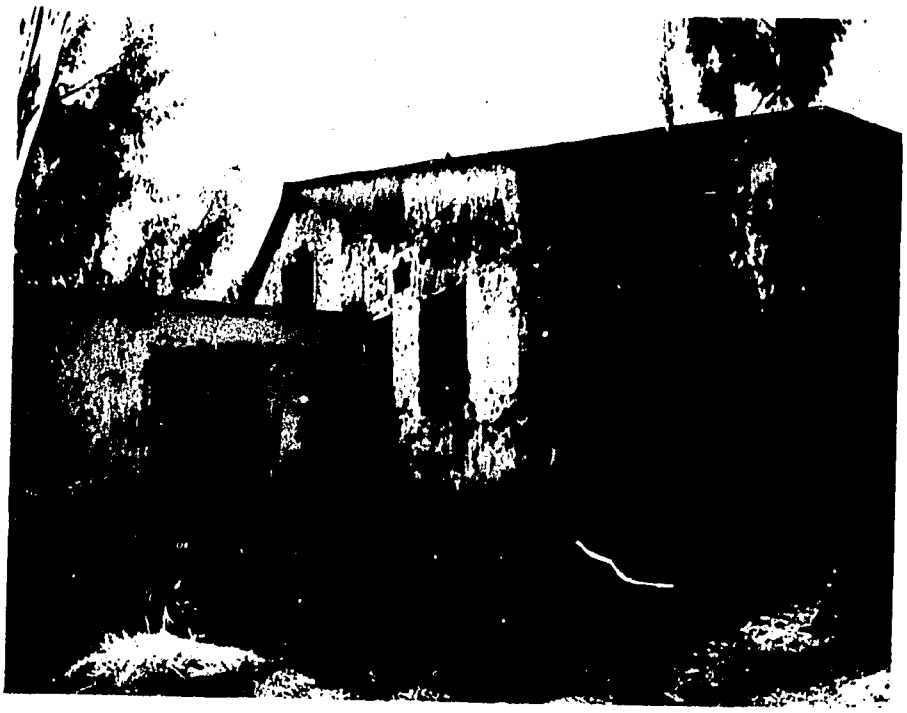


Health Center Hospital at Uncia
(Northern Potosí)
Ministry of Health

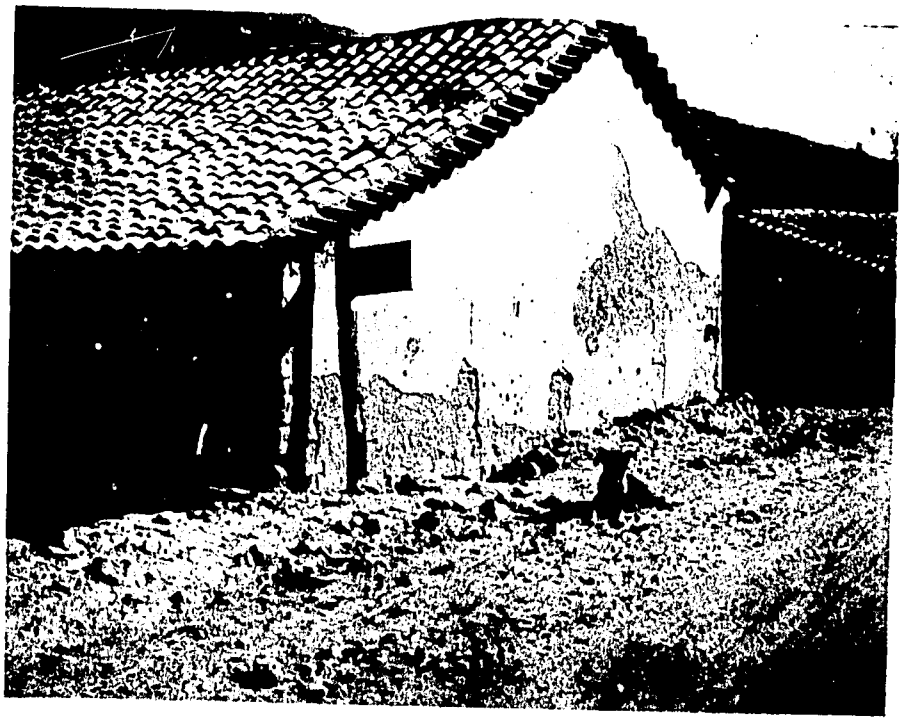
Health Center Hospital at Yotala
(near Sucre)
Ministry of Health



Hospital Health Center at Coripata
(North Yungas)
Ministry of Health

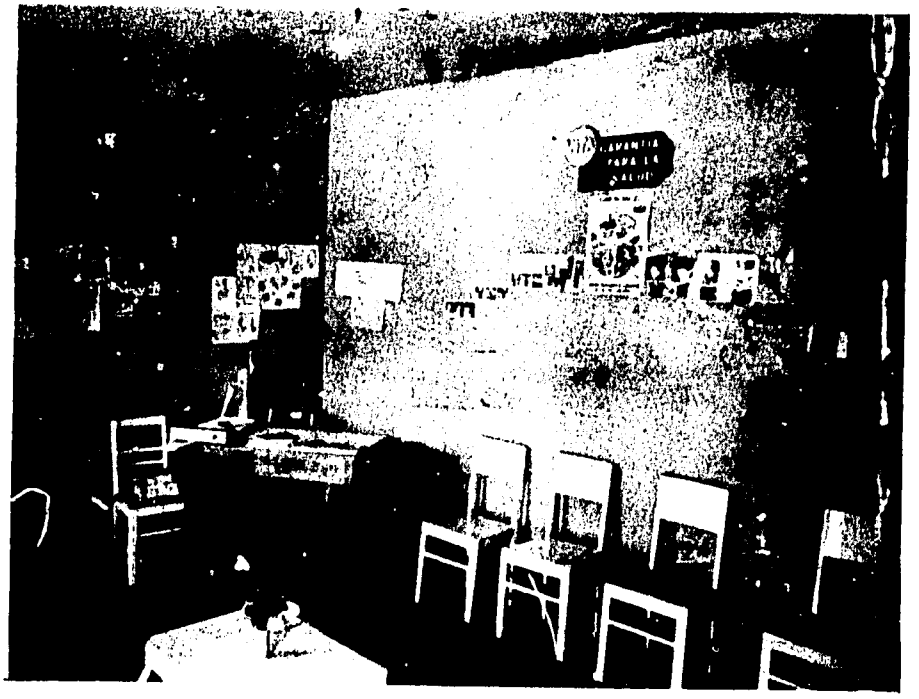


Health Post at Huatajata
(Northern Altiplano)
Operated by the Baptist Mission

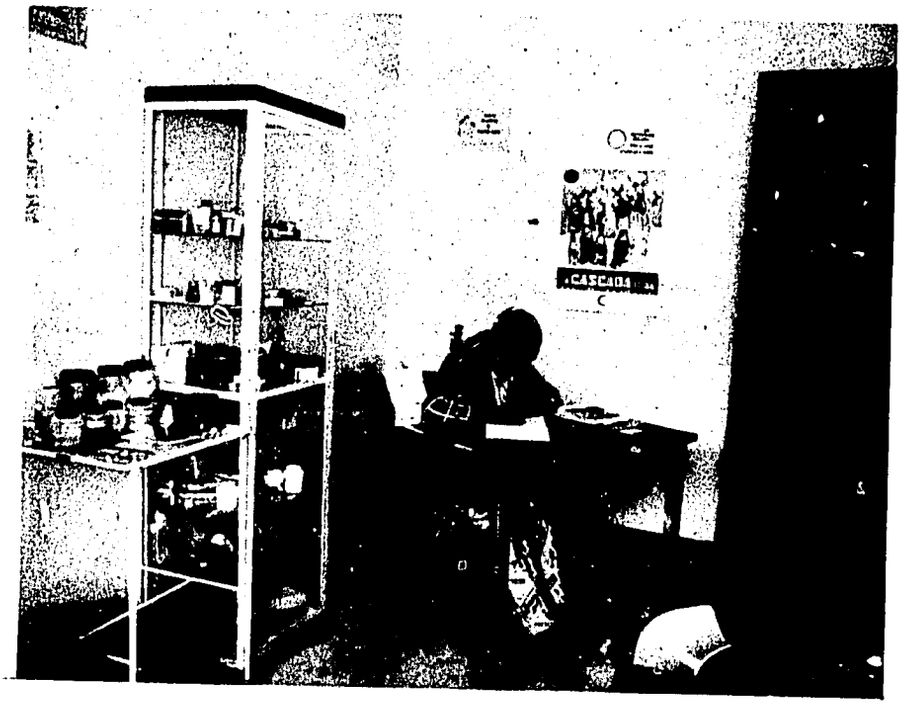


Health Post at Chuqui-Chuqui
(Northern Chuquisaca)
Ministry of Health

Reception and Examination Room
Health Center Hospital at Achacachi
Ministry of Health



Reception Area at unidentified
Health Post



Equipment and Drug Supply
at Huarina Medical Post
Ministry of Health

Nursing Station at Batallas
Health Post
Ministry of Health

A survey of 66 rural health facilities provides a basis for judging their adequacy for the relatively simple purposes that they serve (see Table 6.26). Note that 21 percent were judged poor or inadequate in terms of the size and condition of the buildings and 28 percent in terms of basic equipment. Only 34 percent of buildings were considered "good" and only 22 percent of facilities were considered well-equipped for their function. Supply problems were even more severe. The installations selected for the survey were considered "above average". Therefore, the figures shown almost certainly underestimate the problem of the quality of rural facilities and equipment.

4. Utilization of facilities

The health service productivity of hospital facilities is low. Illustrative data on both bed occupancy and lengths of stay are shown in Table 6.27. Rural beds of the MOH have an occupancy rate of less than 20 percent. Urban and Social Security bed occupancy, in the sample, ranges from 49 to 81 percent. The last value would be acceptably high, but this is counteracted by the extremely long average length of stay: 18.7 days per patient. In fact, all lengths of stay shown are longer than desirable for Bolivia.

The combination of low bed occupancy and long hospitals stays indicates very poor output from hospital facilities and equipment. This is confirmed by 1971 estimates of 17.3 and 8.7 patients served during a year per MOH bed in the urban and rural areas respectively,(7) and 18.9 per bed in the CNSS system.(8) A highly efficient system would produce 30 or more patients served per bed per year.

Similarly, outpatient facilities are poorly utilized. Rural health facilities in Bolivia average from 0.8 to 227 patient visits per month; the typical volume is between 25 and 75 (Table 6.28). Thus, the typical rural health facility receives from one to three patients per day. Similarly, the MOH indicated only [illegible].1 and 1.3 patient visits per doctor hour for urban and rural locations in 1971,(9) which would indicate a very low rate of utilization for outpatient facilities. A facility working 26 days a month, eight hours per day, seeing five patients per hour could provide for 1,040 patient visits per month with just one consultation room.

The availability of hospitals beds and outpatient facilities is low by Latin American standards. Nevertheless, if used efficiently, the existing beds could provide many times the medical services that is actually given. Part of the evident inefficiency is explained by the poor state of facilities and equipment. A more fundamental cause is poor administration, which is responsible for the poor maintenance of facilities.

Table 6.27 - Utilization of Hospital Beds by Agency and Location, 1973

Indicator	Ministry of Health[a]							COMIBOL	Caja Nl. de Seguridad Social[b] (CNSS)				Total
	La Paz	Cochabamba		Chuquisaca		Oruro		7 Districts	La Paz	Cochabamba	Oruro	Potosí	Bolivia
Location	Urban	Urban	Rural	Urban	Rural	Urban		Mixed	Urban	Urban	Urban	Urban	
Percent Occupancy	59.4	49	12	63	15	52		51	80.6	74.9	65.5	57.6	72.2
Average Length of Stay (days)	19.5	10.1	7.1	12	5.9	8		9.3	18.7	11.8	10.7	11.6	13.9

Sources: [a]Ministerio de Previsión Social y Salud Pública, Unidades Sanitarias, División de Bioestadística, unpublished data, 1973.
[b]Urioste, F.J. de, "La Atención Médica en la Seguridad Social Boliviana", unpublished paper, 1974.

Table 6.28 - Average Number of Reported Outpatient Visits per Month, by Type of Facility and Health District, Rural Areas, 1970[a] and 1973[b]

Health District	Health Center Hospitals				Medical Post				Sanitary Post			
	1970		1973		1970		1973		1970		1973	
Pando	(1)	180	(1)		(1)	21	(2)		(5)	0.8	(9)	
Beni & Riberalta	(5)	71	(5)		(3)	72	(2)		(20)	29	(38)	
Tupiza	(3)	98	(3)		(0)	-	(0)		(4)	55	(18)	
Tarija	(4)	157	(4)	172*	(4)	41	(4)	72*	(14)	10	(15)	20*
Santa Cruz	(13)	227	(14)		(15)	90	(17)		(56)	70	(71)	
Potosí	(3)	105	(3)	80*	(5)	97	(7)	51*	(11)	30	(35)*	35*
Oruro	(5)	68	(8)	74*	(3)	149	(1)	30*	(9)	45	(29)	22*
Cochabamba	(12)	53	(13)	56	(10)	59	(7)	63	(9)	30	(16)	39
La Paz	(22)	65	(25)	108	-	-	(4)	30	(20)	29	(40)	39
Chuquisaca	(14)	46	(12)	73	(3)	27	(6)	23	(21)	22	(33)	31

( ) = Number of facilities
* = Estimates

Sources: [a]Ministerio de Previsión Social y Salud Pública, Informe Anual de Estadística de Salud, La Paz, 1970.
[b]Ministerio de Previsión Social y Salud Pública, Regional Health Offices, unpublished data, 1973.

It should not be concluded, because existing facilities are poorly utilized, that investment in buildings and equipment should be entirely stopped. Preferentially, however, funds should be directed to production factors other than new construction, i.e., to better administration, more drugs and supplies, etc. A problem of inequity is caused by the gross differences in the availability of facilities among the different areas of Bolivia; to resolve this problem, further construction may be required. Obviously, future construction designed to keep pace with population growth, could be concentrated in the areas that now are most lacking in facilities.

5. Planning and administration of health facilities

Two major problems cripple efforts to rationalize the investment in medical facilities: (a) the lack of a policy base and (b) the lack of inter-institutional coordination and cooperation. Governments change rapidly in Bolivia. Health policy officials and, in particular, the Minister of Health, change even more rapidly. Unfortunately, the change in policy-level personnel often results in a change of priorities regarding capital investment plans. Thus, funds scheduled to complete works in progress may be diverted to new works especially interesting to new officials.

A second, related problem, already noted in the financial analysis, stems from inadequate financing and more directly from poor financial management. Public budgets are based on income forecasts that often are excessive; as more realistic estimates are made late in the fiscal year, expenditures are severely trimmed. Such unplanned budget cuts are not allowed to affect salaries; but Ministry officials find it relatively easy to defer investment costs by delaying construction. Serious SSS deficits, resulting from high operating expenses, cause similar budget crises that interfere with the investment of reserves in facilities. Such on-again, off-again investment policies create great difficulties in planning, very long construction periods (22 years for the still unfinished Children's Hospital in La Paz), excessive construction costs, outdated facilities, and a very poor return on sunk investment.

At least a half-dozen public agencies build and equip medical facilities. Private agencies also have complete autonomy. These many agencies have no agreed-upon norms, no common criteria for population service requirements, and no program for sharing facilities. The costs of their uncoordinated free enterprise already have been described. However, there have been three recent and commendable attempts to coordinate several major medical care providers in the development of new health service facilities. These are: (1) the Vallegrande model; (2) the Trinidad model and; (3) the Tarija model.

In the Vallegrande model, the MOH and the CNSS are joining to provide services to a city of 8,000. The Ministry will pay for personnel, construction and equipment, and will provide free services to the low income population. The CNSS will pay fees for services rendered to its beneficiaries, based on operational costs of the facility and amortization of the investment costs. A detailed analysis of anticipated costs was made as a basis for the contractual agreement. In the Trinidad model, investment is to be shared 50-50 by the MOH and the CNSS. Personnel are to be paid either by the CNSS or the MOH, but services will be undifferentiated. The Tarija model involves the use of one hospital for five institutions: MOH, CNSS, the petroleum workers, the chauffeurs union and the military. Investment costs will be shared by these institutions. The MOH will operate the hospital and bill other institutions for services rendered to their beneficiaries.

Such cooperative initiatives, while still very minor in terms of Bolivian total health expenditure, are hopeful signs of improved coordination, and they should be encouraged. Typically, each component of the health system develops its facilities independently, using its own processes.

For the MOH, new construction originates in a community action. Efforts are under way to prepare the staffs of the Regional Health offices to respond to such initiatives, but such preparation will be most difficult in view of the lack of appropriately trained professional manpower. The Regional Health office now tends to be bypassed. For hospital construction, community leaders come directly to La Paz to deal with policy-level officials of the government, including the MOH. These officials then formulate priorities among alternative projects.

For rural health posts, such organizations as the National Community Development Service (NCDS), the National Social Development Council (JNDS), or the Departmental Development Committees may assist a community to build its own facility. Some 300 facilities have been built (or are under construction) by these other organizations over the past ten years. The MOH is expected to equip and operate such facilities, but usually it has minimal influence on their design and location or even in the decision as to their construction. This sometimes results in the Ministry being unable to staff and equip a new facility.

Technical responsibilities for planning such investments are located in the MOH's planning office. The planning office is responsible for studies of service demand, staffing and operating budgets. It uses these projections to define the medical program, including listings of spaces and equipment. Architectural responsibility then resides in the Ministry of Housing and Urban Development, in a small

office of hospital architecture. MOH officials are very unsatisfied with the level of support provided by this office. One private architectural firm specializing in hospital architecture exists in Bolivia, and is used by the MOH on a consulting basis. An architect is to be hired by the MOH to facilitate improved coordination.

The matter of architectural design for health facilities in Bolivia is complicated by the diversity in climate and cultural settings. Uniform hospital models and designs would not be practical. The most efficient alternative might be to devise functional norms for facilities, and allow local architects (or craftsmen) to use locally appropriate materials to meet such specifications. No such norms exist now, nor are there plans to develop them. An alternative would be to design and build prototype facilities for different areas of Bolivia.

Maintenance in the MOH is the responsibility of one engineer who has had a two-month hospital maintenance course in Mexico. It is hoped that he may be able to train assistants. However, almost no materials or equipment for maintenance are available or budgeted. One X-Ray technician is available for all the MOH facilities in the country. Some contracts for maintenance have been signed with importers of medical equipment. The Ministry maintains a shop for vehicle maintenance, but it provides no funds for repair parts, so that in effect few services are available.

The IBSS does not require that construction plans be cleared by the MOH. New construction plans are initiated by the central offices of the cajas. Within the CNSS for example, the Department of Planning and Medical Norms is responsible for initial planning, and the Architectural Office has responsibility for detailed architectural plans. The latter office is staffed by two architects, two draftsmen, one surveyor and two clerks. Private architects also are contracted. Final plans are approved by the Technical Advisory Council of the CNSS.

There is no governmental control of the construction of private medical facilities, except through licensing. In order to receive a license, the hospital must provide the MOH with program information and plans. The MOH may make suggestions at this stage, but they are optional. There is no mechanism for enforcement of national standards.

Two major observations stem from the analysis of facilities planning. First, financing is neither predictable nor adequate; this defect can be corrected either by a firm internal or a contractual obligation of the government. Secondly, there is an unmet need for a strong central office of facilities planning and maintenance, and for regional support offices established as necessary. The central office could be formed by transfering the medical architecture office from

the Ministry of Housing to the MOH planning office. Technical assistance might be used in establishing architectural and maintenance norms and procedures.

The cooperative initiatives toward joint facility construction merit further development, to encourage coordination of public and decentralized agencies' facility utilization. The system whereby local communities contribute to the construction of their own outpatient facilities is commendable, but there is an evident need for the MOH to take part earlier in the process; this would assure both: (a) that proposed facilities are adequately designed and (b) that, once constructed, it is within the Ministry's capacity to operate them.

6. Conclusions related to facilities

The existence of buildings does not seem to be the limiting factor on the provision of health services. In fact, existing facilities are being used only to a small fraction of their capacity. Thus, it will be most efficient to increase services by adding other production factors (e.g., equipment and auxiliary personnel) and by moving closer to the frontiers of technological progress. The alternative, heavy capital investment simply to expand a demonstrably inefficient system, seems ill advised in a poor country. Given increasing efficiency, however, additional investment in facilities could be productive to redress existing inequities in the distribution of health care.

The policies for facility construction have been inconsistent and transitory, consequent financing problems have gravely complicated the construction process. Institutional fragmentation has resulted in unnecessary and wasteful duplication of facilities. Some promising initiatives may alleviate these problems, but much remains to be done.

The administrative system for programming and implementing facilities construction, acquisition and maintenance is weak and fragmented. Problems of efficiency and quality of care are directly traceable to these weaknesses. Moreover, to strengthen that system may help to strengthen commitment to a unified policy. Centralization of the system, presumably in the MOH, and technical assistance in revitalizing its component processes, would appear to be beneficial.

F. Pharmaceutical Supply System

1. The General problem

Pharmaceuticals--drugs and vaccines--are among the basic tools of medical services; and the situation in Bolivia is complex. Medications may either abound or be scarce, depending upon circumstances. The beneficiaries of the Social Security system, for example,

literally may be receiving too much medication, and the system almost surely pays too much for their medications*. It is estimated that 40 to 50 percent of the total costs of medical attention in the several Social Security cajas goes for drugs. The remainder of the population, on the other hand, probably is without adequate access to drugs. For example, MOH hospitals do not have pharmacies and do not usually provide medication. Rather, their (largely urban) patients must purchase them in private pharmacies. Pharmacies are readily available, but the prices of drugs are such as to deny them to a large part of the population**.

In rural areas, drugs are physically much less accessible. Only 34 percent of (above average) rural medical facilities surveyed had adequate drug supplies (see Table 6.26). Supplies in such facilities typically were purchased retail by staff personnel for resale to patients. Supplies also are available through small general stores and rural ferias; typically, these are so small that their supplies are obtained from retailers, then resold by the rural vendors at elevated prices. The combination of a appropriate supply system and a health education system, in fact, could make automedication a major means for achieving the improvement of health. Similarly, the pharmaceutical distribution system--if improved--could provide for more efficient and complete delivery of contraceptives, thereby assisting the family planning program.

---

* Some selected figures of products prescribed per SSS outpatient visits are:

CNSS	: Overall	1.78
	General Medicine	1.72
	Pediatrics	2.19
	Pneumology	2.17
	Psychiatry	3.88
	Dermatology	2.78
COMIBOL:	Overall	1.75

** The only available data on such expenses comes from a market survey in La Paz by Michigan State University in which the average annual family expenditure on drugs and medicines was US$23 or 1.5 percent of mean family income.(10)

Total Drug Supply at Achucachi
Health Center Hospital
Ministry of Health

Nursing Station and Drug Supply
at unidentified Health Post

2. The Nature of drugs used

Some 10,000 pharmaceutical products are licensed and in use in Bolivia. These could be reduced to a basic list of four or five hundred useful generic drugs. The larger number corresponds to a variety of brand name variants of these drugs, of non-useful drugs, or of drug combinations. The result is that drugs tend to be more expensive than necessary, due in part to: (a) low volume in individual products, (b) use of inappropriate over-expensive drugs, and (c) sales promotion expenses. Typically, in the health field, sales promotion is directed primarily at physicians and to a lesser extent at retailers. Benefits to consumers may accrue from the education of physicians and pharmacists by drug manufacturers, but the cost of promotion adds significantly to the final price of the product.

In 1973, the IBSS obtained legislation requiring that drugs be purchased by all cajas in accordance with a Vadenecum, a list of 400 or 500 products. However, it appears that the intended reform has not been successful. Drugs continue to be purchased in the traditional way.(11)

3. Sources and marketing of drugs and vaccines

Vaccines typically are imported. However, both the National Laboratory of the MOH and the Ministry of Agriculture are equipped to produce some vaccines (e.g., rabies). The Ministry of Agriculture production is for veterinary purposes; significant doubt exists as to their products' quality. The National Laboratory, at various times in the past, has produced vaccines at low cost, of reasonable quality and in adequate amounts. However, recurring administrative problems have interfered with and reduced its role. Roughly one third of the drugs used in Bolivia is manufactured in the country. The estimate for 1974 for this production was US$4,000,000.(12) Both large and small (18) manufactures share this market. The National Laboratory of the MOH is supposed to verify the quality of the domestic products, but little is done in this respect.

Prices of nationally manufactured goods are determined by the government. The MOH, IBSS, and Ministry of Commerce and Industry together set prices. Their judgment is based on recommendations from the Association of Chemical and Pharmaceutical Industries, which in turn bases its analysis on cost data supplied by the firms. It is suspected that this mechanism is not one likely to insure minimum costs.

The principal biochemical products imported as raw materials for domestic drug manufacture are identified in Table 6.29. The total of approximately US$380,000 is largely spent to import antibiotics. Vitamins B_1 and B_2, analgesics and glucose are also notable in volume.

Table 6.29 - Imports of Principal Pharmaceutical Raw Materials, 1971

Article	Amount (in Kilograms)	Price (in US.Dollars)
Vitamin A	82	3,272
Vitamins B_1 and B_2	706	16,353
Vitamin B_3	9	71
Vitamin B_6	364	6,184
Vitamin B_{12}	40	3,874
Vitamin C	2,173	9;598
Vitamins D (D_2, D_3, and others)	20	129
Natural concentrates of Vitamins A & D	183	1,274
Mixtures, including any kind of solutions and non aqueous solutions of poly vitamins	195	3,208
Other vitamins, non specified	816	2,725
Hypophysis anterior lobule and similar hormones	2	236
Cortico-adrenals and similar hormones	186	7,106
Testicular and similar hormones	1,210	5,324
Pepsin	18	623
Rennet (quimosyn)	1,023	13,408
Other enzymes	2,304	17,846
Heterosides, naturals or synthetic, their salts, ethers and other derivatives	96	2,090
Morphine, diethyl morphine, ethyl morphine spermorphine, methyl morphine (codein), etc.	63	14,631
Narcotine, papaverine, thebain, cotarmine	214	4,006
Quinine, quinidine cynconine, cynconidine	17	1,324
Other alkaloids	1,775	9,324
Sugars chemicaly purified, glucose	36,256	19,902
Sugars chemicaly purified, levoluse	108	407
Sugars chemicaly purified, lactose	103	86
Antibiotics, penicillin, their salts and derivatives	3,859	8,166
Antibiotics, chloramphenicol and their derivatives including chloromycetine	1,385	47,157
Antibiotics, tetracyclin and their derivatives	803	20,311
Antibiotics tyrotricin	1	109
Antibiotics streptomycin	1	10
All other antibiotics	46,189	158,508
All other organic compounds	935	1,272
Total	101,136	378,534

Source: Instituto Nacional de Estadística, unpublished data, 1974

Table 6.30 - Importation of Pharmaceutical Products, 1971

Article	Amount (in Kilograms)	Value (in US.Dollars)
Glandular extracts, including other organs or secretions	1,504	26,213
Plasmas	497	2,679
Serums or wheys (biological), not similar to national industries' production	23,785	45,230
Vitaminized artificial serums, not similar to national production	2,440	2,767
Vaccines, similar to national production	3,436	1,409
Vaccines, not similar to national production	16,266	116,780
Microorganism cultures, similar to national production	70	15
Microorganism cultures, not similar to national production	247	4,590
Other animal serums	109	687
Vitamin preparations, similar to national production	436	194
Vitamin preparations, not similar to national production	89,410	857,992
Hormonal preparations, similar to national production	62	21
Hormonal preparations, not similar to national production	9,360	121,311
Antibiotic preparations, not similar to national production	195,919	1.185,818
Alcaloid preparations, not similar to national production	60,394	151,649
Sulfanilamide preparations, not similar to national production	1,078	17,917
Drugs used in veterinary medicine, not similar to national production	52,352	104,873
Other drugs, similar to national production	839	3,260
Other drugs, not similar to national production	658,057	3,141.384
Medical cottons, gauzes, bandages, not impregnated or dressed with pharmaceutical substances	25,107	79,871
Medical cottons, gauzes, bandages, impregnated or dressed with pharmaceutical substances	50,372	130,859
Bindings (sterile) for surgical sutures	1,632	12,209
Cements and other products for dental obturations	2,162	9,705
Opaque substances for radiological examinations	33,773	19,128
Sterile hemostatic recipients	34	379
First Aid Kits	11,139	7,045
Other pharmaceutical articles or preparations	398	731
Total	1,249,878	6,044,916

The IBSS institutions import their own drugs, exempt from taxes. They are, no doubt, the largest importers of drugs in Bolivia. However, each caja imports its drugs separately and independently, and a significant opportunity to economize via additional volume discounts is thereby lost.

The importation of drugs in 1971 is indicated in Table 6.30. Again, the amount of antibiotics and vitamins is noticeably large. There are estimated to be some 60 drug import firms. They form a diffuse market, with no single firm dominating the market. The import process itself is slow and costly, requiring at least six months for the receipt of merchandise. Goods are typically sent by ship to Peru or Chile and stored (with considerable theft and storage loss) until they can be transferred by train to La Paz. Prices for imported drugs are fixed by the Ministry of Commerce and Industry. The formula is 50 percent profit over all costs: initial price, transportation, taxes, losses, and operational costs. The arrangement is one not likely to foster price competition or low prices.

In view of these arrangements, it is not surprising that there is a thriving black market in drugs. The black market is supplied by both theft and smuggling. Reportedly, the difference of prices can be extreme: a 120 peso drug on the legal market may be only 15 pesos on the black market.(13)

4. Distribution systems

In a reform of 1973, most innoculations programs were taken out of central administrative hands and made the responsibility of local medical units of both the MOH and the IBSS systems. Vaccines were to be shipped to Departmental offices of these agencies, and costs were to be paid by Departmental vaccine banks, reimbursed by the agencies. This financing scheme has not proved successful and, consequently, the distribution system is in some disarray. At the local unit, there is considerable difficulty due to a lack of refrigeration, hence a consequent inability to store vaccines.

The distribution system of the IBSS affiliates is generally adequate. There are basically three levels of warehouses: central, regional, and local. The local repository is usually the pharmacy of the medical facility, whence drugs are dispensed to patients. The existence of a separate but parallel distribution system for each caja suggests duplication and inefficiency. At all levels of the SSS system, facilities are authorized to purchase drugs from private wholesalers or retailers if supplies are not adequate. It has been stated, however, that inventory control and supply systems are genelally good, hence that little such purchasing does occur.(14) It is

also suggested, however, that there may be considerable theft from this system.

There are 533 registered pharmacies in Bolivia, 190 of which are in the Department of La Paz. Only 123 are rural, compared with 410 urban.(15) Thus accessibility is roughly 16 to one for urban vs. rural patients. By law, pharmacies are allowed a 27 percent gross profit. This margin is perhaps slightly higher than that typical for retailing in Bolivia and, in fact, many products are sold at a slight discount from this control price. Licensed pharmacies are required to be managed by graduate pharmacists. As shown in section VI-D, a large number of pharmacists are practicing in Bolivia (1,600) especially in terms of the total number of laboratories (21), medical facilities (375) and licensed pharmacies (533).

In addition to these formal markets, there exist a variety of informal markets. Traditional herbal remedies are available in every city and every rural feria in Bolivia. Unfortunately, very little is known about this market in economic terms. Tiendas (small general stores) sell some drugs, in addition to their other stocks, in most rural areas. Similarly, MOH health professionals purchase drugs for resale to their patients. In both case, such drugs presumably are purchased retail, and marked up again for resale, increasing the already high prices.

Another channel is the group of migrant vendors who sell medicines in the rural ferias in Bolivia. Three of these have been studied in 1967. As the authors state: "There are clear signs that the prerevolutionary economy is slowly being replaced by a newer commercialism. Aging Ayamara women still sell traditional remedies for the gripe, llama fetuses for luck, and multicolored candles for the favor of the Pachamama."

"Alongside this traditional economy, however, is a growing economy of flashlights, cameras, bicycle parts, radios and even some simple cosmetics. The older sellers of home remedies are being replaced by vendors of Alka Seltzer and aspirins".(16) The authors visited ferias in the Altiplano and found vendors of modern medicines in three out of five markets. Their sources of supply were: retailer, 54 percent; factory, 38 percent; and black market, eight percent. Their drugs were 75 percent Bolivian, eight percent Argentine, eight percent Japanese, and eight percent German. The average prices charged by these vendors are higher than in the city, due to the relatively large portion of their goods that they buy retail.

5. Conclusions

Corrective measures for the above-cited situation are obvious: reduce the number of drugs in circulation, provide an efficient public system for the purchase and distribution of drugs, and refinance the vaccine distribution system. The rural market, now perceived to be virtually non-existent, as a matter of fact is more important than the urban and IBSS markets in terms of potential public health benefits. Hence significant efforts would be justified to provide low cost drug and contraceptive through a-low-cost rural health delivery system. The precedent of the IBSS in tax-free importation of drugs could be followed.

It remains necessary to identify a minimal formulary of essential, low cost drugs and to train care providers and users to use these drugs. Within the Social Security System, the problem will be to put the reduced formulary in effect; that will be possible only if there is a serious policy decision to accomplish that end. Physicians in the IBSS will have to become conscious of the terrible costs of their present prescribing habits. An adequate data base and, expecially, an accounting system is required for this purpose.

G. Planning and Information Systems

1. Planning

Two major difficulties interfere with an adequate analysis of the health planning system. First, it is both complex and relatively invisible within the government, hence most difficult to study. Second, health planning in Bolivia does not follow the conventional dictates of academic, idealized planning theory. In view of these problems, the following discussion is advanced as tentative.

The idealized concept that the MOH should plan and coordinate the whole health sector is not viable or relevant within the current Bolivian context. In fact, a variety of independent and autonomous agencies control their own processes, almost totally without consulting the Ministry. Not even the legislated controls over the private sector (through licensure and inspection) are actually enforced. The private sector will be accepted as unplanned in this sense and the following discussion will focus on planning and decision-making processes within the public sector.

Most activity within the public health sector occurs because of an historical accretion of resources organized in an institution to respond to a direct demand from the beneficiaries or patients. The creation and definition of a health institution in Bolivia can be accepted as a rare and political decision. Recent examples such as

the National Social Development Council (JNDS) and the Bolivian Social Security Institute (IBSS) tend to confirm this judgment. Technical and professional personnel are involved in fleshing out plans at the direction of national authorities, but the original concept typically rests elsewhere and the final decision rests with the Presidency. Technical and professional skills and judgments, therefore, respond to initiatives but do not create nor schedule those initiatives. As has been described in section E, facilities belonging to the MOH typically are built at ad hoc community instigation with the approval of national leaders including the MOH. Construction by decentralized agencies is initiated from within those agencies, but their decisions also are surely made on political as well as technical grounds.

Several mechanisms exist by which personnel are appointed and removed from agencies. The Bolivians conceptualize personnel in health agencies as either political or technical. "Political" officials tend to occupy a small number of policy-sensitive positions, typically quite high in organizational hierarchies. They are frequently replaced. "Technical" officials in the health sector tend to have considerable job stability once hired. Hiring appears to follow two main paths: a new agency head will appoint a number of his supporters to new positions, or a new position will be created to meet the demand of a community to increase or improve services in their health services. These position-creation decisions also appear normally to be taken at the level of the agency head. Of course, the construction of a new facility also involves and implies the creation of new staff posts or "budget items". In the sense of decision-making, the occupied "budget items" are most important since they commit resources.

Personnel planning is complicated within agencies by the fact (section VI-D) that educational institutes train professionals in numbers that meet students' demands for education, but do not meet the needs of agencies or the country for personnel. The result is an oversupply of professional personnel. The professional elites, in turn, put organized pressure on government agencies to supply positions. Such pressures for employment are responsible in large part for the excessive governmental agency expenditure on personnel and their resulting inadequate expenditures for drugs, supplies and maintenance. Obviously, unpredicable financing constrains decision makers in their approval of investment in new facilities, and in their creation of new jobs. The small incremental changes in total employment are weighed carefully agains expected increases in budgets.

As is described in section VI-C, the budget of the MOH is subject to the same problems as that of the overall government. Over-estimations of the yearly budget, followed by late year budget cuts, reduce non-personnel expenditures, expecially for such items as drugs and supplies. Social Security is similarly handicapped by

poor financial planning and controls, but solves the problem of its operational deficit by borrowing against insurance reserves for other risks. This, of course, limits the investments which normally (e.g., in other countries) would be financed from these reserves. The share of the national budget that goes to the public health sector is decided upon by the President, with inputs from Ministries of Coordination and Finances. The total income of the Social Security Institutes results from past legal processes which established the Social Security Law.

The technology used in determining health services is not planned per se. It is determined essentially by educational institutions in the training of health workers, because the health agencies are weak in such areas as supervision, medical audits, professional practice norms, and drug formularies. Administrative procedures are so weak as to negate the question of the planning processes that underly them.

Thus, we have a picture of a health system in which inputs and organization are determined by essentially political processes; hence, in specifying inputs, a system in which there is little certainty and probably insufficient consideration as to what the service outcomes or health results will be.

Under such circumstances it is not surprising that technical planning capacity has atrophied. Directors of health facilities have little discretion as to how they will distribute their budget and little real authority over their personnel. Regional authorities of the MOH, for example, do not participate in the yearly budget discussions nor in the elaboration of long term plans. Central planning departments in the MOH and IBSS are small, limited to very narrow technical tasks, and as often as not prepare documents which are plans in name only. CONEPLAN, which is responsible for national planning and coordination among sectors, is also understaffed and tends to concentrate on broad questions on the health field.

A variety of partial remedies have been suggested in previous sections that, together, would greatly improve the planning system, i.e.: strengthen planning offices, adding units of physical and human resources planning to assure that production and distribution are appropriate to need; improve the financial and accounting systems; decentralize authority to regional and local officials, etc. These partial remedies share a common feature: they might reduce the current unrestrained temptation for central officials to make allocation decisions only on political grounds. Therefore, if such remedies are to be truly accepted by policy makers, it will have to be on the basis of their conscious decision that technical and professional improvements will more than compensate for a reduction in their present reliance on matters of favoritism and political considerations.

2. Information systems and data availability

In view of the weak planning and decision-making processes described and the lack of strong administrative structures, it is predictable that the health information system is poor. In fact, there would be no user group for the information developed by a system judged good by international standards. Few resources are spent to collect and process information. Information is adequate only in a few such internal aspects of medical care administration the numbers of outpatient visits, hospital discharges, etc.

The situation in vital statistics and demographic data is one of almost complete lack of data. The first census in 25 years is now being planned, presumably for 1975, 1976 or 1977. Currently, with the exception of the Malaria Program, which has made its own maps and censuses of the malarial areas, all health agencies are working on projections of population from 1950.

The situation regarding vital statistics is summarized in Table 6.31. The estimate of 33 percent for 1973 is somewhat unreliable since the National Institute of Statistics did not know the exact number of offices that did exist. It should be not be assumed that reporting is performed by as high as 33 percent of the Civil Registry offices, because even those offices that do respond to inquiries do not all send complete information; for example, in 1971 of 789 officials who ever sent information, only 375 (48 percent) sent reports every month and 151 (19 percent) of those complying at all sent less than half their required reports. The National Institute of Statistics at present does not process this information, deeming it too incomplete to be useful.

Data are similarly scarce and unreliable regarding the health status or health demands of the population. No up to date sample surveys of health status exist, and there appears to be no permanent mechanism by which to develop such surveys. The system for notification of communicable diseases is deficient. In 1972, only 78.4 percent of MOH facilities were sending in such reports, and their arrival in La Paz normally was three to six months late. Other institutions and private sector physicians scarcely comply with the law on these matters. As a consequence of the failure of the data system, the health service system is very deficient in meeting epidemics. In a recent outbreak of plague, for example, there were 14 cases and five deaths before the government knew of the problem. It is interesting to note that informal channels seemed to work better than formal channels: truck drivers struck, to avoid having to make deliveries in the town affected and, in turn, notified the MOH.

Table 6.31 - Number and Percentage of Civil Registry Offices that Provide Vital Statistics by Year and Urban/Rural Areas, 1971-1973

Year	Total Number	Number Reporting	Urban Total	Urban Reporting	Rural Total	Rural Reporting
1971	1708	789 (46%)	269	153 (57%)	1437	636 (44%)
1972	1708	684 (40%)	269	113 (42%)	1437	571 (40%)
1973	1708	560 (33%)	269	82 (30%)	1437	478 (33%)

Source: Instituto Nacional de Estadística, unpublished data, 1974

Table 6.32 - Percentage of Ministry of Health Facilities Providing Information on Activities, 1971-1972

Type of Activity	Type of Facility	1971	1972
Outpatient visits	Hospitals	98.8	99.7
	Health Center-Hospital	85.4	91.3
	Medical Post	77.8	89.4
	Health Post	72.0	84.4
	Health Center	61.2	92.4
Hospitalization	Hospitals	96.8	99.7

Source: Espino, Esperanza, "Informe de la Misión Realizada en Bolivia del 8 al 17 de Octubre de 1973, Naciones Unidas, unpublished paper, 1973

Data on morbidity attended by medical personnel for the larger institutions is more complete, as shown for the MOH in Table 6.23. Reporting in the CNSS and other IBSS affiliates is also comparatively complete. In general, however, the quality of this morbidity data is poor. Due to lack of diagnostic facilities, the use of the three digit diagnostic code (WHO International Standard) may not be justified and certainly is not efficient.

As indicated earlier in this Chapter, information on resources--financing, human resources, physical resources, drugs and supplies--is very deficient, as is administration information. Various suggestions have been made for strengthening these systems.

Some information related to the service productivity of resources is available in the public institutions: e.g., outpatient visits per doctor hour, bed utilization rates, etc. Other similar data (e.g., operations per day per surgical suite, X-Rays per day per apparatus, etc.) are not collected. No general information exists relative to the quality of services, and there are almost no mechanisms to generate such data. Medical history forms are to be unified over the country in the future, but there now is no such system. Spot checks indicate that medical histories are now often woefully inadequate.

The existence of limited data does not mean that existing data are readily available to interested health officials. There appears to be no standard procedures to distribute information to regional and local users, and the transmission (required by law) of information from other agencies to the MOH and the National Institute of Statistics is very deficient. This information seems to be available only in the central offices of the agency to which it pertains, providing it has been compiled.

3. The health information system

The National Institute of Statistics (INE) is by law the central agency in the government for the collection and distribution of statistics. It therefore is in charge of the census and of vital statistics, theoretically compiled from forms provided through the Civil Registry. In fact, the Registry is now more engaged in its duties of certifying vital events for legal purposes than in providing vital statistics.

Health statistics are the direct concern of the Department of Biostatistics of the MOH. This office is currently in the Division of Technical Services, but discussion is under way to transfer it to the Department of Planning, a most appropriate move in view of other suggestions to locate a planning support group in that office.

Statistics offices have also been established in eight Regional Health office.

The IBSS also has established a central statistics department that now is developing a uniform system of health statistics to be used by all of the individual cajas.

The National Computation Center (CENACO) is responsible for all government electronic data processing. CENACO works closely with INE in processing vital statistics. The MOH is, however, in the process of acquiring a small computer, which in theory can be used as a satellite terminal to the CENACO equipment; the IBSS also has automatic data processing equipment of its own, but of a simpler type.

In the last four years, training has been provided to 161 persons in health statistics and health information, as follows:

	Out of country	In country
Biostatistics Department (MOH)	1	4
MCH programs	1	1
Regional Health offices	5	67
IBSS affiliates	4	57
Private hospitals	3	12

The personnel thus trained should provide the basis for a significant reform and improvement of the health statistics system.

The technology used throughout the information system is antiquated. Forms are cumbersome and codes often inappropriate; for example, the definition of a live birth* has not been changed since the Napoleonic Code. Information collected is highly inaccurate, there is no sampling, and far more information is collected than necessary. Processing is duplicative and manual, with almost no automation within the health agencies as yet.

4. Program of UNDP/PAHO

Significant improvements have been made in the information system of the MOH in recent years as a result of Project 3500 of the UNDP. The forementioned personnel training and computer acquisition are funded through this project. A full-time PAHO advisor is assigned to the program.

---

* A live birth is one that results in "a child human in form in its principal parts who survives 24 hours." Note that deformed children and those who die the first day are not legally born!

The project's goals are generally to strength the infrastructure of the MOH health statistics system at national, regional and local levels, to improve vital statistics, to improve morbidity statistics (both epidemiological surveillance and attended morbidity in the MOH), to improve resource statistics, and to improve service statistics. The project will not address all deficiencies in information in the MOH, but will attack the most important; it is probably a sufficiently large first stage of improvement. It appears that this project will not affect the situation in vital statistics, nor will it provide significant assistance to the IBSS.

5. Health research

The network of institutions engaged in carrying out health research is very extensive but uncoordinated. A list of 49 agencies involved in health-related research is offered in Table 6.33; the list was prepared by the Bolivian National Academy of Sciences, which has the legal responsibility of coordinating all research in the country, including medical research. Unfortunately, this list is very incomplete. Major research institutions not listed include the three medical faculties in Bolivian Universities and the MOH. The Ministry, for example, conducts research through its Division offices in La Paz, the Regional Health offices and occasionally through local facilities.

The importance of applied research for the reform of the health sector is very great, and few Bolivian professionals are qualified for directing and performing quality research. It is therefore very desirable to achieve better coordination of research. A possible mechanism would be the creation of a health research committee representing the Academy of Sciences, the National Council for Higher Education (CNES), the MOH, the IBSS and CONEPLAN. Such a committee could be provided with a small but permanent secretariat. The first task of the secretariat would be the completion of inventories of research capacity and of research projects. This committee could then advise on required research for health, and on funding allocation for research through the several institutions.

6. Conclusions

Suggestions made elsewhere in this Chapter about planning and information improvements will not be repeated here. The correction of deficiencies in the information system, grave as they are, will not correct the problems in planning and administration. The reverse is not equally true, however. On the contrary, a significant improvement in administration and planning will tend strongly to cause a correction of the information deficiencies. The problem of demographic information will be resolved for the short term by the

Table 6.33 - Institutions Engaged in Scientific Activities Related to Public Health.

Code No.	Name of Institution
17-292	Bolivian Association of Protection to the Family (PROFAM)
17-109	Association of Studies and Investigations in Odontology
20-270	Atheneum of Medicine
20-022	National Library of Bolivia
20-209	National Library
31-068	Bolivian-Argentine Center of Scientific Technical Cooperation
36-009	Center of Scientific and Technical Documentation
39-056	Center of Social Investigations
40-057	Center of Archeology Investigations of Tiahuanacu
42-010	Center of Nuclear Medicine
43-037	Center of Social Promotion
46-187	National Center of Computation (CENACO)
47-266	National Family Center (CENAFA)
49-217	Center for the Social and Economic Development
54-297	College of Biochemist and Pharmacy
57-119	Medical College of Bolivia
59-012	Bolivian Commission of Nuclear Energy
105-281	Department of Psychology of the Catholic University
107-139	Department of Veterinary Medicine of Trinidad
116-225	Planning Direction (CONEPLAN)
128-000	National Direction of Antropology
135-111	Humanitarian Assistance Division USAID
170-218	Children's Hospital "Albina de Patiño"
171-222	Elizabeth Seton Hospital
184-020	Institute of Human Genetics
108-115	Institute of Occupational Health (INSO)
201-031	Bolivian Sociology Institute
201-121	Institute of Experimental Biology
206-027	Medical Institute
208-013	Institute of Transmissible Diseases (INET)
209-216	National Malaria Eradication Service (SNEM)
210-023	National Institute of Cancerology
211-028	National Institute of Psychiatry
214-077	National Institute of Blindness
215-085	National Institute of Thorax
217-091	National Institute of Animal Biology
217-094	National Institute of Infant Adaptation
218-104	National Institute of Animal Biology, Santa Cruz
238-065	Bolivian League Against Epilepsy
258-067	World Health Organization (WHO)
259-084	Foster Parent's Plan
279-017	National Community Development Service (SNDC)
284-267	Bolivian Society of Ginecology and Obstetrics
285-269	Bolivian Society of Gastroentereology
286-284	Bolivian Society of Orthopedics and Traumatology
287-290	Bolivian Society of Pediatrics
	Institute of Altitude Biology
	Bolivian Society of Public Health

Source: Bolivian National Academy of Sciencies, unpublished data, 1974.

forthcoming census. Long term reform will require major modification of the Civil Registry and INE, activities which will not pay off in terms of direct health benefits.

Care should be taken to assure that an appropriate information system is built into any future low-cost, integrated health service delivery system. The health promotors and community leaders involved in such a system presumably would be relied on to gather demographic data, vital statistics, and morbidity data, thereby offsetting the weakness of INE. Significant attention will have to be directed at developing simplified, sampled, automated information systems for other aspects of planning and administration.

Footnotes

(1) Public Administration Service, Advisory Group in Fiscal Reform Annual Report, May 1974, p. 28

(2) USAID/Bolivia, Education in Bolivia: A Preliminary Sector Assessment, 1974, p. IV-30.

(3) Chirikos, Thomas, et.al., Human Resources in Bolivia, Center for Human Resources Research, Ohio State University, Columbus, Ohio, April 1971, p. 115.

(4) Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p. 96.

(5) Chirikos, op.cit.

(6) Education in Bolivia, op.cit.

(7) Plan Nacional de Salud, 1973-1978, op.cit. p. 104

(8) Urioste, F.J. de, "La Atención Médica en la Seguridad Social Boliviana", unpublished paper, 1974.

(9) Plan Nacional de Salud, 1973-1978, op.cit., p. 96

(10) Michigan State University, Market Processes in La Paz, Bolivia, Latin American Studies Center, Research Report No. 3, 1969, p. 29.

(11) Urioste, op.cit.

(12) Comisión Interministerial para el Sector Salud, "Informe de la Sub-Comisión de Productos Bioquímicos", 1974.

(13) Zachman, Roberto, Consultant Report, USAID/Bolivia, 1974

(14) Zachman, Ibid.

(15) Ministry of Health, Pharmacy Division, unpublished data, 1974.

(16) Market Processes in La Paz, Bolivia, op.cit., p. 161.

CHAPTER VII

PROBLEMS AND PROGRAMS WHICH REQUIRE INTERSECTORIAL COORDINATION

A. Summary

It is very difficult in many respects to separate "health" from other aspects of life. The relationships between health status, economic status and education, for example, are interdependent. The solutions to "health" problems inevitably demand interventions or changes in related areas. As a result of professional and organizational specialization, truly integrated programs--those which directly address the needs of the population in ways that take these basic interrelationships into account--have been scarce and most difficult to create. More often than not, programs are designed and implemented from a narrow organizational and professional point of view. In Bolivia, intersectorial programs practically do not exist. The closest the country has come to crossing the boundaries that separate the sectors is in the work of the National Community Development Service. Limited resources, a degree of internal specialization and a dependence on other government agencies for technical and material and material support at the community level, however, have limited the Service's effectiveness.

The present chapter deals with two important problem areas in the health field. The first is the serious situation regarding nutrition. Inherently, programs aimed at diminishing the high prevalence of malnutrition in the country must involve the agricultural sector, commercial and transportation systems, educational programs, and other economic segments of the society. Agricultural production now is undirected and places little emphasis on matters of nutrition. The availability of food commodities varies with the season and the adequate storage of food products is unknown. Considerable price fluctuations occur. There are no food fortification programs. Consumption patterns are based on economics, and low incomes make the majority of society financially unable to obtain necessary nutrients. Current programs to meet these needs are extremely limited and inadequate.

The second major problem involves community health promotion activities, especially in the area of health education. Although it commands considerable manpower resources, the rural education system is so plagued with deficiencies that it is ineffective. The Community Development Service has trained many local level health promotors, but they lack adequate supervision as well as technical and material support. Current programs of health education concentrate almost entirely on the diffusion of material and information, but they lack depth [illegible] not

supported by effective actions aimed at changing attitudes and health behavior.

Progress could be made in both areas--nutrition and health promotion--through AID-financed programs in health, agriculture and rural education with participation by the National Community Development Service. Coordinated planning, however, is a necessary first step. In AID loans for both education and agriculture, there are management components aimed at organizational and administrative reform, personnel training and improved information systems. The rural education loan will stress teacher training, curriculum reform and practical experience. The agriculture loan will concentrate on key crop production and marketing techniques, and the NCDS will focuse on small farmer organization. Both agriculture and education propose the establishment of regional service and education (nuclear) multipurpose centers for rural development. There is great potential in these proposals, either to achieve integrated rural development or to create even greater fragmentation. Without real coordination of all pertinent activities across sectorial boundaries, better health status will be almost impossible to achieve.

B. Nutrition Program

1. Introduction: Nutrition and Malnutrition

The nutrition program for a country involves the agriculture sector in the production, processing and distribution of food. It also involves the health sector and its programmatic activities in the areas of research on nutrition status, recuperation of malnourished persons, maintenance of good nutrition and reduction of the prevalence of illnesses that increase food requirements. The Health Sector Assessment does not pretend to treat all such major areas adequately. One principal conclusion related to nutrition is that current information and planning are inadequate to face the major nutritional problems that Bolivia faces.

Nutrition problems are not homogeneous in the national population. Specific age groups and specific geographic groups suffer much more serious problems than does the population in general. "Average" consumption may be high but wide variances in food distribution nevertheless can leave a large portion of the population malnourished. One question is the "average" food availability and consumption; another is the equity of distribution of consumption within the population. Obviously, economic factors are most influential in determining the distribution. Small children are a population group of special concern; pregnant and lactating women are another.

Malnutrition is most serious as a health problem of small children, in Bolivia as elsewhere in the developing world. This is illustrated in Chapter II, where figures indicate that about half of all

Bolivian pre-schoolers suffer from malnutrition. In the study of child mortality done by PAHO, 36 percent of such mortality in La Paz and 30.4 percent in Viacha was directly or indirectly associated with malnutrition. This situation may be further explored using the data of Table 7.1. Mortality associated with malnutrition for all age groups is higher in Bolivia than in the average of the Latin American countries studied. However, for Bolivian infants mortality due to malnutrition is much closer to regional averages than it is for older children. This is almost surely related to the fact that most Bolivian mothers nurse their infants for an extended period.

As other foods are introduced and nursing is terminated, the child faces serious nutritional problems. The Nutrition Survey of 1962, for example, indicated significant reduction in growth from age six months to age two years. The beneficial effect of long nursing on the health of the child is also indicated in Tables 7.2 and 7.3.

Table 7.1 - Mortality Rates* due to Nutritional Deficiency (Principal or associated cause) by Age Group

Location	Less than one year	One year	Two to four years	Total less than five
Average of Latin American Projects	1,867.6	687.5	155.8	660.3
La Paz	2,029.4	1,477.3	285.1	958.6
Viacha	2,941.2	2,676.1	267.4	1,462.7

* Rates for children less than one year of age per 100,000 live births; for other children per 100,000 inhabitants.

Source: Rice Puffer, Ruth and Carlos V. Serrano, Características de la Mortalidad en la Niñez; Organización Panamericana de Salud, Publicación Científica No. 262, Washington, D.C., 1973, p. 177.

Pregnant and lactating women also are a specific concern of nutrition programs. High nutritional demands are placed on such women. The only available information on such women in Bolivia comes from a small sample done in the Nutrition Survey of 1962. Some data suggest a slightly worse nutritional status for these women than for the

Table 7.2 - Percentage Deaths from Diarrheal Disease in Children 28 days to 5 Months of Age

Location	Never Weaned	Nursed one month or more	Nursed less than one month	Not nursed
Average Latin American Projects	31.7	51.4	54.2	51.7
Bolivia	26.3	31.4	32.4	42.9

Source: Ruth Rice Puffer, Carlos V. Serrano, Características de la Mortalidad en la Niñez, Organización Panamericana de la Salud, Publicación Científica No. 262, Washington D.C., 1973, p.281

Table 7.3 - Percentage Deaths for Children Less than One Year of Age with Malnutrition as Basic or Associated Cause*

Location	Never Weaned	Nursed one month or more	Nursed less than one month	Not nursed
Average Latin American Projects	34.1	49.2	50.0	51.5
Bolivia	37.1	40.7	51.3	50.8

* Percentages of deaths from these cases in Bolivia are lower than for the average of Latin American countries due to the relatively high incidence of other causes of death in Bolivia, especially communicable diseases.

Source: Ruth Rice Puffer, Carlos V. Serrano, Características de la Mortalidad en la Niñez, Organización Panamericana de la Salud, Publicación Científica No. 262, Washington, D.C., 1973, p.284

population as a whole, but no statistically significant differences were found in the small sample. The nutritional status of the country was relatively better in 1962 than it is now, however, so these results may have been changed. A study of anemia in 35,000 women of child bearing age in Bolivia, now being conducted, may resolve the question of the current nutritional status of women.

The entire population may also be divided into three general groups according to the food systems that serve them: urban populations; subsistence farmers, primarily in the high and middle altitude zones; and workers in the modernized agricultural sector, primarily in the east of the country. In Table 7.4, data indicate that people in the warm, low altitude zone had notably poorer diets in protein, and slightly higher calorie consumption, than their counterparts in the rest of the country. Similarly, in Table 2.6 of Chapter II the data indicate considerably less child malnutrition in the Santa Cruz area than in other parts of the country.

Table 7.4 further illustrates the nature of the nutrition problem. Food energy production in 1962 was somewhat inadequate, but in much of the country protein production was adequate (the latter is no longer true).

Table 7.4 - Percentage of Nutritional Intake Attained in Different Regions of Bolivia, 1962*

Nutrient	High Altitude Zones	Middle Altitude Zones	Low Altitude Zones	Bolivia Average
Calories	83	84	88	84
Protein	105	107	92	103
Calcium	20	22	22	21
Iron	158	137	115	138
Vitamin A	67	80	35	58
Thiamine	69	88	48	70
Riboflavin	44	48	39	44
Niacin	94	95	69	89
Vitamin C	117	138	125	120

*Based on National Research Council recommended allowances.

Source: U.S. Department of Defense, Bolivia Nutrition Survey, Report of the Interdepartmental Committee on Nutrition for National Defense, La Paz, 1964, pp. 130-131.

Calorie production would still have to play a major role in any nutrition program. Specific deficiencies of high value were noted in Calcium, Riboflavin, and Vitamin A, but the relative importance of these deficiencies is low as compared with those of calories and protein.

Table 7.5 illustrates the relation of food consumption to income. Of course, income is confounded with other variables since urban residents have much higher incomes than rural residents. Nonetheless, the variation is marked.

2. Agricultural production and food consumption

Table 7.6 shows apparent consumption from food balance charts for 1956-62 and 1970, and a projection of apparent consumption for 1980. The nutritional implications of these projections are surprising. If consumption continues to evolve in the 70's as it did in the 60's, nutritional status will improve (Table 7.7); however, one problem may be noted. Protein sources are judged by how fully the protein can be used by the body. High quality protein is similar to that found in animals and meat. On the whole, grains yield relatively low quality protein, due to the different balance of amino acids they contain. As the animal protein in the diet is reduced, and as it is replaced by grain protein (low in lysine), the nutrition value of the diet, per unit of consumption, may be reduced.

Table 7.5 - Calories Consumed per Day by Income Group in Bolivia, 1970

Econoric Level	Percentage of Population	Calories per day
Low	50	1,356
Medium	30	2,165
High	15	2,861
Very High	5	4,813

Source: FAO, "Estudio de las Perspectivas del Desarrollo Agropecuario para Sud América", PSWAO/01, August, 1972. Quoted in Torrico, J.O. "Factores y Recursos para la Producción de Alimentos", Thesis, Faculty of Geosciencies, University of San Andrés, La Paz, 1974.

Table 7.6 - Projected Consumption Patterns of Basic Food Stuffs, 1980

Food Item	Apparent Consumption 1958-1962[a]	Apparent Consumption 1970[a]	Percent Change	Predicted Consumption 1980[a]	Apparent Per Capita Consumption 1980[b]		
					Total Grams	Calories	Grams Protein
Fish	1.14	-	- 100	-	-	-	-
Barley	30	2	- 93.3	-	-	-	-[c]
Beef and Veil	70	52	- 25.7	38.6	18	20.4	3.9[c]
Milk	75	61	- 23.0	49.6	23	13.1	1.4[c]
Quinua Canihua	11.5	9	- 21.7	7.0	3.3	11.6	0.4[c]
Sheep, lamb, llama, alpaca	24	19	- 20.8	15.0	7.3	9.8	1.4[c]
Corn	160	128.	- 20.0	102.4	49	178	4.9[c]
Poultry., rabbit	5.5	5	- 9.1	4.5	2.3	3.9	0.4[c]
Other fruits	137	134	- 1.2	131	60	25	0.5[c]
Pork	18	19	5.5	20	9.8	18.8	1.8
Yuca, sweet potatoe	135	153	13.3	173	81	120	0.7
Potatoes, ocas, olluco	400	515	28.8	663	311	246	8.8[d]
Fats and oils	15	21	40.0	29	14	112.3	-
Sugars	74	106	43.2	152	72	275	-
Rice	28	43	53.6	66	31	113	2.2[d]
Other vegetables (including pulses)	164	254	54.9	393	184	74	1.2[d]
Wheat	144	250	73.6	434	205	720	22.0[d]
Plaintains and bananas	91	173	90.1	347	144	176	1.7[d]
Total						2,106.9	51.4[e]

[a] In 1,000 metric tons
[b] Assuming population of 5,845,000 for 1980
[c] Decreasing in total amount
[d] Increasing faster than population
[e] Animal pretein = 7.1; vegetable protein = 44.3

Source: For apparent consumption data 1958-1962 and 1970: USAID/Bolivia, Agricultural Development in Bolivia: A Sector Assessment, La Paz, August 1974, pp. 9 and 11.

Table 7.7 - Projection of Per Capita Nutrient Availability

Year	Calories per Capita	Grams Protein per Capita	Grams Animal Protein per Capita
1958-62	2,108	66.1	19.9
1970	1,833.6	48.7	12.9
1980	2,106.9	51.4	7.1

Source: Table 7.6.

The nature of the phenomena involved in this projection is clear. The consumption of meat (with the exception of pork), fish and milk is being reduced in absolute amount, as is the consumption of such grains as barley, quinua and corn. Pork and tuber consumption, however, is increasing, but at a lower rate than current population growth. The diet is shifting to plantains, wheat, rice, and sugars - all very low quality foods.

Worse, the projection of this diet would require that one third of calories and more than 40 percent of protein must come from wheat and flour approximately 80 percent of which is imported. (Table 7.8). Wheat imports historically have represented nearly half of Bolivia's total imports. This historical tendency, if continued, would imply a progressively greater expenditure of foreign exchange reserves on food imports and a still greater dependency on foreign agriculture supplies.

The situation relating to production of agricultural products is illustrated in Table 7.10 and Table 7.11.(1) Certain crops (wheat, sugar cane, and rice) have prices set by the government. The remaining 10 crops have all increased in price, indicating that demand has increased faster than supply. The prices of six of these crops (quinua, corn, other tubers, vegetables, citrus fruits and barley) increased faster than their rates of increase in production during the past ten years. This suggests inelastic supply schedules. Most of these crops are grown on limited land areas of the Altiplano and valley zones where significant supply response is difficult.

The relatively slow increase in the price of quinua, barley and other tubers, given the very small increase in supply, reflects only a slight increase in demand for these products. All are

Table 7.8 - Production and Importation of Wheat and Flour, 1970-1973

Year	Wheat[a] Production M/T	Wheat[a] Importation M/T	Flour[b] Imports M/T	Equivalent[b] wheat or flour imports, M/T	Total Import wheat equivalent M/T	Total Wheat consumption M/T	Percent Import
1970	44,190	45,673	116,603	160,000	205,673	249,863	83
1971	47,106	46,283	123,324	170,000	216,283	263,389	82
1972	50,555	82,752	100,475	139,000	221,752	272,307	81
1973	52,700	62,333	76,000	105,000	167,333	220,033	76

[a]Torrico, J.O., "Factores y Recursos para la Producción de Alimentos", Thesis, Faculty of Geosciencies, University of San Andrés, La Paz, 1974.
[b]Using a conversion factor of 1.38 M/T wheat per M/T flour

Source: Daly, John, Consultant Report, USAID/Bolivia, 1974

Table 7.9 - Price and Indices, La Paz, 1960-1974*
Cost of Living

Year	Price Food Index La Paz	General Cost of Living Index La Paz
1960	82.5	73.0
1961	87.1	78.5
1962	89.3	83.1
1963	86.6	82.5
1964	88.9	90.9
1965	91.6	93.5
1966	100.0	100.0
1967	116.1	111.2
1968	124.7	117.3
1969	127.3	119.9
1970	133.1	124.5
1971	138.4	129.1
1972	147.2	137.5
1973	198.7	180.3
1974 (Jan.)	308.6	254.6
1974 (Feb.)	355.1	286.1
1974 (March)	362.7	291.3

* 1966 = 100

Source: USAID/Bolivia, Agricultural Development in Bolivia, A Sector Assessment, La Paz, August 1974, p. 13.

traditionally produced and consumed as subsistence crops in rural areas of the Altiplano and valleys, where population has increased slowly and income has increased hardly at all. The income elasticity of these crops is obviously low. Finally, the preferences of urban consumers for such crops is quite low. In contrast, more rapid increases in the prices of corn, vegetables and citrus fruits, given small increases in supply, reflect relatively larger increases in demand. Hard corn due to rapidly rising demand for animal protein has experienced strong demand pressure from the commercial livestock sector. Bland corn for human consumption has been subject to increasing population pressure and rising income. Corn is widely consumed in urban as well as rural areas, especially in the valleys, and likely has a positive though small income elasticity of demand. Demand for both citrus fruits and vegetables has increased due to increased population, shifting tastes and preferences as rural people move to

urban areas, and from increased income given the positive and relatively high income elasticity associated with these products.

The four crops whose prices increased more slowly than production are potatoes, dried beans, bananas and plantains, and yuca. Potatoes and dried beans experienced relatively slow price increase. This is due to increase in demand which only slightly offset the modest increases in production. Potatoes are a major subsistence crop in rural areas of the Altiplano and valleys, as are beans in the Oriente. In addition, potatoes are a staple in the diet of most urban consumers. Most demand pressure has come from increased population, and to a much lesser extent from increased income since the income elasticity associated with both crops is probably relatively low.

Perhaps the most paradoxical price increases are those for bananas and plantains, and yuca. Prices for these products increased rapidly at the annual rates of 6.8 and 4.5 percent, respectively. Production has increased even more rapidly, however, and one would have expected prices to increase at much lower rates or even decrease, given the limited demand usually associated with these products (excepting perhaps bananas).

Likely these rapid price increases (and to some extent those for vegetables, citrus fruits and corn) can be explained by internal population shifts, associated shifts in tastes and preferences, and resultant substitution effects from relative price changes. First, the rural population of the Altiplano and valleys is shifting to rural areas of the Oriente. Although no data are at hand on the rate of population increase for rural areas of the Oriente, it appears to be much greater than the average rate of population growth for the nation. This has put increased demand pressure on yuca, bananas, plantains, and citrus fruits.

At the same time, rural-urban migration has helped the urban population of Bolivia grow much more rapidly than the national average for total population of 2.6 percent in the last 5 to 10 years. For example, the rate of population growth in La Paz is estimated to be at least 3.5 percent per year, and [illegible] rates are found in other cities. The tastes and preferences of rural-urban migrants tend to shift toward vegetables and citrus fruits and, to some extent, to corn. Finally, higher prices for nutrients in potatoes, beans, other tubers, and cereals may have resulted in a strong substitution effect for yuca and bananas as relatively cheaper carbohydrates. No definitive evidence is at hand, however, to explain the rapid increase in average prices for these two crops.

Table 7.10 - Production, Consumption Growth Rates and Farm Prices for Various Agricultural Products, 1972

Product	1972 Production M/T	1970 Apparent Consumption M/T	Annual Rate of Growth 1963-72 Production M/T	Farm Price US$ M/T
Quinua	9,942	9,000	-0.52	2.34
Corn (grain) [c]	281,994	128,000	0.29	9.30
Other tubers [d]	36,871	a	0.95	3.59
Wheat	53,858	250,000	1.37	-
Vegetables [e]	203,084	254,000 [b]	1.80	5.72
Citrus fruits [f]	87,837		1.91	12.76
Barley	63,757	2,000	2.61	3.30
Potatoes	668,596	515,000	3.27	1.87
Dried beans	12,102	b	3.43	2.95
Sugar cane	1,363,075		5.22	
Bananas [g]	329,687	173,000	6.82	6.77
Rice [h]	75,515	43,000	7.74	
Yuca	232,919	153,000 [a]	7.79	4.49

a. Yuca and "other tubers" are included in the same category of "yuca" in apparent consumption 1970.
b. Vegetables, including pulses are included under vegetables in apparent consumption 1970.
c. Corn production includes hard grain for livestock as well as soft grain for humans.
d. Includes sweet potatoes, oca and papalisa.
e. Includes sweet corn, onions, tomatoes and green peas.
f. Includes oranges, tangerines, lemons, grape fruits and limes.
g. Includes plaintains.
h. Unhulled.

Source: Whitaker, Morris D. and E. Boyd Weunergren, The Status of Bolivian Agriculture, Praeger, Inc., in print.

Table 7.11 - Changes in Yield, Land Use and Growth Rates for Various Agricultural Products, 1963-5 and 1970-2

Product	Annual Rate Change Yield 63-65 and 70-72	Percent Change Land Use 63-65 to 70-72	Overall Annual Rate of Growth 63-72
Wheat	4.8	-22.77	1.37
Potatoes	4.5	-10.1[illegible]	[illegible].27
Quinua	3.8	-24.32	-0.52
Yuca	2.1	40.66	7.79
Vegetables [a]	1.5	30.92	1.80
Barley	0.2	15.02	2.61
Corn [b]	0.2	1.32	0.29
Rice [c]	-0.2	55.11	7.74
Citrus [d]	-0.7	20.27	1.91
Plaintains & bananas	-0.7	62.38	6.82
Sugar cane	-0.7	41.78	5.22
Other tubers [e]	-1.3	17.61	0.95

a. For yield and overall includes sweet corn, onions, tomatoes and green peas. For land includes onions, tomatoes, green peas, spanish beans, garlic, carrots, dried peas, and dried horsebeans.
b. Included corn for livestock and humans.
c. Unhulled rice.
d. Oranges, tangerines, lemons, grape fruits, limes.
e. Sweet potatoes, oca and papalisa.

Source: Whitaker, Morris D. and E. Boyd Weunergren, The Status of Bolivian Agriculture, Praeger, Inc., in print.

Examining Table 7.11 it can be seen that three crops: wheat, potatoes and quinua, have experienced simultaneously great increases in productivity and significant decreases in land planted. In fact the reduction in planting, assuming that marginally producing lands are withdrawn, would explain a portion of the increase in yield.

The remainder of the increase is probably due to improved technology and factor inputs. As can be seen in Table 7.12, these crops are grown primarily in the Altiplano and valleys where available land is sharply limited. The freed land in these areas has been put into corn, barley, oats, miscellaneous, tubers and barley hay which continue to show low increases in yield.

Such crops as plantains and bananas, rice, yuca and sugar cane have experienced great increases in planting, with little increase in yield. They are typically grown in the tropical lowlands, where there are great tracts of new land that can be opened. The effort in these areas has been to increase the land factor in the production function, while leaving technology and other inputs relatively stable. Of course this area of the country enjoys a higher technology and more modern factors than the Altiplano and valleys.

Table 7.12 - Cultivated Areas of Selected crops by Area, Bolivia, 1972 (Thousands of Hectares).

Crop	Altiplano La Paz, Oruro Potosí	Valleys Cochabamba, Tarija, Chuquisaca	Oriente Pando, Beni Santa Cruz
Wheat	19.9	49.1	0.2
Potatoes	52.5	33.2	2.1
Quinua	14.1	-	-
Barley	60.1	21.3	-
Corn	26.0	125.9	75.5
Rice	7.6	4.1	34.0
Citrus	3.0	1.4	1.9
Plantains and bananas	2.5	10.0	4.1
Sugar cane	-	6.1	34.3
Coffee	13.3	2.1	-
Coca	2.2	4.1	-
Total land occupied by agricultural production	410	311	221

Source: Whitaker, Morris D, and E. Boyd Wennergren, The Status of Bolivian Agriculture, Praeger, Inc., New York, in print.

The Agriculture Sector Assessment identifies general problems in terms of the lack of adequate government support of the sector, lack of research, of top scientific manpower, and of inadequate training of intermediate level manpower. The AID agriculture strategy is to attempt to assist in resolving these problems.

In the traditional sector of small farms (85 percent of farmers, with a typical farm from two to three hectares in size) these problems are gravely confounded by lack of education and knowledge of the farmers, lack of land, lack of credit, lack of modern technology (improved seeds, fertilizers), lack of water (irrigation), lack of capital, lack of market information, and lack of access to markets.

While 175,000 or more of these campesinos are expected to migrate during the 70's, the population of the Altiplano and the valleys continues to increase. Most available land in these areas is either in production or in the fallow phase of a long production yield. Without improving the production technology, the amount of land that can be put into production is fixed. While increases in yield in potatoes, wheat and quinua show that new technology can be effectively introduced in these areas, most of the traditional sector is only very slowly integrating into a market economy and a modern agricultural practice. To increase the speed at which this occurs, it appears that the whole range of problems affecting and limiting this sector will have to be attacked simultaneously.

The AID agriculture assistance strategy is to focus on limited geographic areas of the agricultural sector. Within those areas, stress is to be placed on the following crops: corn, wheat, rice, barley, other cereals, potatoes, forages, vegetables, and selected other crops which are important as income earners in the small farm sub-sector. From a nutrition stand point, it may be suggested that some attention be given to the production of pulses and high protain grains to supplement the grain program since if the campesinos raise poultry, swine and milk cattle, it will probably be for marketing in the first place and for a considerable time, the remaining grain and tuber production would then provide a diet lacking in essential amino acids.

The demand for migrant workers in harvest season - estimated in 10,000 for sugar cane and 90,000 for cotton - may be discussed in some detail as creating special health and nutrition problems. Such workers are typically subsistance level farmers from the highlands who work for the season, and then return to their farms. They are poorly supplied with environmental and medical services. Work in such occupation is demanding and nutrient requirements go up. The results are predictable: poor nutritional status, leading to high vulnerability to disease, faced with high exposure, leading in turn to high disease prevalence, which complicates and is complicated by the poor nutrition

status. The entire cycle is cited as a reason, in addition to low wages, why workers have not been available in sufficient number to harvest cotton. Nutritional programs based on the integration of plots for family food consumption, and improved environmental and medical services would greatly improve the situation - probably at low cost. A particularly important aspect is medical screening of applicants and migrants.

The benefits of such a program would include greater work productivity and less reluctance of workers to participate in the harvest, with direct economic benefits in the productivity of these sectors. A second benefit would accrue from the reduction of the spread of disease. Migration of farm workers to Argentina and back and the mass migration of workers from the highland to the lowland of Bolivia creates a major potential for the spread of heretofore locally contained diseases, and for the acceleration of problems by the change of environment.

Returning to the factor problems of the agricultural systems of the eastern part of the country, the small farmers face most of the same problems as those of the Altiplano and valleys. The one exception is that the small farmers of the east are considered to be more open to change.

One final problem deals with the amount of protein lost due to animal diseases. As reported in Chapter V.C., it was estimated that in 1972 there was a total loss of 7.7 million kilograms of meat and 10.2 million liters of milk due to hoof and mouth disease, bovine rabies and brucellosis.(2) This represented a conservative estimate of approximately 612,000 kilograms of milk protein and 4.62 million kilograms of consumable animal protein, or an available protein loss of 2.8 grams per person per day. The potential for improved nutrition is substantial in that 2.8 grams is 17.5 percent of the average national intake of animal protein (16 grams per person per day(3) and represents about a 15 percent available protein loss due to zoonosis.

3. Food processing, storage and transportation

The situation in these areas is one of negligibly small existing infrastructure. Meats and fish are processed in extremely rapid fashion due to an almost complete lack of refrigeration. (In 1967, according to the Michigan State University, La Paz Market Survey, only 12 of 30 meat wholesalers in La Paz had refrigerators. Slaughtering is done on a custom basis, since no refrigerative equipped slaughter homes existed). Table 7.13 shows the spoilage of several foods. Note that from 11 to 35 percent had to be discarded or sold with a discount due to spoilage. In part, this problem stems from poor transportation facilities and practices. The price fluctuations in Table 7.14 attest to lack of storage practices, since prices in the off-season are 54 percent higher for rice

and 166 percent higher for potatoes. In part, this lack of storage is due to government pressure against speculation, but in part it is due to lack of storage facilities.

Table 7.13 - Spoilage Conditions by Type of Product, La Paz, 1967

Product	To Sales at Discount	Average Discount	Percent Product Completely Spoiled
Bananas	20	23	15
Potatoes	7	7	6
Tomatoes	10	15	13
Onions	6	11	5
Carrots	7	11	13
Lettuce	8	16	9
Cabbage	10	11	3

Source: Michigan State University, Market Processes in La Paz, Bolivia, Latin American Studies Center, Research Report No. 3, East Lansing, Michigan, 1969, p. 102.

Table 7.14 - Price Movements in Potatoes and Rice During 1966*

Month	Potatoes	Rice
January	107	154
February	100	130
March	100	130
April	100	100
May	107	100
June	107	115
July	120	108
August	133	115
September	200	115
October	266	115
November	240	115
December	160	115

* April = 100

Source: Michigan State University, Market Processes in La Paz, Bolivia, Latin American Studies Center, Research Report No. 3, East Lansing, Michigan, 1969, p. 194.

Transportation of food is primarily by truck (and airplane in the case of the transportation of meat from the eastern part of the country to urban markets). Trucks are owned either by small entrepreneurs or by the government. Price advantages of trucking over railroad shipment have been demonstrated, and mitigate against rail shipment of foods. The principal problem of the current system is the extreme lack of roads. This causes failure to market in time of bad weather. In the best of cases, transportation costs are high. Improvement of this system of storage and transport of foods, by cutting both food losses and food prices, might stimulate production and probably more significantly improve nutrition.

In terms of processing there appears to be no significant use of food additives of any kind. An opportunity for such programs should be available through the five large firms who dominate the importing and wholesaling of flour, canned goods, pork lard and, to a certain extent, edible oils. Such a program would potentially be a reasonable one for attacking the secondary nutritional priorities of specific vitamin and mineral deficiencies noted previously.

An area deserving serious consideration is the development of a low cost, high-protein vegetable mix for pregnant and lactating women and for small children. (It is emphasized again that breast feeding should be strongly encouraged for infants; the mix program is for mothers, and for children of ages six months to two years). The population in question is approximately 12 percent of the total population, and is biologically very vulnerable. In traditional societies, and in Bolivia in particular, death rates are very high in this population and are strongly correlated with poor nutrition. The problem is not only one of availability of food, but also one of digestibility. A small child literally cannot eat enough of low quality foods (such as yuca, plantains, sugar syrup) to obtain required protein, or even to survive. New vegetable protein mixes (Incaparina, etc.) provide a high quality food at low price. The development of a product on plant for such food, put into a marketing and distribution program through health services and other channels, should be investigated. It might also provide additional market stimulus for the agricultural program.

4. Distribution Systems:

a. The urban system

The distribution system in Bolivia is extremely inefficient and introduces large increases in cost of food. Table 7.15 illustrates this point for a variety of staple foods. In 1967, the percentage of food cost that went to the farmer was 52 to 77 percent if he sold in

Table 7.15 - Percentanges of Retail Price of Selected Products Absorbed at Each Level in Channel, 1967

Point of Distribution	Onions	Tomatoes	Carrots	Cabbage	Bananas	Rice*
			Initial Sale at Country Fair			
Producer	34	45	48	51	32	56
Country Assembler	18	14	12	11	52	22
Wholesaler	28	21	18	17	-	5
Retailer	20	20	22	21	23	17
	100	100	100	100	100	100
			Initial Sale at La Paz			
Producer	52	59	60	62	77	
Wholesaler	28	21	18	17	-	
Retailer	20	20	22	21	23	
	100	100	100	100	100	
			Initial Sale at Farm			
Producer					32	41
Assembler (miller)						37
Wholesaler					45	5
Retailer					23	17
					100	100

*Rice sold at mill rather than country fair.

Source: Michigan State University, Market Processes in La Paz, Bolivia, Latin American Studies Center, Research Report No. 3, East Lansing, Michigan, 1969, pp. 199-202.

La Paz, but only 20 percent of food was so sold. For the remaining 80 percent of food, producers received only 32 to 56 percent. Retailing costs were always about 20 percent of total costs.

Retailing and country assembly are both activities done by a very large number of people, working with little capital and often with low total income. In La Paz in 1967, with an estimated population slightly in excess of 400,000 there were about 10,000 food retailers.

While their gross margin of profit was low, a more efficient system with relatively large retail outlets would, it was estimated, be able to reduce prices by three to five percent. More significant savings would be achieved if such outlets could, by vertical integration, absorb the roles of one or more middlemen.

A significant policy problem for USAID in the reform of the urban distribution system stems from the fact that the vast majority of persons working in this area are women. While their incomes are not large, even by Bolivian urban standards, this employment is often the major source of family income, and provides the women with a certain degree of social position. A rationalization of this system would almost certainly reduce such employments and might very well result in males displacing females in the more important posts in a reduced system. Thus, in keeping with AID's policy of trying to assist in improving the role of women in the society, alternative employment opportunities should be provided for women displaced from retailing by AID programs. Roles as health promotors would perhaps be appropriate.

The importance of savings in food purchase can be estimated through inspection of Table 7.16. For the lowest third income group of the population, two thirds of expenditures went toward the purchase of food. Nearly 60 percent of expenditures for middle income groups was expended on food. Both groups experienced net deficits in trying to live on such incomes. The high inflation in food prices in recent years (Table 7.9) had obviously gravely strained the capacity of these people to buy food (Table 7.5).

Currently, the government maintains price controls on a variety of foods: wheat, sugar and rice being among the most important. There is some question as to the effectiveness of the administration of these controls.

Their effect is to subsidize the consumer at the expense of producers and the marketing system. It would appear that such subsidy may be required. The high percentage of income for food expenditure of the urban poor, and their poor nutritional status,

indicate that redistribution will be required for the problem to be solved, as well as increased efficiency of food production.

Table 7.16 - Family Income, Expenditures and Marginal Propensity to Consume by Income Class, La Paz, 1967

Item	Lower Third		Middle Third		Upper Third	
	US$	Fraction	US$	Fraction	US$	Fraction
Family Income	560		1,096		2,914	
Food	437	0.657	717	0.584	1,308	0.390
Clothing	80	0.120	155	0.126	446	0.133
Housing[a]	72	0.107	167	0.136	403	0.121
Miscellaneous[b]	77	0.116	189	0.154	622	0.185
Savings (deficit)	(106)	0.000	(132)	0.000	135	0.171

[a]Including water, taxes, light, washing and maintenance, home textile articles, kitchen articles and equipment, furniture.
[b]Including health care, personal care articles, recreation, tobacco, education, trips, vehicle purchases, gasoline and oil, communication and other miscellaneous expenses.

Source: Michigan State University, Market Processes in La Paz, Bolivia, Latin American Studies Center, Research Report No. 3, East Lansing, Michigan, 1969, pp. 30-31.

It might well be reasonable, however, for such subsidies to be direct, rather than in the form of price controls, so that a wider portion of the society can share the burden.

b. The rural sector

The small rural farmers produce enough to feed themselves plus about one third of the urban population. A large part of their production goes directly into household consumption (Table 7.17). Another major portion is bartered at regional ferias which are held weekly. Relatively small portions are sold to the city or exported.

Thus to improve the nutrition of these people, who are the great majority of the Bolivian population, it will be necessary to build a strategy on the following three tactics:

i. Help them to grow a more adequate diet on their own land: more food and more balanced in protein;

ii. Help balance the cropping by regions so that the diet can be balanced by bartering at the local feria each week, and help the farmer grow more on his own land so that he has more to barter; and

iii. Help these farmers enter into a modern market system, increasing their income so that they can purchase what they require.

All three of these tactics are strongly based on increase in real income, and increase in nutrition knowledge.

Table 7.17 - Estimated Disposition of Principal Crops Produced in Bolivia, 1973.

Crops	Consumed on Farm	Sold for Domestic Non-Farm Consumption	Sold for Exportation
Potatoes	40	60	-
Vegetables	10	90	-
Corn (grain)	55	45	-
Sugar cane	-	100	-
Wheat	30	70	-
Yuca	60	40	-
Rice	30	70	-
Barley	35	65	-
Other tubers	40	60	-
Citrus Fruits	25	75	-
Bananas and plantains	20	80	-
Coffee	5	18	77
Quinua	55	45	-
Cotton fibre	-	15	85
Dried beans	35	65	-
Oats	40	60	-
Barley Hay	95	5	-

Source: USAID/Bolivia, Agricultural Development in Bolivia: A Sector Assessment, La Paz, August 1974, p. 74.

5. Current Agriculture Sector Resources

Solutions to the nutrition problem in Bolivia will depend not only on the development of integrated national and regional

policies, but also on the coordination of health, agricultural, educational and other resources and programs at the local and regional level. The basic resource is technical and professional manpower, backed up by adequate facilities and supplies. The role of education and community development activities will be explored in Section C.

a. Agricultural Extension Agents

In early 1974, the agricultural extension service contained 84 workers. (See Table 7.18). To its credit, over 85 percent (72) of these were extension agents who were based in provincial capitals and worked in rural areas. Three-fourths of the extension agents and two-thirds of all workers were technical agronomists (see Table 7.19); 17 of the extension agents were university graduates. The service included, however, only one veterinarian. At present the extension agents, who were trained in several disciplines, are isolated and they suffer from the same problems as other rural professional workers, e.g., inadequate supervision, lack of professional and social contact, lack of incentives, etc. As a result, few remain for more than two years. The service is studying the possibility of centralizing its agents in groups of two or three which would serve 20 to 25 larger areas. This would overcome some of the above-mentioned problems and might better utilize the varying specialties of the workers, but adequate coverage of the rural population might be weakened in the process. (See Figure 7.1 for locations of agents).

At present the agents are primarily involved in working with groups of farmers and with agricultural cooperatives on technical problems. It would appear that these agents could incorporate some health-related activities into their programs. By working in conjunction with local health personnel they could render valuable assistance in the areas of nutrition education and nutrient crop production for family consumption, aspects of occupation health and first aid, home economics, the control of zoonosis, vaccination campaigns and perhaps family planning.

b. Agricultural research stations

There now are 15 research or experimental stations, three of which are managed by the Bolivian Development Corporation (CBF) and the remainder by the Ministry of Agriculture. (See Table 7.20). The primary function of these stations varies according to the agricultural potential of the particular region. Most, however, are involved with some activity related to the production of high protein source items. (See Figure 7.1 for locations of stations).

Unfortunately, the stations in general to date have operated somewhat independently and isolated from the farmers.

Table 7.18 - Distribution of Agricultural Extension Workers by Position and Department, 1974

Department	Department Chief	Department Supervisor	Veterinarian	Extension Agents	Total
La Paz	1	-	-	16	17
Cochabamba	1	1	-	13	15
Santa Cruz	1	1	1	10	13
Chuquisaca	1	1	-	8	10
Oruro	1	-	-	7	8
Potosí	-	1	-	10	11
Tarija	-	1	-	7	8
Beni	-	1	-	-	1
Pando	-	-	-	1	1
Total	5	6	1	72	84

Source: Department of Agricultural Extension, Ministry of Agriculture, unpublished data, 1974

Table 7.19 - Level of Education of Agricultural Extension Workers by Position and Training, 1974

Training	Department Chief	Department Supervisor	Veterinarian	Extension Agents	Total
Agricultural Engineers[a]	2	2	-	11	15
Veterinary Medicine	-	-	1	-	1
Agricultural Graduates[b]	2	2	-	6	10
Technical Agronomists[c]	1	2	-	55	58
Total	5	6	1	72	84

[a] High school diploma plus four or five years university study.
[b] Same as (a), but failure to complete final exams.
[c] Two years high school plus two to four years university training

Source: Department of Agricultural Extension, Ministry of Agriculture, unpublished data, 1974.

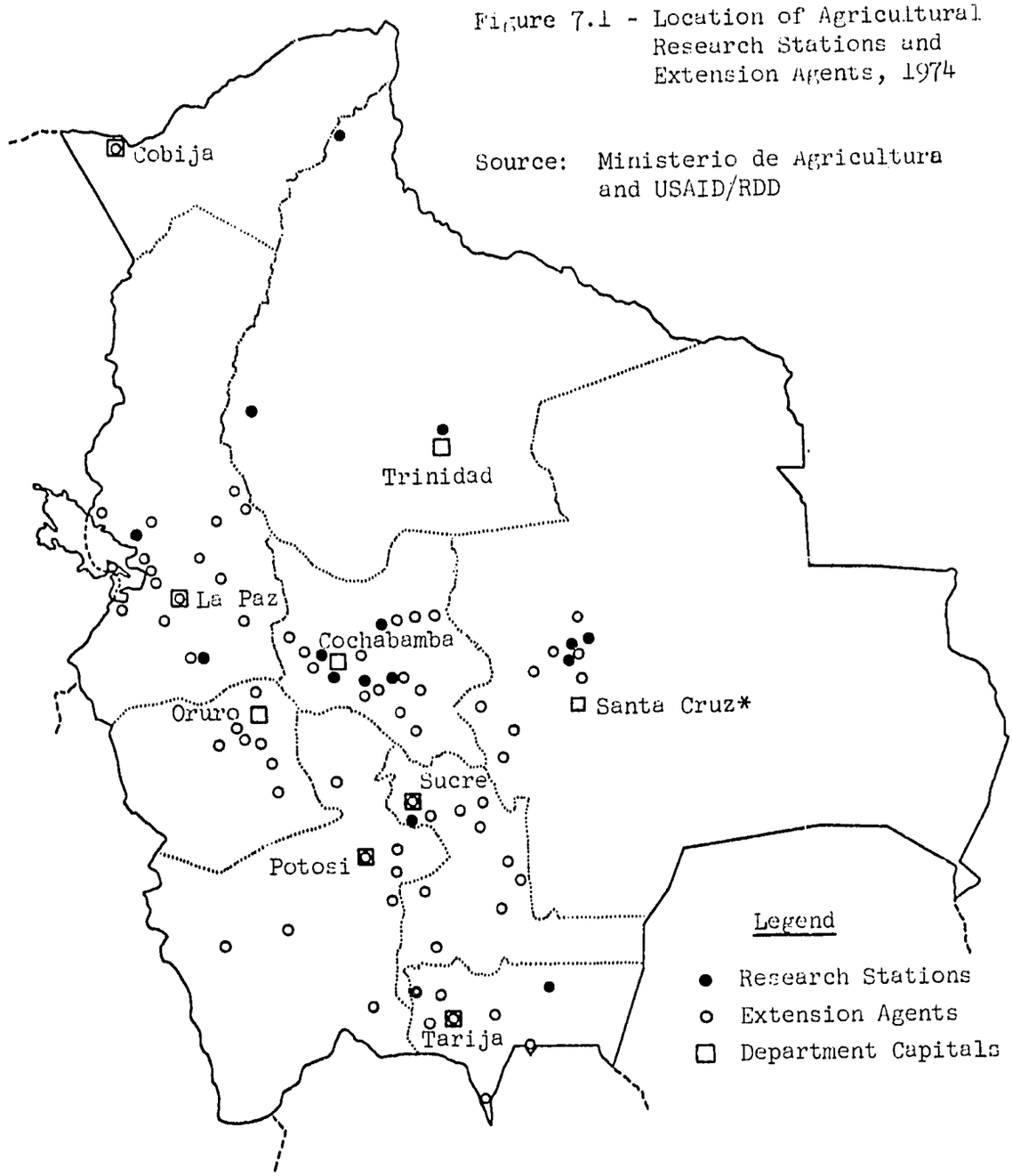


Figure 7.1 - Location of Agricultural Research Stations and Extension Agents, 1974

Source: Ministerio de Agricultura and USAID/RDD

* Locations of three agents unknown

Table 7.20 - Distribution of Agricultural Research Stations by Location and Principal Focus, 1974

Station	Location	Year Developed	Principal Focus
La Tamborada (UMSS)	Cochabamba (Valleys)	1947	Wheat
Belen	La Paz (North Altiplano)	1946	Potatoes, sheep, Vegetables
Reyes	Beni	1948	Cattle, pastures
Saavedra	Santa Cruz	1948	Rice, sugar cane, corn
Muyurina (Salecian Priests)	Santa Cruz	1953	Cattle
Trinidad	Beni	1961	Beef cattle, rubber
Riberalta	Beni (Amazon Rain Forest)	1952	Rubber
Patacamaya	La Paz (Central Altiplano)	1953	Sheep, forage, wheat
Chinoli	Chuquisaca (North)	1962	Potatoes, wheat
Toralapa	Cochabamba	1962	Potatoes
Chipiriri	Cochabamba (Chapare)	1964	Rice, citrus
San Benito	Cochabamba (Valleys)	1970	Fruit, wheat
Villamontes (CBF)	Tarija (Chaco)	1970	Oilseeds
COTESU (CBF)	Cochabamba (Valleys)	1974	Dairy cattle
COTESU (CBF)	Santa Cruz (Todos Santos)	1974	Beef, dairy cattle

Source: USAID/Bolivia, Agricultural Development in Bolivia: A Sector Assessment, 1974, p. 206

Efforts have concentrated on research and little has been done in terms of outreach and educational activities. The Ministry of Agriculture would like to transform the stations into regional educational centers with a broad range of activities. Their purpose would be not only the development of more productive technologies but also the transfer of knowledge and technical assistance to the small farmer. These centers could be involved in many of the activities suggested above regarding the extension agents. They could also be ideal sites, in relevant areas, for the integrated orientation of new colonists and for the necessary technical follow-up to the colonists once they were settled on the new lands.

6. Current nutrition programs of the Health Sector

The Division of Nutrition in the Ministry of Health is continuing to conduct a series of investigations into nutritional problems of the Bolivian population. Four are currently in progress. These are clinical in nature and more directed at detecting nutritional status than at exposing the causes of malnutrition.

A conceptually more extensive program of nutrition planning is under way in CONEPLAN, in which the approach followed is much like the one contained in this section.

Table 7.21 describes the nutrition supplement programs of the Ministry The large emphasis on school children is probably misplaced, since nutritional problems are usually less severe and acute in these children than in younger children. Further, it may be suggested that children attending school may not be as needy as their peers who do not attend school.

Clearly significant impact on nutritional status can be made by medical care systems and by environmental sanitation programs. Each degree of fever increases calorie requirements by six percent, so that prevention or cure of febrile disease has a significant effect on reducing nutrient requirements. Similarly, parasitic and diarrhea disease can reduce absorption and utilization of nutrients by 25 percent or more. Prevention and cure of these diseases also pay off in reduced nutrient requirements.

Table 7.21 - Food Distribution Programs in Bolivia

Program	Type of Service	Population Coverage
Food Distribution (MOH, 1974)	School Lunches (Rural)	180,000
	School Breakfast (Rural)	20,000
	Rations to Pregnant Mothers	50,000
	School Breakfast (Urban)	30,000
Goiter Reduction (MOH, 1973)	Iodine Injection	8,000
Mothers' Clubs	Food distribution, nursin · malnutrition, immunization, education, other services	13,088 (mothers) 55,059 (beneficiaries)

Source: USAID/Bolivia, Food for Peace Office, unpublished data, 1974

C. Community Health Promotion

1. Introduction: Health Education

The development of appropriate health attitudes and behavior is essentially an educational process. This process begins in early childhood and continues through adulthood. The primary "teacher" in this case is the family unit, or more specifically parents and grandparents. High rates of illiteracy and widespread lack of contact with modern health and medical practices in Bolivia perpetuate a reliance on traditional attitudes and behavior for the majority of the population. Changing traditional health patterns is a complex and delicate process, given the marginal and precarious nature of this majority's way of life. As a result, endeavors at health education must be considered as a long-term and continuous process requiring substantial resources, multiple and coordinated approaches, and an intimate understanding of traditional social, cultural and economic interrelationships. Unfortunately, attempts at health education in Bolivia are extremely limited and deficient in these respects.

While the family plays a central role in the support of health practices, the community is very influential in terms of behavioral sanctions and in providing the most effective resource base or mechanisms through which changes can take place. The school is potentially perhaps the most significant vehicle not only for reaching the largest number of children and adults but also in providing for a continuous educational process. At present, however, it suffers from critically low attendance rates (especially in rural areas), inadequate curriculum and teacher preparation, deficient facilities and resources, and the lack of adult education programs. All of these render the school system highly ineffective and certainly unable to fulfill its potential. In addition to its schools, most Bolivian communities have some experience, however limited, at group action toward the solution of common problems. This is a vital facet of the community learning process. Few programs in Bolivia, however, the Community Development Service being the major exception, have built upon this potential and indispensable resource.

The promotion of health activities at the community level is an essential component of any comprehensive health services program. Without basic attitude and behavioral changes on the part of both utilizers and providers of health services, the improvement of the health status of the Bolivian people can be only partially realized. Public health and programs of preventive medicine are not only the most crucial areas of attention but also the most difficult to gain acceptance. Of particular importance regarding the general populace are changes in nutritional habits and beliefs, personal and family hygiene,

the utilization of sanitation facilities and potable water, the acceptance of immunizations, and the early utilization of diagnostic and treatment services. Professional attitude changes are needed regarding the cultural determinants of health behavior, the distribution of available resources, interagency coordination, and the utilization of para-professional personnel.

The successful implementation of health education and promotional activities at the community level inevitably requires the effective integration of resources and activities among various service agencies. The following section looks at the rural education system, teacher training programs, the National Community Development Service, and several programs of the Ministry of Health. The preparation of health professionals was analyzed in the previous Chapter (VI.D).

2. Rural Education

The rural education system in Bolivia comprises a considerable, but only a potential, resource for the promotion of health activities. In spite of the large number of schools and teachers and their widespread distribution in rural areas, the system has many deficiencies. Table 7.22 and 7.23 illustrate the physical capacity of the system. It is an unsystematic "system" however, due to an inadequate administrative infrastructure and the lack of a realistic or functional pedagogical approach. In particular, health education programs and community outreach activities on a systematic basis are all but nonexistent. What activities do take place in these areas are results of the personal initiative and resourcefulness of individual teachers.

a. Schools

Table 7.22 contains statistics on the numbers of schools, teachers and students for 1968. These figures have undoubtedly increased over the past six years, but it is unlikely that the comparative ratios have changed significantly. In 1968 there were 6,823 rural primary schools. By 1971 the number of rural schools, practically all of which provide primary education, was almost 7,700 (Table 7.22). Over 90 percent of all schools in Bolivia are primary schools and 85 percent of these are located in rural areas. The comparative sizes of the schools obviously affect the ratios cited, for urban primary and secondary schools are larger than the rural schools. Nevertheless, the urban pre-primary and primary schools are quite crowded. The rural primary schools and pre-primary schools fare poorly regarding the allocation of teachers. As of 1970, there were only 250 public and school libraries in all of Bolivia with a total of 560,000 volumes.(4) This represented at the time only one such library for almost 3,000

Table 7.22 - Distribution of Schools, Teachers and Students by Level of Education, 1968

Level	Schools	Teachers	Students[b]	Teachers per School	Students per Teacher	Students per School
Pre-primary[a]	189	555	24,211	2.9	43.6	128.1
Primary	7,994	22,401	612,629	2.8	27.3	76.6
Urban	1,171	12,257	318,629	10.5	26.0	272.1
Rural	6,823	10,144	294,000	1.5	29.0	43.1
Secondary	574	6,202	128,949	10.8	20.8	224.6

[a] 1969 data

[b] Number enrolled, regular attendance is considerably lower especially in rural areas.

[c] Includes general secondary, vocational and normal schools: 490 urban, 84 rural

Source: Instituto Americano de Estadística, América en Cifras, 1970 - Situación Cultural: Educación y Otros Aspectos Culturales, Organización de los Estados Americanos, Washington, D.C., 1971 pp. 35,37,42,52,62,76,111,118,150.

Table 7.23 - Distribution of Nuclear Schools, Sectional Schools and Rural Teachers, 1971.*

Region	District	Nuclear Schools	Sectional Schools	Teachers
Valle	Cochabamba	72	784	1,859
	Chuquisaca	30	380	712
	Tarija	27	265	683
	Villamontes	7	59	186
	Aiquile	8	90	193
	Chapare	8	61	138
	Camargo	17	194	393
	Vallegrande	10	151	327
	Sub-Total	179	1,984	4,491
Oriente	Santa Cruz	27	277	656
	Camiri	13	141	338
	Montero	18	247	548
	Roboré	9	95	254
	S. Ignacio (Velasco)	5	104	182
	Cobija	12	124	206
	Trinidad	23	197	321
	Riberalta	14	118	251
	Rurrenabaque	7	77	149
	Sub-Total	128	1,380	3,005
Altiplano	La Paz	140	1,852	3,185
	Apolo	10	100	154
	Oruro	36	447	741
	Potosí	27	310	537
	Cristo Potosí	16	165	359
	Tupiza	23	219	380
	Uyuni	16	180	361
	Uncía	34	452	720
	Sub-Total	302	3,725	6,437
Total	25	609	7,089	13,933

* Does not include schools nor teachers located in Provincial capitals which are part of the urban education system.

Source: Ministerio de Educación, Dirección de Educación Rural, as reported in Fortún, Julia Elena, Consultant Report, USAID/B, 1974.

primary and secondary students and an average of 2,240 volumes per library. Without a doubt, these libraries barely affect the rural sector.

The administration of rural schools is divided into three regions (supervisorías) and 25 districts. Each district controls an average of about 25 nuclear schools (ranging from five in San Ignacio de Velasco to 140 in La Paz) which in turn oversee on the average 12 sectional schools. (Table 7.23). The rural education system is complicated by the fact that all schools located in Province capitals comprise part of the urban education system.

The physical quality of rural schools on the whole is sub-standard. Many buildings lack even the basic amenities of adequate lighting, ventilation and sanitary facilities. Most facilities lack adequate desks and other equipment is almost non-existent. Many of these facilities, older constructions and purchases, are not well adapted to efficient teaching requirements. Some of the newer constructions, especially those sponsored by the Community Development Service, have overcome most of these deficiencies. One remaining problem, however, is that of providing for continuous maintenance; even the better facilities deteriorate to poor conditions after several years of use.

b. Teachers

The rural education system claimed almost 14,000 teachers in 1971. (Table 7.23). This represented less than two teachers per rural school, as compared with more than ten per urban primary school. Less than 60 percent of all elementary teachers in 1971 were normal school graduates and as much as 30 percent of the rural supervisors had not graduated from normal schools.(5) The lack of adequate supervision is, in fact, one of the major deficiencies of rural education. The education sector assessment concluded that "the combination of poor facilities, inadequate materials, ill-trained teachers and absentee supervisors results in an overall low quality of teaching. Rote learning remains the primary teaching mode, especially in rural areas".(6)

The lack of continuity of rural teachers, like rural health professionals, also appears to be a significant liability to effective rural education. Precise data are not available but it is estimated that few rural teachers complete their required four years in the Provinces. The concentration of resources in urban areas, and the lack of adequate professional and personal accommodations in rural areas, tend to encourage the exodus of rural teachers to urban positions. The relatively low salaries paid to rural teachers (approximately $60 per month), the isolation and discomfort associated with the job, and

the lack of professional contact and adequate teaching materials all tend to discourage professional dedication.

Finally, the teachers are ill-prepared to execute their role as community change agents. In most areas, teachers command a high status within the community, but few fulfill a community development role, especially concerning "extra-education" activities. Active collaboration with other professionals, in health and agriculture for example, is at a minimum and only on an individualized basis. Non-formal educational activities are very limited in rural areas and, with exception of literacy programs, for the most part they do not involve the rural teachers.

c. Teaching materials

When assigned to rural areas, the rural teacher is provided with little more than a small salary, a decrepit building, an inadequate curriculum and his or her own ingenuity and will power. Many schools lack even chalkboards, and books and teaching aids are almost unheard of. Students have to purchase their own paper and pencils, pay minimum registration fees and wear required socks; these items represent significant costs to marginal families, especially those with several children in school simultaneously. Few instructional materials and teacher guides are utilized in the educational system and the content of the books used is not responsive to differentiated learning needs. Bilingual education and programs adapted to the practical aspects of rural life are particular deficiencies.

3. Teacher Training

The key to the integration of rural health and educational programs lies in the effective coordination of the activities of health and educational personnel at the local level. The normal schools, therefore, have an important role to play in training and retraining rural teachers toward this end. At present, little is being done in the normal schools to prepare rural teachers for their part in health education, formal and non-formal, and community development activities. There is, however, a latent potential for intersectoral participation at the normal school.

a. Normal schools

There are 28 normal schools in operation. Six are urban normal schools, fifteen are rural normal schools and seven are rural technical institutes.(7) During the previous four years (1970-1973), the rural normal schools produced a total of 4,571 new teachers for an average of about 76 per school per year. The school in Paracaya

Table 7.24 - Teacher Graduated from Normal Schools and Institutes of Rural Education, 1970 - 1973.

Number	Training Center (Department)	1970	1971	1972	1973	Total
	Normal Schools					
1	Santiago de Huata (La Paz)	170	124	87	95	476
2	Warisata (La Paz)	89	87	84	97	357
3	Vacas (Cochabamba)	102	82	99	135	418
4	Paracaya (Cochabamba)	164	100	157	145	566
5	Caiza "D" (Potosí)	58	44	48	43	193
6	Canasmoro (Tarija)	97	62	62	68	289
7	Portachuelo (Santa Cruz)	88	123	117	114	442
8	Charagua (Santa Cruz	66	37	26	42	171
9	Riberalta (Beni)	64	25	20	38	147
10	Llica (Potosí)	63	86	61	64	274
11	Villa Serrano (Chuquisaca)	35	49	41	34	169
12	Caracollo (Oruro)	106	91	152	123	442
13	Cororo (Chuquisaca)	55	69	28	58	208
14	Sacaca (Potosí)	79	80	82	66	307
15	Chayanta (Potosí)	-	-	55	57	112
	Sub-Total	1,236	1,039	1,099	1,177	4,571
	Institutes					
1	Belen-Agriculture (La Paz)	-	32	18	45	95
2	Tarata-Physical Education (Cochabamba)	-	28	46	44	118
3	Tarata-Music Educ. (Coch.)	-	22	35	29	86
4	Ucureña-Health Educ. (Coch.)	-	-	53	38	91
	Sub-Total	-	82	152	158	390

Source: Ministerio de Educación, Jefatura Nacional de Escuelas Normales Rurales, as resported in Fortun, Julia Elena, Consultant Report, USAID/B, 1974.

(Cochabamba) was the most active with an average output of 142 teachers per year, followed by Santiago de Huata (La Paz) with 119, and Portachuelo (Santa Cruz) and Caracollo (Oruro) with 111 each. (See Table 7.24). Data from four rural technical institutes indicate an average annual output of 33 teachers. All normal school graduates are guaranteed positions by the Ministry of Education, but there is little indication that expansion in the numbers or change in the specializations of normal school graduates conform to any deliberate Ministry or government priorities.(8)

Apparently the normal school system will be reorganized and the number of normal schools will be reduced in the near future. The government is currently studying a proposed law which will establish five basic types of normal schools: five integrated urban normal schools, three of which will be equipped with mobile units for continuing education; three specialized urban schools, type 1; one specialized urban school, type 2; 14 specialized rural schools, type 1, three of which will be equipped with mobile units for continuing education; and six specialized rural schools, type 2. The specialized normal schools type 1 will prepare teachers for only one school cycle, i.e., basic or intermediate. The type 2 specialized schools will prepare teachers with technical/practical disciplines. One of these rural technical schools, Ucureña, will continue to train teachers specialized in public health. Figure 7.2 shows the proposed distribution of these schools. Several other reorganization plans are being discussed. Dr. Julia Elena Fortún, Sub-Secretary of Education for Culture, is proposing that, due to the socio-cultural and geographic differences that exist in the country, the rural technical institutes should be closed in favor of integrated rural normal schools which would offer the technical training to all students. This would avoid specialization and foster more integration in rural areas; also, it would prepare teachers in the geographic/cultural areas where they come from and where they should expect eventually to teach. The health sector assessment strongly favors this proposal. Finally, the USAID Education Division in Bolivia is also considering the reduction of rural normal schools to around eight in conjunction with a proposed rural education loan.

b. Teaching programs

Urban normal schools admit students who have completed high school into a three - or four - year program. Students may choose courses which lead to pre-school, primary, secondary, technical or physical education teaching. Only the secondary program lasts four years. The urban normal schools are now graduating between 900 and 1,000 primary school teachers per year. About 29 percent of the students currently enrolled are being prepared for primary schools and 54 percent for secondary schools.(9) Some basic problems facing the

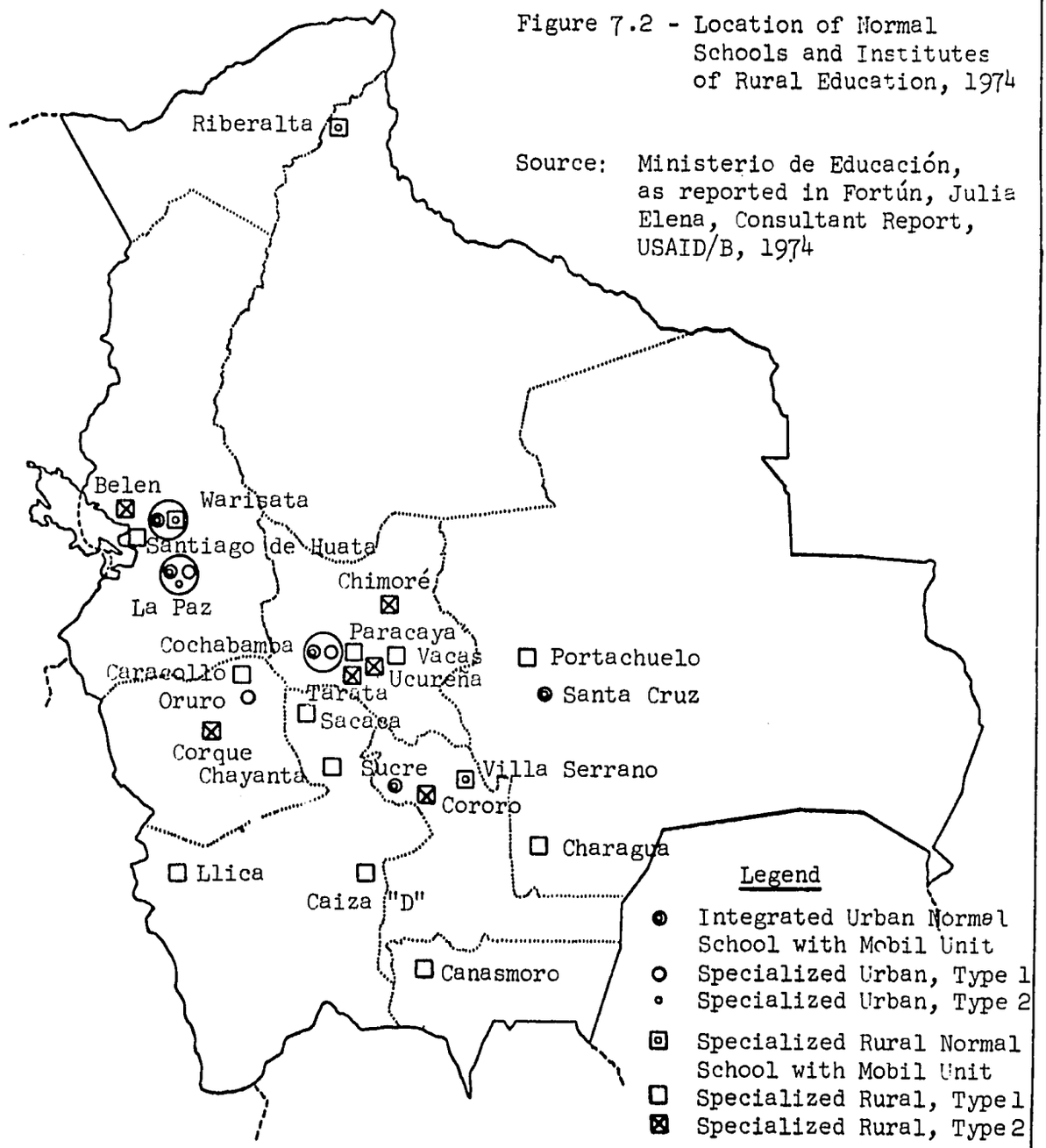


Figure 7.2 - Location of Normal Schools and Institutes of Rural Education, 1974

Source: Ministerio de Educación, as reported in Fortún, Julia Elena, Consultant Report, USAID/B, 1974

urban normal schools include the irrelevancy between what is taught and current educational needs, inadequate preparation and supervision of teachers, outdated teaching methods, and the lack of adequate library and laboratory facilities and practical experiences.(10)

Rural normal schools admit students for a two-to-four-year program, depending on whether the student has completed high school, has some high school work or has completed primary school, respectively. In 1971, four years of secondary education was established as a pre-requisite for entry. This action might help to standardize rural normal school education, but it also effectively eliminates teaching as a potential career for rural youngsters who simply have had no access to secondary education. The quality of teaching is probably lower than in urban normal schools, given the even more limited resources. In addition, physical conditions are often extremely poor. Most of the schools are crowded and lack adequate dormitory and sanitary facilities.(11)

The Ministry of Education was unable to provide even rudimentary information regarding normal school curriculum in areas related to health education. It is felt, however, that teacher training in these areas is very limited and at best theoretical. There are no systematic programs which involve the Ministry of Health in either the curriculum development, teaching or practical experience activities. In fact, programmatic relationships between personnel of the two Ministries is extremely limited in general.

The National Institute for Health Promotors, located in Ucureña (Cochabamba), is charged with the preparation of rural teachers specialized in public health. The first class of 53 graduated in 1972, followed by 38 in 1973. It is intended that these teachers would teach health subjects in the rural nuclear and dependent sectional schools and supervise the teaching of regular teachers in these areas. In practice, however, many have ended up in urban districts.(12) To approach preparation for health education in this way faces an obvious and significant problem: how to train students from all over Bolivia in only one location, and yet acknowledge different sets of cultural and geographic characteristics. Another basic problem lies in the preparation of specialized teachers for situations which require an integrated approach. Finally, the program has no input from the Ministry of Health.

The students are offered two years of basic biological sciences and psychology, two years of nutrition and environmental sanitation and one year of first aid and maternal and child health in addition to nine other courses related to pedagogy and general subjects over a four year period. It is doubtful that so much course work is actually required to become adequately prepared for this level of health worker in rural areas. A better approach would be to integrate

shorter but more directed training within the regular (and more regionally-adapted) rural normal schools, hence to instill in all rural teachers the more general purpose of promoting community health. This approach should also include practical experiences in community organization and development.

4. The National Community Development Service

The National Community Development Service was established in 1965 as an alternative means to achieve development purposes. Its basic philosophy entails the provision of material and technical assistance at the community level in response to community's felt needs. It involves the promotion of community organization and participation in self-help projects towards the solution of common and pressing problems. The process of community learning and human development is a fundamental objective. Without a doubt, the community development process is a vital complement to national economic development activities, given that human welfare is not only the ultimate goal of socio-economic development and that the people are the country's most valuable resource.

a. Activities to date

Projects involving construction of one type or another always have comprised the bulk of the Service's activities. Education projects, and specifically the construction of rural schools, have been the most frequently cited community problem and thus the first priority of investments. (See Table 7.25). From the beginning, however, health has been a major concern of the population. Health projects include the construction of small rural hospitals, health posts and potable water systems; these have commanded 13.5 percent of the Service's project budget. The construction and improvement of roads, bridges and, lately, irrigation projects have also been high priorities. Overall, the communities involved have contributed two-thirds of the total project costs. These contributions have taken the form of labor, materials, services, land and some money.

In addition to individual project assistance, the Service has engaged in training community level workers. During its early years, over 300 village level workers were trained and employed by the Community Development Service. Their training consisted of both methodological concepts and practices as well as basic technological aspects of the various potential project areas. However, there now are fewer than 50 of these workers and they receive only a partial stipend. The training programs have concentrated more on the preparation of voluntary workers during recent years, about 1,000 of which are currently associated with the Service. In all, it is estimated that the Service has trained more than 16,000 villagers since its conception.(13) One of the

Table 7.25 - Summary of National Community Development Service Expenditures by Type of Project, 1965-1973* (in thousand pesos bolivianos)

Type of Project	Number of Projects	Community Support		Program Support		Total Costs	Percent Investment	Cost per Project
		Amount	Percent	Amount	Percent			
Education[a]	577	7,942	57.0	5,980	43.0	13,922	42.9	24.1
Health[b]	176	2,723	62.4	1,641	37.6	4,364	13.5	24.8
Engineering[c]	332	10,624	77.7	3,054	22.3	13,678	42.1	41.2
Agriculture[d]	174	388	78.4	107	21.6	495	1.5	2.8
Total	1,259	21,677	66.8	10,782	33.2	32,458**	100.0	25.8

* Through September 1973
** Does not total due to rounding

[a] Includes construction of schools
[b] Includes hospital and medical post construction and potable water systems
[c] Includes irrigation projects and construction of roads, bridges, etc.
[d] Includes agriculture and livestock construction

Source: Servicio Nacional de Desarrollo de la Comunidad, División de Control de Proyectos, unpublished data, 1974

main reasons for the shift was the high demand for technical and financial assistance caused by employees who were charged with promoting projects to which the Service was unable to respond.

The Community Development Service has had good results in terms of its human development objective, but has produced "little or no results" toward economic development: the rural population continues to exist on a subsistence economy and on the margin of society.(14) To deal more effectively with this problem, it was decided in 1972 to focus on areas of direct economic impact and to coordinate community development activities more closely with regional and national development plans. This approach has not taken hold, however, due to the lack of clear, specific objectives, an effective organizational adaptation, adequate planning and technical and financial resources, and to continued community pressure for the social (health and education) projects.(15) Other problems faced by the Service have been the lack of adequate follow-up on trainees and the inability to obtain the necessary coordination with other Ministries. Many of those trained have had no further contact with the Service. Some of the better trainees have, however, been recycled into later training programs. The second problem--coordination--is more difficult, since for the most part it depends on the interest of other agencies. A typical construction project includes a written agreement with the appropriate Ministry to provide personnel and equipment. This has not been a serious problem with the Ministry of Education, but the Ministry of Health, for example, has almost never lived up to its share of the bargain and has not participated in the planning stages.

b. Current plans

The Community Development Service is presently undergoing several significant changes. The most important concerns the implementation of the 1972 decision to concentrate on projects having an economic impact. This basically means greater promotion and support of engineering and agricultural projects rather than health and educational activities. This shift was strongly restated in early 1974,(16) but the budget for 1974 does not reflect the stated intent. A comparison of all previous project investments (Table 7.2) with the $b. 43 million project budget for 1974 (Table 7.26) shows that the percentage investment for health as well as agriculture would increase considerably, engineering would remain about the same, but education would decrease. Actual expenditures for the year, however, are not yet available, so the validity of the comparison cannot yet be confirmed. The budget for 1975 may confirm the shift more clearly.

Under the new emphasis, the project budget will make percentage allocations to the various types of projects (health and

Table 7.26 - General Budget of the National Community Development Service by Source of Financing and Type of Project, 1974 (in thousands of pesos bolivianos)

Type of Project	External Financing[a]	Community Support[b]	Government Support[c]	Total Amount	Total Percent (1)	Total Percent (2)
School construction	5,422	6,160	-	11,582	19.3	26.8
Hospital construction	2,157	2,500	-	4,657	7.8	10.8
Water systems	2,041	2,200	-	4,241	7.1	9.8
Irrigation	4,622	2,950	-	7,572	12.6	17.5
Roads	1,285	3,200	-	4,485	7.5	10.4
Bridges	1,240	1,200	-	2,440	4.1	5.7
Agriculture	2,510	2,600	-	5,110	8.5	11.8
Other Economic	1,527	1,600	-	3,127	5.2	7.2
Research	100	-	-	100	0.2	-
Training	800	-	-	800	1.3	-
Administration	2,685	-	1,584	4,269	7.1	-
Salaries	674	-	10,865	11,538	19.3	-
Total	25,063	22,410	12,449	59,922*	100.0	100.0
Percent	41.8	37.4	20.8	100.0		

* Does not total due to rounding

[a] USAID Loan
[b] Includes labor, materials, money, services and land
[c] Includes salaries, benefits, and some office materials and supplies

Source: Servicio Nacional de Desarrollo de la Comunidad, "Plan General de Actividades y Financiamiento Programado para el año 1974", March 1974, p. 13.

(1) Percent of total operating budget.

(2) Percent of project budget (excluding research, training, administration and salaries).

education together, for example, are not to receive more than 40 percent of the budget) and will set limits on the funds available to each region. Apparently, when any project type or regional allotment has been allocated, no new projects will be accepted. These prior determinations might be justified in terms of limited resources and the economic impact objective. Nevertheless, they seem to compromise the Service's goal and "indirect" approach of responding to community felt needs as a means of developing the human potential. Under the new plan, the human development goal is maintained and community contributions are expected to be worth over 60 percent of the project costs. A danger, however, lies in the tendency of the agency to become more directive and less responsive concerning which projects will be funded and which will not. If the human development aspects of the Service are allowed to slip, then the agency will become more of an economic development or public works organization than a community development service. The result would be the loss of a vital and unique institution but would add little to the already existing pool of economic development agencies. Health and educational programs, which in part rely on community awareness and promotional activities, would particularly suffer.

The second major change concerns and administrative reorganization of the Community Development Service. There now are regional offices in most Department capitals (8) and eight zonal offices. To achieve better management of both technical resources and projects, the number of regional offices will be reduced to four and the zonal offices will be increased to 25 in 1975. Figure 7.3 indicates the location of these offices. The five training centers will continue at their present sites.

Table 7.2 shows the proposed staffing pattern to support the reorganized structure. The reduction in the number of regional offices will allow a concentration and, hopefully, better utilization of specialized technical staff. The lack of good transportation systems, however, may limit the effectiveness of this plan. On the other hand, the Service has recently installed a radio system; it has considerably improved communications with regional offices. In all, the agency proposed to have over 550 employees, almost 60 percent of whom (315) will be technical field personnel. This compares with about 480 employees at present. One current problem facing the Service is the result of its rapid expansion. The administration management systems have to be adjusted to accommodate the new structure and emphasis as well as to handle the increased personnel, financial and project loads. Finally, the Service recognizes the need and plans for more economic specialists to meet the demand of the new emphasis.

5. Health Education Programs

To date, only the Ministry of Health has made any systematic attempts at health education. Even these, however, are seriously

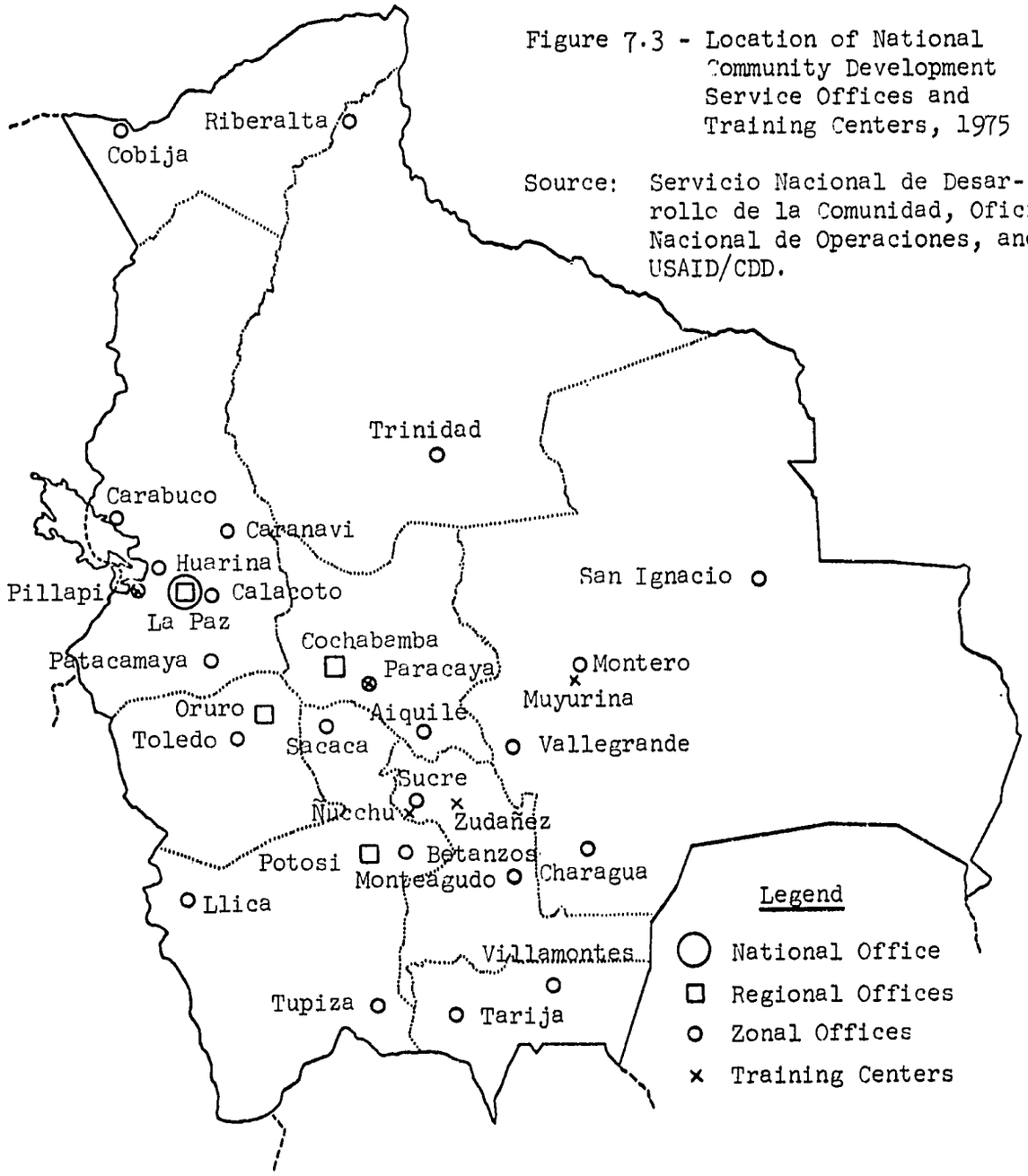


Figure 7.3 - Location of National Community Development Service Offices and Training Centers, 1975

Source: Servicio Nacional de Desarrollo de la Comunidad, Oficina Nacional de Operaciones, and USAID/CDD.

Table 7.27 - Proposed Staffing Pattern of National Community Development Service by Position and Location, 1975

Office[a]	Administrative Staff	Technical Staff	Area Supervisors	Auxiliary Social Workers	Total
La Paz (R)	12	14	-	-	26
Huarina (Z)	4	5	4	4	17
Patacamaya (Z)	4	5	4	4	17
Pillapi (Z)	3	4	3	3	13
Calacoto (Z)	3	4	3	[illegible]	13
Carabuco (Z)	3	4	3	[illegible]	13
Caranavi (Z)	4	6	4	4	18
Oruro (R)	12	14	-	-	26
Toledo (Z)	3	4	3	3	13
Sacaca (Z)	3	4	3	3	13
Llica (Z)	3	4	3	3	13
Potosí (R)	12	14	-	-	26
Sucre (Z)	4	5	4	4	17
Tarija (Z)	4	5	4	4	17
Betanzos (Z)	3	4	3	3	13
Tupiza (Z)	3	4	3	3	13
Monteagudo (Z)	3	4	3	3	13
Villamontes (Z)	3	4	3	3	13
Cochabamba (R)	12	14	-	-	26
Paracaya (Z)	4	5	4	4	17
Aiquile (Z)	3	4	3	3	13
Vallegrande (Z)	3	4	3	3	13
Montero (Z)	4	5	4	4	17
Villa Tunari (Z)	3	4	3	3	13
Charagua (Z)	3	3	3	2	11
San Ignacio (Z)	3	3	3	2	11
Trinidad (Z)[b]	3	3	2	2	10
Cobija (Z)[b]	3	3	2	2	10
Riberalta (Z)[b]	3	3	2	2	10
Total	130	159[c]	79	77	445[d]

[a] R = regional office; Z = zonal office
[b] Dependent on the central office in La Paz
[c] Includes the following specialities: construction (48), agriculture (14), veterinary medicine (4), cooperatives (28), economists and credit (24), social work (33), research (8)
[d] Does not include administrative and technical personnel of the central office in La Paz (80-100) nor the teaching staffs of the five training centers (approximate 25). In addition, the Service provides minimum stipends to about 50 village level workers and benefits from the services of about 1000 community volunteers.

Source: Servicio Nacional de Desarrollo de la Comunidad, Jefatura Nacional de Operaciones, and USAID/CDD, unpublished data, 1974.

limited, despite the lip service given to the importance of health education by almost every program. The extremely tight budget of the Ministry as a whole is obviously one reason for the limitations. Another reason is that concepts vary among health educators and service program staff as to the function and methodology of health education and the role of the health educator. The resultant ambiguity has caused a certain amount of conflict within the Ministry; it undoubtedly has contributed to general ineffectiveness of health educational activities.

a. The Division of Health Education

The Division of Health Education is a unit of the Department of Technical Services, under the National Directoratore of Public Health. Nineteen professional health educators have been trained under Ministry sponsorhisp, but only seven are currently employed by the Ministry of Health. The central office has only a director and one secretary. Other health educators work with the Institute of Occupational Health, the Institute of Communicable Diseases and four of the regional health offices (La Paz, Cochabamba, Tarija and Trinidad). The background of these professionals is surprisingly extensive. All are required to have a university degree and at least three years of experience in a health-related field, plus completion of the basic public health course offered by the School of Public Health. In addition, all hold the equivalent of a master of public health degree in health education. Their primary specialties include dentistry, social work, teachers and bio-chemists.

The high turnover of health educators is primarily due to the low salaries they are paid. A health educator in the field currently earns $b.1,600 per month (US$80) and the national director earns slightly more than $b.4,000 (US$200). These salaries compare extremely unfavorably with the preparation required as well as with the earnings of other health professionals. An environmental sanitation technician, for example, earns about $b.2,000 per month.

The Division has three primary areas of activity. The first is the preparation of educational norms for each service program, e.g., maternal and child health, communicable diseases, and environmental sanitation. Norms and guidelines also have been prepared for school health programs but these have not been incorporated into teacher training programs. The second area involves the provision of technical assistance for health education activities. In addition to supervising Ministry personnel, the Division also works with voluntary workers and other agencies. Unfortunately, the Division has had no travel funds for at least six years. "Supervision" therefore is accomplished by correspondence. The Division also produces a limited amount of educational materials, mainly pamphlets and posters. The budget makes

no provision for these publications, and most are paid for by soliciting private industry. The third set of activities involves in-service training of other Ministry program personnel. The health educators do no actual consumer education, but work with the doctors, nurses, social workers and other personnel involved in the delivery of health services. In practice, health educators are often utilized for the compilation of statistics, public relations and a series of other and sometimes menial tasks desired by program directors.

b. Other Ministry activities

Through its School of Public Health, the Ministry trains about 200 health workers per year with short courses in environmental sanitation, basic public health orientation and basic health statistics. (See Chapter VI.D for more detail). The Institute of Occupational Health has provided seminars for mining supervisors and labor leaders and CENAFA reaches an estimated 25,000 people per year with seminars on demography and family planning. An equal or larger number of women are reached with nutrition and related information through the mother's clubs sponsored by the Department of Nutrition. Very little coordination exists between the Ministry and the university faculties of health sciences.

In practice, the Ministry accomplishes very little in terms of the ultimate educational objects of changing health attitudes and behavior. An inadequate number of personnel and unclear definitions of the appropriate role of the health educator are primary deficiencies. Budget allocations for research and materials preparation also are sorely needed to improve health education programs.

Foodnotes

(1) Whitaker, Morris D. and E. Boyd Wennergren, The Status of Bolivian Agriculture, Praeger, Inc., New York, in print, pp. 132-133.

(2) Ministerio de Agricultura, Dr. Orlando Aguirre, "Informe de la Comisión de Enfermedades Transmisibles", 1974.

(3) CONEPLAN, Estudio para la Definición de una Política Nacional de Alimentación y Nutrición en Bolivia, 1973, Vol. III, p. 4.

(4) Instituto Americano de Estadística, América en Cifras - Situación Cultural: Educación y Otros Aspectos Culturales, Organización de los Estados Americanos, Washington, D.C., 1971, p. 311.

(5) USAID/Bolivia, Education in Bolivia: A Preliminary Sector Assessment, Education Division, 1974, p. IV-19.

(6) Ibid., p. IV-20.

(7) Ibid., pp. IV-89, 93-94

(8) Ibid., p. IV-97.

(9) Ibid., pp. IV-89-91.

(10) Ibid., pp. IV-92-93.

(11) Ibid., pp. IV-93-96.

(12) Fortún, Julia Elena, Consultant Report, USAID/Bolivia, 1974.

(13) USAID/Bolivia, Community Development Division, unpublished data, 1974.

(14) Servicio Nacional de Desarrollo de la Communidad, "Plan General de Actividades y Financiamiento Programado para el año 1974", Marzo 1974, p. 14.

(15) Ibid., p. 6.

(16) Ibid., p. 4

CHAPTER VIII

GOVERNMENT PLANS FOR THE HEALTH SECTOR

A. Summary

In 1974 the Government of Bolivia carried out its first major attempt at comprehensive planning for the health sector. This effort was accomplished simultaneously with USAID's.Sector Assessment. Prior to this time, the few planning efforts realized in the sector were done by individual institutions and could hardly be considered comprehensive nor sectoral.

In 1972-3, the Ministry of Health prepared its National Health Plan (or Five-Year Plan, as it has become to be known). At the same time, the National Economic and Planning Council (CONEPLAN), which was later incorporated into the Ministry of Coordination and Planning, prepared a regional development plan for Chuquisaca and Tarija. This plan includes the GOB's objectives and strategy for regional development efforts and also details a specific role for health activities. In 1973 the Ministry of Health also outlined its position regarding the coordination of foreign assistance.

Several smaller planning activities have been carried out for isolated purposes within the sector. CONEPLAN has sponsored a conference aimed at defining a national population policy which focused on the permissible extent of family planning activities. The Bolivian Social Security Institute (IBSS) has been developing a plan to extend medical services to the large campesino population. The sum of all these planning efforts, while not necessarily cohesive nor indicating definate outcomes, does nevertheless provide a picture of the general directions government health programs could take in the future.

The Five-Year Plan of the Ministry of Health originally proposed the inclusion of other health service agencies in the planning and development of future programs. When no such participation was forthcoming, the resulting document described only the activities of the Ministry itself. The Plan consists for the most part of statistical tables, with very little devoted to analytic discussions. It is nevertheless a good descriptive document of the health situation in Bolivia, and correctly analyses the priority problems facing the sector communicable diseases, infant mortality and malnutrition.

The plan proposes that greater attention be given to providing health services to the rural sector and to administrative reform. It proposes a very ambitious program to be accomplished within five years, but lacks depth in its programming aspects. The Five-Year Plan does, however, mark the Ministry's first attempt at program budgeting. Its major limitations are that it applies only to Ministry of Health activities and that no attention is given to a methodology for implementation. The Plan has been accepted by the government, but adequate financing has not been allocated for implementation.

The program for Chuquisaca and Tarija is the GOB's first attempt at integrated regional development. The effort involves both economic and social activities through multisectorial participation. UNICEF is financing the social development component, of which over one-third of the budget is designated for public health and environmental sanitation. The Ministry of Health is the executing agency for these activities. The program reflects the MOH's intent to stimulate the regionalization (decentralization) of health services administration. This objective, together with the promotion of intra and intersectorial coordination, is also included in the MOH's position regarding the role of foreign assistance. This position, which was developed in 1973, reiterates the priorities stated in the National Health Plan. It also emphasizes the need to develop a single health development policy and to coordinate foreign assistance through the Ministry of Health.

The Bolivian Social Security Institute (IBSS) contemplates an increased coverage and upgrading of existing primarily urban and curative services through its present system of cajas. It also contemplates the establishment of a new social security system to bring health services to the campesinos. These plans are not in conflict with the Ministry of Health. In fact a major step towards reconciliation and coordination was recently taken when the IBSS was transferred from the Office of the President back to the Ministry of Health.

The Interministerial Commission has spent the better part of 1974 in analyzing the state of the health sector. It has reaffirmed the inclusive goal of increasing life expectancy which has been stated in the National Health Plan. Communicable disease control, infant mortality and malnutrition were identified as the primary factors influencing this goal. In order to solve these problems the sector would need considerably more financial resources, improved comprehensive planning and better trained personnel in addition to an increased coverage of environmental sanitation and realistic administrative reform measures.

The Commission's major recommendation is the creation of a single National Health Service. Its characteristics would include a reorganization of all existing health programs under the Ministry of Health to achieve effective coordination; the regionalization of health services for more efficient administration and planning; and the general application of the social security systems to meet the financial and integration requirements of providing medical and hospital services. Priority attention would be given to the provision of comprehensive rural health services. Systems would be developed on a regional basis and would stress intersectorial coordination and the simultaneous development of effective administrative and technical support systems. However, the Commission emphasizes its concern for geographical balance in terms of health development activities.

The final report of the Commission has not yet been released nor accepted by the Government. It is felt, however, that its comprehensive, in-depth approach, as well as the wide interagency participation, give considerable weight to its recommendations. The GOB is currently preparing an overall development plan which will cover the period through 1980. It is felt that the commission's recommendations will provide the basis for a national health policy as part of this plan.

B. Ministry of Social Welfare and Public Health

The Ministry of Health is the government agency charged with the promotion, protection and recuperation of the health of the population. To date the Ministry has been able only partially to fulfill this mandate. The major limiting factors have been insufficient financial resources and the fragmentation of service providers within the sector. The planning office of the Ministry is well aware of these as well as other programatic deficiencies concerning the sector and, in spite of inadequate statistical data, has correctly prioritized the country's major health problems. It also recognizes that meaningful solutions to these problems will require substantially increased attention to the rural population, effective inter and intrasectorial coordination and a realistic transformation of the present administrative systems.

The demands placed on the Ministry of Health, both technical and political, in terms of projects or activities to be executed, have always outweighed its capacity to supply. As a result, the more visable needs, personnel and urban health services, have traditionally commanded the bulk of the Ministry's budget and constitute a very difficult pattern to break without considerably increased resources. In short, the health planners know what has to be done but for all practical purposes their hands are tied by factors out of their control.

1. The National Health Plan, 1973-1978

a. Background

The Ministry's plan of activities for the five year period 1974-1978 was developed in 1972-3 and published as the National Health Plan. The Five-Year Health Plan had its origins in the meeting of the Latin American Ministers of Health sponsored by PAHO in 1972 and in the desire of the Ministry of Health planners to develop a working document which would guide programming activities within the sector in Bolivia. It originally was intended that all major health service agencies in Bolivia would participate in the analysis and development of the Plan. This intra-sectorial participation, however, was not forthcoming. The document was, therefore, prepared by the planning office of the Ministry of Health, based on information provided by the Ministry's regional and programatic sub-divisions, with limited assistance from CONEPLAN. As a result the document presents only those activities directly dependent on the Ministry of Health.

However, this document has been approved by the Government and remains as the Ministry's guide for programming activities. It is basically a descriptive document, the bulk of which consists of statistical tables which detail both existing and proposed levels of service outputs. Both financial and statistical information are questionable, however, due to the inadequate reporting systems for Ministry activities. Furthermore, very little attention is devoted to analysis, and nothing is mentioned regarding a proposed methodology for implementation. The objectives of the plan are, however, in accord with the Panamerican Health Organization's "Ten Year Health Plan for the Americas"(1) and financial requirements are expressed by program budgeting.

b. Priorities and objectives

The overall goal proposed in the Plan is to increase the average life expectancy at birth by three years by 1978.(2) This goal is primarily directed at increasing the productive capacity of Bolivia's population. It recognizes that the achievement of the goal would depend on the reduction of infant mortality and the prevalence of infectious diseases and malnutrition. It also implies the provision of more services to the rural sector, which makes up the majority of the population, and the necessary coordination with simultaneous development in the areas of education and agriculture in order to increase the economic well-being and nutritional status of the population.

The Ministry Plan identifies six major programs. In order of priority they are: i) the control of communicable diseases; ii) the extension of maternal and child health activities; iii) an

increase in applied nutrition programs and nutritional research; iv) increased coverage of environmental sanitation systems; v) expanded coverage of medical, hospital and dental services; and vi) the improvement of the health infrastructure.(3) Table 8 1 summarizes the objectives and program emphasis as well as suggested measurable indicators and the increment in resources estimated to be necessary to implement the programs. The Plan lacks internal consistency; and, is weak in specifying measurable objectives. Only three of the objectives are quantifiable, and many of the measurable indicators do not appear to be realistic.

The programatic activities include a number of seemingly non-priority areas. Communicable disease control and environmental sanitation programs are perhaps the most well-defined and complete areas. Maternal and Child health programming is weak in terms of the attention given to infant and preschool mortality and morbidity. The nutrition programs make no mention of the need for intersectorial coordination (without which the likelihood of success is extremely limited). The inclusion of program to increase medical and hospital services probably is the result of demand pressures rather than a benefit to cost analysisof its potential to reduce the major causes of death and disease. The program for improvement of the infrastructure is an absolute necessity for the success of the above program areas. As proposed, however, it seems to be considerably overweighted in favor of construction projects, and little is mentioned regarding the specifics of improving the administrative and information systems. There also is very little connection demonstrated between the general objective of intersectorial coordination and the activities proposed. In spite of these deficiencies, tha Plan is a valuable document in and of itself. For the first time the Ministry has made an attempt at long-range planning and program budgeting.

c. Budget

The proposed budget increases for each program are expressed in terms of 1972 Bolivian pesos (12 to the dollar) and reflect costs at that time. The total budget increment for these new programs over the five-year period is $b.600 million. (See Tables 8.2 and 8.3). Almost two-thirds of these funds are designated for capital investment projects, with one third of the total budget going for new urban construction and equipment. These expenditures considerably increase the amount proposed for infrastructure programs, and as a result decrease the percentage allocation to communicable disease control, maternal and child health and nutrition programs.

It is well recognized, however, that public health interventions required considerably less investment than medical services and construction activities in order to achieve significant results, i.e., benefit to cost ratios are higher in terms of lowering mortality.

Table 8.1 Summary of Ministry of Health Priorities, Objectives, Program Emphasis, Measurable Indicators and Proposed Increase in Resources, 1973-1978

Priority Areas	General Objective	Program Emphasis	Measurable Indicators	Proposed Increase in Resources
1. Communicable Disease Control	Give priority to the control and/or erradication of communicable diseases in infancy and other vulnerable groups.	- Maintain erradication of smallpox, urban yellow fever and plan; - Maximum reduction of diseases controlled by vaccination; measles, whooping cough, policmyelitis, diphtheria and tetanus; - Malaria erradication; - Maximum reduction of tuberculosis and typhus; - Control of hemorrhagic fever; - Control and increased coverage and research for parasitosis, salmonella, typhoid, jungle yellow fever, Chagas' disease, bubonic plague and leishmaniasis. - Support the national and regional vaccine banks.	- Obtain coverage of 78.5% attack phase and 20.3% consolidation phase of population at risk for malaria; - Reduce mortality due to measles, whooping cough and tetanus to 1.0, 1.0 and 0.1 per 100,000 population respectively; - Vaccinate 100% of population at risk to jungle yellow fever; - Vaccinate 80% of children under five years against measles, whooping cough, diphtheria, tetanus and policmyelitis; - Reduce by 30% mortality due to tuberculosis; - Vaccinate 80% of population under 20 years against tuberculosis and smallpox; - Reduce by 20% the annual incidence of leprosy and increase by 20% the control of contacts; - Vaccinate all persons bitten a confirmed rabid dog and vaccinate 80% of the dog population.	Expenditures: $b 23.0 million Personnel " 0.5 " Operations " 22.5 " Capital investment " -- Source of funds: $b 23.0 million National treasury " 2.0 " External " 6.3 " Deficit* " 14.7 " Total personnel: 9 Professional 4 (TBC) Auxiliary/technical 5 (BHF) * Malaria erradication and vaccination programs.
2. Maternal and Child Health.	Reduce child mortality and morbidity. Facilitate the well-being of women of child-bearing age.	- Increase maternal and child activities so that they become 60% of all hospitalizations and outpatient visits; - Increase family welfare activities for mothers and children including the promotion of responsible parenthood; - Coordination of MCH activities with other health programs.	- Reduce by 20% the maternal mortality rate; - Obtain 40% of all deliveries in hospitals, and 25% coverage of all post-partums; - Recruit and train 100 midwives per year.	Expenditures: $b 39.4 million Personnel " 16.9 " Operations " 17.1 " Capital investment " 5.4 " Sources of funds: $b 39.4 million National treasury " 11.2 " External* " 23.7 " Deficit " 4.5 " Total personnel: (included in medical attention) Professional Auxiliary/technical * Includes $b.21.9 million proposal to UNFPA of which only $b.0.9 million was approved for a study.
3. Nutrition.	Decrease the prevalence of malnutrition by: - reducing Grade II malnutrition by 30%, - reducing Grade III malnutrition by 85%, - reducing endemic goiter by 20%.	- Rehabilitation of malnourished children in Grades II and III; - Prevention of malnutrition in rural children through a school lunch program; - Treatment and control of endemic goiter; - Continue nutritional research.	- Anemia prevalence survey of 35,000 women of child-bearing age; - Nutritional survey of 6,000 women and children in Beni, Santa Cruz and Cochabamba; - Anthropometric survey of 19,800 pre-school children in Oruro, Cochabamba and Tarija; - Endemic goiter survey of 45,000 children 5-14 years of age; - Treatment of 266,000 malnourished children; - Experimental injection of 8,000 people with iodized oil in Cochabamba, Santa Cruz, La Paz and Chuquisaca; - Instalation of salt iodizing plants in Uyuni, Salinas, Sucre, Cochabamba and Santa Cruz.	Expenditures: $b 24.9 million Personnel " 0.9 " Operations " 21.7 " Capital investment " 2.3 " Sources of funds: $b 24.9 million National treasurey " 12.8 " External " 2.0 " Other local* " 9.2 " Deficit " 0.9 " Total personnel: 20 Professional -- Auxiliary/technical 20 * Includes community, SNDC, INC, civic action, JNTJ and Departmental development committees.

Table 8.1 Summary of Ministry of Health Priorities, Objectives, Program Emphasis, Measurable Indicators and Proposed Increase in Resources, 1973-1978 (Continued).

Priority Areas	General Objective	Program Emphasis	Measurable Indicators	Proposed Increase in Resources
4. Environmental Sanitation.	Provide potable water.- and excreta disposal systems to 30% of urban population not presently covered. Provide potable water to 20% of rural population. Establish rubbish disposal systems to 50% of cities over 20,000 inhabitants. Conserve health and well-being of workers by decreasing occupational accidents and diseases.	- Apply the legal norms of the Ministry of Health on a national scale; - Provide potable water, sewerage systems and letrines to rural areas; - Improve environmental conditions in the mines and agro-industry; - Improve the control of foods and beverages; - Set norms, control and combat environmental pollution and contamination.	- Provide potable water systems to 180 rural communities of less than 2,000 inhabitants; - Increase coverage of working population from 8.2% to 25%; - Creation of a regional office of INSO in Santa Cruz.	Expenditures $b 95.1 million Personnel " 2.7 " Operations " 27.0 " Capital investment " 65.4 " Sources of funds: $b 95.1 million National treasury " 29.2 " External " 41.3 " Other local* " 24.1 " Deficit " 0.5 " Total personnel: 155 Professional 15 Auxiliary/technical 140 * Includes community, SNDC, INC, civic action, JNDS and Departmental development committees.
5. Medical, Hospital and Dental Services.	Increase outpatient visits from 9/100 to 31/100 MOH service population. Increase hospital discharges from 1.35/100 to 2/100. Increase dental visits from 2.4/100 to 3.6/100. Increase auxiliary nurse visits from 1.4/100 to 28/100.	- Continued expansion of services to rural areas, primarily through auxiliary nurses, and collaborate closely with education, agriculture and other sectors; - Improve existing facilities; - Set operational objectives and standards; - Regionalize the organization and provision of health services; - Expand dental services, with preference to preventive aspects; - Coordinate with the social security system, especially regarding the seguro social campesino.	- Increase population coverage to 95% of urban sector and 16.6% of rural sector, including 990,645 and 769,656 outpatient visits respectively; - Increase hospital discharges to 92,103 in urban sector and 18,214 in rural sector; - Survey 21,845 people in Oruro, Cochabamba and Santa Cruz for prevalence of dental caries; - Carry out dental resource surveys in Cochabamba, Sucre, Tarija, Beni, Pando, Riberalta and La Paz; - Establish intensive care units and progressive treatment in all hospitals over 100 beds; - Obtain 4.4 million outpatient visits, covering 2.3 million persons, by auxiliary nurses in rural areas; - Increase by 17% dental activities.	Expenditures: $b 74.7 million Personnel " 20.8 " Operations " 46.1 " Capital investment " 7.8 " Sources of funds: $b 74.7 million National treasury " 66.9 " External " 7.8 " Total personnel: 1,490 Professional 683 Auxiliary/technical 807* * 305 of which are rural auxiliary nurses.
6. Improvement of the Infrastructure.	Obtain the effective coordination of intersectorial programs and activities aimed at achieving the complete integration of health services.	- Establish effective systems of intersectorial coordination under the direction of MOH with emphasis on the vaccine bank, health statistics, cooperative activities, planning and standardization of norms; - Implement systems of supervision; - Improve personnel training, coordinating with educational system; - Improve administrative-organizational systems with emphasis on budget and accounting, personnel, maintenance, supply and inventory aspects; - Improve the normative and physical capacity of the central laboratory (INLASA); - Control and reduce the costs of medications by improving the drug analysis laboratory, adjust prices and commercialization practices and promote local processing industries; - Increase human health resources.	- Establish a single national health service system; - Update the sanitary code of 1957; - Establish regional planning offices in all health districts; - Secure legislation giving the MOH sole normative authority regarding all health statistics, prepare and publish norms; - Construct a new building for INLASA; - Secure a $US8 million loan from Argentina (Acta de Jujuy); - Secure the integration of the School of Public Health into the national university system; - Provide in-country training for 3,127 health workers and secure scholarships for 149 worker for training in other countries.	Expenditures: $b 342.5 million Personnel " 7.5 " Operations " 10.2 " Capital investment " 313.1[a] " Training " 11.7 " Sources of funds: $b 342.5 million National treasury " 265.4 " External " 18.9 " Other local " 34.7[b] " Deficit " 23.5[c] Total personnel: 284 Professional 53[d] Auxiliary/technical 231[e] a Includes $b.297.5 million for construction. b Includes community, SNDC, INC, civic action, JNDS, and Departmental development committees. c Primarily construction programs. d Laboratories (33) and health education (20). e Includes 225 in biostatistics and 6 laboratory assistants.

Note: All goals are to be reached by 1978 or refer to the cumulative total 1974-1978 depending on the activity in question.

Source: Ministerio de Previsión Social y Salud Pública, Oficina Sectorial de Planificación, Plan Nacional de Salud, 1973-1978, La Paz, 1973.

Table 8.2 - Summary of Proposed Health Expenditure Increases of the Ministry of Health by Program, 1974 - 1978.
(In million pesos bolivianos based on 1972 rate of 12 $b.: 1$us.)

Program	Personnel	Operations	Investment	Training	Total
Communicable Diseases	0.5	22.5	-	-	23.0 (3.8%)
Maternal and Child Health	16.9	17.1	5.4	-	39.4 (6.6%)
Nutrition	0.9	21.7	2.3	-	24.9 (4.1%)
Environmental Sanitation	2.7	27.0	65.4	-	95.1 (15.9%)
Medical Services	20.8	46.1	7.8	-	74.7 (12.5%)
Infrastructure	7.5	10.2	313.1*	11.7	342.5 (57.1%)
Total	49.3 (8.2%)	144.6 (24.1%)	394.0 (65.7)	11.7 (2.0%)	599.6 (100.0%)

* Includes $b.40.1 million for urban construction and equipment projects presently in progress (6.7%) of total expenditures), $b.201.3 million (33.6%) for proposed urban construction projects and $b.49.6 million (8.3%) for rural construction projects.

Source: Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973 - 1978, La Paz, 1973, pp. 172.

Table 8.3 - Summary of Proposed Health Financing of the Ministry of Health by Program, 1974 - 1978.
(In million pesos bolivianos based on 1972 rate of 12 $b.: 1$us.

Program	National Treasury	External	Other Local*	Deficit	Total
Communicable Diseases	2.0	6.3	-	14.7	23.0
Maternal and Child Health	11.2	23.7	-	4.5	39.4
Nutrition	12.8	2.0	9.2	0.9	24.9
Environmental Sanitation	29.2	41.3	24.1	0.5	95.1
Medical Services	66.9	7.8	-	-	74.7
Infrastructure	265.4	18.9	34.7	23.5	342.5
Total	387.5 (64.6%)	100.0 (16.7%)	68.0 (11.3%)	44.1 (7.4%)	599.6 (100.0%)

* Includes community, SNDC, INC, civic action, JNDS and Departamental development committees.

Source: Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973 - 1978, La Paz, 1973, pp. 173 - 174.

Table 8.4 - Summary of Proposed Health Personnel Increases of the Ministry of Health by Program, 1974 - 1978.

Program	Professional	Auxiliary/Technical	Total
Communicable Diseases	4	5	9 (0.5)
Maternal and Child Health	*	*	*
Nutrition	-	20	20 (1.0)
Environmental Sanitation	15	140	155 (7.9)
Medical Services	685	807	1.492 (76.1)
Infrastructure	53	231	284 (14.5)
Total	757 (38.6)	1.203 (61.4)	1.960 (100.0)

* Included in Medical Services.

Source: Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973 - 1978, La Paz, 1973, pp. 169 - 170.

In addition, it is much easier for the Ministry to secure international funding for public health programs than for curative services and buildings. Although it has been shown that budgetary allocations are not good measurements of the relative program priorities, the proposed budgetary allocations, nevertheless, do not appear to give adequate weight to the Ministry's stated priorities. The breakdown of proposed personnel requirements (Table 8.4) reflects this resource-priority imbalance.

d. Implications of the budget

In order to carry out the programs proposed in the National Health Plan, the Ministry estimated that it would need a total additional budget of $US.48.2 million by 1978. This would represent an increase of 423 percent over its 1973 budget of $US.11.5 million. This is a very ambitious, and probably unrealistic, projection. For instance the proposed increment for 1974 amounted to a 100 percent increase over 1973; while in fact, the Ministry was only allowed a nine percent increase. The budget would have to be increased by 41 percent annually compared to the tentative allocations to the Ministry for 1975 of only a 16 percent increase. Table 8 5 and Figure 8.1 compare the Ministry's request with the trend in actual allocations. The Ministry received 3.0 percent of the national treasury budget in 1970 and 4.3 percent in 1974. It would have to receive 18 percent in 1978 to be allocated $US.58.7 million.(4)

The budget projections for the Five-Year Plan were based entirely on 1972 prices They did not take into consideration inflation nor were the addition of supernumerarios* and adjustments to existing salaries contemplated. Assuming an annual rate of inflation of 10 percent, the real buying power of $US.58.7 million in 1978 would be reduced to $US.36.3 million. Thirty-eight percent ($US.22.4 million) of the proposed budget would be eaten up by inflation. Thus if the Ministry wished to carry out all the activities in the Plan, it would need a $US.94.5 million budget by 1978, or an annual increase of 55 percent over its 1973 budget.

Thus,one would have to question the ability of the MOH to do any of the programs it projected. The Ministry has developed a revised budget request of $US.5.5 million for 1975. (See Table 8.6). In effect, the Ministry has been forced to revert to year-by-year, nonsystematic planning. If the Ministry does not get its $US.5.5 million, the traditional pattern will be perpetuated, i.e. salaries will claim the bulk of the budget

---

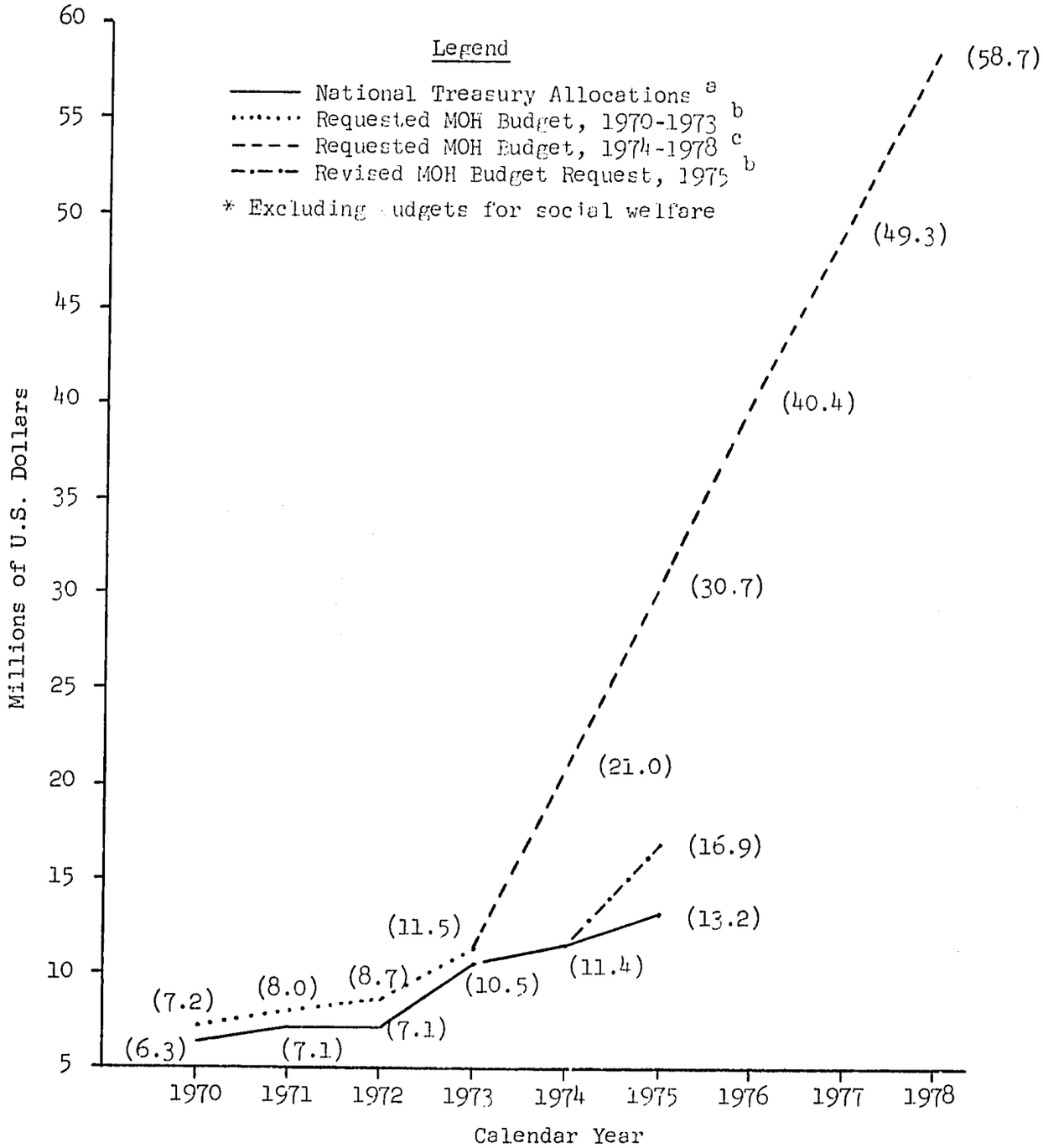
* Personnel hired on local funds which are to be absorbed into the Ministry's budget.

Table 8.5 - Comparison of Proposed and Actual Health Budgets of the Ministry of Health, Per Capita Expenditures and Percentage Allocations of the National Treasury, 1970-1978.

Year	Proposed Budget[a] Increase	Proposed Budget[a] Total	Actual Budget[a] Increase	Actual Budget[a] Total	Per Capita Expenditures	Percent of National Treasury
1970	NA	7.2	NA	6.3	1.30	3.0
1971	1.7	8.0	0.8	7.1	--	--
1972	1.6	8.7	0.0	7.1	--	--
1973	4.4	11.5	3.4	10.5	--	--
1974	10.5	21.0[b]	0.9	11.4	2.15	4.3
1975	9.7	30.7[b]	(1.8)	(13.2)	--	--
1976	9.7	40.4[b]	--	--	--	--
1977	8.9	49.3[b]	--	--	--	--
1978	9.4	58.7[b]	--	--	(10.00)	(18)[c]

[a]In millions of US dollars. [b]National (Five-Year) Health projections.
[c]USAID/Bolivia/ECON ( ) Estimates
Source: Ministry of Social Welfare and Public Health, Planning Office, personal communication.

Figure 8.1 - Comparison of Requested Ministry of Health Budgets for Health Programs, 1970-1978, with Actual National Treasury Allocations, 1970-1975 *



Sources: a Table 6.4, Chapter VI.C.
b Ministry of Health, Planning Office, unpublished data, 1974
c Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 172

Table 8.6 - Tentative Health Budget Increase as Compared with the Fiscal Needs of the Ministry of Health for 1975. (In million pesos bolivianos at 20:1)

Tentative Budget Increase		Projected Budgetary Needs	
Item	Amount	Item	Amount
Personal Services	12.9	Personal Services	28.5
		Chuquisaca-Tarija	5.1
		Other departments	8.6
		Central level	4.2
		Increased hours	0.7
		Increased salaries	5.0
		Supernumerarios*	4.9
Non personal services	1.3	Non-personal Services	6.4
		Benefits	5.4
		Food	1.0
Materials and supplies	3.6	Materials and supplies	13.4
Capital investment	19.0	Capital investment	61.1
		Continuing projects	46.6
		New projects	14.5
Total	36.8	Total	109.4

* Consists of personnel, previously paid from locally-raised institutional funds, which are to be incorporated into the national budget.

Source: Ministry of Social Welfare and Public Health, Planning Office, personal communication.

At present, the National Health Plan remains in force as the Ministry's guiding document. Conceptually it states what the MOH is trying to do. In practice, however, the lack of sufficient funds have all but prohibited any substantial progress toward the stated goals.

2. Regional Plan for Socio-Economic Development, Chuquisaca-Tarija

Since 1972 the government of Bolivia has placed emphasis in improving its systems of regional planning and programming. The implementation of this strategy falls primarily on the Ministery of Coordination

and Planning and specifically with CONEPLAN. Their activities are closely coordinated with the Departmental Development and Public Works Committees and the other sectorial Ministries of the Government. International technical and financial support of these efforts has been obtained from the United Nations Development Programme (UNDP), in economic development aspects, and from UNICEF, in social development aspects. The first phase of the program concentrates on regional programming for Chuquisaca and Tarija and the improvement of the regional planning capacity of CONEPLAN during the period 1974-1977. It is contemplated that the second phase (beginning in 1978) will extend the process to the Department of Potosí.

a. Regional development objectives and strategy

The Government's objectives and strategy for regional development and its relationship to overall national development are summarized in Table 8.7. The developmental goals are expressed primarily in economic terms. It is recognized, however, that social development must be accomplished simultaneously to achieve a balanced improvement in the quality of life. This is directly expressed in terms of improving the living conditions in rural areas and in the promotion of family welfare, both of which require health interventions. The regional development objectives include the achievement of a just society based on family development and the restructuring of population centers in order to efficiently provide necessary social services. The regional development strategy and immediate objectives place high priority on the extension of social services at the community level, including specifically the improvement of nutritional status.

Three of the twelve programmatic areas of involvement are: i) health, with emphasis on improving preventive services, ii) nutrition, and particularly the elimination of nutritional deficiencies, and iii) environmental sanitation, concentrating on rural areas. Specific health activities in the Chuquisaca-Tarija region are to focus on research on the biostatistics system and communicable disease problems. Program interventions are to include construction and equipment, personnel training, communicable disease control, maternal and child health and health education. Specific nutrition activities are to be defined through research and the formulation of a nutrition and food policy. Environmental sanitation projects would consist of the provision of potable water and excreta disposal systems and of the construction of adequate laundry facilities in medical posts.(5) The organizational restructuring and proposed methodologies necessary for implementing these programs are not described in the CONEPLAN document, possibly because regional planning is a novelty and many of the details have yet to be worked out.

Table 8.7 - Summary of National and Regional (Chuquisaca-Tarija) Deve opment Objectives and Strategies.

National Development Strategy		Regional Development Strategy - Chuquisaca and Tarija			
General Objectives	Strategy for Regional Development	General Objectives	Regional Strategy	Immediate Objectives	Programatic Areas
- Increase per capita income; - Promote physical, economic and social integration; - Decrease international dependency; - Improve utilization of natural resources; - Improve utilization of human resources; - Obtain optimum productivity; - Promote scientific and technologic research; - Improve rural living conditions; - Promote regional and sub-regional integration (polos de dedesarrollo); - Promote family welfare.	- Adequate treatment to high development zones; - Promote internal migration to zones of low population density and high economic potential; - Promote the concentration of the dispersed population; - Special treatment for planned colonization activities; - Preferential treatment to high economic and social priority zones; - Create an economic and social structure capable of countering centralism and permiting adequate inter and intra-regional integration.	- Obtain full employment in order to increase consumption capacity; - Develop industries to exploit natural resources; - Obtain a just society based on the integral family; - Develop a regional structure of hierarchical population centers which support economic activities and offer necessary social services.	General - Universalization of social services; - Expansion of construction activities; - Modification of urban-rural relationship; - Integration of complementary zones; Creation of centers of demand; - Localization of industrial activities; - Reorganization of regional administration. Economic Development - Develop an appropriate technology, concentrating on labor intensive activities; - Restructure supply and demand patterns; - Promote specialized production according to ecologic-economic sub-regions. Social Development - Transformation of social, economic and political power structure; - Stimulate community participation in the development process.	- Increase income levels, especially in rural areas, in order to improve living conditions; - Extend social services to the community and improve nutritional status and educational level of the individual family and the society.	- Agriculture, livestock, forestry, and fishing; - Mining and petroleum; - Industries: food, non-food and foundries; - Health, with emphasis on preventive services; - Nutrition, with emphasis on eliminating major deficiencies; - Environmental sanitation, concentrating in rural areas; - Education, focusing on the community and work-oriented aspects; - Housing and urbanization; - Transportation; - Communications; - Energy, with emphasis on rural electrification; - Technical training and data processing.

Source: Consejo Nacional de Economia y Planificación, et. al., Plan Regional de Desarrollo Economic-Social Chuquisaca-Tarija: Ensayo de Planificación Regional, Imprenta Tupac Catari, Sucre, 1972, pp. 108-159.

The Chuquisaca-Tarija program budget for 1973-1974 called for an investment of $US.16.3 million; $US.10.5 million (64.4 percent) was to come from national sources and the remainder from international donors. Health programs were to claim 17.7 percent ($US.2.8) of the total budget, the financing of which would be in about the same proportions. Only $US.0.2 million (1.2 percent was programmed for nutrition activities, with 70 percent of these coming from external sources. Environmental sanitation would require $US.0.7 million (4.3 percent), 57.1 percent of which would be financed nationally.(6) Budget figures for 1975-1977 are not provided in the document, and will probably depend on the progress made during 1973-1974.

b. Social development and health

UNICEF is financing the social development aspects of the regional program, and will emphasize the provision and improvement of services to rural areas. Table 8.8 summarizes the objectives and activities programed for the period 1974-1977. Strong emphasis is given to comprehensive regional planning and intersectorial coordination. UNICEF is working at both the national (CONEPLAN) and regional (Departmental Development Committees) levels in this respect. Program coordination and financing will be channeled through the Development and Public Works Committees of Chuquisaca and Tarija. As with the overall development plan, significant attention is given to employment and family income aspects. Improvement of nutritional status is also one of the sector objectives.

The UNICEF participation contemplates a wide range of activities to be implemented. For the most part the proposed activities are considerably well-detailed as to what the program plans to do. The overall program and specific activities are very much oriented to the family level, and contemplate the active participation of the campesino in most areas. Health and agriculture together will receive almost two-thirds of the proposed budget. (Table 8.9). However, the combination of the large number of activities plus a relatively small three-year budget has apparently left some gaps and limited interventions in many of the program areas. Also the provision of technical assistance, with the exception of vocational training, is hardly mentioned. Finally, no comprehensive study was carried out prior to the formulation of the plan to determine whether these largely traditional activities are in fact the most effective interventions to achieve the program's goals.

The Ministry of Health, through its Departmental health offices (Unidades Sanitarias) will be the executing agency for the health, environmental sanitation and nutrition components of the program. As with other sectors, a wide range of activities is contemplated. Environmental sanitation, however, will receive about 60 percent of the

Table 8.8 - Summary of UNICEF Social Development Objectives and Activities for the Chuquisaca-Tarija Regional Development Program.

Program Objectives	Program Activities		Objectives for Health and Environmental Sanitation Activities
- Establish an aggregate of intersectorial activities in which social services support the development of a basic development infrastructure; - Achieve an aggregate of immediate operational social objectives in order to implement long-range regional development; - Consolidate the region into a planning unit and the Departments into administrative and decision-making unit, establishing adequate intersectorial coordination mechanisms; - Maximize the utilization of local resources as a source of financing social services; - Create the conditions for a rapid increase of family income and the extension of social services; - Generate employment, especially among the rural young population; - Improve nutritional level by stimulating local food production.	- Administration: . Central level (CONEPLAN) . Departmental level (Development Committees); - Regional food and nutrition policy: . Agriculture production, . Education, . Health . Nutrition; - Vocational training: . FOMO . International technical assistance; - Rural housing and recreation: . Research, . Construction, . Rural urbanization, . Playgrounds and sports facilities; - Road improvement: . Secondary roads, . 1,126 km. serving 56 communities; - Cooperatives (Chuquisaca): . Production, . Marketing, . Food processing, . Weaving;	- Public health and environmental sanitation: . Administrative reorganization, . Regional office of supply and maintenance, . Extension and improvement of basic health services (construction, equipment, personnel), . Urban medical attention, . Rural medical attention (supervision), . Dental attention, . Biostatistics, . Personnel training, . Communicable disease control, . Nutrition, . Health education, . Environmental sanitation; - Education: . Rural education (25 nuclear areas), . Research, . Administrative reorganization, . Pre-vocational and vocational training, . Adult education, . School lunch, . Teacher training, . Technical supervision, . Non-formal education including literacy, . Construction, equipment, books and teaching materials, . Reproduction facilities; - Agriculture and livestock: . Nutrition (family gardens), . Cooperatives and credit, . Research, . Irrigation, . Family porcine projects.	- Improve the level of health of urban and rural populations, especially for mothers and children; - Organize, improve and extend health services; - Develop regional health programs, promoting, intra-sectorial coordination; - Administrative reorganization of regional service, giving particular importance to the gradual integration of SNEM with other services; - Improve environmental sanitation conditions, with special priority to schools and health facilities; - Improve the nutrition level of the population, with emphasis on mothers and children.

Source: UNICEF, Bolivia: Programa para la Cooperación de UNICEF, Junio 1974-Mayo 1977, Tomo III, La Paz, 1973, pp. 15-201.

Table 8.9 - Summary of Social Development Financing for the Chuquisaca-Tarija Regional Development Program by Program and Year. (In U.S. dollars).

Programs	First Year		Second Year		Third Year		Sub-Total		Total	
	National	UNICEF	National	UNICEF	National	UNICEF	National	UNICEF	Amount	Percent
Administration	9,780	58,400	10,720	42,260	13,860	39,120	34,360	139,780	174,140	6.3
Vocational training	--	20,000	--	30,000	--	20,000	--	70,000	70,000	2.5
Rural housing and recreation	10,000	4,000	15,000	10,000	15,000	10,000	40,000	24,000	64,000	2.3
Road improvement	80,073	13,000	82,173	9,000	70,223	9,000	232,469	31,000	263,469	9.6
Public health and environmental sanitation	205,077	192,792	224,883	164,285	200,709	33,642	630,669	390,719	1,021,388	37.0
Education	61,102	25,000	19,890	40,000	19,890	75,000	100,882	140,000	240,882	8.7
Agriculture and livestock	175,560	60,429	193,490	67,380	196,435	58,370	565,485	186,179	751,664	27.2
Cooperatives	28,980	28,790	42,367	39,310	19,259	18,505	90,598	86,605	177,203	6.4
Sub-Totals	570,572	402,411	588,523	402,235	535,368	263,637	1,694,463	1,068,283	2,762,746	100.0
Percent (by year)	58.6	41.4	59.4	40.6	67.0	33.0	61.3	38.7		

Source: UNICEF, Bolivia: Programa para la Cooperación de UNICEF, Junio 1974-Mayo 1977, Tomo III, La Paz, 1973, p. 203.

budget (Table 8.10), followed by nutrition (16 percent) and the improvement of service facilities (15 percent). Only nine percent of the budget (or about $US.30,000 per year) is left for the other nine programs.

The commitment of the Ministry of Health to this program is significant in several ways. Foremost is the consistency of objectives among the Ministry's proposed regional activities, the UNICEF social development and CONEPLAN regional development program, and the Ministry's Five-Year Health Plan. Undoubtedly this is partly due to the influence of CONEPLAN in the different planning efforts. The proposed health budget for Chuquisaca-Tarija marks a notable shift, however, as compared with the Five-Year Plan. For the first time the vast majority of resources is being allocated to preventive programs as opposed to construction projects and curative medicine. Finally, the Ministry's planned activities are well detailed.

However, it is questionable whether the Ministry will be able to meet its full commitments. As planned, the Chuquisaca-Tarija program would require 15 percent of the total tentative budget allocations for 1975. Even then the proposed budget would be very limited for the majority of activities and therefore leave many gaps in terms of its effective implementation. Thus the Ministry would like to complement this budget with an additional $US3.5 million (mostly for malaria control); but that would mean that the program would require one-forth of the tentative 1975 budget. At the present time, the Chuquisaca-Tarija program remains in the programming stage; little has been advanced in terms of the implementation of projects.

3. The coordination of external assistance

In February of 1973, the Ministry of Health participated in a meeting which outlined the government's position regarding international cooperation. Representatives from the Interamerican Commission for the Alliance for Progress, the Interamerican Development Bank, the World Bank and various government agencies were present. One of the purposes of the meeting was to stimulate the government to design a global country development plan which would serve to guide the utilization of foreign assistance. One of the overriding concerns of the Ministry of Health was the difficulty it faced in developing a national health plan due to the lack of this global development plan. The Ministry also stressed the need to promote the integration of the various government agencies working in the health sector and to concentrate on regional development through multisectorial coordination.

Table 8.11 summarizes the Ministry's objectives for the health sector and priorities for technical cooperation as prepared for the 1973 meeting. For the most part, the objectives coincide with those stated

Table 8.10 - Summary of Health Financing for the Chuquisaca-Tarija Regional Development Program by Project and Year. (In U.S. dollars).

Projects	First Year		Second Year		Third Year		Sub-Total		Total	
	National	UNICEF	National	UNICEF	National	UNICEF	National	UNICEF	Amount	Percent
Administrative organization	2,800	--	1,400	--	--	--	4,200	--	4,200	0.4
Supply and maintenance	4,200	--	2,100	--	--	--	6,300	--	6,300	0.6
Improvement of services	11,048	57,555	17,016	37,985	13,985	19,892	41,922	115,432	157,354	15.4
Urban medical attention	622	--	1,275	--	1,911	--	3,808	--	3,808	0.4
Rural medical attention	270	--	270	--	270	--	810	--	810	0.1
Dental attention	--	--	--	--	--	--	--	--	--	0.0
Biostatistics	1,000	2,000	1,300	--	1,350	--	3,650	2,000	5,650	0.6
Personnel training	560	13,337	560	2,150	560	11,750	1,680	27,237	28,917	2.8
Communicable diseases	7,572	1,000	7,777	1,500	8,195	2,000	23,544	4,500	28,044	2.7
Nutrition	52,195	400	53,175	4,000	54,155	--	159,525	4,400	163,925	16.1
Health education	2,300	1,000	3,700	1,150	7,200	--	13,200	2,150	15,350	1.5
Environmental sanitation	122,510	117,500	136,310	117,500	113,210	--	372,030	235,000	607,030	59.4
Sub-totals	205,077	192,792	224,883	164,285	200,709	33,642	630,669	390,719	1,021,388	100.0
Percent (by year)	51.5	48.5	57.8	42.2	85.6	14.4	61.7	28.3		

Source: UNICEF, Bolivia: Programa para la Cooperación de UNICEF, Junio 1974-Mayo 1977, Tomo III, La Paz, 1973, p. 67.

Table 8.11 - Summary of Objectives and Priorities for External Cooperation in the Health Sector.

Policy Issues	Sector Objectives	Priorities for Technical Cooperation	Special Considerations
- Develop a single and basic health development policy for all agencies, public and private, based on a global country development plan; - Concentrate on the expansion of rural services and regional programming, interagency coordination, maternal and child health and communicable disease control; - Concentrate on regional social and economic development through multi-sectorial coordination.	- Increase life expectancy and work capacity: . erradication/control of communicable diseases, . improvement of work environment, . improve nutrition status, . increase preventive actions including health education, . increase maternal and child health services; - Reduce morbidity, especially as related to the labor force: . improve facility utilization, . extend coverage of services to rural areas, . incorporate health component in all development projects, . improve capacity and efficiency of health facilities, . increase research and set national standards; - Strengthen, improve and extend health service coverage: . adequate health planning towards the integration of services, . revise and up-date health legislation, . strengthen the normative functions of the Ministry of Health, . expand the training and improve the quality of health personnel, . increase the utilization of external technical assistance in critical areas.	- Highest priority areas: . Communicable diseases, .. malaria .. vaccinations .. hemorrhagic fever and Chagas'; . Nutrition, .. endemic goiter .. child and mother feeding; . Rural sanitation, .. potable water .. excreta disposal; . Health services, .. facilities .. maternal and child health; . Biostatistics; . Laboratories; . Drug supply and control. - Secondary priorities: . Facility maintenance and renovation of equipment; . Health planning; . Personnel training; . Health legislation.	- No technical assistance has been received for drug control nor health legislation; - Little technical and financial assistance has been received for statistics, laboratories, training and health education; - All external cooperation should be channeled through the Ministry of Health; - Nutrition, health education and environmental sanitation are areas which should receive special consideration in terms of intersectorial coordination; - External cooperation should be coordinated at both the sectorial and global levels; - Public administration systems should be improved to reduce obstacles and maximize external assistance.

Source: Ministerio de Previsión Social y Salud Pública, "Coordinación de la Cooperación Externa a Bolivia", Reunión Conjunta: Bolivia - CIAP, BID, BIRF, Sector Salud, La Paz, February 19-22, 1973, pp. 3, 11-15.

in the Five-Year Plan, but the priorities are understandably oriented to those aspects more likely to gain external support. The extension of health services to rural areas, especially concerning maternal and child health and communicable disease control, remains the major concern. Nutrition and environmental sanitation are also high priorities. Improvement in the biostatistics and reference laboratory systems and an increased supply and better control of drugs complete the list. To improve the efficiency and effective utilization of foreign assistance the Ministry recommended the improvement of administrative systems and better coordination of external assistance through the Ministry of Health.

No concrete policies regarding the utilization of foreign assistance have evolved from this meeting. Nevertheless, some international donors --PAHO and UNICEF, in particular -- have taken the Ministry's position into consideration and have programmed subsequent activities accordingly.

C. Other Sector Agencies

With the exception of the Ministry of Health, the government agencies involved in the health sector have not carried out any comprehensive planning efforts. Several limited plans have been developed, mostly dealing with specific aspects of an agency's scope of activities. Until the formation of the Intersectorial Commission for the Health Sector in early 1974, no attempt had been made at comprehensive sectorial planning. However, several of the independent studies which probably will influence future developments within the health sector are summarized below.

1. CONEPLAN - population problems

In July of 1974, CONEPLAN sponsored a conference to analyze and provide a base for a rational national policy regarding population problems. The conference was attended by 62 people representing 21 government, private, voluntary and religious organizations. The participants concluded: i) that a population policy should not be established independently but rather within the context of integrated development and exempt from foreign pressures which interfere with national sovereignty; and ii) that on a national level, Bolivia does not have an accelerated population growth, but rather a maldistribution of its population with resulting pressures in certain areas.(7)

The recommendations of the conference included a rejection of a birth control program which would necessarily be oriented towards altering demographic parameters. Nevertheless, it was recognized that a couple has the right consciously and freely to determine the timing

and number of pregnancies, without pressure from any source, in order to alleviate negative social consequences such as high rates of abortion and maternal mortality. Due to the lack of adequate demographic statistics and the isolated activities of some organizations it was also recommended that a national population council be established. Finally, the conference recommended that the proposed national census be carried out urgently.

As an official document of the Ministry of Coordination, it is felt that these recommendations will have a considerable influence on a forthcoming national population policy. A second seminar has been scheduled for early 1975 to further define specific recommendations which would then be submitted to the government for consideration. It is likely that the GOB will try to avoid making any official policy statement regarding family planning; but rather will continue its laissez faire position of responsible parenthood.

2. The Bolivian Social Security Institute (IBSS) - rural social security

Since at least early 1973, the possibility of a Seguro Social Campesino has been mentioned frequently in the national press. In September of 1971 a commission was formed to carry out the appropriate feasibility studies. Unfortunately, these studies and the resulting project proposal were not available for review by the Health Sector Assessment personnel. The following analysis is based on discussions with IBSS and Ministry of Health officials and the proposed Supreme Decree for the creation of the Seguro Social Campesino.(8)

a. Services

The Seguro Social Campesino (SSC) would function as a separate entity or caja under the supervision of the IBSS. and in coordination with other cajas. In contrast, however, the SSC would offer only medical services for sickness, maternity and accidents (prestaciones en especie), and would not include old age, disability nor death benefits. The specific services would include curative medicine, general surgery, hospital and limited dental attention and the provision of basic drugs. Preventive health services would also be offered, but would be provided by the Ministry of Health.

b. Beneficiaries

The beneficiaries of the SSC would be: i) all independent agricultural workers who possess legal title to their land, ii) employed agricultural workers who would be transferred from the present social security system (CNSS), and iii) non-agricultural rural residents on

a voluntary basis. Dependents of the above workers would also be insured. At present no provision is made for the large number of independent agricultural workers who do not possess legal title to their land. Presumably this group could join voluntarily but the financial arrangements have not been determined.

c. Financing

Financing for the system is contemplated from several sources: i) monthly payments by the head of household at $b.30.00 per household per month; ii) special taxes on certain agricultural products, particularly coca (10 percent) and chicha ($b.1.30/bottle); iii) a percentage of taxes now collected from agricultural enterprises and on agricultural lands; and iv) 70 percent of the taxes paid for registering rural land titles. In the absence of an employer (patron), no matching funds are to be provided, nor will the government directly match premiums with the campesino by formula.

Analysis of health financing among the campesinado in Bolivia shows that an average of $US.6.00 out of an annual family income of $US.300 is spent on health (traditional and modern), amounting to two percent of income. This totals $b.10.00 monthly, as compared to the monthly premium projected for the SSC of $b.30.00. Assuming that all monies now spent by the campesino on traditional and modern medicine were transferred to the payment of premiums, an estimated three-fold increase would still be necessary. However, experience in a fairly efficient health program of preventive and curative services with good rural coverage * -- among a population more receptive to social change -- showed that the campesino spent on the average $b.1.00 per person per month, or about $b.6.00 to $b.7.50 per family per month for health.

The campesino also contributed his labor and cash for the construction of local health posts. However, in this same health program each local peso was more than matched with outside assistance (the National Institute of Colonization provided some salaries and the Methodist Church provided salaries, equipment, drugs and technical advisors).

d. Organization

The organization of the SSC would be much the same as other cajas. At higher service levels, contracts would be made with other hospitals (CNSS, Ministry of Health, etc.). At lower levels (postas sanitarias and puestos médicos) the SSC would take over existing

---

* Yapacani colony in Santa Cruz sponsored by the Methodist Church.

Ministry of Health rural facilities using these as a base for more extensive coverage. Remodeling and additional construction is contemplated. This transfer has not been approved by the Ministry of Health, and it is unlikely that this would occur without resistance. Primary care would then be provided directly by the SSC with its own personnel. Some innovation is possible in the training and use of paramedical personnel delivering primary care (preventive and curative) and the training of physician's assistants and/or traditional practitioners (e.g. curanderos). In addition, an administrative system for the collection of premiums and medical fees is anticipated but at present undefined.

e. Implementation

It is envisioned that the SSC gradually would assume all responsibility for rural and small town populations from the Ministry of Health, the Institute of Colonization and other decentralized agencies. The Ministry of Health tends to favor the system, but with certain reservations regarding implementation, basically as a means of financing medical (curative) attention in rural areas. Programatic areas have been selected for the first year of operation: the Lake region, the Valle Alto of Cochabamba, and the northern provinces of Santa Cruz. (See Figure 8.2). In subsequent years, coverage would be expanded to adjoining Provinces and to the Department of Tarija.

Even though the SSC has been studied and a plan of action prepared, it has not yet been approved by the government. Many of the details have yet to be worked out. In October 1974 the IBSS was transferred back to the Ministry of Health. This action is obviously a necessary first step to secure a coordination of activities between the two institutions, and could pave the way for eventual implementation.

C. The Interministerial Commission on the Health Sector

In late 1973, the Ministry of Health undertook to rectify two major deficiencies within the health sector: the government agencies providing health services were seriously fragmented and there was no comprehensive health plan that could be considered truly sectorial in nature. In an effort to develop such a plan, which in turn would serve to stimulate intrasectorial coordination, the Government decided to form an Interministerial Commission to carry out an evaluation of the health sector. More than 60 persons representing 12 agencies were assigned temporarily to the task of analyzing the current status of health problems and programs in Bolivia and of formulating recommendations to improve the present conditions. The Commission was assisted throughout by USAID and PAHO technical consultants.

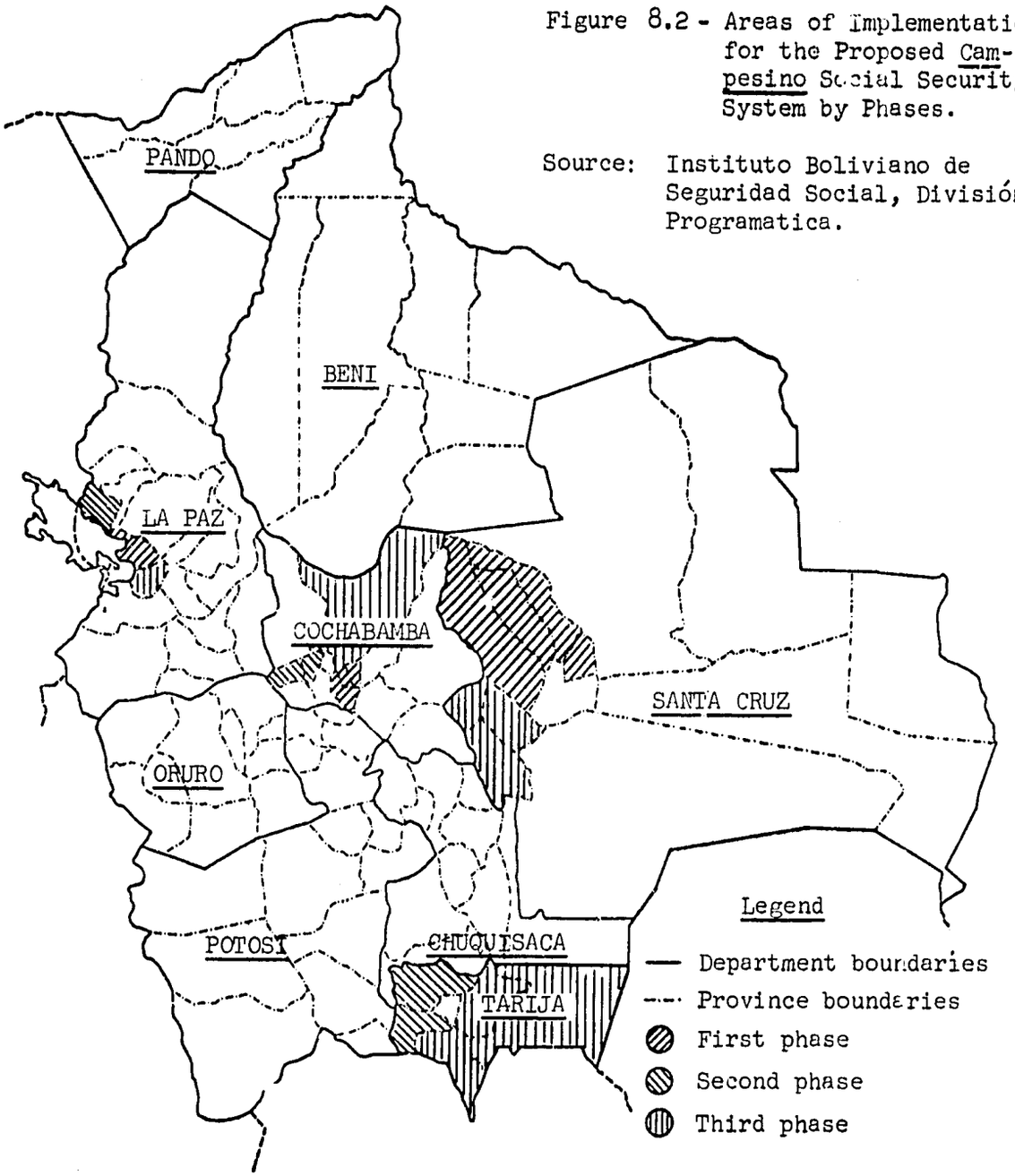


Figure 8.2 - Areas of Implementation for the Proposed *Campesino* Social Security System by Phases.

Source: Instituto Boliviano de Seguridad Social, División Programatica.

At the time of writing this Assessment, the Commission's final report was being drafted. It is to be submitted to the appropriate authorities in early 1975 for discussion and formal adoption. The following analysis is based on the reports of the various working groups and conversations with the coordinating committee which was preparing the final draft.

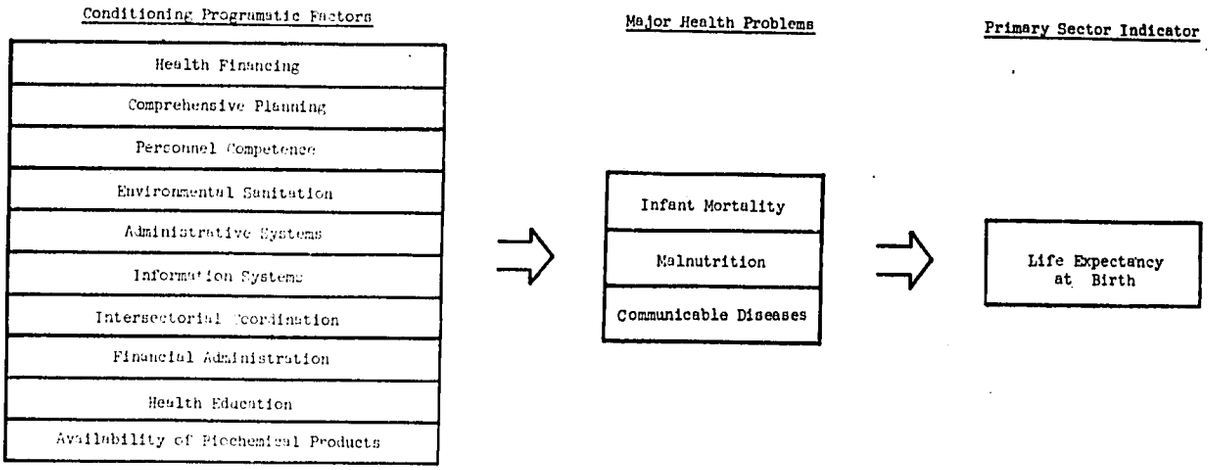
1. Sector priorities

The Commission members were assigned to eleven working groups. These sub-commissions analyzed five programmatic areas (medical and hospital attention, maternal and child health, communicable diseases, nutrition, and environmental sanitation) and six areas comprising the health infrastructure (administration, financing, human resources, facilities and equipment, information systems, and pharmaceutical supplies). Over 160 recommendations were presented by the sub-commissions aimed at improving various aspects within the sector. Many of these, of course, were overlapping. The heads of each working group then met several times for the purpose of integrating the work of the sub-commissions into a single document and to determine sector priorities from the numerous recommendations presented. This group reaffirmed that increasing life expectancy at birth was the most adequate and inclusive sector goal. It also recognized that the major health problems influencing life expectancy in Bolivia were the high rates of infant mortality, malnutrition and communicable diseases.

The group decided that sector priorities, or recommendations for primary attention, should focus on those factors which determine the effectiveness of the programs which were designed to overcome the major health problems. This factor analysis approach is illustrated in Figure 8.3. The 160 recommendations presented by the working groups were consolidated into ten principle conditioning factors. In the discussions that took place, it was intrinsically recognized that the health sector could not be considered an independent entity, but rather interrelated with other aspects of socio-economic status. Of particular importance were the general levels of education and family income, communications and transportation systems and agricultural production. While simultaneous advancement in these areas would be imperative to progress in the health field, it was decided that the Commission's scope of action could only realistically deal with those aspects related to and dependent on interventions within the health sector. Finally it was recognized that to achieve a significant impact on the major health problems, primary attention must be given to the rural population.

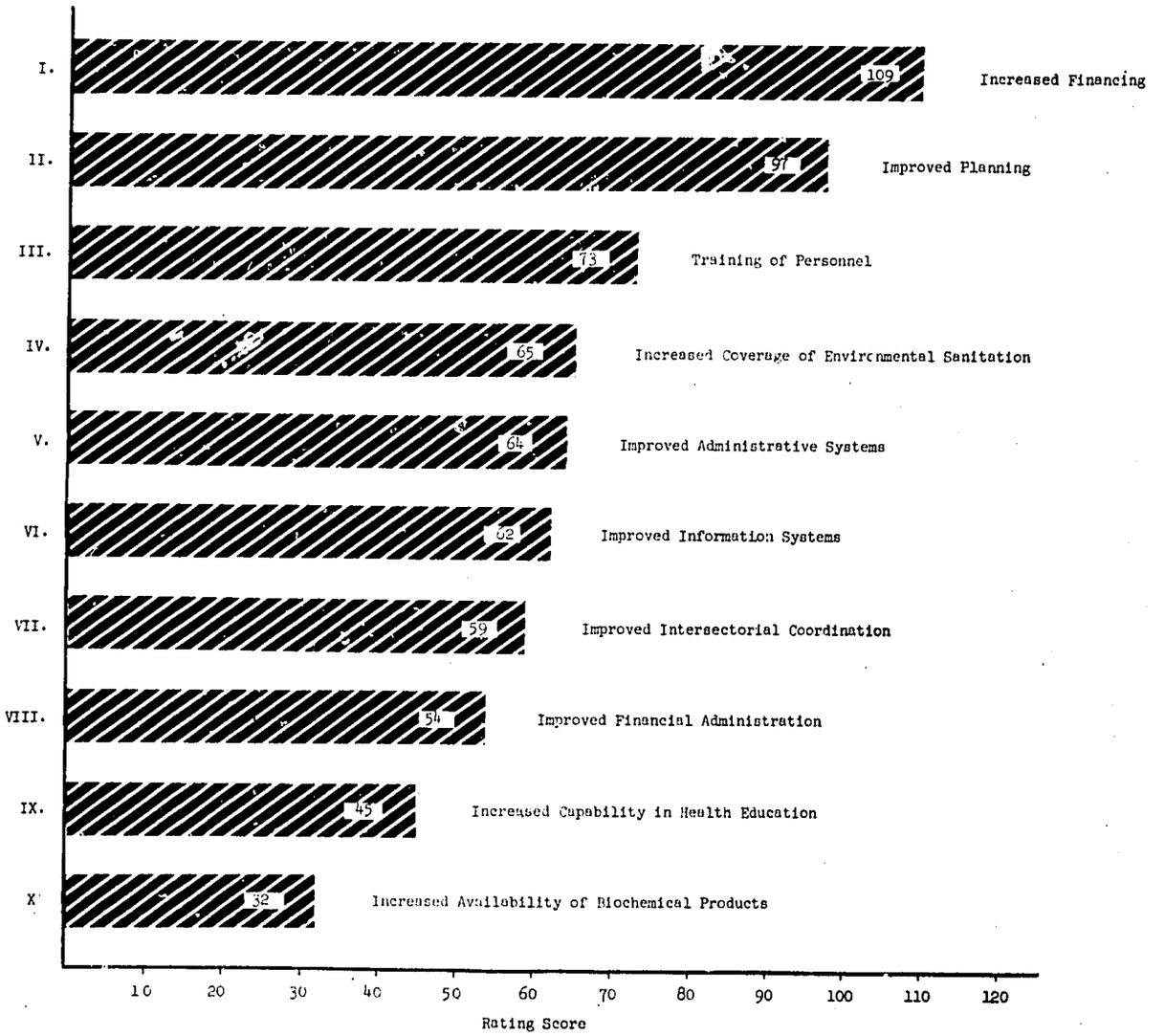
An attempt was made to quantify and rate the ten factor interventions identified by the Commission. This exercise, it was felt, was necessary in order to focus on those problems deserving most attention

Figure 8.3 - Relationship of Programatic Factors to Health Problems and Sector Goal.



Source: Comisión Interministerial para el Sector Salud, Informe Final, 1974.

Figure 8.4 - Rating of Health Sector Priorities



Source: Comisión Interministerial para el Sector Salud, Informe Final, 1974.

in light of limited financial resources. The nominal group process was employed for this purpose. (The results are shown in Figure 8.4). It was of little surprise that increased financial resources for the health sector was the first concern of the Commission members. This was closely followed by an improved comprehensive planning capability. Upgrading the competence of health personnel was the third priority. As a first attempt to quantify health priorities, it was felt that the results were highly significant although subsequent refining would be necessary. It was difficult for health professionals to try to isolate individual aspects of very complex problems. The tendancy throughout was to consider multiple factor inputs, which of course is imperative in increasing the efficiency and effectiveness of health programs.

2. The National Health Service

The major, and more innovative, recommendations of the Interministerial Commission focused on the broader issues of providing health services in Bolivia. The most significant recommendation was for the establishment of a National Health Service. The Service would become the sole provider of public sector health services in Bolivia. While many of the issues currently being discussed have a sound technical basis, experience dictates extreme caution in trying to predict what form, if any, the Service will eventually take. As tentatively conceived, however, the Service would have the following characteristics.

a. Institutional reorganization

All health programs and facilities currently serving the general public and sponsored by different government agencies would be consolidated and centralized under the Ministry of Health. These would include the IBSS, the National Social Development Council (JNDS), the Institute of Colonization, the health facilities planning unit of the Ministry of Urbanism and Housing and others. The government has, in fact, moved in this direction with the recent transfer of the IBSS back to the Ministry of Health-- an action partly based on the preliminary reports of the Interministerial Commission. Studies would be made to determine whether current non-health activities sponsored by these agencies such as death and old-age benefits and pensions, would be transferred to other, more appropriate Ministries.

Various plans for the organizational restructuring of the Service are being considered. Strong attention is being given to innovative arrangements based on a more rational and functional approach which would fully integrate both curative and preventive services as well as provide a psychological reorientation for existing personnel. A more appropriate distribution of health personnel would be facilitated by the mandatory civil service system. The integration of all health and vital statistics systems is also contemplated.

b. Regionalization of health services

The regionalization, or decentralization, of health services' administration would be another major characteristic of the National Health Service. This trend has lately achieved increasing importance among health professionals within the Ministry of Health, other service agencies and the university faculties of medicine. It was also, the central theme of the last (May 1974) congress of the Bolivian Public Health Society. Most likely the present Unidades Sanitarias (Health Units) of the Ministry of Health, which correspond in all but two cases to entire Departments, would be renamed Regional Health Services. Several more innovative plans which would relate health districts more closely to social, geographic and ecological factors, however, have also been proposed.

As contemplated, a significant amount of administrative decision-making would be transferred to the regional level; this would include executive functions of personnel hiring, budget administration and resources management. Regional planning activities would also be supported. The national level would be strengthened in the areas of global planning, the setting of norms and standards, technical assistance and the administration of certain national programs. The major barrier to the implementation of regional administration is the present lack of sufficient and adequately trained personnel.

c. Universal social security coverage

The role of the Social Security System would be greatly increased under the National Health Service, primarily for its ability to finance costly medical and hospital attention. Social security coverage would be extended eventually to all of Bolivia's inhabitants. The implementation of the Seguro Social Campesino would be an important link in this strategy for reaching the rural population. The physical location of the SSS within the National Health Service would facilitate the functional integration of curative and preventive services at the local level.

It is recognized that this integration would require significant changes within the present administrative and planning systems. The result, however, should be the more efficient utilization of health resources. Particular benefits would be derived in terms of hospital utilization, health information systems and pharmaceutical supply systems. The major problem concerns the development of precise and realistic financing mechanisms, especially for the provision of medical services to the rural population.

3. Rural health services

It was apparent to the Commission that major attention would have to be placed on increasing the coverage of health services (preventive and curative) to rural areas. The Ministry of Health's Five-Year Plan and the Government regional development strategies stressed these needs. As it now stands, over three-fourths of the population reside in rural areas, while existing health resources are heavily concentrated in urban areas.

The Commission decided to define and analyze potential rural areas and determine which of these comprised the highest priority for the implementation of comprehensive health programs. Given the personnel and financial limitations of the government, it was obvious that all of rural Bolivia could not be approached simultaneously. USAID consultants assisted the Commission in developing a methodology by which potential health regions were defined, primarily on the basis of geography, population density and accessibility. A set of criteria for comparing the relative merits of each region in terms of its potential for developing and sustaining a rural health program was also formulated.

Based on personal knowledge, available data and site visits, the Commission evaluated and selected six priority regions. (See Figure 8.5). These were the Department of Tarija, the northern provinces of the Department of Santa Cruz, the Yungas-Alto Beni area, the central Cochabamba valleys, the northern Altiplano, and northern Chuquisaca. Four of these areas concide with those selected for the SSC. Secondary areas for future consideration included northern Potosí, the Camiri-Monteagudo region, and central Beni. It was felt that these areas should be studied further in depth to determine the appropriate methodologies for implementation. One factor which gained favor was to make the areas coincide with political (at least Provincial) demarcations. While the selection of priority areas would influence the allocation of limited resources, the Commission emphasized the importance of promoting a balanced (geographical) development throughout the country.

4. Conclusions and implications

The Commission's report is scheduled to be completed by early 1975. Some sections, primarily programming and budget aspects are at present being discussed and therefore the specifics are unknown. The report will be presented as a supplement to the MOH's Five-Year Plan and will reflect the basic goals and program priorities stated therein: communicable disease control, maternal and child health, nutrition and environmental sanitation. As indicated above, the recommendations of the Interministerial Commission will primarily focus on those factors

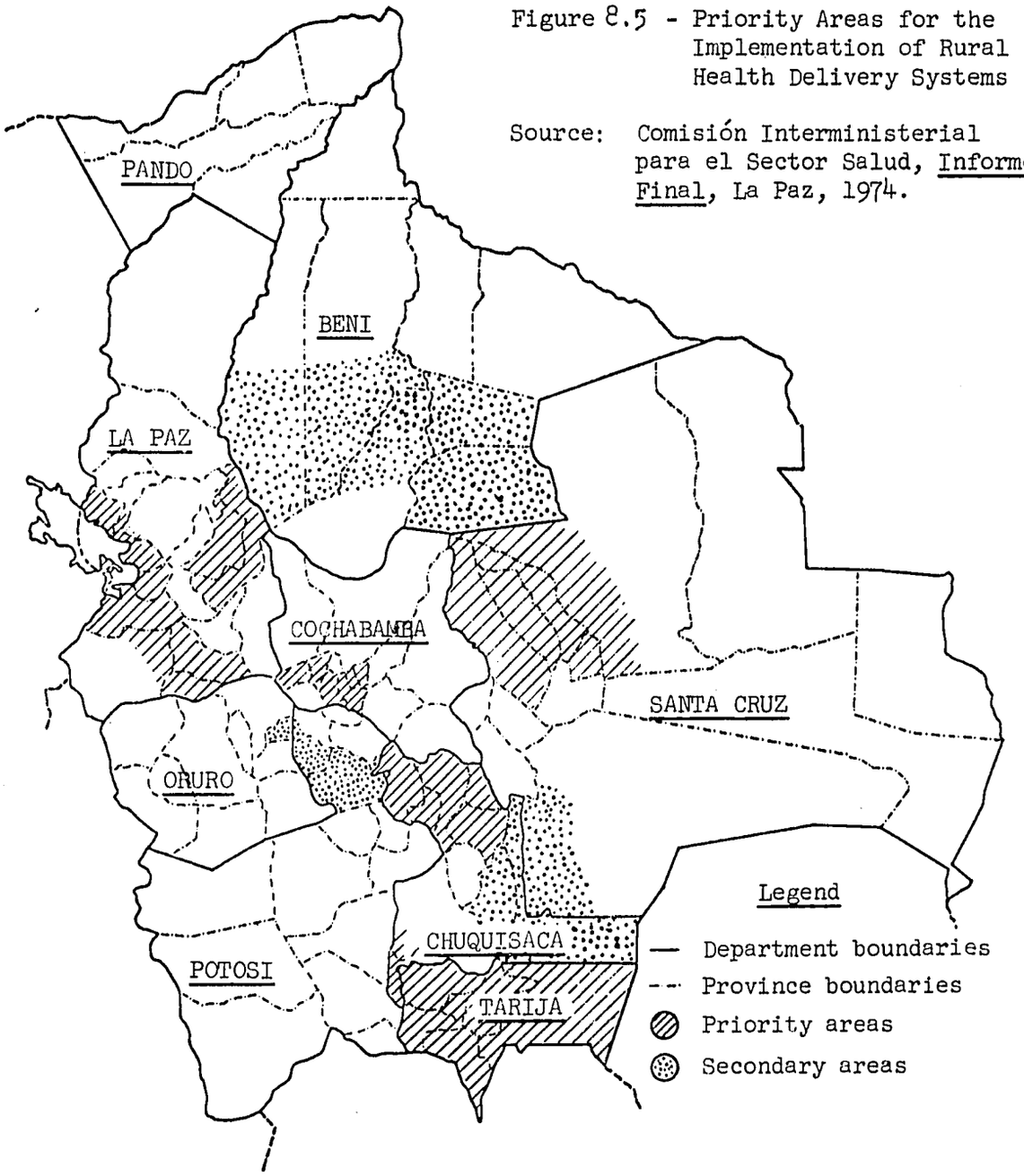


Figure 8.5 - Priority Areas for the Implementation of Rural Health Delivery Systems

Source: Comisión Interministerial para el Sector Salud, Informe Final, La Paz, 1974.

which presently constrain the effectiveness of these programs: insufficient financing, the lack of comprehensive sectorial planning and intersectorial coordination, inadequately trained personnel, etc. Priority attention will be given to the need for developing a realistic "system" which can effectively reach the majority of the rural population.

The final report is to be presented to the appropriate GOB authorities -- the Minister of Health, the Ministry of Coordination and Planning, the Ministry of Finances and, ultimately, the Presidency -- in late February or March for consideration. At the present time the GOB is formulating a new Five-Year Global Development Plan (1976-1980). The Commission believes that their report and recommendations could very well form the basis for the national health policy which is to be included in this Global Development Plan.

Footnotes

(1) Organización Panamericana de Salud, Plan Decenal de Salud para las Américas, III Reunión Especial de Ministros de Salud en las Américas, Santiago, Chile, Octubre, 1972.

(2) Ministerio de Previsión Social y Salud Pública, Plan Nacional de Salud, 1973-1978, La Paz, 1973, p.1.

(3) Ibid., pp. 2-4.

(4) USAID/Bolivia/ECOM.

(5) Consejo Nacional de Economía y Planificación, et. al., Plan Regional de Desarrollo Económico-Social Chuquisaca-Tarija: Ensayo de Planificación Regional, Imprenta Tupac Catari, Sucre, 1972, pp. 149-152.

(6) Ibid., p.296

(7) Ministerio de Coordinación y Planeamiento, CONEPLAN, "Coloquio sobre Problemas de Población: Conclusiones y Recomendaciones", La Paz, Julio 30 a Agosto 1, 1974.

(8) Taylor, B. Brooks, Consultant Report, USAID/Bolivia, 1974. Part III.

CHAPTER IX

THE ROLE OF FOREIGN ASSISTANCE IN THE HEALTH SECTOR

A. Summary

A private American organization, the Rockefeller Foundation (RF), was the first foreign agency to provide technical and financial assistance to the health sector in Bolivia. This effort began in 1932 before the existence of the Ministry of Health, which was created on 20 August 1938. The RF brought the first vistages of modern public health measures to the Bolivian population even though its original scope of activities was limited to the control of yellow fever, and later malaria, typhus, smallpox, bubonic plague and hookworm. Its participation continued through March 1953. In addition to being very effective in the eradication of yellow fever, RF also developed a cadre of highly capable and experienced epidemiologists (a brand new discipline in Bolivia at that time) who later became key figures in the malaria eradication program.

The RF span of existence was about two decades, with an appreciable over-lap in service with the official U.S. government program which started operations as a consequence of a meeting of Latin American Ministers of Foreign Relations held in Rio de Janeiro on 15 July 1942. At that time U.S. Ambassador Pierre de Boal offered the Government of Bolivia (GOB) technical assistance in health and sanitation plus US$ one million to establish and operate these programs for a two-year period. The Supreme Decree creating the Inter-American Public Health Cooperative Service in Bolivia, better known as the Servicio Cooperativo Interamericano de Salud Pública or SCISP, was signed on 2 October 1942. The first American Co-Director was General George C. Dunham, who shared his administrative responsibilities with a Bolivian counterpart. General Dunham was also the Chief of the American field party group sponsored by IIAA. Initially, the overall goal of the SCISP was to provide sanitation assistance to the rubber workers or gomeros in northeastern Bolivia, and more specifically, the intention was to attenuate and eventually eliminate the drastic negative impact which malaria had on the health of the gomeros. Concomitant objectives were to stimulate the output of a strategic material (rubber) as a contribution to the U.S. World War II effort and to establish a cooperative mechanism in the southern hemisphere for continental defense. Using hospital launches, some of which were provided by the GOB, the American health officials and their Bolivian counterparts provided free medical treatment to thousands of malaria victims along the river routes of the Beni and Pando Departments, working from temporary bases established in Magdalena, Santa Ana, Trinidad, La Esperanza, Abuná and Cobija.

Although the SCISP was preceeded in its work by the Rockefeller Foundation, it is generally recognized that the health Servicio laid the groundwork for and developed the first modern public health service in Bolivia. During its era, technical and financial assistance were provided by the SCISP for the establishment of health centers, training of personnel, communicable disease control (especially malaria), sanitary engineering programs, and industrial hygiene. The health Servicio operation was phased out in 1962, with the simultaneous phase-in of the Alliance for Progress, the predecessor agency to the modern USAID operation.

From 1962 to 1966, Mission efforts in the health sector were limited to some budget support for malaria eradication and the creation of four entities: the National Institute of Occupational Health, the National Institute of Communicable Diseases, the Planning Division of the Ministry of Health, and CORPAGUAS (water supply service). From 1966 to date, USAID has provided financial and technical support in Family Care, an umbrella-type program designed to discretely promote responsible parenthood programs as integrated into a Maternal and Child Health network and organization.

At various times during the period of 1940's to 1950's, other international donors established programs in Bolivia to provide financial and technical assistance in the health sector. Among these, and more or less in order of importance as well as magnitude of contribution are: the World Health Organization (WHO), through its operating branch the Pan-American Health Organization (PAHO) starting in 1949, and the United Nations Children Fund (UNICEF) in 1953.

The PAHO was essentially involved in communicable disease control, environmental sanitation activities, training, health administration, occupational health and radiation monitoring plus the provision of related advisory services. Many of these activities were carried out in cooperation with other members of the U.N. family of international donors including UNICEF, UNIP and UNESCO; as well as with USAID and it predecessor agencies. The UNICEF was principally involved in malaria eradication, institutional development, communicable disease control, environmental sanitation, training, nutrition, and in recent times, in the development of a regional socio-economic development plan - with some of these activities interrelated with those of PAHO.

The major private voluntary organization in Bolivia has been Catholic Relief Services (CRS) who started their operation in 1955.

Their major past activity has been in the field of nutrition, by channeling PL 480 Title II commodities to maternal, child and other institutional feeding programs through a Bolivian counterpart (Caritas). More recently, CRS has become involved in socio-economic development projects which are oriented to improving the social status of the common man in Bolivia.

Finally, some of the new-comers in the health discipline have been the United Nations Fund for Population Activities (UNFPA), the International Planned Parenthood Federation (IPPF) and Pathfinder Fund, all of whom have just recently planned or made rather limited financial assistance available for family planning activities in Bolivia. Bilateral assistance in health has been very limited, focussing on isolated projects.

Until 1973, there appears to have been little or no coordination or even dialogue among the international donors and USAID or predecessor agencies, excepting that between the Mission and CRS. As a consequence, the impact of foreign assistance may have been less than optimal, and in general the assistance has been provided on the basis of fragmentary data and has not addressed the sector problems in a comprehensive manner - a shortcoming which the Health Sector Assessment is expected to resolve.

. General Role of Foreign Assistance

Quite simply, it can be stated that foreign assistance brought public health practices to Bolivia, created the related institutional mechanisms, and developed the cadres of quite well trained health professional personnel which were an essential pre-requisite to staffing the health facilities currently operating in Bolivia. Concomitantly, there were also negative impacts. The GOB reduced its financial inputs in the health sector from an average of six percent of the GDP in pre-SCISP days to about two percent in the early sixties. The proportional contribution has barely recovered from that low to date. Modern medicine and public health practices combined with improved nutrition undoubtedly influenced the population growth, but not to the extent as witnessed on a world-wide basis in the under-developed and developing countries. Nevertheless, on balance the contribution was positive in that it established the institutional facilities and capabilities for the coming era in which the common man in Bolivia, the rural dweller or campesino would have access to preventive medicine and be given the opportunity to determine the size of his family. This was a critical step toward a better, more productive life for himself, his progeny and his country.

Interestingly enough, the need for providing technical and financial assistance in the health sector was first recognized by an American philanthropic organization (RF), with an appreciable delay before the U.S. and other governments, as well as other international donors and voluntary agencies became involved. Unfortunately, the involvement was planned piece-meal by the individual institutions for short term activities, usually oriented to the solution of a specific health problem through a technological approach and uncoordinated, by and large, with other donors. It was never based on a methodological evaluation of the inter-locking factors or possible cost-effective interventions.

This was the general role of foreign assistance until early 1973 when GOB called a meeting of international donors to stimulate the coordination of technical and financial assistance. Almost simultaneously, AID demonstrated considerable interest in and promoted the utilization of the sector assessment approach for health development, with priority attention to Bolivia, among other Latin American countries. This technique provides an in-depth evaluation of the requirements in the health sector, from the institutional, human and financial resources, and perhaps more importantly, the individual and community points of view. The resulting and hopefully realistic Bolivian health plan that will emerge should be of a design and scope that shall permit the international donors to select the facet of greatest interest to them for their financial support. Also it may provide a real possibility for a coordinated effort with a high benefit to cost ratio and hence a new, positive role for future foreign assistance to the health sector in Bolivia.

C. Predecessor U.S.G. Agencies and Present USAID Programs

1. SCISP, 1942-62

As was true in the education and agriculture sectors, the first direct, official U.S. Government assistance to Bolivia in the health sector was provided through a mechanism later denominated a "Cooperative Service" - in this case, the Interamerican Public Health Cooperative Service, or Servicio Cooperativo Interamericano de Salud Pública, better known by its Spanish acronym of SCISP. This entity was originally sponsored by and received technical assistance from the Institute of Inter-American Affairs (IIAA). SCISP operated with counterpart contributions from the Government of Bolivia. It had a basic objective of supporting the U.S. World War II effort by increasing the production of rubber (and later tin) through an improvement in the health status of the related workers.

The original agreement, signed between GOB and the IIAA, stipulated that the SCISP would operate for a period of two years, at the end of which time it was believed that an independent, viable, GOB health organization would be established. This proved to be an optimistic goal since it lasted 20 years. Fundamentally and philosophically, the primary objectives were the:

i. promotion of health; and

ii. prevention of diseases which cause human suffering and economic woes.

Its specific goals were to:

i. establish a cooperative effort for the identification and solution of public health problems in their order of importance;

ii. assist the GOB to collaborate with neighboring countries and international agencies in resolving health problems of common interest;

iii. develop demonstration public health programs;

iv. train cadres of specialized public health personnel to staff demonstration and operational programs; and

v. carry out studies to evaluate the results of the SCISP operations in order to facilitate the planning of future health programs.(1)

The activities of the SCISP between 1942 and 1955 may be categorized as a mix of project and personnel development. The major aspects were Public Health Nursing and Administration, Health Centers (construction), Health Education, Sanitary Engineering, Statistics, Industrial Hygiene, and Nutrition. Malaria Eradication did not formally begin as an independent activity until February 1956. By 1959, the Servicio mechanism had crystallized into five well defined basic divisions, namely Medical, Sanitary Engineering, Malaria Eradication, Industrial Hygiene, and Administration.

During its existence of somewhat more than 20 years, i.e., from 1942 to 1962, the SCISP expenditures amounted to the equivalent of US$6,829,960, of which 94.6 percent or US$6,457,833 was contributed by the U.S. (52.4 percent) and GOB (42.2 percent) with the remainder (5.4 percent) coming from earnings (unspecified but believed to be interest, 2.6 percent) and also unidentified third parties (2.8 percent). Annual disbursements averaged US$341,498 per year from 1942

to 1962, with a high of US$476,024 in 1957 and a low of US$5,118 in the phase-out year of 1962. The US$6,457,833 was equivalent over time to a local currency value of 28 billion pesos for which only 16.7 billion can be accounted for by existing documentation. Nevertheless, a rough breakdown, as of 30 June 1972, by official SCISP project titles is provided in Table 9.1. These figures do not include malaria eradication costs which amounted $b.50,590,550 (or approximately US$ four million) for the period of 1959-1968.

Only fragmentary data exists as to the total number of U.S. and Bolivian personnel involved in the SCISP operation. It is conservatively estimated, however, that between 125 to 150 American health specialists served two-years (or more) tours of duty in Bolivia and that a maximum of 853 Bolivians were employed by the SCISP in 1959 during its apogee. The majority of these Bolivians were involved in the malaria eradication programs.

Thumb-nail sketches of the SCISP component programs are as follows:

Medical Division

This unit was responsible for two basic operations, namely Health Centers and communicable diseases (excepting malaria) control.

The construction of health centers began in the earlier days of the SCISP. Starting in La Paz in 1943 and terminating with San Ignacio de Mojos in 1960, 15 health centers were eventually built. In addition two mobile units were made operational (one in Potosí and the other in Tarija) and a laboratory was established in Cochabamba. Although it is virtually impossible to estimate the scope of coverage provided by these health centers and even more difficult to determine a breakdown by category into curative and public health services, it is conservatively estimated that between 300,000 and 500,000 persons (or 10 to 15 percent of the total population during that era) received fairly modern medical attention from these facilities. Interestingly enough, all the health centers are still functional, with the exception of the La Paz unit which moved to a new locale, leaving the original structure to serve as the headquarters for the Ministry of Health.

The Medical Division was also responsible for the control, and in some cases the eradication, of communicable diseases. The major efforts were the following:

Table 9.1 - A Resumé of SCISP Expenditures, 1942-62

Code	Title	Date Project Started		Expenditures Pesos	Percent
	GENERAL ADMINISTRATION				
A-1	Administrative Expenses	10/29/42		3,732,214,947	
A-2	Transportation System	1/ 1/47		749,463,306	
A-3	Maintenance SCISP Buildings	1/ 1/47		40,250,653	
			Sub-total	4,521,928,904	27.1
	CONTROL OF SPECIFIC COMMUNICABLE DISEASES				
F-1	Small Pox	11/ 1/54		1,305,433,969	
F-2	Yaws	11/ 1/54		206,235,773	
F-3	Yellow Fever	11/ 1/54		52,320	
			Sub-total	1,511,722,062	9.0
	TECHNICAL SERVICES AND TRAINING				
H-1	Administrative	1/ 1/59		71,512,381	
H-2	Health Education	11/ 3/52		181,981,563	
H-3	Nursing	1/ 1/58		88,631,687	
H-4	Statistics and Epidemiology	1/ 1/58		122,769,077	
H-5	Technical Training	7/ 1/52		161,025,731	
H-6	Local Nurse Training	11/ 3/52		451,119,419	
			Sub-total	1,077,039,858	6.5
	ENVIRONMENTAL SANITATION				
K-1	Environmental Sanitation	1/30/49		2,981,143,497	
K-2	Occupational Health	1/ 1/54		388,983,558	
			Sub-total	3,370,127,055	20.2
	NATIONAL LABORATORY				
L-1	National Institute of Bacteriology			386,066,238	
M-1	Public Health Ministry			5,826,619,139	
			Sub-total	6,212,685,377	37.2
			Grand Total	16,693,503,256	100.0

Source: Touchard, G., et al., "Resumén de las Actividades Desarrolladas por el Servicio Cooperativo Inter-Americano de Salud Pública desde su Iniciación hasta su Terminación" sponsored by USAID/B, unedited and unpublished typescript, 1970.

i. by 1959, 2,606,000 individuals were vaccinated against small pox, a 77 percent coverage of the estimated population;

ii. a brief campaign against yaws, which is endemic in the Yungas (Provinces of La Paz Department), was carried out in 1958-59. This activity was relatively successful in that 170 locales, out of 319 originally infected, were freed of this disease. However, yaws remains a communicable disease problem because of a hiatus in the control process and the heavy travel on the roads leading into the Beni combined with the epidemiological similarity of the two regions;

iii. yellow fever was also brought under control, at least in the urban areas, by 1942 when the aedes egypti mosquito was eliminated - rural epidemics continued until 1950 when 1,806 cases were reported and at present only the sylvatic variety exists in Bolivia;

iv. prior to the creation of the SCISP, there were 4,623 registered cases (2,260 deaths) of bubonic plague during the period of 1921-1938 as compared to 40 outbreaks in the next 20 years involving 252 cases and 134 deaths;

v. less success was obtained with leprosy, venereal diseases, leishmaniasis, and tuberculosis;(2) and

vi. among the non-transmissible diseases, malnutrition was recognized as a problem, but of unknown dimension in 1959; whereas goitre was known to be endemic in various areas of Bolivia. (To combat this problem, two salt iodizing plants were imported by the SCISP but no data was found on their utilization or success in the reduction of this problem).

Sanitary Engineering Division

These activities began in 1947, and carried out about 50 projects in most of the Departments of Bolivia. Essentially, this Division provided the design (and, in some cases the construction) of potable water and sewage disposal systems, health centers, hospitals, and other health services related buildings, including the Ministry of Health, Nursing School and the sanitary engineering laboratory at the University of Oruro. It also provided in-service and other types of training for Ministry of Health personnel as well as technical consultations.

Division of Industrial Hygiene

This unit, which established the basis for the later creation of the USAID supported National Institute of Occupational Health (INSO), started in June 1953 as a joint SCISP/Ministry of Labor operation. Each entity contributed US$5,000 to reactivate a Ministry of Labor industrial hygiene program that had started to operate in 1946 as the result of an ILO study(3). This study recommended that the GOB invite U.S. Government "specialists in safety engineering and industrial hygiene, to advise as to safety and industrial hygiene methods in the mines" and also that the "Government of the United States invite the Bolivian Government to send suitable persons to study safety engineering and industrial hygiene at educational institutions in the United States." As a consequence of the study, the United States Public Health Service provided some sporadic technical assistance in industrial hygiene between 1946 and 1950. From 1954 to 1962, the SCISP provided all the financial support in the amount of Bolivianos 387,783,558, (which cannot be converted into dollars because of the fluctuating rate of exchange during this period).

The basic objectives of the Division were to:

i. evaluate the industrial environmental to ascertain what risks it presented to the laborers involved, especially the miners; and

ii. carry out the required atmospheric and biological analyses to identify the types and degrees of risks associated with a given industry.

In 1954, the first industrial survey was finished. It involved 528 plants employing 60,360 workers in industries, mines, manufacturing, transportation and allied services. It was found that Bolivian workers were exposed to 39 potentially toxic substances but in varying degrees of exposure. The most important problem found was that of silicosis among 60,000 miners, of which 27,000 underground laborers were exposed to serious risk. During the 11 year period of 1936-1947, the Caja Nacional de Seguridad Social (CNSS) had paid indemmization to 14,300 miners for silicosis and complications. In 1969 alone, it was estimated that 6,000 ex-miners received pensions, worth about US$ four million, with unknown hidden costs for loss of production and medical attention. Although the magnitude of the problem was established, the SCISP program was not able to mount an effective program to deal with it.

Malaria Eradication Division (SNEM)

This pioneering effort of the SCISP was undoubtedly its most successful undertaking both technically and in terms of socio-economic impact. Malaria control, through the distribution of anti-malarial drugs, started in 1943 in the Beni and Pando Departments. Chemical control by spraying od DDT officially started on a small scale in 1956. The SCISP and successor agencies (USAID) provided US$ four million toward these efforts; UNICEF[4] donated materials worth US$879,293; and advisory services from PAHO, which cannot be quantified, are believed to be about US$250,000 to US$500,000.

During the preparatory phase (lasting 15 months from April 1956 to June 1957), 92 percent of the malarious area of Bolivia, or 824,600 square kilometers of territory, were evaluated. These included the lowlands or plains of the Departments of Beni, Pando, Santa Cruz, La Paz, Tarija, Cochabamba, Potosí and Chuquisaca. The attack phase started simultaneously on a country-wide basis in September 1958. In four years 260,000 houses in two-thirds of the areas had been sprayed. As a consequence, the transmission of malaria had been interrupted in 619,540 square kilometers having 1,119,144 inhabitants. This was equivalent to having 70 percent of the Bolivian malarious areas in "consolidation" by 1962. However, due to financial problems continuous spraying was not effected and by September 1969 between 5,000 and 7,000 new cases of malaria occurred, with the area under "consolidation" reduced to 52 percent.

Still, through sustained effort the SCISP had brought malaria under relatively good control and had opened malarious areas (especially Santa Cruz) for economic development. The most important beneficiaries were the petroleum industry in the Santa Cruz area, rubber industry in the Beni and Pando areas, as well as the lumber industry in those three areas.

Administration Division

This division grew, from the embryonic SCISP counterparts in La Paz, Cochabamba, Riberalta and Guayaramerin, into six branches, employing 68 persons. These included legal, personnel, property and supplies, accounting, printing, and maintenance. Its objectives were to:

i. establish administrative standards and procedures to better service the SCISP operation;

ii. advise (and cooperate with) the Ministry of Health in the implementation of new efficient administrative procedures, and

iii. train personnel.

As mentioned by Touchard et al., the SCISP was the first public health organization in Bolivia which established a technically sound administrative system and developed a personnel administration plan which contributed to the establishment of the Bolivian civil service plan. Furthermore, it made an important contribution to the development of hitherto unavailable public health specialists. From its inception to 1964, SCISP (through the IIAA mechanism), provided 203 scholarships. A partial breakdown of the disciplines involved is as follows:

Public Health Physicians	77
Sanitary Engineers	31
Public Health Nurses	25
Laboratory Technicians	11
Social Workers	7
Industrial Engineers	7

The 1967 Evaluation Report, previously cited, concluded among other things that the SCISP had: i) "introduced public health to Bolivia"; ii) "prevented a significant volume of infectious diseases"; iii) "reduced maternal and child mortality"; and iv) "prepared technicians." This Report also recognized the lack of definite plans and constant reorientation of the program which occurred with each change of Minister and/or Chief of the IIAA Mission. In retrospect, what it overlooked was the super-structure effect whereby the SCISP was a second, and at times more important, Ministry of Health. It also made no mention of the relative freedom the SCISP enjoyed from political interference in its program planning or selection of personnel. As a consequence, SCISP obtained the very best professional potential available. Many of them have served as advisors for other international donors, notably WHO, and an appreciable number are still employed by the present Ministry of Social Welfare and Public Health - an enviable record of continuous professional services to the Bolivian population.

2. <u>The Alliance for Progress and USAID, 1962 to 197</u>

The major efforts of the Alliance in the health sector were in occupational health (1962-67) and family care (1968 to date).

A financially minor but somewhat strategically important technical input was also made in communicable diseases and health planning, both in 1965-66. Potable water projects were considered to be engineering projects and were sponsored by the Engineering Transportation Division.

a. Occupational health

In view of the socio-economic problems generated by silicosis in Bolivian mines, it is not surprising that occupational health was the major Bolivian "health" project financed by the Alliance in the early sixties. In late 1962, Supreme Decree 06278 was promulgated creating the Bolivian Institute of Occupational Health (INSO). During the five year span of 1962-66 approximately US$ one million (60 percent USAID) was invested in the creation and operation of INSO. This included the construction of a building, which was especially designed for an occupational health program, the purchase of the latest engineering, chemical, and medical equipment, including a US$30,000 self-contained mobile X-ray unit complete with generator and dark room facilities.

The innovative objectives of the program were to scientifically:

i. identify the type and quantity of toxic air-borne constituents, especially free silica, in the workers ambient atmosphere, to permit the implementation of corrective ventilation measures and thereby reduce or eliminate the generation of more silicotics; and

ii. evaluate differentially the additional physiological stress caused by silicosis, when imposed on a high altitude miner, to assure the correct diagnoses of disability and fair adjudication of related pensions.

Although these objectives were met completely, it did not prove feasible, for political and financial reasons, to implement fully the further objectives, which were to:

iii. improve the ventilation in the major tin mines of Bolivia and concomitantly reduce the prevalence of silicosis from its world record high of 20 percent; and

iv. recover a significant number of incorrectly adjudicated disability pensions.

Insofar as the installation of ventilation measures were concerned, only one mine (Potosí) did so using natural procedures. The high cost of mechanical ventilation systems, coupled with decreasing mineral prices and low value attached to the human element mitigated against the more widespread utilization of ventilation systems as well as the "unhealthy working conditions bonus" to be paid to the miners. In any case, natural ventilation techniques, which were relatively inexpensive and production-related, were never used to maximum advantage.

Some of the major achievements of the occupational health project included:

i. a massive four-year tuberculosis case-finding and treatment campaign carried out by INSO among 24,955 miners and a total of 120,420 persons, including the families of the workers;(5) (As a result of the INSO tuberculosis control campaign, the prevalence of tuberculosis in the Potosi mining community was reduced from 3.67 percent in 1964 to 0.68 percent in 1969 with a similar reduction from 1.38 percent to 0.54 percent in Oruro.)(6)

ii. the design and production by INSO, as well as the utilization by the miners, of an "industrial health card" which helped in the relocation of potential and actual silicotics to avoid exacerbation of their disability and facilitate the future tabulation of disability due to silicosis for compensation and pre-employment purposes; and

iii. the demonstrated feasibility and desirability of using Food-for-Peace to complement other health activities, experimental, prototype medical equipment in field projects, and the team approach in attacking and solving a public health problem.

In summary, USAID created a health institution which, although at present is not highly productive for political reasons, is still viable - as judged by the fact that PAHO assigned an advisor and some financial support to it in 1974 - and permits the provision of real, but limited, public health services to Bolivia's miners. They comprise a small select group representing about four percent of the industrial population but an element that still produces more than half of Bolivia's foreing exchange.

b. Family care

This program began in FY-1967 and provided financial and technical assistance to three major organizations: the National Family Center (better known by its Spanish acronym, CENAFA), the University Departments of Preventive Medicine, and the Ministry of Health's Maternal and Child Health Division. The three-pronged approach to catalizing the creation of a Bolivian family planning program was based on a strategy(7) which is synthesized in the diagram illustrated in Figure 9.1. CENAFA, as the umbrella organization is basically responsible for conducting research in family planning and population dynamics for dissemination to GOB decision-makers. Training of medical personnel in family planning aspects was the responsibility of the three major Bolivian universities. Originally, family planning clinics were to have been incorporated into the University Health Center mechanism (as implemented in Colombia), but it was later decided that it would be better to utilize the Maternal and Child Health clinics of the Ministry of Health.

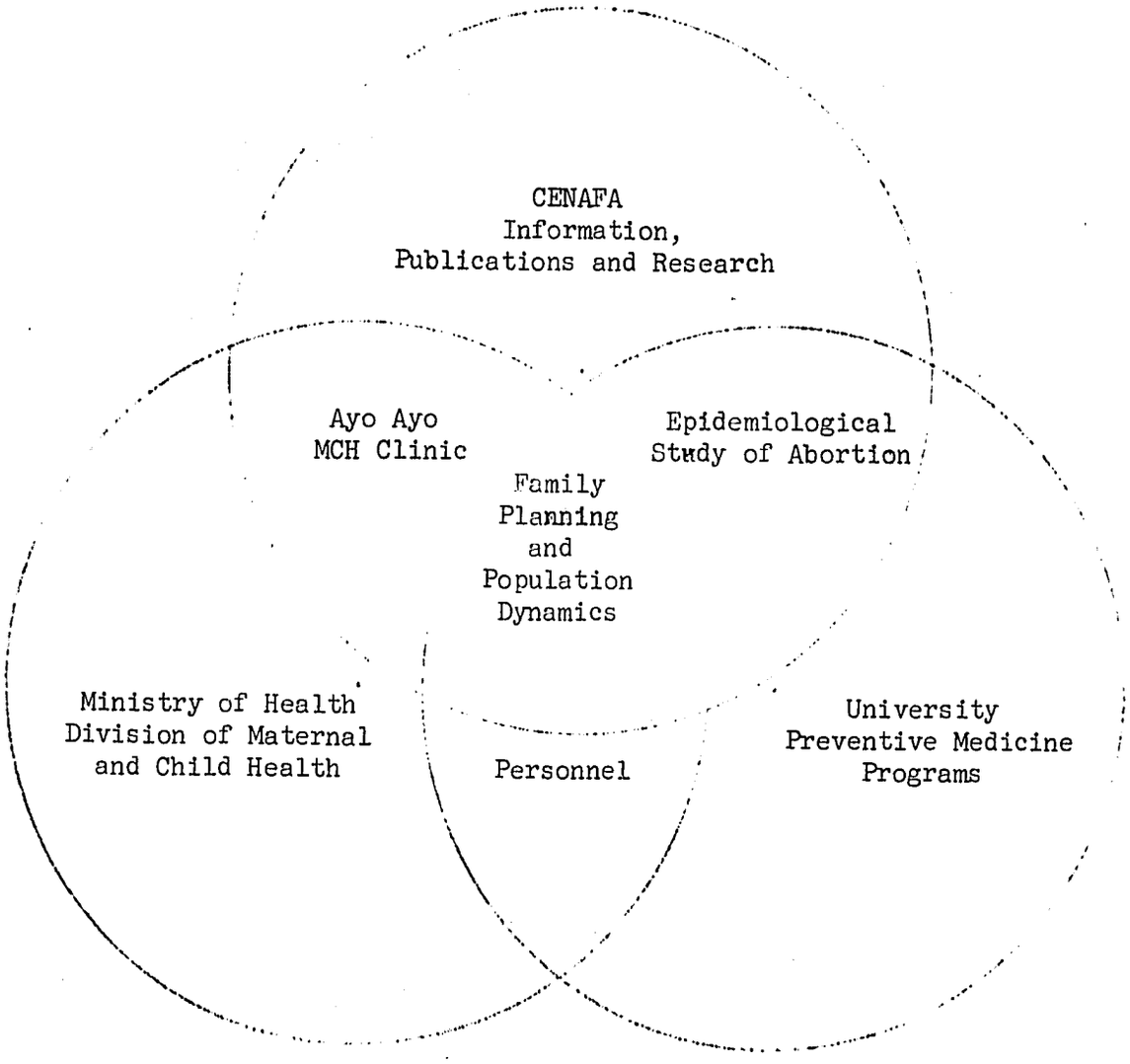
During the period of June 1968 to June 1974, AID has provided US$1,367,000 for the Family Care Project.(8) An approximate breakdown of that amount by activities is shown in Table 9.2. Beginning in FY-1972, the GOB has provided periodically increasing financial support for: CENAFA (ten percent in FY-1972 with 100 percent planned for FY-1976); the Maternal and Child Health Department (25 percent in FY-1973 and terminating with 100 percent in FY-1976); and Ayo Ayo (50 percent in FY-1975 rising to 100 percent in FY-1977). To date the amount contributed by the GOB has been approximately US$117,000.

A description of the operation of each of the major components of this project and their accomplishments follow:

CENAFA

The Bolivian Center for Population Studies (Centro Boliviano de Estudios de Población), or CEP, may be considered as the embryonic structure from which CENAFA emerged because it carried out the pioneering population studies in Bolivia. During 1967, USAID entered into a contract with CEP to carry-out population studies under the supervision of CELADE, the Centro Latinoamericano de Demografía. On 27 November 1967, Resolution No. 524 was promulgated by the Ministry of Health creating an inter-ministerial committee charged with the responsibilities of studying current problems related to family planning and proposing the appropriate course of action which should be taken by the GOB. In 1968, the inter-ministerial committee recommended the creation of a National Family Center, and Supreme Decree 08562 of 20 November 1968 implemented the suggestion by creating CENAFA.

Figure 9.1 - The Three-Prong Approach to Responsible Parenthood in Bolivia.



Source: Landry, Amedee S., USAID/Bolivia, Humanitarian Assistance Division, unpublished, 1974.

Table 9.2 - Summary of USAID Family Care Project Expenditures by Activity, 1968-1974

Activity	Expenditure (Thousands US$)
Continuing activities	1,215
CENAFA	447
MOH/Maternal and Child Health Division	285
University Preventive Medicine Departments	335
Ayo Ayo MCH Center	108
Bolivian Association for Sex Education (ABES)	40
One time grants	152
Lake Titicaca Hospital Barge	42
National Census (equipment, etc.)	50
University Health Center construction	60
Total	1,367

Source: "Economic Assistance to Bolivia, 1942-1974", U.S.G. Briefing Paper, USAID, May 1974, p.10.

CENAFA is a semi-autonomous institution operating under the tuition of the Ministry of Health and has been assigned the responsibility of providing "advisory services and coordinate programs related to the family and Bolivian population matters by promoting and carrying out research, as well as education and training."(9) Originally, CENAFA was governed by a Board of Directors, with an Executive Director who was administratively responsible for the operation. However, in 1970 the new Ley de Bases permitted the Minister of Health an opportunity to dissolve the Board (unofficially) and name the Executive Director. A year later USAID was able to obtain a commitment from the GOB to make proportionally increasing contributions to this project, with a total phase-out of USAID funding in FY-1976.

Structurally, CENAFA is composed of a Library, Administrative Section and a Division of Population Studies (DPS). The latter is the backbone of the institution. More specifically, the Chief Demographer (who is the Director of the DPS), has been the intellectual author and promotor of the following accomplishments:

i. carrying out research on "Induced Abortion and Contraceptive Practices in La Paz, Cochabamba and Santa Cruz", abortion in mining areas, and mortality tables for Cochabamba and Santa Cruz; (These data resulted in a basic publication entitled "Condicionamientos Socio-Culturales de la Fecundidad en Bolivia.")

ii. implementing, between 1971 and 1973, seven courses and two seminars on sex education in various cities of Bolivia, plus one on Sex Education, Family Planning and Demography; (These activities had a direct impact on the creation in 1973 of the Bolivian Association of Sex Educators, of which the CENAFA Demographer was one of the founders.)

iii. holding, during 1972 and 1973, three seminars on Population and Labor for union leaders and others; (As a consequence, 23 of the major Bolivian labor leaders signed a declaration endorsing the need for family planning in Bolivia and calling upon COB to provide such services.)

iv. stimulating the founding, in 1973, of the Bolivian Association of Communicators in Demography (ABCODE);

v. promoting the creation of the Ayo Ayo Maternal and Child Health Center, a joint GOB/USAID financed project with a significant community contribution; and

vi. catalyzing the formation of a private family planning organization, PROFAM, which has obtained Pathfinder Fund and IPPF support to start clinical operations.

In conclusion, through the seminar activities and the dissemination of information to GOB decision-makers, the medical profession and the population in general, CENAFA brought about a turn-around situation. In 1970 family planning when mentioned in the press was always from a pro-natalist point of view. Today, press treatment is more balanced. Sex education seminars have been held on various occasions and the subject is about to be taught in Bolivian schools.

Maternal and Child Health

At the request of GOB, the USAID reprogrammed $b. 868,341 (about US$72,000) to finance the creation of the Ministry of Health's Department of Family Protection (DFP). The objectives, as stated in ProAg 10053, were to "create action areas for the implementation of Maternal and Child Health standards and research which will assist the DFP to develop a policy on family well-being and planning." This established family planning within the maternal and child health context. The above mentioned funds were used for budget support and to provide some equipment.

The central office of the program whose name was changed to the Division of Maternal and Child Health (MCH) in 1972, was established in La Paz. Four regional offices were subsequently created in La Paz, Cochabamba, Santa Cruz, and Chuquisaca. Although development was rather slow, the status of MCH programs and requirements was evaluated in each area, with the preparation of documents to serve as the basis for future activities. More importantly, and due mainly to the dynamic approach of the MCH Director, GOB officials at the highest level were convinced of the need for responsible parenthood programs.

As a consequence, the President and Cabinet approved and submitted to the United Nations Fund for Population Activities (UNFPA) a request for a US$1.3 million extended maternal and child health project, with a heavy family planning component.

The Ministry of Health gave its full support to the creation of PROFAM, a private family planning organization and reached a written agreement with this group for setting up a family planning clinic. It also submitted an official request to USAID for a one-time financial contribution to start five family planning clinics under MCH. The total investment by USAID in this project was US$285,000.

University Preventive Medicine Programs

Three major Bolivian universities, namely San Andrés, San Simón and San Francisco Xavier, have modified their curriculae to include demography and family planning related courses. Further, for the first time students prepared theses based on actual field work and saw the negative impact of large families on the socio-economic development of the country as well as the families.

Based on prior agreements, the University of San Andrés (UMSA) and USAID have contributed the equivalent of US$40,000 and US$60,000 respectively towards the construction of a University Health Center on grounds donated by the Ministry of Health. This will permit UMSA to strengthen its undergraduate medical training program - including

family planning techniques. During the life of the project, US$335,000 has been provided by USAID of which approximately US$40,000 was for equipment with the remainder for budget support, in conjunction with the universities involved.

Ayo Ayo Maternal and Child Health Care

As an outcome of promotional activities by CENAFA, the Ministry of Health received a written request from Ayo Ayo officials for the provision of family planning services through the mechanism of an MCH center in that locale. Since this was a rural campesino area of about 35,000 inhabitants and readily accessible from La Paz, the USAID concurred on the establishment of the project on a "pilot-demonstration" basis for providing maternal child health attention, including family planning services, to the inhabitants of Ayo Ayo and surrounding areas. A breakdown of the planned use of the US$108,000 provided by USAID consisted of US$62,000 for the construction of the building, US$15,500 for equipment and US$32,500 for a mobile unit.

Inauguration of the center is expected to occur in February 1975. The mobile unit associated with the clinic already is operational. It has a built-in generator, refrigerator and sink with sources of hot and cold water, complete audio-visual equipment and a dental chair which converts into a gynecological examination table with supporting laboratory and medical equipment to provide family planning services. It is the first unit of this kind in Bolivia. By travelling from its base to neighboring open-air markets, held periodically in the area, the mobile unit should service a large group of otherwise unreachable campesinos with preventive and curative medical procedures.

The Bolivian Sex Education Association (ABES)

The Mission has made a one-time grant of US$40,000 to catalyze the creation of ABES, which will receive in-kind and other support from the Ministries of Education and Health. The objective is to train normal and secondary school teachers in sex education pedagogical procedures and to collaborate with Ministry of Health professionals in the dissemination of sex education information at the family planning clinics. The major portion of the funding (US$35,000) is in local currency for budget support. The remainder (US$5,000) is for office equipment. Financial support for operations in the future is to be provided by other international donors.

c. Institute of Communicable Diseases and the National Health Planning Office

As a continuation of its institutional development program, the USAID (in 1965) promoted the creation of, and provided some financial support for, the Instituto Nacional de Enfermedades Transmisibles (INET) and the Oficina Nacional de Planificación de Salud. Both still operate as viable entities fully financed by the GOB.

Unfortunately, INET has never attained the originally stipulated goal, namely assuming full operational responsibility for all communicable disease control programs in Bolivia, including malaria eradication (SNEM), and to improve efficiency and reduce administrative expenditures. Further, it did not make effective use of a mobile X-ray unit donated by USAID for tuberculosis control purposes and its communicable disease operational methodology is of questionable efficiency.

Insofar as the Health Planning Office is concerned, the output has been quite satisfactory, including several Five Year Health Plans and up-dating modifications. However, limited travel funds have contributed to a somewhat theoretical approach to the design of these plans. In any case, this office has played an important role in the development of the Bolivian facet of the Health Sector Assessment.

d. Potable water projects, USAID/ETI-CORPACUAS

As a spin-off from SCISP-initiated activities, the USAID office of Community Potable Water Supplies (ETI PWO) was created on 1 April 1963. The objective was to provide potable water to Bolivian communities with populations between 500 and 10,000 inhabitants. To initiate the operation, USAID provided 100 percent of the budget support for 1963 with a phase-in of GOB funding in increments of 20 percent starting in 1964 and complete phase-out of USAID funding scheduled for 1968. These financial inputs were supplemented by obtaining a 50 percent contribution from each community where the ETI/PWO projects were implemented. Table 9.3 gives a breakdown on activities from 1963 through 1967.

In addition to the these projects, ETI/PWO also carried out 43 water supply feasibility studies and perforated 150 wells in different areas of Bolivia. On 8 March 1967, by Supreme Decree No. 07942, the Corporación de Agua Potable y Alcantarillado (CORPACUAS) was created. This institution, a decentralized agency, was assigned the responsibility for planning, implementing and/or monitoring the development of all Bolivian potable water and sewerage disposal systems.

Table 9.3 - Summary of USAID/ETD-PWO Projects, 1963 - 1967

Locale	Department	Population Served	Cost
Rurrenabaque	Beni	1,500	140,601.31
San Ignacio de Moxos	"	2,200	99,272.70
Sorata	La Paz	2,800	188,831.71
Caranavi	"	2,500	154,447.41
Achacachi	"	4,000	441,610.38
Chorobamba	"	500	88.814.58
Villa Rosa	"	250	27,958.00
Batallón Ingenieros	"	500	29,604.60
Peñas	"	492	137,422.60
San José de Alcoche	"	542	105,069.89
Collana	"	1,500	184,628.07
Caquiaviri	"	981	170,700.50
Viacha	"	7,579	934,322.37
Villa Irpavi	"	2,500	449,613.25
Coripata	"	2,615	512,586.46
El Paso	Cochabamba	907	129,313.83
Pasorapa	"	990	71,226.10
Aiquile	"	4,542	451,107.96
Tarata	"	3,090	477,032.96
Mizque	"	1,562	270,314.30
Sacaba	"	3,826	391,129.23
Pojo	"	1,100	216,725.97
Portachuelo	Santa Cruz	4,363	882,624.80
Warnes	"	2,500	89,349.90
Los Negros	"	60	99,828.19
Montero	"	9,000	1,131,707.01
Buena Vista	"	2,375	514,394.05
Roboré	"	3,980	506,838.43
Gen. Saavedra	"	1,164	357,511.86
Cotoca	"	1,335	405,531.16
Vallegrande	"	6,113	528,008.85
Samaipata	"	1,987	580,807.34
San Ignacio de Velasco	"	3,473	755,832.62
Cobija	Pando	1,957	591,026.00
Padcaya	Tarija	1,100	79,355.00
Tarija	"	16,604	1,094,617.15
San Lorenzo	"	1,053	142,521.50
Vilacaya	Potosí	305	76,391.50
Tupiza	"	9,062	762,064.24
Atocha	"	3,695	465,450.30
Vitichi	"	1,430	165,185.27
Total (42)		118,032	$b.14,895,879.35

Source: CORPAGUAS, personal communication, November 1974.

In summary, the bilateral cooperative approach in the public health sector produced some major accomplishments. These include: institutional building, the development of well trained cadres of health professionals, the construction of modern facilities, and perhaps more importantly, the introduction of public health measures which made a significant contribution to the development of economically valuable territory in Bolivia. Concomitantly, some important lessons should be learned from the U.S. bilateral public health experience in Bolivia which deserve replication in future programming. Undoubtedly, the most noteworthy is the "team approach", supported by modern technology and involving GOB financial participation in ever increasing proportions with a finite USG phase-out date. Secondly, by establishing technical rapport with high, as well as middle level, GOB officials and appropriate "listening" procedures to stimulate and assure counterpart leaderships in joint undertakings, political constraints can be significantly reduced and project continuity can be expected in spite of volatile political changes.

F. International Donors, 1949 to date

Unfortunately, the local offices of the international agencies have a rather limited "memory" of their activities even in the fairly recent past. Nevertheless, the limited quantitative data available, which in most cases is more detailed than for past USAID activities, is presented as background for evaluating future programming.

1. Pan American Health Organization (PAHO)

Early historical descriptive data on the impact of this organization's programme, i.e., from 1931 to 1964, are virtually non-existant in Bolivia. However, a resumé of PAHO activities, which has been compiled from Annual Reports obtained from the PAHO Country Representative, is shown in Table 9.4. This summary gives the scope, probable duration, and objectives of PAHO programs and identifies the collaborating U.N. or other agencies. Table 9.5 shows some of the outputs in terms of communicable disease control.

As may be noted from the latter tabulation, reporting on accomplishments decreased notably each year from 1965 to 1972, the latest report available. This is understandable for smallpox, since eradication was virtually obtained in 1968. Tuberculosis control appears to have suffered a procedural change; only BCG vaccinations were administered on a rather continuous basis. Insofar as malaria eradication is concerned, the reports keep mentioning the lack of adequate funding and the data reflect the results. These include decreasing spraying activities and ever increasing positivity from 0.4 percent in 1965 to an alarming 5.1 percent in 1971, followed by an improvement in 1972 and a relapse in 1973 with the positivity reaching 5.4 percent and 7,000-cases of malaria reported.

Table 9.4 - Descriptive Resume of PAHO Program Activities, 1965-72

Code - Category	Probably Duration	Objectives	Collaborating Agencies
BOLIVIA-0100, Epidemiology	1968	The determination of prevalency and characteristics of transmissible diseases in the country and control of same.	PAHO/RB, UNDP (also AMRO-0104)
BOLIVIA-0200 (-4), Malaria Eradication	1957-1976	To eradicate malaria.[a]	PAHO/SMF, AID, UNICEF PAHO/RB
BOLIVIA-0201, Collective Drug Treatment for Malaria Eradication	1970-1971	Elimination of malaria focus in the Southern part of Bolivia by treatment with drugs.	PAHO/SMF
BOLIVIA-0300, (-8), Smallpox Eradication	1962-1976	To continue the smallpox vaccination campaign until 80% of the population has been protected; and to initiate the maintenance program.	WHO/RB, UNDP
BOLIVIA-0400 (-7), Tuberculosis Control	1969 1976	To organize the available resources for the application of tuberculosis control procedures, with a view to obtaining a better utilization of, and a maximum yield from, those resources; and to incorporate tuberculosis control work into the regular activities of the local health services.	UNICEF, PAHO/RB
BOLIVIA-0500, Leprosy Control	1969-1976	Leprosy control within the country	(Previously reported as AMRO-0504
BOLIVIA-0701, Zoonoses Control (Control of Rabies and Other Zoonoses)[b]	1971-1976	To assist the Government through the Ministries of Social Security, Health and Agriculture, to take measures designed to effectively control the principal zoonoses. (Implementation of demonstration programs on control of rabies and other zoonoses of public health importance, with a view to training personnel and developing work methods best suited to the country's requirements).	WHO/RB
BOLIVIA-0901, Typhus Control	1967-1974	To carry out a serologic survey of a representative sample of the rural population in the affected areas, with a view to ascertain the proportion of the population with serological conversion and determining the true importance of louse-borne typhus in relation to the other febrile infections with which it is undoubtedly found in combination; to conduct trial vaccination, in a populations group in order to determine the resultant symptomatology, as well as the possibility of employing the vaccine in conjunction with other vaccines; to evaluate the first phase of the program, on the basis of the results of the serologic survey and the trial vaccination, so that the second phase of controlling the disease in the affected areas can be started, by means of vaccination and application of insecticides.	WHO/RB
BOLIVIA-2100, Environmental Sanitation (Engineering and Environmental Sciences)	1969-1976	To improve urban and rural environmental sanitation; to extend substantially the coverage of the population served with potable water, sewerage, adequate waste disposal, and garbage removal; to improve food production and distribution; to regulate the sector coordinate its component institutions, and improve their technico-administrative capacity; and to train personnel in this sector. (Planning and implementation of general programs for environmental improvement as well as training for Sanitation Supervisors and other auxiliary personnel).	PAHO/RB
BOLIVIA-2200 (-15), Water Supplies	1960-1976	To prepare a national public water supply program, and to design and build municipal and rural water supply systems.	PAHO/CWSF
BOLIVIA 2201, Water and Sewer Administration (Water Supply and Sewerage Services Administration [La Paz])	1971-1974	To provide consultant services to the Corporación de Aguas Potables y Alcantarillado on administrative reform and institution building in order to foster the best utilization of resources and better service for the people of Bolivia. (Strengthening of administrative systems and practices of the National Water and Sewerage Corporation (CORPAGUAS) to enable it to provide service to the greatest possible number of persons under technical and financial conditions suited to the country's possibilities and needs).	

Table 9.4 - Continued (Page 2)

Code - Category	Probably Duration	Objective	Collaborating Agencies
BOLIVIA-2202, Water and Sewer Administration; Cochabamba (Water and Sewerage Services Administration [Cochabamba])	1971-1974	To provide consultant services and operational manuals to the Municipal Water Supply and sewerage Service of Cochabamba, Bolivia, on the analysis of present standards, systems, and practices, and recommendations for improvement. (To strengthen the infrastructure and development of a program of administrative reform at the Municipal Water, Sewerage, and Drainage Service [SAMAPA]	PAHO/CWSF (IDB)
BOLIVIA-2203, Water and Sewer Administration; Potosi (Water and Sewerage Services Administration: [Potosi]).	1972-1974	To provide technical support in 1974 in preparing a broad program to identify various activities and determine those responsible for their implementation in order to carry out the recommendations made. (Improvement of the internal organization and administrative systems of the Potosi Sanitation Works Administration [AAPOS])	PAHO/CWSF
BOLIVIA-3100 (-10), Health Services (National Health Services)	1955-1976	(To develop health services at both the ministerial and the local levels; and to train technical and auxiliary personnel in accordance with the needs of the country).	PAHO/RB, AID, UNICEF, UNDP
BOLIVIA-3101 (-11), National Plan for Rural Development	1953-1970	To promote the economic and social development and the health of the indigenous populations of the Andean highlands so as to facilitate their integration into the national community.	WHO/UNDP, FAO, ILO, UN, UNESCO, UNICEF
BOLIVIA-3102 (-16) Fellowships	1976	To train health personnel for the improvement and expansion of health services in Bolivia.	WHO/RB
BOLIVIA-3103, Training for Rural Development	1965-1967	To train auxilliary health personnel in order to develop activities that will raise the individual, family and community living in the rural environment.	UNICEF
BOLIVIA-3104, Health Services, (Cochabamba and Tarija), (National Health Services [Cochabamba and Tarija Pilot Plans])	1966[c] 1973	To improve the sanitary conditions of the environment in both urban and rural populations in order to provide integrated health services for the socio economic development of Bolivia. (To develop the health services of Cochabamba and Tarija, as the initial phase in the application of the national health plan).	WHO/UNDP, UNICEF, PAHO/RB
BOLIVIA-3200, Nursing Services	1972-1976	In 1975 country projects have been established to reflect the services to be provided by zone consultants, as well as participation by each country in zone seminars and courses.	
BOLIVIA-3300, Laboratory Services	1972-1976	To cooperate with the Government in organizing a national system of laboratories and in the activities required to improve the efficiency and promote the utilization of that service.	
BOLIVIA-3301, Production of Immunoglobulin Against Hemorrhagic Fever	1973 1974	To collect by the plasmapheresis technique at least 200 units of plasma from 15 donors immune to Bolivian hemorrhagic fever, i.e., residents of Beni who have adequate levels of anti-bodies against the Machupo virus. From this, gammaglobulin will be prepared for use in emergencies and the protection obtained will be evaluated in the laboratory and the field.	
BOLIVIA-3400, Health Education	1972-	To improve the National Health Education Department and its services.	WHO/OF (UNFPA)
BOLIVIA-3500, Health Statistics	1968-	Development of a national statistics system to supply the basic data needed for planning and programming in the health sector.	PAHO/RB, WHO/UNDP
BOLIVIA-3600, Administrative Methods and practices in Public Health	1968-	The improvement of the organization and administration of health services.	PAHO/RB
BOLIVIA-4200, Nutrition	1971-1976	Reduction of infant malnutrition and the incidence of endemic goiter in the country.	PAHO/RB
BOLIVIA-4201, Endemic Goiter Control Program in Bolivia (Applied Nutrition)	(1964-1968) (1973-1974)	Four towns in Bolivia in the area of high endemicity of goiter are being studied to determine the incidence of goiter in a sample population, and to administer iodized oil orally in two towns and intramuscularly in the other two towns, as a demonstration of its efficacy and as an interim measure until iodized salt is readily available. (To develop an integrated applied nutrition program in selected areas of the country, including training of professional and auxiliary personnel, laboratory studies and investigation of the magnitude of protein-calory malnutrition).	PAHO: Foundation for International Child Health, Inc. FAO/UNICEF

Table 9.4 - Continued (Page 3)

Code - Category	Probably Duration	Objective	Collaborating Agencies
BOLIVIA-4202 (-17), Effects of Iodine Deficiency and its Correction on Mental Performance of Children (Nutrition)	1965-1967	In some parts of Bolivia endemic goiter reaches rates as high as 60%. Cretinism and other harmful effects on mental development are also frequent. It has not yet been possible to set up a national salt iodization program to control this problem. The purpose of this project is to evaluate the effects of iodine deficiency on the mental development of schoolage children and the effects of administering iodized oil as a preventive measure in areas with a high incidence of goiter until such time as salt iodization can be implemented nationwide. (To establish a nutrition pilot study to establish standards, structure, activities, and evaluation of criteria to be implemented on a national scale).	PAHO: William Waterman Fund
BOLIVIA-4500 (4507), Radiation Protection	1967-1974	To establish a radiation protection service, and to train professional and technical personnel in this field and in the use of radioisotopes for clinical medicine.	PAHO/RB
BOLIVIA-4600, Occupation Health Program, (Occupational Health)	1971-1976	The purpose of this project is to collaborate with the Government of Bolivia in protecting the mining population from the risk of contracting diseases such as silicosis which are rather widely disseminated in the mines, the principal industry of the country, and to establish programs for the protection of workers in all other industries. (Reduction of the frequency and seriousness of work accidents in mining and other industries).	WHO/UNDP
BOLIVIA-4800, Medical Care Service	1972-1976	Improvement in the administration of the country's medical care service. Restructuring of the principal hospitals.	WHO/RB
BOLIVIA-4900, (4100)[d], Maternal Child Health	1972 1976	To reduce the mortality and morbidity rates for mothers and children, to extend coverage of institutional child-birth, supervised childbirth at home, prenatal care and care of newborn, provision of educational and clinical services to promote responsible parenthood, control of cervico-uterine cancer, and the timely detection and referral of cases presenting a high degree of obstetric and prenatal risks. An additional purpose is to establish centers of training and service in Maternal and Child health and family planning, which will develop the training of personnel for extension of services and for conducting operational research.	UNFPA
BOLIVIA-6000, Textbooks for Medical Students	1967-	To raise the level of medical education in supplying students with textbooks; to develop a system for cooperation with the medical schools in the selection of textbooks of highest scientific and pedagogical quality; and to set up a revolving fund system to ensure the continuity of the program.	
BOLIVIA-6200, Medical Education	1968-	The development of programs at the three faculties of medicine in Bolivia, adjusted to health needs of the country, and the incorporation of concepts on social and preventive medicine to the curriculum.	PAHO/OB
BOLIVIA-6300, Nursing Education (23 Nov.-4 Dec., 1970)	1970	To provide an opportunity for teaching nurses and to the chiefs of nursing services for up-dating and expanding their knowledge of nursing education.	PAHO/OB
BOLIVIA-6400, Sanitary Engineering Education	1964-1973	To improve the teaching of sanitary engineering in the universities of the country in order to increase the number of sanitary engineers and raise the level of their education.	PAHO/RB
BOLIVIA-6500, Veterinary Medicine	1967-	To develop the teaching of veterinary preventive medicine and public health.	
BOLIVIA-6600, Dental Education	1968-1972	The reorganization of the curriculum of the Odontology Faculty at "Universidad Mayor de San Andrés", including the teaching of social and preventive odontology.	PAHO/OB

[a] Consolidation phase was expected to have been completed by 1970.
[b] Parenthesis identify former category of project and original description of objectives.
[c] Under project Bolivia 3100.
[d] Previous year number.

Source: Compiled from Pan American Organization, Annual Reports of the Director, 1965, pp. 147-149; 1967, pp. 158-161; 1968, pp. 177-181; 1969, pp. 162-166; 1970, pp. 190-193; 1971, pp. 1972, pp. 166-170

Table 9.5 - Summary of PAHO Communicable Disease Control Interventions, 1965-72[a]

Control Program	Program/Calendar Year 1965	1967	1968	1969	1970	1971	1972
Malaria Eradication (OPD/SMP/AID/UNICEF)							
Houses sprayed	31,013	54,987	53,214	13,105[d]	63,673	--	--
Blood smears taken	187,395	214,537	187,635	167,287	--	--	--
(positivity)	(0.4%)	(0.7%)	(1.1%)	(2.4%)	--	(5.1%)	(3.2%)
Smallpox Eradication (OMS/UN-TA)							
Vaccinations							
Primary	410,839	935,040	191,503	295,355	--	638,576	--
Revaccination	115,917	319,642	43,535	--	--	--	--
Vaccination, total[b]	1,365,751[c]	615,398	147,968	--	--	--	--
		3,435,791[c]	--	--	--	--	--
Tuberculosis Control (UNICEF)							
Tuberculosis test administered	9,889	--	--	349,565	--	--	--
BCG vaccination given	3,199	--	349,565	349,565	--	190,649[e]	157,691[f]
X-ray films taken	7,735	--	--	--	--	--	--

[a]No report available for 1966.
[b]Since inception of program in 1962.
[c]By vaccinating 200,000 persons in 1967, an 82% coverage had been expected.
[d]55% of number programmed.
[e]43% of target.
[f]36.3% of target.

Source: Compiled from Pan American Health Organization, Annual Reports of the Director, 1965, pp. 147-149; 1967, pp. 158-161; 1968, pp. 177-181; 1969, pp. 162-166; 1970, pp. 190-193, 1971, pp. 191-195; 1972, pp. 166-170.

The above descriptive material is complemented by Picardi's[10] paper which gives some background information on PAHO and, more importantly, attempts an evaluation of the influence that PAHO programs had on domestic public health services. This paper also gave computer readout information on the GOB annual expenditures for the health sector in 1931 pesos, and the PAHO yearly expenditures in 1966 dollars. These data were compiled and are given in Table 9.6. From the latter it may be seen that the GOB input was negligable from 1931 to 1934, rose to a peak in 1942, declined to a low in 1956, rose again to an all time high in 1967, and dropped to a somewhat lower level in 1968 to remain constant until 1971. Concomitantly, the PAHO contribution rose rather steadily from 1949 to 1963 where it reached a plateau, and then moved up slightly to a maximum in 1970. The combined effect, which unfortunately does not take U.S. inputs into consideration, is better understood and more easily interpreted by presenting the data on a cumulative per capita basis, even though relatively accurate population data are not available beyond 1950. Nevertheless, Picardi used such an approach. Figure 9.2, constructed from his graphs (5 and 6) shows an interesting and rather significant phenomenon. As the cumulative PAHO contribution per capita began to have an impact, i.e., in 1951, the counterpart GOB financial effort reached a plateau and in effect stagnated for the next twenty years.

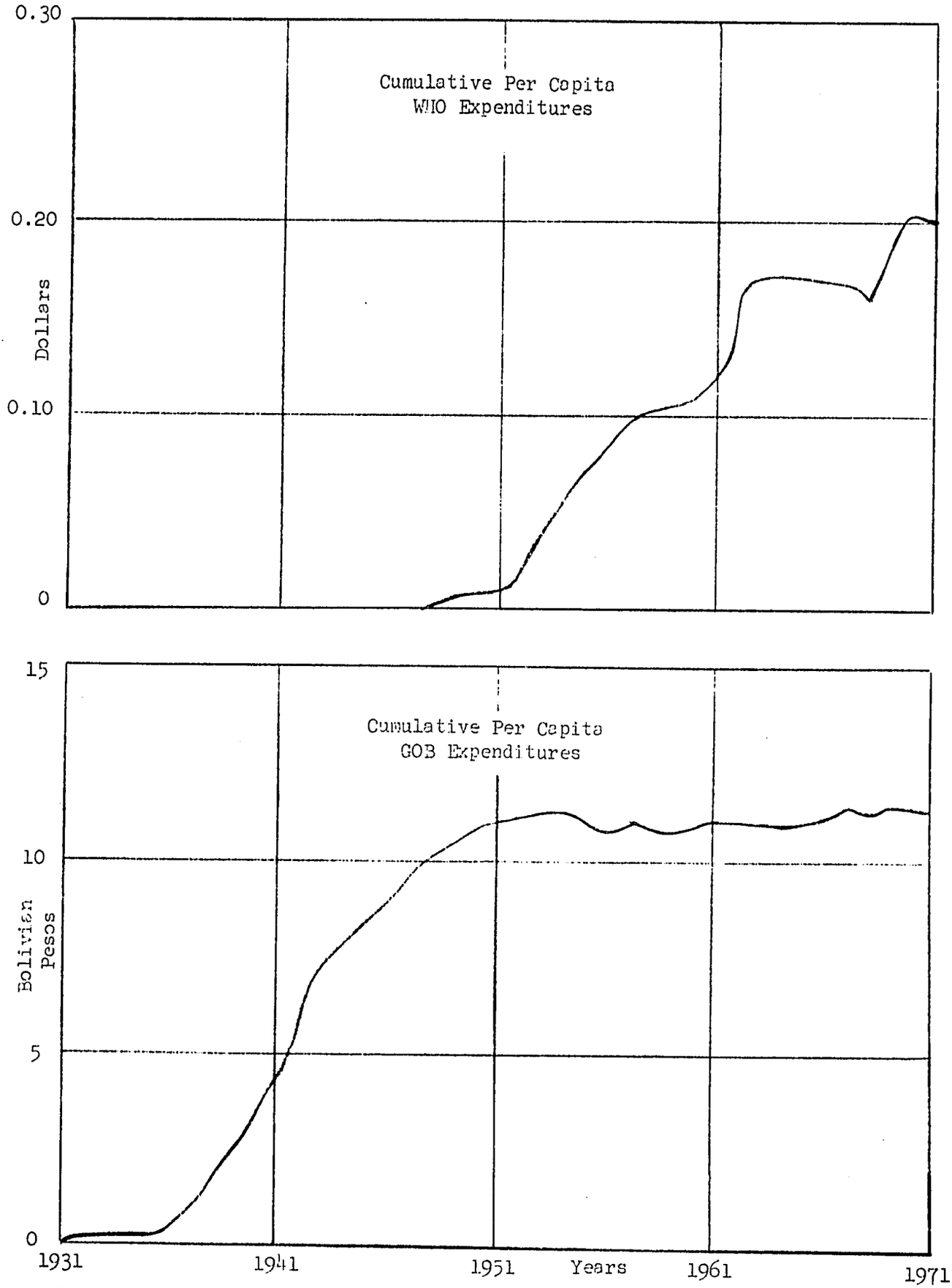
Picardi noted that there had been a "dramatic increase of average lifetimes since 1930," from approximately 20 years in 1934 to 50 years in 1971, which may be attributed to two influences alone, that of the GOB and PAHO. According to the author, "World Health Organization projects commenced in Bolivia in 1949 with a typhus control program and have since included maternal health care services, malaria eradication, tuberculosis control, nutrition education, and milk supplements for infants and primary school education. Beginning in 1964, a sanitary engineering training program was initiated and in the early 1960's construction was started on a number of urban sewerage systems and urban and rural water supply systems." In order to evaluate the impact of the above mentioned PAHO/GOB health programs, Picardi regressed his average lifetime curve as a linear function of international agency and local government per capita expenditures, and found that "each of the independent parameters is correlated fairly well with the average lifetime." Finally, he stated that "many of the countries with high average lifetimes and low health expenditure rates have received high infusions of World Health Organization health services which, as shown in the above analysis, are extremely effective in small amounts in raising the average lifetime."

Table 9.6 - A Comparison of PAHO and GOB Expenditures in the Bolivian Health Sector, 1931 - 1971 (in thousands of monetary units)

Calendar Year	GOB 1931 Pesos	PAHO 1966 Dollars	Calendar Year	GOB 1931 Pesos	PAHO 1966 Dollars
1931	190	-	1952	2,900	90.34
1932	80	-	1953	2,960	90.34
1933	120	-	1954	2,770	94.98
1934	70	-	1955	2,050	94.98
1935	70	-	1956	2,400	94.98
1936	820	-	1957	1,860	94.98
1937	2,410	-	1958	2,600	94.98
1938	2,760	-	1959	2,950	92.72
1939	2,760	-	1960	3,640	139.35
1940	3,300	-	1961	3,350	251.75
1941	3,910	-	1962	3,530	210.36
1942	4,700	-	1963	3,460	168.55
1943	3,430	-	1964	3,760	168.55
1944	2,960	-	1965	3,640	168.55
1945	3,000	-	1966	4,860	153.25
1946	3,200	-	1967	5,100	125.82
1947	2,800	-	1968	3,500	301.10
1948	3,060	-	1969	4,240	301.10
1949	3,200	10.56	1970	4,500	180.60
1950	3,170	18.82	1971	4,500	180.60
1951	2,900	18.82			

Source: Picardi, A.C., "A Two Sector Population Growth Model for Bolivia", MIT, Cambridge, Mass., 1972, p.55.

Figure 9.2 - A Comparison of Cumulative per Capita Expenditures by WHO (PAHO) and GOB, 1931 - 1971



Source: Landry, A.S., USAID/Bolivia, Humanitarian Assistance Division, based on data published by A.C. Picardi, "A Two Sector Population Growth Model for Bolivia" MIT, Cambridge, Mass., 1972, pp. 10-15

Hence it seems reasonable to conclude that PAHO's role in providing health services to Bolivia was reasonably effective, even if undifferentiated from other significant health sector inputs from UNICEF, CRS and USAID predecessor agencies. No doubt, these other organizations made contributions to increasing the average life span. Insofar as future PAHO activities are concerned, these are stated in Table 9.7, which is self-explanatory. Details of individual programs were given previously in Table 9.4, with the exception of several programs for which no descriptive information was available.

Until the very recently, USAID had seen no evidence that PAHO was planning its future health interventions by using an integrated and comprehensive health planning technique. However, perhaps as a consequence of a concerted USAID effort to establish and maintain close liaison with international donors (with special emphasis to discussing and reviewing Health Sector Assessment material), it now appears that PAHO has developed a planning strategy. This is discussed in more detail in Chapter X, but in broad terms it includes what PAHO categorically calls protection of health, promotion of health and the development of educational institutions. The coverage is wide in scope but with rather limited financial inputs for given individual projects. The largest of these is in Family Health and Population Dynamics for which US$123,375 has been budgeted for CY-1975. Consequently, the technical support and administrative modernization impact may be somewhat diluted. Nevertheless, the PAHO effort should favorably complement rather than compete with USAID's health sector activities.

More concretely, PAHO has recently defined four basic programmatic areas of concentration from which specific projects are determined. As may be seen in Figure 9.3 these are environmental improvement, communicable disease control, health services and human resources development - all of which are represented as interlocking interventions. However, the supporting descriptive material seems to be project oriented with a technological solution rather than mutually supportive approach. Given the relatively long lead time required for PAHO to plan and implement its future programming and their commitment to the long term support of on-going activities (67 percent of the projects in Table 9.4 have received PAHO support for five years or more and 21 percent are at least ten years old), it seems unlikely that any substantial change in the program's profile shall occur in the near future. However, very recent reorganizational moves in the Ministry of Health might conceivably change the picture to a degree which is unpredictable at this time.

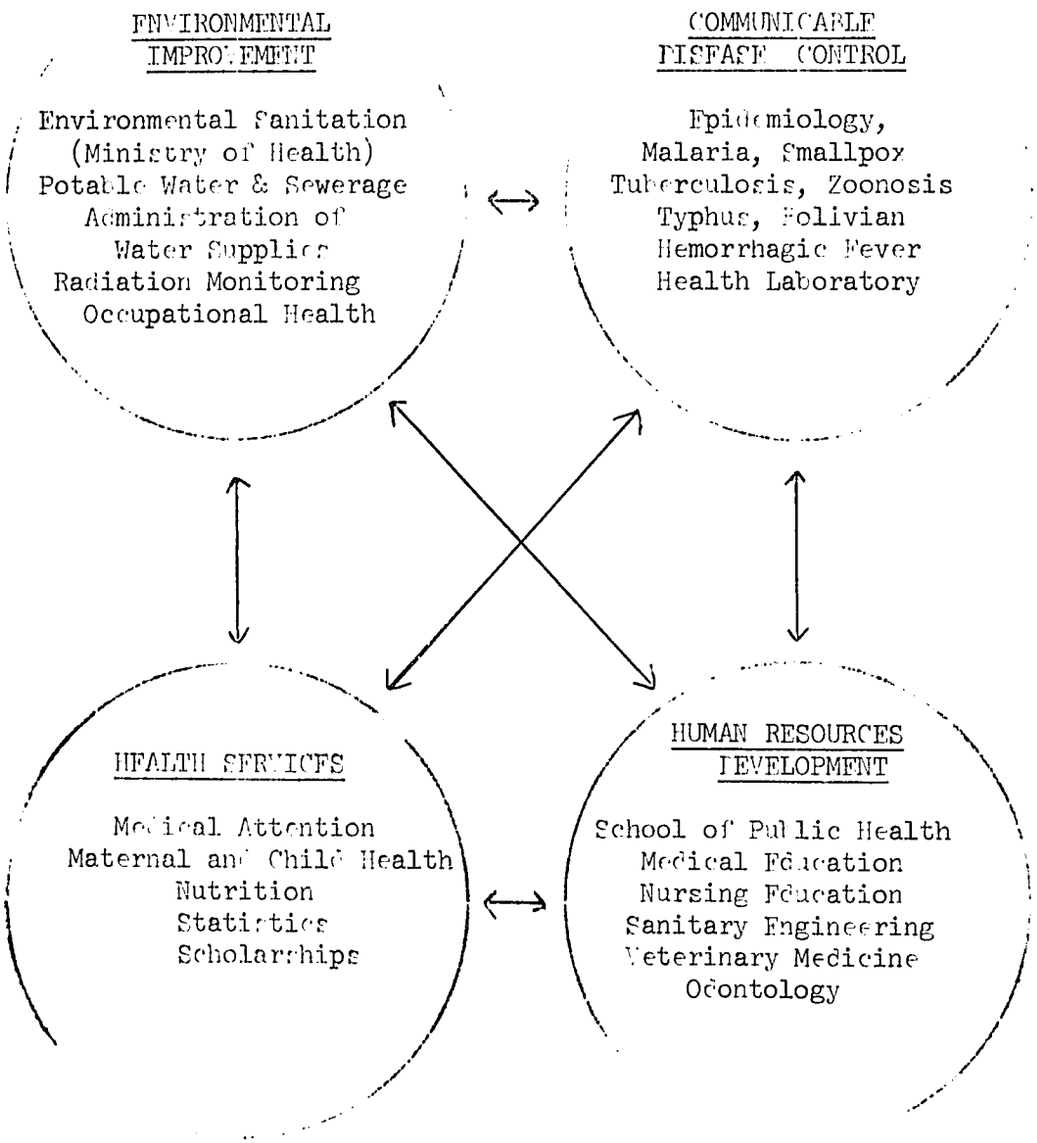
Table 9.7 - PAHO Proposed Program and Budget Estimates for 1973-76

Category	Calendar Year 1973	1974	1975	1976
I. Protection of Health	$ 341,042	$ 328,041	$ 294,012	$ 346,167
A. Communicable Diseases	209,493	177,027	165,795	204,011
0100 General	49,139	39,865	31,740	43,820
0200 Malaria	73,090	58,529	60,657	64,263
0300 Smallpox	6,265	7,481	6,758	7,102
0400 Tuberculosis	20,522	16.173	13,209	22,470
0500 Leprosy	4,937	7,188	4,471	5,510
0600 Venereal Diseases*	-	320	176	1,554
0700 Zoonoses	42,711	43,311	43,901	52,854
0900 Other	12,536	2,880	3,431	4,458
1000 Parasitic Diseases*	293	1,280	1,452	1,980
B. Environmental Health	131,549	151,014	128,217	142,156
2100 General	84,814	72,496	71.983	82,842
2200 Water Supplies	44,955	75,827	53,184	56,097
2300 Aedes Aegypti Eradication*	383	638	646	691
2400 Housing*	925	1,133	1,431	1,504
2500 Air Pollution*	472	920	973	1,022
II. Promotion of Health	446,793	462,950	558,647	582,331
A. General Services	254,212	193,267	199,365	217,219
3100 General Public Health	116,090	95,240	96,637	107,485
3200 Nursing	38,737	44,084	44,902	48,442
3300 Laboratory	22,973	13,174	20,463	22,854
3400 Health Education	872	1,271	1,159	1,417
3500 Statistics	42,997	9,880	10,064	11,351
3600 Administrative Methods	12,968	15,638	14,862	15,638
3700 Health Planning*	19,575	13,980	11,278	10,032
B. Specific Programs	192,581	269,683	359,282	365,112
4200 Nutrition	127,179	106,501	100,331	107,732
4300 Mental Health*	-	-	4,408	7,208
4400 Dental Health	4,994	4,688	3,940	5,675
4500 Radiation and Isotopes	1,918	1,740	3,685	2,317
4600 Occupational Health	5,549	34,503	61,510	52,374
4700 Food and Drug*	2,707	4,962	6,232	7,283
4800 Medical Care	27,702	45,989	52,877	52,964
4900 Family Health and Pop. Dynamics	20,092	68,582	123,375	126,439
5000 Rehabilitation*	2,161	1,768	1,848	2,002
5100 Cancer and other Chronic Diseases*	279	950	1,076	1,118
III. Development of Educational Institutions	83,873	96,811	97,624	120,872
6100 Public Health*	4,646	3,796	3,702	4,271
6200 Medicine	52,525	44,600	44,188	49,608
6300 Nursing	5,339	14,111	12,036	23,169
6400 Environmental Sciences	13,057	17,083	18,007	19,748
6500 Veterinary Medicine	4,801	7,754	7,438	9,418
6600 Dentistry	1,500	4,079	4,372	5,425
6700 Biostatistics*	2,005	5,388	7,881	9,233
Grand Total	$ 871,708	$ 887,802	$ 950,283	$1,049,370

* No descriptive data given in reference, which is latest information available. For other projects, see Table 9.4

Source: PAHO Official Document #129, June 1974, p. 421

Figure 9.3 - PAHO Programmatic Areas of Concentration, 1974 and beyond.



Source: Aguilar, Oswaldo, WHO/PAHO Representative to Bolivia, based on a seminar given at the Institute of Occupational Health, La Paz, October, 1974.

2. United Nations Children Fund (UNICEF)

According to a UNICEF descriptive paper[11] (from which a part of this section has been extracted), this institution began its programs in Bolivia in 1949 by extending the work of the Rockefeller Foundation in the eradication of malaria and other vertical-type communicable disease control programs, including tuberculosis, typhus and tetanus. Later, the Fund became involved in institutional development and certain aspects of nutrition. A breakdown of UNICEF activities and related expenditures from 1949 to 1966 is summarized in Table 9.8.

Table 9.8 - Summary of UNICEF Expenditures by Program, 1949-1966

Program	Amount (US$)
Malaria Eradication	879,293
Communicable Diseases Control (Typhoid, TB)	121,177
Institutional Development Public Health Infrastructure	282,846
Environmental Sanitation	195,194
Nutrition	
Infant (provision of milk)	47,235
Applied	72,588
Equipment/materials (PIL Plant)	182,718
Transportation	231,559
Total	2,012,610

Source: "Asistencia del UNICEF al Sector Salud en Bolivia," UNICEF, Lima, March 1973, p.5.

Starting in 1967, and at the average rate of approximately US$100,000 per year, the Fund provided cooperation to the GOB in the implementation of the First Health Plan of Bolivia.

The principal objective of the plan was to raise the health status of the Bolivian population through: i) the improvement of the basic rural health services, ii) environmental sanitation activities, iii) training of personnel, iv) health education, v) the promotion and formation of Mothers' Clubs and vi) vaccination campaigns. From 1967 to 1973 inclusively, UNICEF invested approximately US$ two million. It continued to support the development of the Health Plan and certain communicable disease control programs by providing DDT, laboratory materials for hospitals, health centers, medical and sanitary posts, laboratories, nurseries and Mothers'Clubs, as well as radio equipment, vehicles and drilling equipment for environmental sanitation projects (including latrines and wells).

Up to 1971, the above services were provided in the Departments of Beni, Cochabamba, Chuquisaca, Pando, Potosí, Santa Cruz and Tarija with an extension in 1972-73 to Oruro and La Paz. The total number of facilities equipped is given in Table 9.9. Insofar as training activities are concerned, the Fund supported the School of Public Health and equipped in-service training centers in eight of Bolivia's Departments (all but Pando). The SPH in La Paz programmed and executed courses for professional, technical and auxiliary personnel of the Ministry of Health. The number of health workers benefiting from these activities are also found in Table 9.9.

Table 9.9 - Results of UNICEF Support for Training and Provision of Equipment, 1967-1973

Training		Equipment	
Discipline	Number	Facility	Number
Public health nurses	20	Health centers	78
Nursing instructors	20	Medical posts	86
Auxiliary nurses	310	Sanitary posts	348
Sanitary technicians	155	Training centers	8
Statisticians	92	Mothers' clubs	67
Health planners	28	Dental clinics	67

Source: "Acción del UNICEF en Bolivia," UNICEF, unpublished document, 1974.

In support of the GOB Environmental Sanitation program, UNICEF has financed some training and the purchase of supporting equipment. The latter included well drilling equipment, reinforcing steel, cement, pumps and accessories for latrines and wells, tools for the related workshops and a water analysis laboratory. As a

consequence, UNICEF estimated that by 1973 water and sanitary facilities had been provided to 190,000 persons by drilling 774 wells and constructing 11,888 latrines. This exceeded their original projections. UNICEF has also provided appreciable transportation support to the Ministry of Health programs. As shown in Table 9.10, it has donated 179 vehicles and 152 other transportation equipment items in addition to a Central Automotive Workshop (Cochabamba) and four satellite units, complete with tools and machinery.

Table 9.10 - A Resumé of Transportation Equipment Donated by UNICEF to the Ministry of Health by Program Category, 1950-71

Program	Vehicles	Outboard Motors	Boats	Motor-cycles	Total
Malaria	104	56	15	30	205
Health Services	42	3	3	45	93
Sanitation	12	-	-	-	12
Communicable Disease Control					
Tuberculosis	7	-	-	-	7
Typhus	12	-	-	-	12
Nutrition	2	-	-	-	2
Total	179	59	18	75	331

Source: "Annual Report", UNICEF, Lima Area Office, 1971, p.51.

In nutrition, the Fund was involved in two basic areas: the provision of protein-rich foods followed by equipment for the PIL milk plant in Cochabamba and the development of a multisector applied nutrition program.(12) The latter was carried out in coordination with the Secretariat of the National Economic and Planning Council (CONEPLAN, which has become a section of the recently created Ministry of Coordination), and in cooperation with PAHO, FAO, UNESCO, and CEPAL/ILPES. To complement this effort and help resolve the endemic goitre problem, UNICEF provided funds for a feasibility study on the iodization of salt.

Insofar as the nutrition project is concerned, only the "Diagnostic" or evaluation has been terminated and published(13) in two volumes. However, the U.N. report indicated that GOB actions in this discipline have been very limited because of the lack of a nutritional policy and even more importantly that of the qualified

personnel required to take a concerted and broad scope action. Nevertheless, the GOB is carrying out a survey covering the anthropometric and biochemical aspects of nutrition, in coordination with UNICEF and PAHO.

According to the same U.N. publication(14) this organization had been involved in assistance designed to extend and improve health and education services in Bolivia until 1970. However, in 1971 the goals and scope of the UNICEF operation were changed radically. The new orientation and emphasis were towards social development as related to health, education and nutrition. The strategy stipulated closer cooperation with other donors and identified CONEPLAN as the new Bolivian counterpart agency. The UNICEF objectives were:

i. to promote social development by innovative techniques which could have a multiplier effect in solving "bottleneck" social problems; and

ii. to support integrated regional development including social development projects.

Consequently, for the period of 1974-77, UNICEF plans an investment of US$514,000 (see Table 9.11). A total of US$432,000 is to be provided to support the implementation of the National Health Plan. These funds are designated for:

i. the purchase of equipment and materials for rural health facilities throughout Bolivia, including 28 medical posts, 126 sanitary posts, 12 mothers' clubs, 40 basic laboratories and 1 reference laboratory;

ii. the preparation of health personnel, including 38 health educators, 150 home economists, 90 auxiliary nurses, 180 vaccinators, 25 physicians in public health and 90 environmental sanitation technicians and inspectors;

iii. the publication of three manuals on public health;

iv. the installation of 246 wells, 9 water systems, 300 septic tanks and 4,800 latrines, which will provide potable water to 34,400 persons and excretion disposal for 47,400 individuals; and

v. field work, including an anthropometric, clinical and nutritional survey, treatment of 8,000 persons for goitre and the installation of an iodizing plant in Uyuni.

Table 9.11 - A Resumé of Proposed UNICEF Assistance to Bolivia, 1974-1977, (in US. dollars)

Activity	1974	1975	1976	1977	Total
Social Planning					
Training	6,900	14,500	7,000	4,000	32,400
Research	13,100	27,500	10,000	2,000	52,600
Seminar, (family, children and youth)	--	10,000	10,000	5,000	25,000
Advisory Services	--	--	7,000	--	7,000
Local Support for Programming	--	5,000	5,000	--	10,000
Subtotal	20,000	57,000	39,000	11,000	127,000
National Health Plan					
Equipment and Materials: Maternal & Child Health & Environ. Sanitation	35,000	124,000	122,000	9,900	290,900
Transportation	7,000	30,000	37,400	6,800	81,200
Training	--	24,000	24,600	11,300	59,900
Subtotal	42,000	178,000	184,000	28,000	432,000
Social Development Project (Integrated Services)					
Equipment and Materials: Health & Environmental Sanitation	127,200	132,800	17,400	15,700	293,100
Agriculture	23,400	53,500	43,000	27,400	147,300
Improvement of Housing	3,600	8,900	8,900	--	21,000
Education	9,000	20,000	20,000	11,400	60,400
Manpower Development	--	22,200	22,200	8,800	53,200
Administrative Costs	12,200	1,800	1,800	1,200	17,000
Transportation	34,900	42,100	16,000	17,200	110,200
Training	30,500	39,200	33,700	8,100	111,500
Administrative Costs	28,200	47,500	44,000	21,200	140,900
Subtotal	269,000	368,000	207,000	111,000	955,000
Total:	331,000	603,000	430,000	150,000	1,514,000

Source: Naciones Unidas, Consejo Económico y Social, E/ICEF/P/L. 1602, 29 marzo 1974, p. 26.

It is anticipated that national sources will provide counterpart funds in the amount of US$2,128,812 to reach the goals which are outlined in Chapter VIII, (Table 8.1). The program shall be implemented under the supervision of the Dirección Nacional de Salud by the Regional Health Offices with the active participation of community organizations. Special effort is to be given to the integration of vertical programs such as the Malaria Eradication Service (SNEM).

UNICEF has allocated US$127,000 for the improvement of CONEPLAN's social planning activities. This amount covers a three year period, during which time UNICEF will reimburse the GOB for local training costs, support related research, a national seminar and short term advisory services for the development of a social planning methodology. Emphasis shall be given to family, infancy and youth aspects. CONEPLAN's contribution shall be in the amount of US$150,000 and the International Development Bank (IDB) will provide advisory services valued at US$472,150. The ultimate objective is to develop the Bolivian infrastructure required for institutional and personnel development. These are believed to be pre-requisites to the effective programming, coordinating, executing and evaluating of social projects.

The Fund shall also provide US$955,000* in support of the regional social development project in the Departments of Chuquisaca and Tarija. This project will cost US$2,649,663 of which US$1,694,463 or 64 percent is to be provided by the GOB and local contributors (communities, US$367,760 and committees US$590,150) with 36 percent, or US$955,000, from UNICEF. The scope and objectives are multi-disciplinary, including sub-projects in public health, agriculture, education, housing and recreation, manpower development and others. The program objectives, a summary of activities and specific objectives for the health sector are given in Chapter VIII, (Tables 8.7 and 8.8). The projects will be administered jointly by the Regional Health Offices and the Development Committees of each Department. This is a new approach which decentralizes the planning and execution of regional projects, with advisory services to be provided by a Regional Planning Office, and coordinated by a Regional Coordination Council.

---

* This figure is US$113,283 lower than that given in the previous chapter (Table 8.9). Upon review by the UNICEF Executive Directorate, several items in the proposed budget were reduced: the Chuquisaca porcine project (US$32,795) and transportation costs (US$80,488).

Finally, UNICEF has assisted the MOH/Division of Environmental Sanitation to develop a National Rural Potable Water Plan. The execution of this plan, during the period of 1975-1977, will provide benefits to 64 communities with a population of 87,741 inhabitants, at a cost of US$1,943,978. Of this amount, the GOB will contribute US$505,434 or 26 percent, with US$388,796 or 20 percent to come from the communities and the balance of 54 percent or US$1,040,748 expected to be provided by the Government of Canada. These funds will be channeled through UNICEF, and for this reason they are not included in the UNICEF budget. The money will be used for equipment, materials and related transportation costs in selected Departments other than Chuquisaca and Tarija.

3. UNFPA, IPPF and Pathfinder Fund

These international donors have just recently (1974) become involved in providing somewhat limited financial and technical support for family planning operations in Bolivia. UNFPA seems to have the greatest potential for future assistance, but to date only about US$43,000 has been positively allocated to Bolivia for the development of a more comprehensive family planning program. IPPF (International Planned Parenthood Federation) and Pathfinder Fund have provided some family planning commodities to PROFAM in an amount estimated at US$20,000. Prospects for future assistance depend on GOB and PROFAM capability for starting and operating more clinics.

E. Private Voluntary Agencies

1. Catholic Relief Services

Using Title II commodities provided by USAID and its predecessor agencies, and working through its counterpart organization (Caritas Boliviana), Catholic Relief Services (CRS) started its Food for Peace (FFP) program in 1955 and Food for Work (FFW) component in 1965. During FYs 1969-73 inclusively, CRS had distributed 53,445,897 pounds of food valued at US$8,512,000. A breakdown is given in Table 9.12. The commodities (including various combinations of powdered milk, wheat flour, rolled oats, cornmeal, vegetable oil, bulgur, CSM and WSB), as summarized in Table 9.13, fed an average of 400,000 recipients per year. They were distributed through Maternal Child Health, Rural and Urban School Breakfast/Lunch, Other Child, and Institutional Feeding, Food for Work and Health Cases programs.

As may be seen from Figure 9.4, a phase-over trend is in progress with a shift in emphasis from school feeding to Maternal and Child Health (MCH), which now has the highest USAID priority.

Table 9.12 - Food and Other Commodities Distributed by Catholic Relief Services by Weight, Dollar Value and Fiscal Year of Operation (In 000's Pounds and 000's U.S. Dollars)

FY	Food		Other*	
	Pounds	Value	Pounds	Value
1969	5,210	895	1,227	453
1970	7,899	1,248	232	445
1971	11,659	1,576	374	1,015
1972	13,963	2,391	16	311
1973	14,715	2,402	292	532
Total	53,446	8,512	2,141	2,756

* Includes used clothing, hospital equipment, medical equipment and supplies but exclusive of ocean freight and inland transportation.

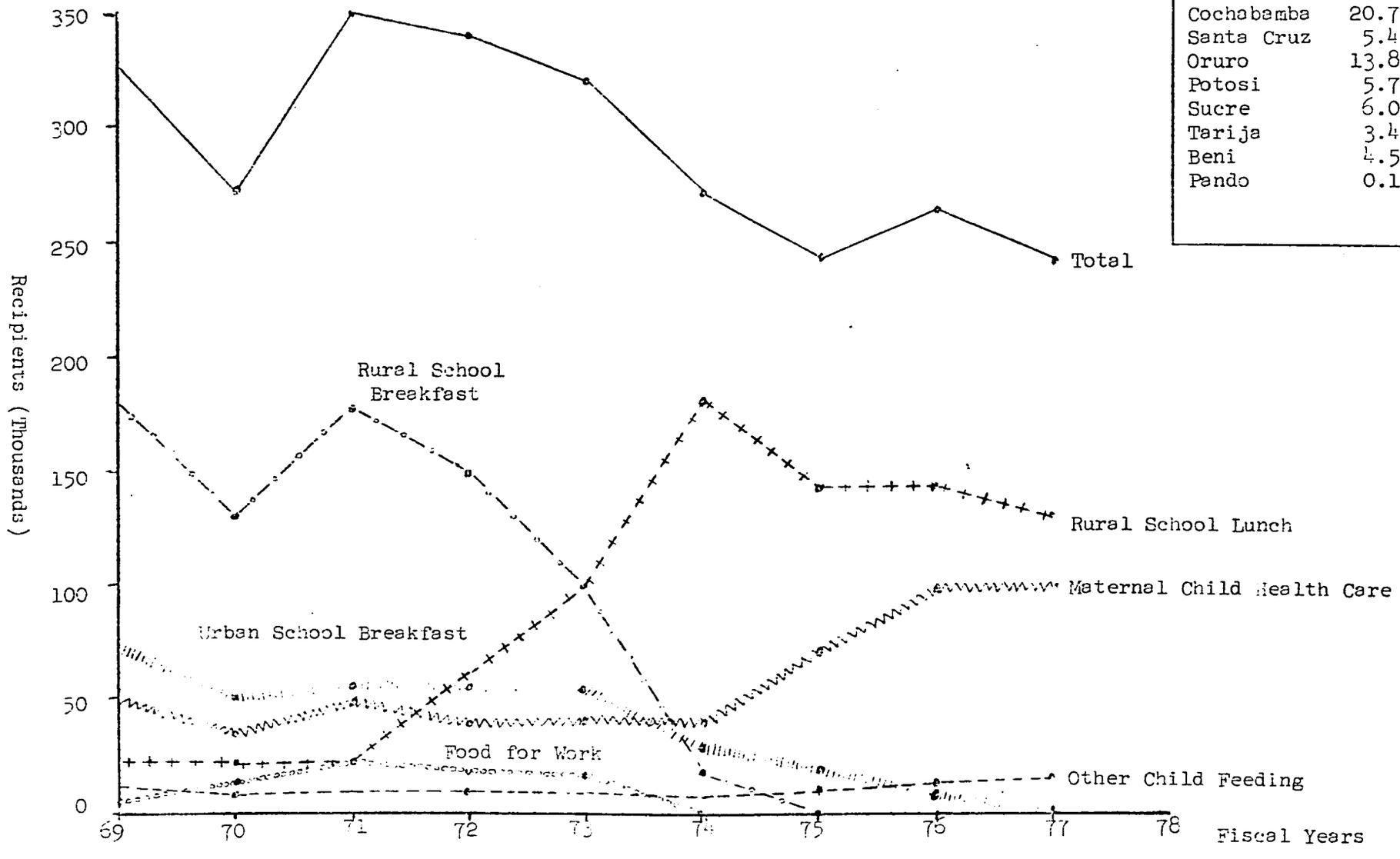
Source: CRS Fiscal Year Reports and personal communications.

Table 9.13 - Catholic Relief Services Title II Food Assistance by Commodity and Value for Fiscal Years 1969-73 (In 000's Pounds and 000's U.S. Dollars)

Commodity	FY 69		FY 70		FY 71		FY 72		FY 73	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
NFDMilk	1,928	597	2,479	847	2,581	859	2,942	1,339	2,807	1,297
Wheat flour	1,093	62	2,917	167	4,057	234	4,008	253	3,425	195
Cornmeal	284	13	97	4	776	38	856	60	911	53
CSM	300	30	116	11	685	68	1,051	119	2,623	305
Rolled oats	1,160	108	1,726	124	2,187	153	2,523	228	2,076	148
Bulgur wheat	9	1	-	-	45	3	380	23	913	53
WSB	-	-	-	-	422	44	1,277	148	973	105
Vegoil	436	84	558	94	906	177	926	221	987	246
CSB	-	-	-	-	-	-	-	-	-	-
Beans	-	-	6	1	-	-	-	-	-	-
Total	5,210	895	7,899	1,248	11,659	1,576	13,963	2,391	14,715	2,402

Source: CRS Fiscal Year Reports and Personal communications.

Figure 9.4 - Number of Food for Peace Recipients by Category, Area Percentages and Fiscal Years



FY73 AREA	Recipients Percent
La Paz	40.4
Cochabamba	20.7
Santa Cruz	5.4
Oruro	13.8
Potosi	5.7
Sucre	6.0
Tarija	3.4
Beni	4.5
Pando	0.1

Source: USAID/Bolivia, Food for Peace Office, unplished data 1974

Figure 9.5 demonstrates the planned general phase-down in the provision of Title II commodities because of world-wide shortage and greatly increased acquisition costs for the food which have led to greatly reduced availability. School Breakfasts will be completely phased out by FY-1977, with the urban component terminated in FY-1975, and the MCH facet increasing in FY-1974 to a plateau in FYs-1976-77. Food for Work was phased out in FY-1974 but Other Child Feeding has remained at a fairly constant level.

During the same five-year span mentioned above, CRS also had distributed US$2,755,658* worth of used clothing, hospital equipment and medical supplies (2,141,091 pounds) to various institutions, orphanages and clinics. In addition, US$48,039 donated by OXFAM (England) were utilized for socio-economic projects that are expected to expand appreciably in the future. In 1972, CRS created its Socio-Economic Department, with the objective of promoting more just and better conditions of life for the Bolivian man.(15)

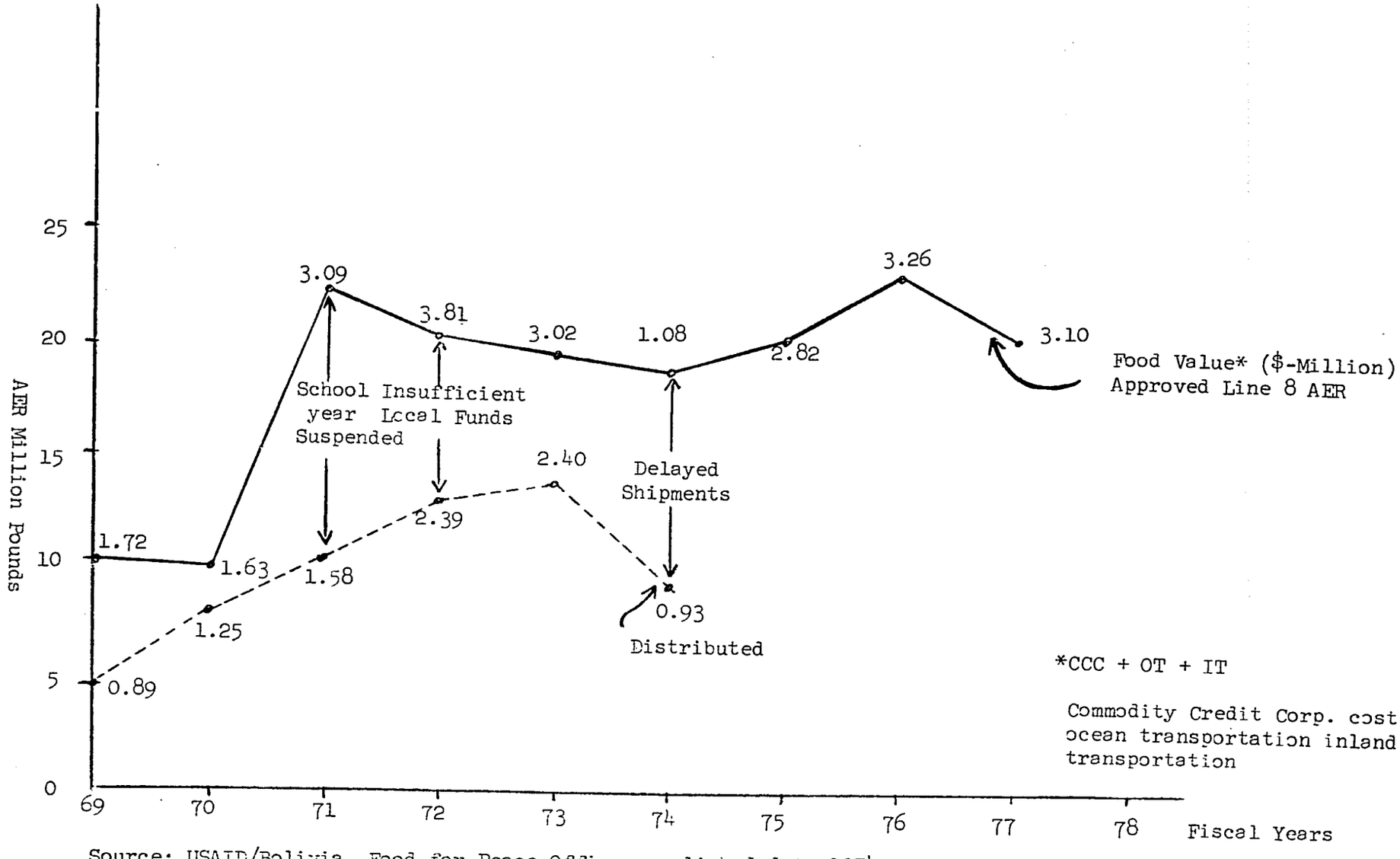
A rotating fund and scholarship program will be established to make loans (not exceeding US$1,000 each for maximun periods of two years) to communities or cooperatives and to train their personnel. The goal of this program is basically the promotion of social changes. The specific objectives are: i) to identify the best possible project for a given region and disseminate promotional information to the different organizations working in that area; ii) to strengthen regional organizations by searching for a system that responds to the needs of that zone; iii) to discover potential leaders through concrete projects followed by the future development of these leaders through scholarships or in-service training; and iv) to train people to design, plan and execute projects.

These objectives are an outgrowth of an earlier project which established a rotating fund of US$6,000 in late 1972 to make loans to the Alto Beni Development and Coordinating Committee (DCC). These funds were used to: i) modify existing production systems or improve agricultural output; ii) introduce new types of agricultural products; iii) promote small industries; and iv) stimulate responsibility and participation in decison-making for the utilization of credit. The Alto Beni DCC has a broad base and is composed of representatives from Heifer Project, the Catholic and Methodist churches, the Federation of Colonizers, the Association of Small Farmers, Cooperative Promotion and Agricultural

---

* Exclusive of ocean freight and inland transportation.

Figure 9.5 - Comparison of Food Commodities Approved Versus Quantities Actually Distributed and Future Program Levels



Source: USAID/Bolivia, Food for Peace Office, unplished data 1974

Extension. The group is committed to the development of the colonization area. One specific, smaller project is the commercialization of coffee by cooperation with MINK'A and CIPCA.

During the second half of 1973 an additional US$6,783 was added to initiate the second, or coordination, phase among the other programs working in rural areas. As of August 1974, the rotating fund was still in operation to promote the social changes required to improve the life style of the Bolivian campesinos, but present funding levels were felt to be insufficient. The financial requirements for the Socio-Economic Department for the period of 1974-77 are expected to amount to US$201,452, of which US$84,780 are expected to come from local sources with the remainder to be provided by CRS (US$39,900) and the Inter-American Foundation (US$76,772). During the next three years the project plans to expand its activities to include the North Altiplano, Chapare and North Santa Cruz areas.

Footnotes

(1) "Servicio Cooperativo Interamericano de Salud Pública, Informe de Conferencia de Evaluación", La Paz, 1957, pp. 75-77.

(2) Touchard, G., et.al., "Resumén de las Actividades Desarrolladas por el Servicio Cooperativo Interamericano de Salud Pública desde su Iniciación hasta su Terminación", sponsored by USAID/B, unedited and unpublished typescript, 1970.

(3) "Labor Problems in Bolivia", International Labor Office, Montreal, 1943, p. 45.

(4) "Asistencia del UNICEF al Sector Salud en Bolivia", UNICEF, mimeographed report, Lima, 16 March 1973, p. 5.

(5) Gumiel, B., Alberto, et.al., "Campaña de Control de Enfermedades Respiratorias y Ocupacionales en la Industria en Bolivia", Instituto Nacional de Salud Ocupacional, 1969, pp. 9-21.

(6) Pinell, A., Luis, "Análisis y Comentarios de algunos Indices Epidemiológicos en las Empresas Mineras - Unificada del Cerro de Potosí y San José de Oruro", INSO, undated and unpublished report.

(7) Non-capital Project Paper (PROP), 511-11-570-439.2, USAID, 18 April 1972, p. 16.

(8) Briefing Paper U.S.G. "Economic Assistance to Bolivia, 1942-74", USAID, May 1974, p. 10.

(9) Azzi, R., "CENAFA: Entidad de Asesoría y Coordinación de Programas relacionados con la Atención de la Familia y Población Boliviana", 1974, p. 7 (publication in preparation).

(10) Picardi, A.C., "A Two-Sector Population Growth Model for Bolivia", M.I.T., 1972, pp. 55-57.

(11) "Asistencia de UNICEF al Sector Salud en Bolivia", Lima, March 1973, pp. 1-5.

(12) Naciones Unidas, Consejo Económico y Social, E/ICEF/P/L. 1602, 29 March 1974, limited distribution, paragraph 19.

(13) "Estudio para la Definición de una Política Nacional de Alimentación y Nutrición en Bolivia", Secretaría del Consejo Nacional de Economía y Planificación, División de Política Alimentaria, La Paz, June 1973.

(14) Op. cit., Naciones Unidas, pp. 5-6

(15) "Fondo Rotativo de Préstamos, CRS letter (and attachment) to CAP. August 1974, p. 18.

CHAPTER X

THE MISSION'S PROPOSED HEALTH SECTOR PROGRAM

A. Summary

For the lack of a census since 1950 and because of rather unreliable vital statistics, the Bolivian health "indicators" have to be interpreted with some degree of caution, and through qualified professional judgment as is the case in this Assessment. Nevertheless, the inescapable conclusion is that the health status of Bolivia is markedly deficient.

Mortality rates are high, both for children and mothers, undoubtedly as the synergistic effect of a variety of unhealthly conditions including the primary effect of diseases compounded by malnutrition and inadequate environmental sanitation. Managerial and financial short-comings have further complicated the health delivery picture which is heavily oriented towards curative medicine and services to the urban areas.

This Assessment has identified the major constraints which have inhibited progress in the health sector, and has categorized them as managerial, institutional, economic and cultural. These, and certain specific negative aspects of important health activities, have been evaluated in some detail and recognition has been made of a number of favorable factors which can be expected to facilitate the implementation of measures to improve the health situation.

There exists a broad, if not completely quantifiable, concensus among international donors that health is an essential pre-requisite to the socio-economic development of any country Using a U.S. Department of Health, Education and Welfare methodology, this Assessment has tried to use benefit to cost analyses for evaluating the impact of a health sector investment in Bolivia. Although this calculation had to be quite crude in nature because of the lack of data, it is believed that reaching the total rural Bolivian population with over 60 percent effective programs would have produced direct and indirect benefits worth over US$100-million in 1974.

Although recent Government of Bolivia planning documents recognize the importance and scope of the above existing health problems, the continued limited financial and technical resources will delay remedial measures unless there is external assistance in implementing a comprehensive, fully integrated and well-coordinated health services delivery system. Such an approach also could provide the vehicle for expanding family planning services in Bolivia.

A rationale and strategy for potential USAID assistance in the health sector has been defined. The strategy involves grant funding to start an experimental-development project (EDP), in a relatively small area. Approximately one year later it would be followed by full scale health and rural sanitation activities in selected high valleys and lowland areas to be supported by both grant and loan funding. The target population has been defined, quantified, and potential international donor participation has been taken into consideration. The basic premise is that improved rural health depends fundamentally on achieving improvements in four interrelated health areas: a lower incidence of communicable diseases, reduced maternal and child morbidity and mortality, better nutritional levels and access to potable water and minimal sanitation; and that those investments will not be achieved except as components of a low cost, comprehensive rural health delivery system in FY1977.

We should continue our current programs in family planning and supplemental feeding under Title II. The former program will be the subject of a separate strategy paper. The latter, which has a national geographic focus and the potential for building country programs somewhat faster than the achievement of similar coverage by the comprehensive rural health delivery system would be used as one element of a national nutrition plan to be developed and supported by a later AID loan.

B. Program Framework

1. Resumé of sector's salient characteristics and performance

a. Health status of Bolivia's population

In Bolivia, there has been no census since 1950, and the available vital statistics are incomplete, as well as unreliable. As a consequence, Bolivian health indicators should be considered as rather "soft" data needing a strong element of professional judgment. In the case of this Health Sector Assessment (HSA), that judgment has been provided by personnel both with long-term, first-hand knowledge of the country, and with extensive experience in other countries (see list of participating personnel in the Preface). They all agree, as mentioned in Chapter I, that: "the health status of the Bolivian population is possibly one of the worst in Latin America." This came as no great surprise because UNICEF reached a similar conclusion in 1973--namely: "the indicators universally accepted to establish the health situation of a particular country or group show that in Bolivia this situation is markedly deficient."

In any case, an overall picture of the Bolivian health status and facilities may be gleaned from the following resumé:

i) Hospital discharge data, although partial and therefore limited, is probably the most accurate measure of morbidity available in this country. It shows that the major causes of morbidity for all ages in urban and rural areas are very similar in nature and do not vary significantly in degree. In rural areas, the first three causes are respiratory illnesses, gastro-intestinal disturbances, and trauma; whereas, the order of the last two are reversed in the urban population. Tuberculosis is undoubtedly the number one problem in rural areas, but its true prevalence rate is unknown as is the case of the diseases mentioned above.

Relative to mortality, there is no breakdown available into rural/urban categories. However, it is believed that the Crude Death Rate is 19 per thousand--one of the highest in Latin America (Chapter I). The major causes for adults are: "poorly defined", respiratory and gastro-intestinal. For children below age five, diarrheal diseases were the basic cause of mortality with a rate of 1,074.6 per 100,000 followed by measles at 748.3, whooping cough at 119.4, and tuberculosis with a rate of 29.9. Taken as a group, the above infectious diseases had an overall rate of 1,970.1 per 100,000; whereas, nutritional deficiencies were the first associated cause of death for infants one year old or less.

ii) In general, it may be said that most communicable diseases are geographic specific. Those of the tropics are Malaria, Yellow Fever, Hemorrhagic Fever, Leprosy, Leishmaniasis, Hookworm and Chagas' disease. In the valleys, there are Chagas' disease and Leprosy. Typhus and Scabies are more typical of the Altiplano. Malaria again became a major problem in 1973 with more than 7,000 cases reported

iii) The environmental sanitation related enteric disease, i.e., bacterial (Typhoid, Shigella, Salmonellosis) and parasitic (Amoebiasis, Hookworm) cause significant morbidity and mortality in Bolivia. Although overshowed by Influenza, Tuberculosis, Malaria and Measles, and undoubtedly understated for lack of adequate laboratory facilities, the enteric diseases were among the first half of all the communicable diseases reported to the Ministry of Health (MOH) in 1971. Of the 4,595 cases, 8.1 percent were diarrheal.

iv) A 1969 study done on the consumption habits of Bolivians revealed a 15 percent deficit in calories and a 40 percent deficiency in protein in the average diet. No breakdown was given by urban/rural areas; however, most observers agree that deficiencies are greater in the rural areas. During 1967-1970, the per capital availability to the Bolivian population of protein and calories has decreased from 59 grams of proteins to 49 with a concomitant drop in calories from 2,108 to 1,834 The protein-calories malnourishment rate in the age group one-six years is about 50 percent.

v) Not unexpectedly, fertility rates are higher in rural areas with the average number of children per women 45-49 years of age ranging from 4.98 to 6.88, as compared to 4.41 to 5.30 for urban areas. Under current mortality rates this results in a population growth rate of between 2.4 and 2.8 percent per year. The abortion rate is conservatively estimated to be one pregnancy termination out of every four conceptions.

vi) The MOH's rural system, as of 1973, consisted of 88 health center hospitals, 50 medical posts and 304 health posts, with the major effort being directed to curative medicine, which is supplemented by about an equal input from the folk medicine system. The rural network also includes four large COMIBOL hospitals which provide good, principally curative, service to a geographically concentrated population, the miners and their dependents. Finally, the Caja Nacional de Seguridad Social (CNSS) also operates a few rural outpatient clinics and health posts.

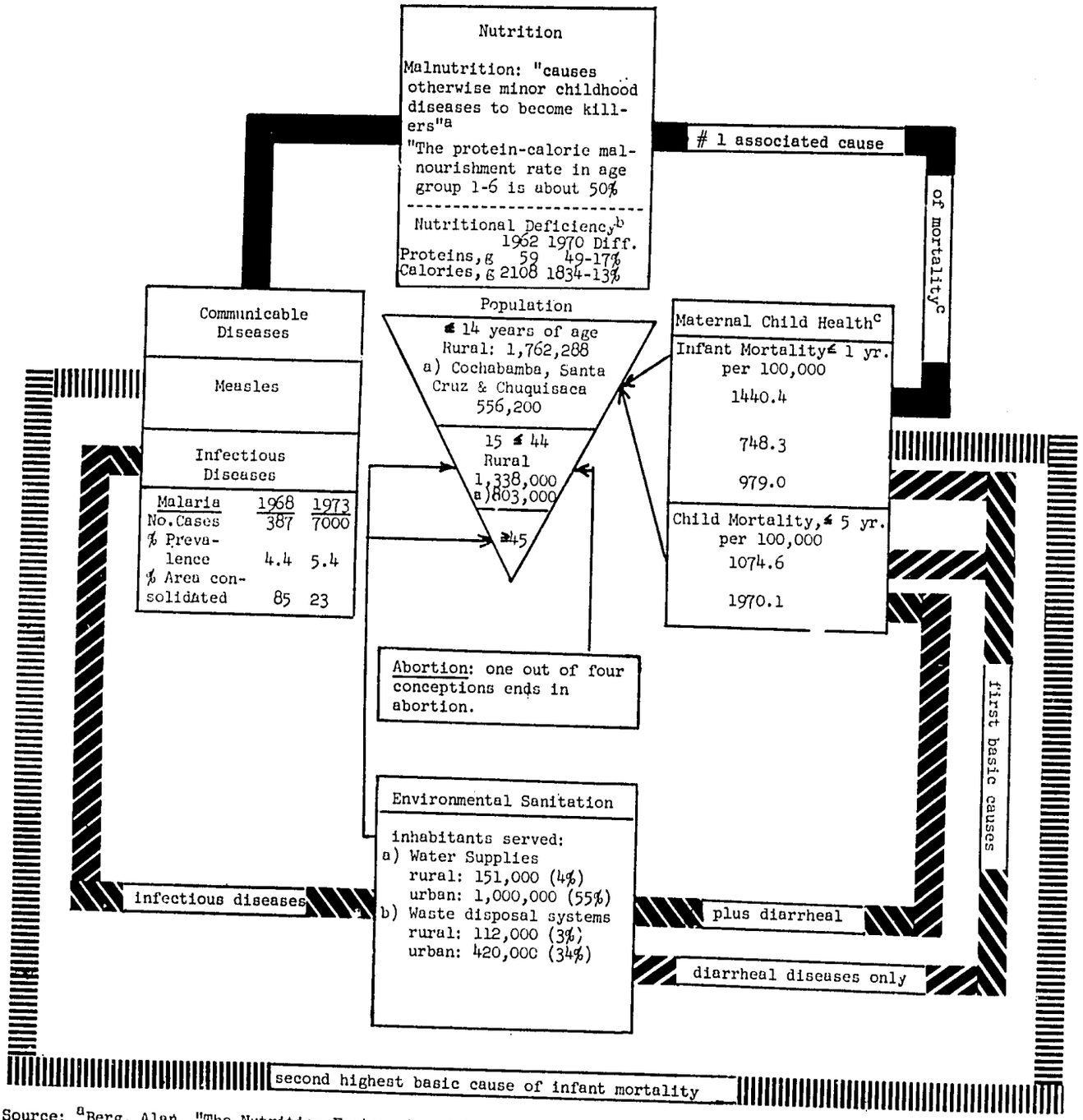
The caja system (CNSS, other cajas such as the petroleum, railroad, chauffers, etc.) and the military provide outpatient and inpatient curative medicine to about 630,000 urban residents. An additional 600,000 persons use MOH facilities, some of which are specialized: Tuberculosis, Children's and Psychiatric hospitals plus General Hospitals in each Department capital. Finally, the MOH has health centers in the urban areas. Most centers have a special outpatient service for patients with Tuberculosis. From the above, it is evident that there is considerable intertwining of services and facilities. However, there is not a well-defined division of labor or programmatic integration.

vii) Environmental sanitation and potable water supply systems are virtually non-existent in rural Bolivia, and less than adequate on a country-wide basis. In 1973, IBRD/IDA/WHO estimated that only four percent of the rural inhabitants (or approximately 151,000 Bolivians) versus 55 percent (1,000,000) of the urban dwellers had access to pipe-distributed water supplies; whereas about three percent of the rural inhabitants (112,000) had some type of individual waste disposal compared to 34 percent of the urban counterpart, who were served by public sewerage facilities. It should come as no surprise, therefore, that diarrheal diseases were a primary cause of the high mortality rate among Bolivian children under five years of age, and they also caused serious problems in the school age group.

viii) Disease patterns in Bolivia are closely interrelated with its population composition, and are characteristic of developing countries. Since 41.2 percent of the population is 14 years of age or younger, it follows that the majority of illnesses occur among young people and infants. The infant mortality rate is very high, fluctuating between 150 and 250 per thousand depending on the area of the country, i.e., urban or rural. This compares to 52 and 62 for the neighboring countries (with similar cultures) of Paraguay and Peru respectively. A contributing factor in infant mortality is malnutrition which causes otherwise minor childhood diseases to become killers. Nutritional deficiency was found to be the number-one associated cause of mortality for Bolivian children one year of age or under, with a rate of 1,440.4 per 100,000. Furthermore, although conclusive proof for some health interactions are yet to be obtained, malnutrition appears to have serious societal consequences in that it adversely affects mental development, physical development, and the span of working years - all of which significantly influence the economic potential of man. There is a highly negative comulative effect of malnutrition, poor environmental sanitation, coupled with the additional stresses of inadequate communicable disease control measures and limited maternal and child health services. The synergistic linkages of these four major Bolivian health problems are better understood by referring to Figure 10.1.

In sum, the health status of the Bolivian people, in general, is not equal to that of neighboring countries with similar cultures and life styles. Infant mortality is significantly higher as are communicable disease rates. Malnutrition is getting worse, and environmental sanitation facilities are woefully lacking.

Figure 10.1 - Major Bolivian Health Problems and Linkages



Source: [a]Berg, Alan, "The Nutrition Factor, Its Roles in National Development", the Brookings Institution, 1973, Washington, D.C., p.4.

[b] Wilson, Dean, Consultant Report, USAID/Bolivia, 1974, pp. 5, 19.

[c] Puffer, Ruth and Carlos V. Serrano, "Características de la Mortalidad en la Niñez," Organización Mundial de la Salud, Oficina Panamericana de la Salud, 1973, Washington, D.C., pp. 139, 409.

Compiled by: Landry, Amedee S., Humanitarian Assistance Division, USAID/Bolivia, 1974

b. Effect on economic and social development

There is a broad consensus among international donor agencies that good health is an essential component of socio-economic development. The Inter-American Development Bank (IDB) has concluded that:

> "lack of adequate health has a direct (negative) economic impact on the work force by causing loss of workers as economic units through death, and loss of work time and productive capacity while at work through disability and debility; failure to apply adequate preventive measures means invariably higher socio-economic costs for curative services."

In assaying the impact of health programs on socio-economic development in Bolivia, we should understand the costs of the current health status, and the benefits that may be expected by certain levels of intervention.

The Office of International Health in the U.S. Department of Health, Education and Welfare, has provided a brief outline of the costs of disease to society:

i) the direct cost of diagnosis and care;

ii) the indirect cost of lost wages and lost productivity

iii) the indirect costs attributed to increased caloric needs of the population, working and non-working;

iv) the indirect costs attributed to investment in individuals who die as a result of disease; and

v) the indirect costs to the government through social security payments.

Given the current status of statistical information in Bolivia, a quantified determination of all of these costs is impossible. However, by making certain assumptions our consultants have estimated that the current health status in Bolivia entails a cost of over US$772-million per year. Although this is a highly theoretical calculation, it is a startling figure. Using alternative assumptions, the Mission concluded the sum might be in the vicinity of US$200-million. Even this lower limit calls attention to the possibly significant losses of production associated with poor health. Nevertheless, it is believed that the EDF may throw some light on this subject. A breakdown of this cost is displayed in Table 10.1 below. (For details see Chapter III).

Table 10.1 - Summary of Estimated Costs of Disease in Bolivia - 1974

(US$ 000)

Cost Category	Urban	Rural	Total
1. The direct cost of diagnosis and care	36,823	10,101	46,924
2. The indirect cost of lost wages and lost productivity	563,500	162,500	725,000[a]
3. The indirect cost attributed to increased caloric needs of all population working and non-working	-	-	b
4. The indirect costs attributed to investment in individuals who die as a result of disease	-	-	b
5. The indirect cost to the government through Social Security payments	-	-	(8,500)[c]
Total	600,323	172,601	772,924

a. This figure represents an upper limit calculation. Using alternative assumptions concerning absenteeism and productivity, the amount of US$260-million was derived as a lower limit.
b. Insufficient information in Bolivia to make quantitative estimates.
c. Financial cost only, not true economic costs. Not added into total.

In any case, it is generally agreed that the magnitude of indirect costs are greater, both in number and value, than those of direct costs. Direct costs can be reduced by conscious decisions to ignore a problem, or by taking measures to improve efficiency. Indirect costs, however, remain the same or increase, if the disease is ignored. Thus, inaction may prove to be more costly (through indirect costs) than action (through direct costs).

Preventive health programs would reduce the prevalence of diseases that now consume resources for diagnostic and curative services. Also healthier workers would be more able and more highly motivated to produce than those who are debilitated. The impact of these benefits should be greater in labor-intensive industries and agriculture.

Improvement in health also would support the more efficient utilization of funds expended for other social services. Health and education are especially related. Studies have shown a relationship between nutrition and the mental development of young children; thus, public funds expended in education would be more efficiently utilized when directed at more intelligent and more attentive student populations. Also health centers, along with schools, are among the first channels of acceptance for innovative ideas in rural areas since not only do the accomplishments of medical sciences in their curative and rehabilitative aspects have an expanding effect on the future horizon of these people, but also there is engendered through successful medical treatments a respect for the possibilities of other technological suggestions that may come from the agricultural or educational sectors.

Finally, an investment in the development of the health sector in a country would be an expansion of an important industry. The health sector is one of high labor intensity. Particularly with the development of a rural health service through the extensive use of auxiliary personnel, an increased demand for semi-skilled workers would be created. This demand would have not only direct employment advantages but also an important educational advantage as the program develops skills which are transferable to non-health markets.

c. Conclusion

A Ministry of Health study has indicated that about 33 percent of all diseases seen in their outpatient clinics were at least partially reducible by preventive health, dental, and environmental sanitation programs. If it is assumed that such preventive programs were 60 percent effective on the populations reached, it can be seen that the potential benefits for a nation-wide comprehensive preventive health benefit approaches US$152-million in 1974; or, as might be more realistic for such a preventive health investment, if 70 percent of the population were reached with the 60 percent effective programs, the benefits anticipated would be close to US$107-million. With a similar analysis, we could conclude that the potential 1974 benefit for the rural areas alone could have been almost US$24-million. (See Chapter III for complete discussion). From this analysis of the benefits of preventive health in Bolivia, we are provided with the basis for projecting the magnitude of program costs that one could consider while still returning, in the simplest form, an advantageous benefit-to-cost ratio.

2. Major constraints which influenced the current status of the health sector's performance

The following is a resumé of the most significant shortcomings that have been identified. The factors mentioned are interrelated, but for presentation are broken down into five major categories, namely: managerial, institutional, specific program components, economic and cultural.

a. Managerial constraints

(1) Administrative

The annual budget presentation of the Ministry has been extensively delayed; suffers from being overly complicated and detailed; and does not provide information necessary for informed policy decision-making in part because operational units of the Ministry make very little input into budget formulation since there is no systematic effort to solicit proposals or estimates from the field units.

Estimates of expected income have been consistently higher than could realistically be expected.

Overcentralization of administrative decision-making, at the central Ministry and other related institutional levels, greatly reduces the interest of the field personnel in the implementation of health plans.

(2) Personnel management

Recruitment of personnel often has been influenced heavily by political considerations with the result that the available technical personnel are not utilized with maximum efficiency.

Supervision and evaluation of personnel is, at best, very fragmentary and often completely lacking, with the most obvious problems existing in the rural areas.

(3) Health resources

(a) Manpower

Although scarce by any standards, the composition and distribution of Bolivian health manpower is so geographically distorted that there is general inefficiency in its use and deficient attention to the rural areas. There is an oversupply of educated professionals such as physicians and pharmacists and a lack of middle manpower, including technical, maintenance and administrative personnel. Notably lacking are health promotors, outreach workers and auxiliary nurses at the grassroots level of operation, and mid-level technicians such as mid-wives, health educators and nutritionists.

A realistic health manpower inventory is not available, nor is there data on professional work habits, health manpower migration and attrition or population utilization patterns. Traditional practitioners and sanitarios, who have a small degree of medical training, are believed to provide a majority of the medical needs of the rural

population; and yet, no data exists as to the numbers involved, their technical proficiency or the degree of interest they might show in receiving training for incorporation into a rural health system.

(b) Facilities

Most facilities are under-utilized. In part this is due to a lack of supporting elements such as paramedical personnel, drugs, vaccines, supplies and an outreach mechanism.

Fragmentation of responsibility for the provision of health services has resulted in unnecessary and wasteful duplication of facilities, in weak maintenance, and in deficient equipping.

No "systems analysis" approach is used in planning health facilities; and, therefore, little or no consideration is given to function programming, prototype design and/or planning norms for the varing needs of differing climates and sub-cultures. Preventive maintenance techniques are not employed.

(c) Biochemical supplies

Drugs and vaccines are not used in an effective way nor available for the general populace because of the high cost of imported material and the inefficient, high-cost internal distribution system.

(4) Health planning

Planning is done from the top down without field personnel participation.

A variety of independent and autonomous agencies control their own planning processes, almost totally without consulting the MOH.

Too many activities within the public health sector occur solely because of an historical accretion of resources which have been organized in an institutional response to a direct demand from the community, recipient of patronage or even the patient.

(5) Health information system

There are no reliable census data.

The system for notification of communicable diseases is deficient, and epidemiological surveillance is virtually non-existent.

Deficiencies in the vital statistics system result from the submission of partial statistics by untrained registry officials who receive appointments without examination and are remunerated on a fee-for-service basis. The problem is exacerbated by archaic definitions of terms; poor identification of the causes of death--more often than not without medical attention--much less autopsies; and with the use of clandestine cemeteries, especially in the rural areas, which results in severe under-registration of infant and child mortality.

b. Institutional

A pattern emerges consisting of inadequate and maldistributed funding, a paucity of planning and epidemiological data, a lack of in-depth, adequately trained personnel; and, perhaps more significantly, an apparent ad-hoc, uncoordinated, non-integrated approach to the solution of Bolivian public health problems--with too much emphasis on the curative aspects. This situation is due to the:

i) fragmentation of agencies;

ii) growth of decentralized or "técnico" agencies; and

iii) uncertainty concerning a future division of labor between the MOH, the Junta Nacional de Desarrollo Social (JNDS), and the Bolivian Social Security System (so-called cajas).

Translated into end results and illustrated in Fibure 10.2, the above short-comings result in:

i) exceedingly little coordination among the public agencies in the sector and too much ambiguity concerning spheres of responsibility;

ii) a tendency to organize semi-autonomous, single-service agencies, when the demand for the efficient provision of a given service becomes sufficiently powerful; and

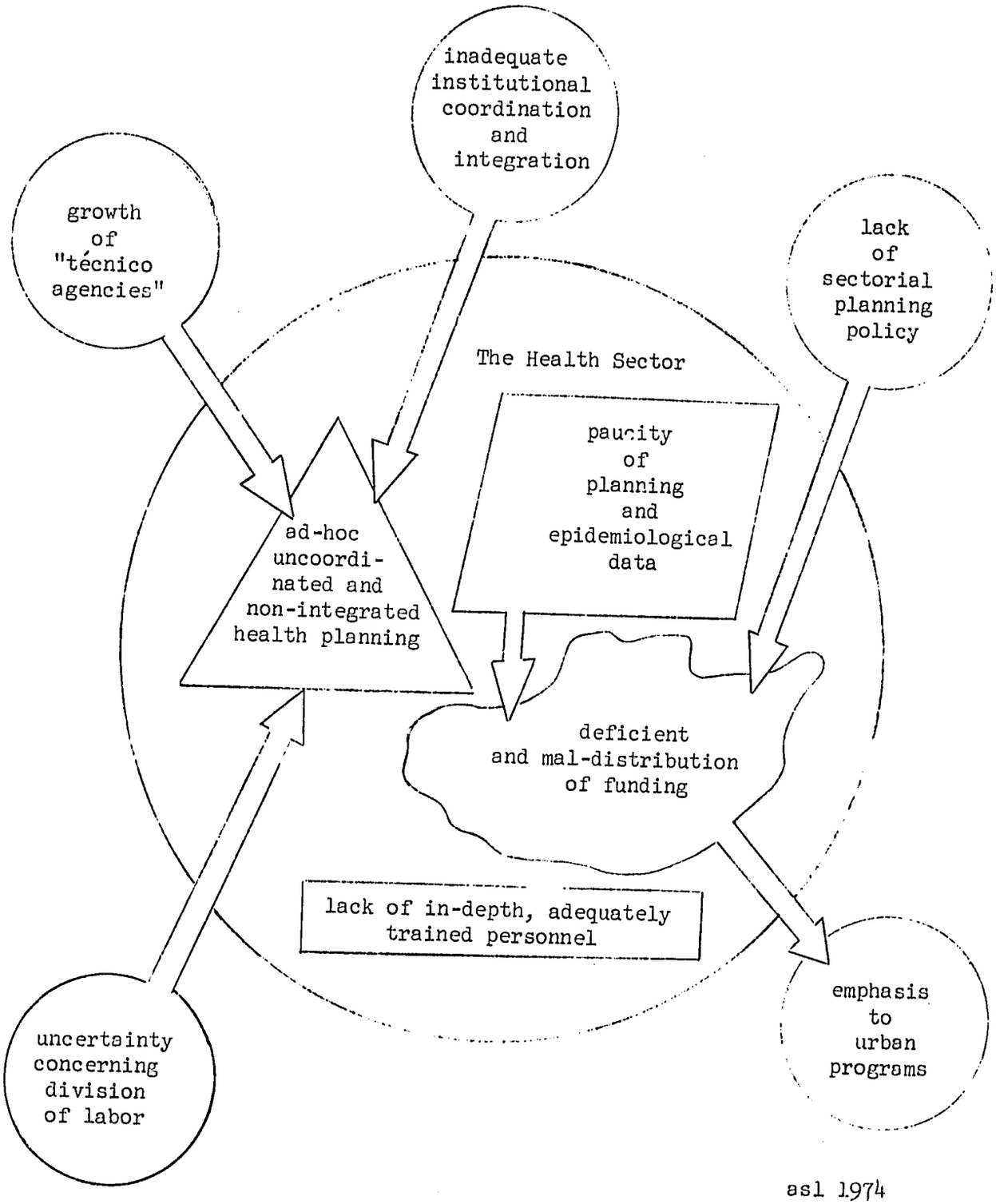
iii) the provision of facilities and services by the cajas to the urban sector, which excludes campesinos or rural dweller participation.

c. Specific negative aspects of important program activities

(1) Inadequate communicable disease control

National surveillance data is incomplete, and no information is gathered from the private sector.

Figure 10.2 - Institutional Considerations: Some Aspects of the Bolivian Administrative Jig-saw Puzzle and Impact on the Provision of Health Services



asl 1974

The ability to confirm diagnoses is severely limited by the scarcity of laboratory resources and the under-utilization by physicians of those few resources that are available.

The supervision of and technical support for field personnel is inadequate.

The Vaccine Bank is underfunded.

Vaccination programs in general are too highly centralized.

The Malaria Eradication project is virtually paralized for a lack of commodities, especially DDT.

The true prevalence of and/or population-at-risk for certain diseases with potentially serious economic impact are unknown. Among these are Chagas' disease, cutaneous leishmaniasis and leprosy.

The National Reference Laboratory (INLASA) does not carry-out periodic serological surveys to gather badly needed epidemiological data.

(2) Poor maternal and child health services

There is a lack of integration with other preventive medicine programs such as communicable disease control, nutrition, and environmental sanitation.

Provision of services is too dependent on professional personnel with the result that the costs of health services are high.

(3) Malnutrition

The GOB has no national nutrition policy and has developed no programs to address the deteriorating nutritional status of the population.

(4) Lack of environmental sanitation services

Only four percent of the Bolivian rural population have access to water supply coverage including services by house connections and public standpipe; whereas, three percent have waste disposal services such as septic tanks, sanitary latrines, etc. Comparable figures for the urban areas are 55 and 34 percent.

(5) Limited family planning services

Although a few clinics have been started by GOB, the scope and coverage is extremely limited - with virtually no service offered in the rural areas.

Not all elements of Bolivian society are convinced of the need for a population program which would be oriented towards a rationalization of the birthrate for demographic, social and development reasons.

d. Economic

Public health sector expenditures in 1974 accounted for approximately four percent of the Central Government's Budget and two percent of GDP, or roughly US$6 per capita. This is about half of what might be required to provide "minimal adequate" health services for the Bolivian people.

Budget allocations are strongly oriented towards salary payments, leaving insufficient funds for travel and per diem--and a resultant lack of supervisory and evaluation activities.

The extremely low average per capita income in 1967 of US$224 (with 63 percent of the labor force, or agricultural sector, earning US$84) virtually prohibited the rural dweller from obtaining adequate professional medical attention--because it is estimated that yearly minimal attention would cost him 12 percent of his income.

e. Cultural

A strong, self-perceived linkage between an individual's health status and Aymara or Quechua magical-religious concepts may limit the effectiveness of a modern rural health delivery program unless a satisfactory "bridge" can be built between the divergent cultures.

3. Factors which should favorably influence health sector developments

Although the positive aspects which are expected to influence health sector development are relatively few in numbers, they are of significant importance. They are:

i) the active participation of a diversified group of Bolivian professionals from various disciplines (health, social security, GOB sectorial planning, etc.) in the national Health Sector Assessment which was carried out in a parallel but highly coordinated manner with the USAID effort;

ii) the formulation by the Bolivian Inter-Ministerial Commission of 161 recommendations in the major areas of interest, including: financial aspects, facilities and equipment, communicable diseases, systems of information, medical attention, maternal and child health, biochemical products, nutrition, environmental sanitation, occupational health, human resources, and administration;

iii) a concerted effort by MOH to plan the decentralization of health services systems by a regionalization process;

iv) the interest of the MOH in an administrative reform process which is expected to centralize all responsibilities for health services, including those of social security, within the MOH; and

v) the existence of a regional structure such as Unidades Sanitarias, mothers' clubs, volunteer workers, and a highly structured malaria eradication system, which can provide the backbone for an improved rural health system.

C. Goals, Plans, Priorities and Interrelationships

1. GOB

The first phase of health program planning by the GOB, which terminated in 1973, involved an empirical approach which resulted in 1973 in the latest MOH's National Health Plan and, somewhat independently, also in 1973 in the National Economic and Planning Council's (CONEPLAN) Five Year Plan for Development which included a health sector component.

The MOH's National Health Plan (NHP) is, in essence, a descriptive document. The analytical facet is very limited, perhaps as a consequence of the virtual non-existence of epidemiological and other programming data; and the Plan does not provide a coherent, methodological framework for solving Bolivian health problems. At most it is a collection of semi-quantified health goals based on the extrapolation of Bolivian data which are tied to recommendations made at the 1972 Third Special Meeting of Ministers of Public Health of the Americas. The general objectives of the Plan are to: control and/or eradicate communicable diseases which have an impact on children and other vulnerable groups; reduce child mortality and morbidity; decrease the prevalence of malnutrition; provide excreta disposal systems and/or potable water - with emphasis on the urban component; increase outpatient visits; and, most importantly, obtain the effective coordination of intersectorial programs and activities for achieving the complete integration of health services.

The NHP is still relevant, and it is anticipated that it will be implemented. However, the sources of the financial support required

are not fully identified and the requirements stated, although realistic, may exceed GOB capacity - unless health is given a higher financial priority. Currently the MOH is preparing an appendix to the NHP as the result of its additional anolytical work. This document is expected to coincide almost completely with the conclusions of this Assessment relative to health sector programs.

CONEPLAN sponsored a meeting in 1973 of international donors to promote the coordination of all external assistance to Bolivia. The health policy framework for that meeting was defined as the need to:

i) develop a single and basic health development policy for all agencies, public and private, based on a national development plan; and

ii) concentrate on the expansion of rural services and regional programming with interagency, and multisectorial coordination.

The sector objectives of CONEPLAN's health plan, which were broader than but essentially included in those of the NHP, are to:

i) increase life expectancy and work capacity;

ii) reduce morbidity, especially as related to the labor force, and

iii) strengthen, improve and extend health service coverage.

This plan is still in the final planning process with no actual implementation to date.

The above plans jointly laid the groundwork and institutional supporting basis for the second phase of the Bolivian health planning process which began in 1974. Early that year, an Inter-Ministerial Commission (IC) was created by the GOB to develop, to the extent possible, a comprenensive evaluation of the health sector, including service institutions, personnel, facilities, budgeting, and future requirements for all the identifiable resources. The IC required most of 1974 to carry out its analyses of the health sector. Its final report has not yet been completed. Nevertheless, based on the close contact which has been maintained with the IC by USAID personnel, we believe we can state with some assurance that the goals and priorities stated in the NHP and CONEPLAN documents will be reaffirmed in the IC's report; and that the report will contain the major recommendation of the creation of a single national health service. This would involve: a complete reorganization of MOH's functions to permit effective coordination; the regionalization of all health services as a means for attaining more efficient planning and administration; and the assumption by the Social Security System (rather

than the MOH) of managerial responsibilities for the provision of curative services. It is also anticipated that the IC's report will identify program and related budget requirements. The report should be presented to relevant GOB authorities for discussion by March 1975 and serve as an appendix to the existing MOH's National Health Plan. It is strongly felt by the IC coordinating committee that the report will form the basis for a national health policy and will be incorporated into the National Development Plan (1975-1980) which the GOB is presently preparing. The IC's membership and modus operandi established a favorable precedent in that it was the first time that an interagency/inter-ministerial group had jointly studied the health sector in a systematic and comprehensive manner, and had travelled in composite groups to look at health problems in the field.

Figure 10.3 was designed to facilitate an understanding of the relationships of the various goals and priorities stated in the documents previously mentioned i.e., the NHP, CONEPLAN's Five Year Development Plan and the IC's recommendations.

2. International Donor Plans

As described in detail in Chapter IX, the Pan American Health Organization (PAHO), the United Nations Children's Fund (UNICEF) and the United Nations Fund for Population Activities (UNFPA) are, or will be, active in programs in the Health Sector.

a. PAHO

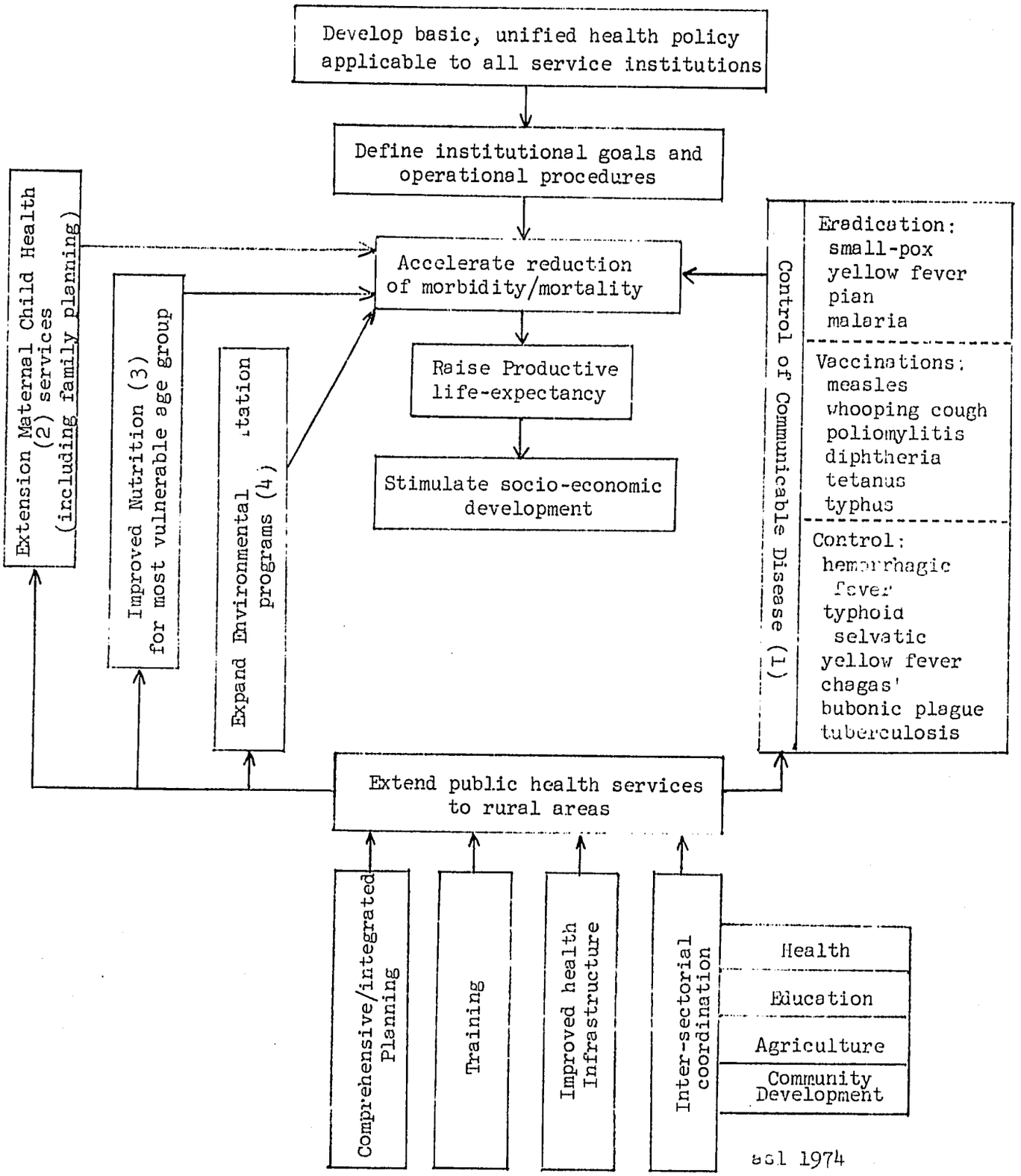
During CYs 1975 and 1976, PAHO will provide US$1,999,653 worth of advisory services related to three basic activities:

i) protection of health, essentially related to communicable diseases, such as malaria and zoonoses, and environmental sanitation, i.e., water supplies;

ii) promotion of health, including general services, broken down into general public health, nursing, laboratory, etc., and specific programs, with the major inputs for family health and population dynamics, nutrition, and occupational health; and

iii) development of educational institutions, with the major emphasis to be given to medicine, nursing and environmental sciences.

Figure 10.3 - Principal Bolivian Development Goals and Related Health Interactions (GOB Priorities in Parenthesis)



PAHO is concentrating on a "technological solution" to Bolivian public health problems whereby advisory services are provided to individual health programs as entities rather than considering them as components of a complex health status.

b. UNICEF

This international donor has conceptualized its social development planning for Bolivia, effected jointly with CONEPLAN, in a rather comprehensive and integrated manner. The health component, however, is quite limited both geographically and programmatically. For the period of 1974 inclusively, UNICEF's developmental oriented assistance to Bolivia is expected to reach $1,514,000. Of that amount $665,200 (or 43.9 percent) is allocated to health sector activities, with the major share to go for the purchase and transportation of materials and supplies--namely $243,100 for environmental sanitation in the Departments of Chuquisaca and Tarija, and $372,100 for maternal and child health activities in the same Departments.

UNICEF also is actively engaged in promoting the design and implementation of a national environmental sanitation project, at a cost of $1,943,978. Of this amount, GOB would contribute $505,434 (or 26 percent), with $388,796 (20 percent) to come from the communities involved. The balance of 54 percent, or $1,049,748 is expected to be provided by an international donor, probably the Canadian Government. It is expected that the funds will be channeled through UNICEF which will monitor all phases of the implementation. During the period of 1975-1977, the project is planned to provide potable water and excreta disposal to 64 communities (with 500 to 2,000 inhabitants in several Departments of Bolivia) and reach 87,741 persons, or 2.1 percent of the estimated rural population of 4,061,035 individuals. In Bolivia, there are an estimated 457 communities with populations of 200 to 2,000 individuals.

c. UNFPA

This UN entity is negotiating with the GOB for the development of a family planning component to the MOH's Maternal and Child Health program. The assistance would include advisory services, training and equipment. No commitments or plans of action have yet been concluded. It is likely that any program would concentrate on the urban areas--at least in the early stages.

D. Rationale and Strategy of USAID's Assistance

1. Reasons for attention to health problems

There are a variety of motives for directing concerted attention to the solution of Bolivian health problems. These can be divided succinctly into three major categories, namely:

a. Socio-econimic development

Unless certain communicable diseases are virtually eradicated and enteric infections drastically attenuated, in concert with a realistic reduction in malnutrition and maternal child mortality, Bolivia will not be successful in developing the human and institutional resources which are pre-requisites to the accelerated socio-economic development it desires. In particular, it is unlikely that an accelerated population growth beyond whath Bolivia's likely development can absorb will be avoided unless the rate of survival of children is improved so that parents will be prepared to accept the use of family planning services in support of responsible parenthood.

b. Technical efficiency of U.S. and international donor assistance

Poor health is a drain on human energy and financial resources, which precludes the most efficient utilization of technical/financial inputs into the agricultural, educational and industrial sectors of Bolivia. Thus, health interventions complement those in the agricultural and education sectors by making the USAID's and international donors' development assistance efforts more effective. More specifically, the full utilization of new lands will require the solution of health impediments; and the achievement of a better educated rural youth will require attention to their nutritional and health status to encourage attendance and alertness. Furthermore, the continued budget constraints facing the GOB's development efforts would be alleviated if the inevitable, increasing demand for the health services can be met, at least in part, by more efficient, less costly delivery systems.

c. Humanitarian concern

Good health is an integral part of man's well being in the physical, mental, psychological senses. It is a goal which is sought by all nations and cultures. Involvement in support of the GOB's programs to improve the health status of Bolivia's people would be the clearest, most direct expression of the concern the U.S. people have for the Bolivian people's well being. It would be in conformity with the Congressional mandate that AID programs reach the poor with effective programs geared to their human problems.

2. Key development problems to be addressed by USAID

The overall sector goal of the USAID is to improve the standard of health of low income groups in rural Bolivia, particulary the young This Health Sector Assessment has identified several key development problems related to achieving this goal. They are need for:

a. Improved management and comprehensive health planning--to implement a comprehensive, integrated and coordinated health sector policy, with appropriate emphasis on the rural areas.

b. Personnel development--to train a broad spectrum of presently unavailable public health and related personnel including cadres of outreach workers, midlevel health professionals plus supporting staff such as paramedics, and maintenance workers.

c. Reorganizing the public health technical infrastructure--to convert single objective health institutions (e.g., malaria eradication program) into multifaceted, integrated and highly coordinated operations.

d. Rural health institutional development--to create the framework for and implement a low cost, public health outreach system aimed at rural areas.

e. Sanitary facilities improvement--to expand substantially the availability of potable water and sanitary waste disposal facilities.

f. Nutrition improvement--to prepare and implement a national program involving the efforts of the agriculture, education and health sectors.

g. Expanded family planning services--to adopt a demographic strategy to avoid the adverse economic and social consequences of an accelerated growth in population.

h. Critical disease abatement--to devote adequate resources to campaigns to save past investments (e.g. malaria eradication) and to achieve substantial savings at small cost (e.g. malabsorption of foods because of enteric disease).

Since the problems mentioned above are closely interrelated, and even though some positive benefits could accrue from a single intervention (e.g. environmental sanitation) the most effective approach would be to establish a comprehensive health delivery system that will address the eight problems mentioned above.

Admittedly just providing environmental sanitation facilities would make a significant contribution to reducing infant and child mortality due to diarrheal diseases. However, the combination of communicable diseases and intestinal parasites was the first basic cause for the mortality of Bolivian children five years age and younger, with a rate in 1968-70 of 1970.1 per 100,000. Therefore, it is self-evident that solving the environmental sanitation problem without that of the communicable diseases would result in a partial and less than adequate solution.

Silicosis and silicotuberculosis are two occupational health problems of great significance in Bolivia because they involve the miners, who produce a large portion of the foreign exchange. Although, an estimated 20 percent of these miners have silicosis, the Mission will not invest in resolving their health problems because PAHO is actively assisting GOB reorient the activities and re-equip the responsible entity, or the Institute of Occupational Health. Similarly, the majority of long term, out of the country training, if done at all, will be effected by other international donors.

3. Program focus

It is clear that, given the magnitudes involved in mounting a comprehensive health improvement program, it would not be possible to seek national coverage immediately. Thus there is a need for careful program focusing.

a. Concept of comprehensive and integrated health services approach

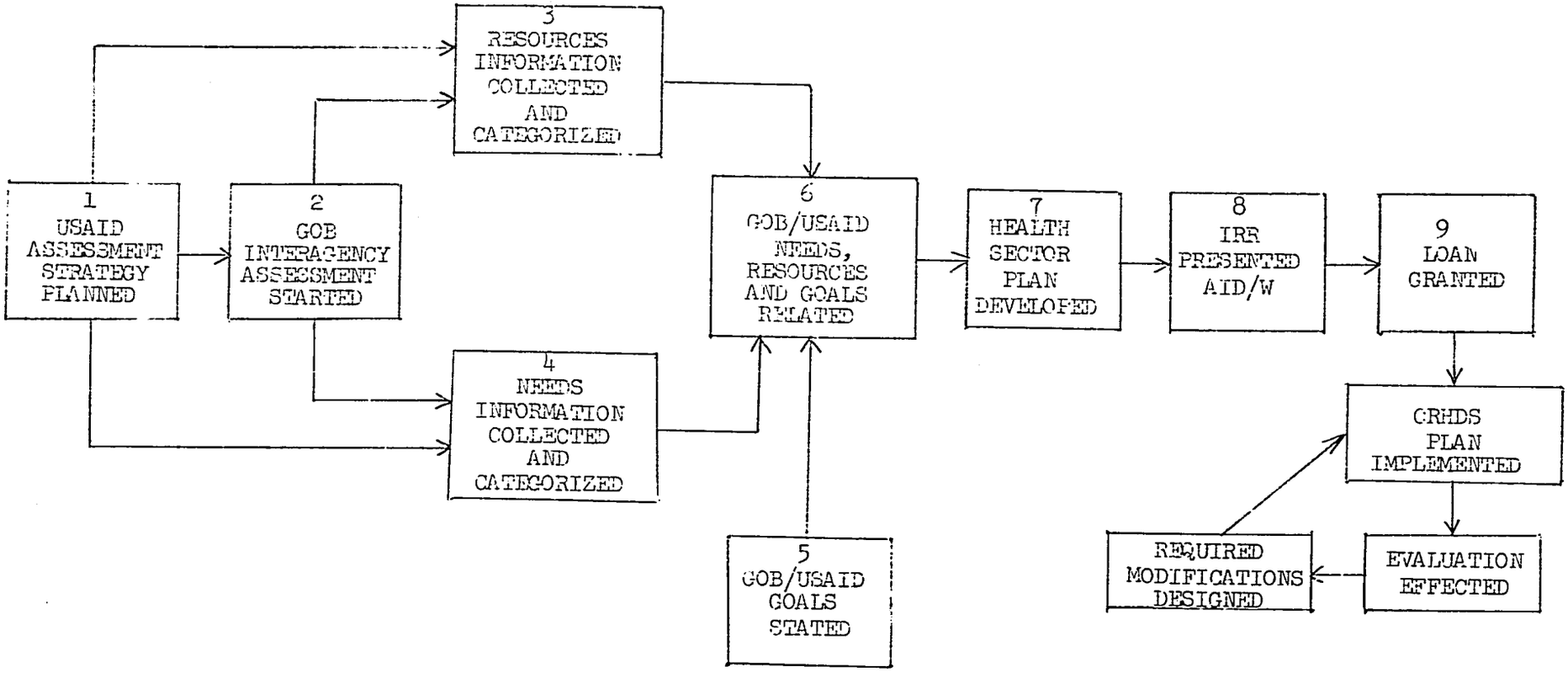
Our assistance strategy for the health sector proposes to concentrate on the development of an integrated, coordinated and low-cost but comprehensive rural health delivery system (CRHDS). All facets of the CRHDS planning would be based on a methodology involving a system's analyses approach. An example of the procedure is shown in Figure 10.4, as a "milestone diagram". Essentially, the first seven steps (or boxes in the diagram) are related to the Health Sector Assessment itself, and the remaining ones would be related to the preparation and implementation of the CRHDS, including the evaluation and feedback loop.

The basic reason for this choice is that improved rural health depends fundamentally on achieving improvements in four inter-related health conditions--i.e., a lower incidence of communicable disease, reduced maternal/child morbidity and mortality, better nutritional levels and more potable water-- and that these elements cannot be achieved except as components of a low cost, comprehensive rural health delivery system. Such a system requires realistic epidemiological data, and up-to-date vital statistics and the use of outreach workers, malaria eradication personnel, traditional practitioners, teachers and agricultural extension agents. The relationship of these elements is shown in Figure 10.5.

b. Geographic and inter-sectorial relationships

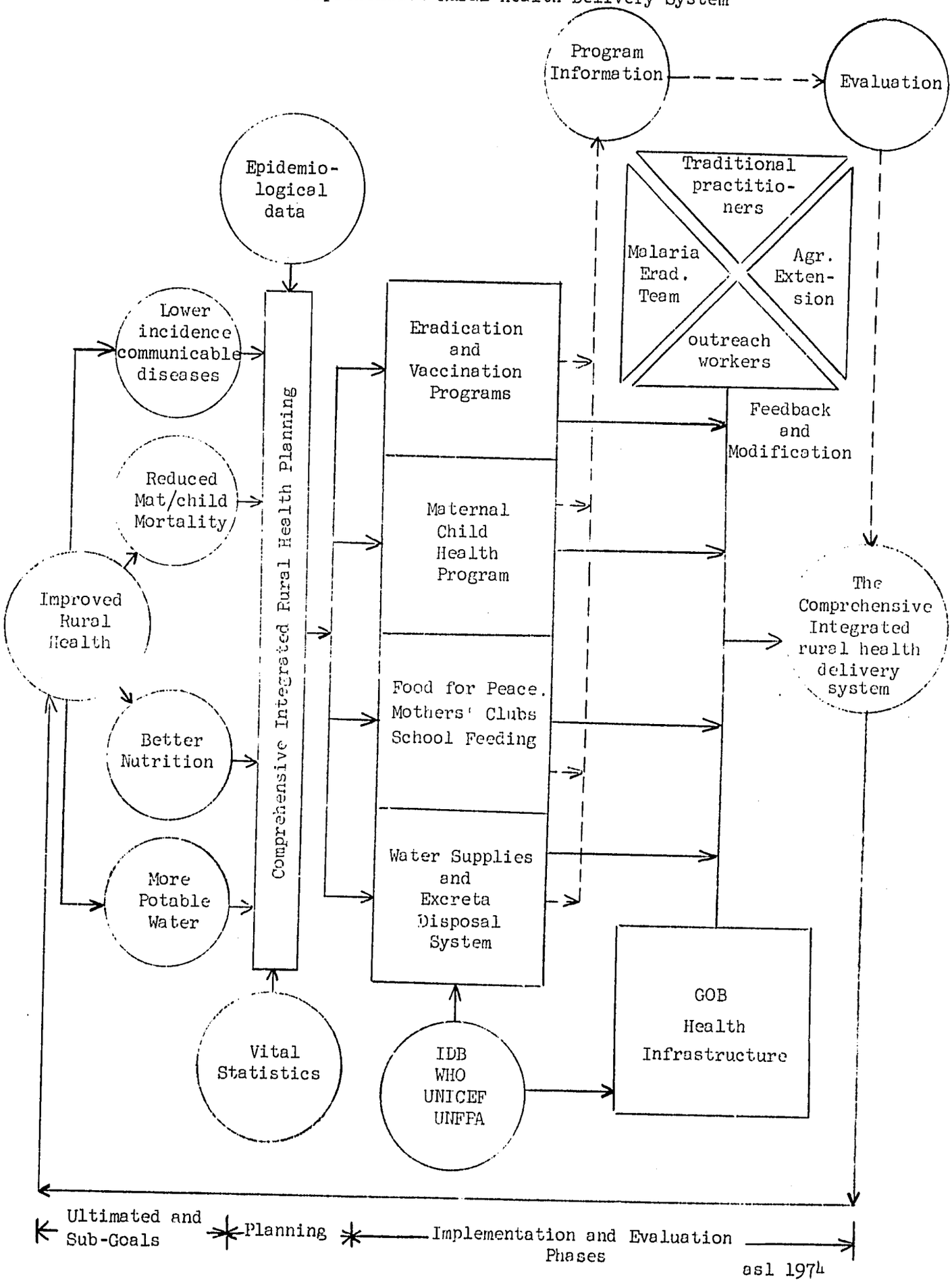
In order to complement our activities in the Agricultural and Education Sectors, as well as those of international donors, we should

Figure 10.4 - A Milestone Diagram for the Bolivian Health Sector Assessment and Possible Loan Project to finance a Comprehensive Rural Health Delivery System (CRHDS)



asl 1974

Figure 10.5 - USAID Methodology for Planning and Implementing a Comprehensive Rural Health Delivery System



plan to concentrate our Health Sector assistance initially in the central high valleys and eastern lowlands of Bolivia. This includes the valleys in the Department of Cochabamba and parts of Chuquisaca, plus the lowlands in the Department of Santa Cruz. The target areas mentioned were selected because of the fact that 33 percent of the population is concentrated in these Departments and that the health problems of these rural residents have not been, nor will be, addressed in any substantial way by any other international donor programs. The implementation of the comprehensive health programs should materially contribute to the attainment of the following multisector objectives:

i) Provide communicable disease control (CDC), maternal and child health services (MCHS), and improve nutritional education (INE)--as a first step in improving nutritional intake from the greater availability of agricultural outputs--in areas with potable water/waste disposal systems, and with populations ranging from 100 to 2,000 persons. If environmental sanitation facilities do not exist, use the outreach mechanisms to create a demand but in the meanwhile start the CDC, MCHS and INE to establish a health status impact, which should be followed by that of sanitation.

ii) Increase small farmers' productivity in the central valley region, which is overpopulated and is one of the poorest in Bolivia.

iii) Provide adequate services for migrants into the lowlands which have the capacity for absorbing them and the greatest potential of any region for rapidly increasing agricultural production.

iv) Effect a reduction in the incidence of malaria in the valleys and lowlands which is essential to the proposed increase in the production of crops required to improve the nutritional status of the Bolivian population; and

v) Raise the health status of Bolivian children in the valleys and lowlands to permit their assimilation of the educational opportunities offered them by the GOB/USAID inputs into that sector. This would include pure health sector aspects too, essentially nutritional and general health education.

c. Target groups

The majority of the rural residents in the central valleys and lowlands mentioned above, or "target persons", are poor health-wise, as described earlier in this Chapter, as well as economically. As a general rule, they have limited access to health and educational facilities. Subsistence level farming, based on traditional agricultural techniques, is the way of life, as is the extensive utilization of family labor for crop production. It is estimated that 50 percent of the 1,338,000 rural dwellers or campesinos live in conglomerates of 100-2,000 people. Therefore, approximately 669,000 persons would be the primary targets in the Departments of Cochabamba, Chuquisaca (five provinces) and Santa Cruz. This would coincide with the rural sanitation loan coverage, which proposes to reach 420,000 of these people with potable water and waste disposal facilities. The Rural Sanitation Loan has a lower limit of 100 individuals because of technical and economic constraints that would prohibit the extension of services to population clusters below that level. Insofar as the comprehensive rural health delivery system is concerned, it is believed feasible to reach an additional secondary target of 134,000 persons for a total of 803,000 individuals (or a maximum of 60 percent), by the rural outreach mechanism.

For two fundamental reasons, the Health Sector assistance would be directed, as a first priority, to the 400,000 mothers and children who populate the above mentioned geographical areas:

i) the age structure of the population means that almost half of the health problems are associated with the youth or younger children; and

ii) the importance of materially reducing infant mortality as a positive stimulus to the adoption of responsible parenthood

Finally, concerted efforts would be directed to the rural sector because:

i) the greatest mass of population without adequate health coverage is in that section;

ii) AID's Congressional mandate is to provide services to the poor and deprived; and

iii) the health sector effort complements those in agriculture, education and other international donors'.

d. Time frame and phasing

The basic thrust of our proposed assistance to the health sector is the creation of a system to deliver comprehensive public health

services to important rural areas of Bolivia, while assisting the Ministry of Health to improve its ability to analyze problems, set policies for the sector and effectively implement programs. This will be somewhat time consuming because of the innovative modifications required, the dispersed nature of the rural population and the rather difficult terrain.

We should plan to begin in FY-1975 with a US$300,000 grant-financed Accelerated Program Development (APD) hereinafter called an Experimental-Development Project (EDP) whose basic objectives would be the development of a methodology for the design and management of a low cost, comprehensive, rural health delivery system. This would involve technical assistance; in-service, on-site training; selected public health services; plus the collection, evaluation and storage of related data for management decision-making. It would be directed at a specific geographic area within the target areas described above insofar as the provision of services and collection of data is concerned; but it also would include assistance to the central MOH to begin training of central, regional, and local health managers and planners.

Although the EDP would contain within it elements of family planning and food supplements, we should continue our current programs in family planning and Title II which have a wider geographic focus and the potential for building national programs somewhat faster than the achievement of a similar coverage by the comprehensive rural health delivery systems. The degree of support to family planning would depend on the rapidity with which other donors provide resources in support of the programs the GOB may adopt. At the moment we should anticipate the need for our continued involvement through the IAP period. The degree of support to the Title II program would depend on the progress made by the GOB in preparing and adopting a national nutrition program.

Assuming that the EDP shows progress, in FY-1976 we should plan to undertake a Health Resources Development (HRD) grant project to improve the capacity of the MOH in the formulation and implementation of effective and comprehensive policies for the implementation of integrated rural health delivery services and a Rural Health Delivery Services Loan (RHDSL) to develop an integrated, comprehensive, low cost health service for the target areas described previously and to enhance the administrative capability of MOH. Complementary to that package would be a Rural Community Sanitation Loan to provide potable water and waste disposal systems to reduce enteric and communicable diseases in the same target areas.

In FY-1977 we should hope that the GOB would have prepared a National Nutrition Program to provide the institutional framework for reducing malnutrition among target people and that we could support it with a loan. Finally, in FY-1977 technical and financial support would continue to be provided, if necessary, to complement other international

donor activities to assure the full fledged operation of a national scale family planning program. More in-depth information on these on-going or projected activities is given in the following part.

4. Program units of implementation

The following descriptions seek to give the basic components of each activity and how it would address one or more of the Key Development Problems identified in subpart D.2 above.

a. Experimental-Development Project (EDP) grant (FY-1975)

This project, supported by US$300,000 of FY-1975 grant funds and two long term advisors, would have the following objectives:

i) to provide the GOB with an experience base for determining the planning and development pre-requisites and systems necessary for implementing low-cost, replicable, comprehensive rural health delivery systems in Bolivia;

ii) to facilitate the training of Bolivian administrative and planning personnel in comprehensive health planning techniques;

iii) to identify related planning information requirements as well as data collection, processing and utilization systems;

iv) to obtain baseline information and indices for future program development and evaluation; and

v) to provide early feedback information on the methodology utilized for justification and implementation of an expanded Departmental scope in the rural health delivery program.

A major portion of the EDP funds would be used to initiate an experimental demonstration project, expected to last 15 to 18 months. During this period the Bolivian and contractor staff would be gaining the experience and implementation feedback which would be used to refine the methodology for implementation on a department-wide basis in Cochabamba, Santa Cruz and Chuquisaca.

It is proposed that these activities be carried out in the eastern lowlands of the provinces north of Santa Cruz, with the administrative center being at Montero. The reasons for this choice are multiple, but principally due to the facts that the:

i) area is readily accessible and has great development potential;

ii) area is the site of AID supported colonization project;

iii) local public works committee and an ecumenical church organization wish to invest in such a health project; and

iv) existing health infrastructure would give the experimental-development project a head start unavailable elsewhere.

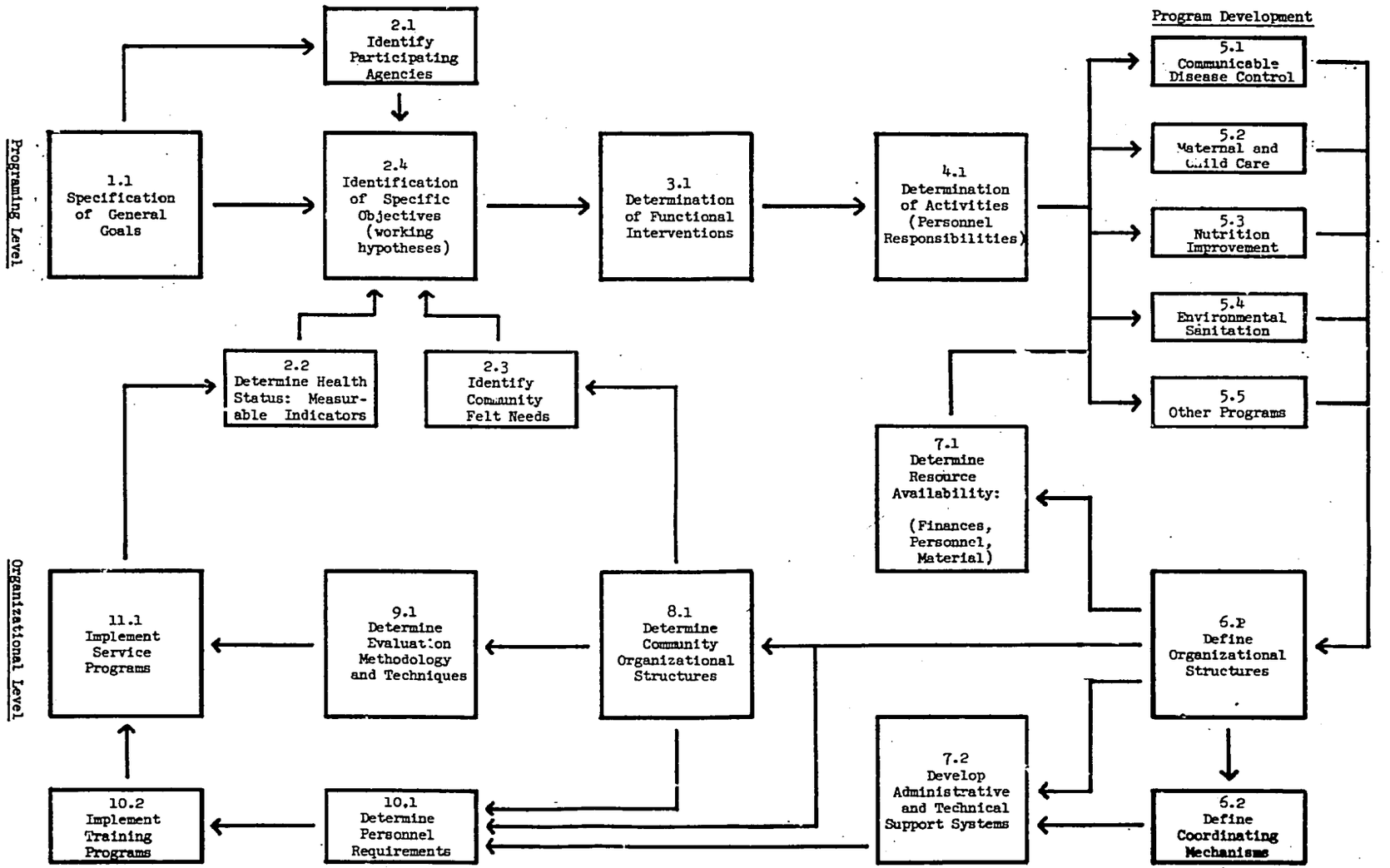
The Montero area and environs include about 150,000 "target persons" of whom an estimated 62,000 are under 14 years of age. The experimental comprehensive health measures would reach approximately 60 percent of the targets and be effected at MOH clinics. Potable water exists in some cases, and this coupled with improved communicable disease control and nutrition would provide some base-line and feedback data very early on the progress of the EDP.

Since the implementation of a comprehensive rural health system has not been attempted in Bolivia, constant evaluation will be required for informed managerial decision-making on EDP itself and for the expanded program. This will require a defined strategy involving the selection of management and planning personnel who are aware of program goals and objectives, with access to a continual flow of timely, systematic, and relevant information. This will be accomplished by financing the in-service training of central MOH personnel at the Montero site.

Concomitantly involved would be officials and personnel of the Seguro Social Campesino, Junta Nacional de Desarrollo Social, Comité de Obras Públicas de Santa Cruz, Instituto de Colonización, and United Church. This group would be able to participate, as members of a joint committee, in and contribute to the comprehensive planning and evaluation of the activity which would include an in-depth analysis, including the determination of specific health and related indicators (mortality and morbidity rates, etc.) and the identification of existing resources. On the basis of these indicators specific program interventions, functional activities and organizational structures would be determined by which the major local health problems could be alleviated.

The USAID has developed a functional approach for the above mentioned activities. It is shown in schematic detail in Figure 10.6. While these activities would have obvious immediate benefits for the area itself, the primary purpose would be to establish a planning and development methodology which can serve as a model for similar efforts on a national scale.

Figure 10.6 :- A Functional Approach to Health Program Development by Systems Analysis.



Source: Becht, James N., Consultant Report, USAID/Bolivia, 1974.

In order to obtain a replication effect in other areas of Bolivia, it will be necessary to develop an administrative and technical support system at the national, regional and local levels. Therefore, the EDP also would finance specific in-service training and seminars for MOH personnel, with the following goals:

i) for key central MOH and EDP administrators, it would involve them for the first time in problem-solving exercises based on comprehensive health planning techniques, and the joint participation of national, regional, and local counterparts in on-site planning; and

ii) for MOH health planners, it would develop problem-solving capabilities by the implementation of comprehensive health planning procedures, and analytical capability by the identification of information requirements coupled with the design of data storage and retrieval systems--which are pre-requisites to comprehensive health planning.

Finally, EDP would carry out epidemiological and vital statistics research in Montero and surrounding areas that partially would fill the considerable need for adequate, up-to-date, and reliable information on the health status of the Bolivian population. PAHO and UNICEF would be invited to participate in the project as observers and/or provide advisory services if they so desire. The Public Works Committee of Santa Cruz is expected to contribute about US$60,000 to the project.

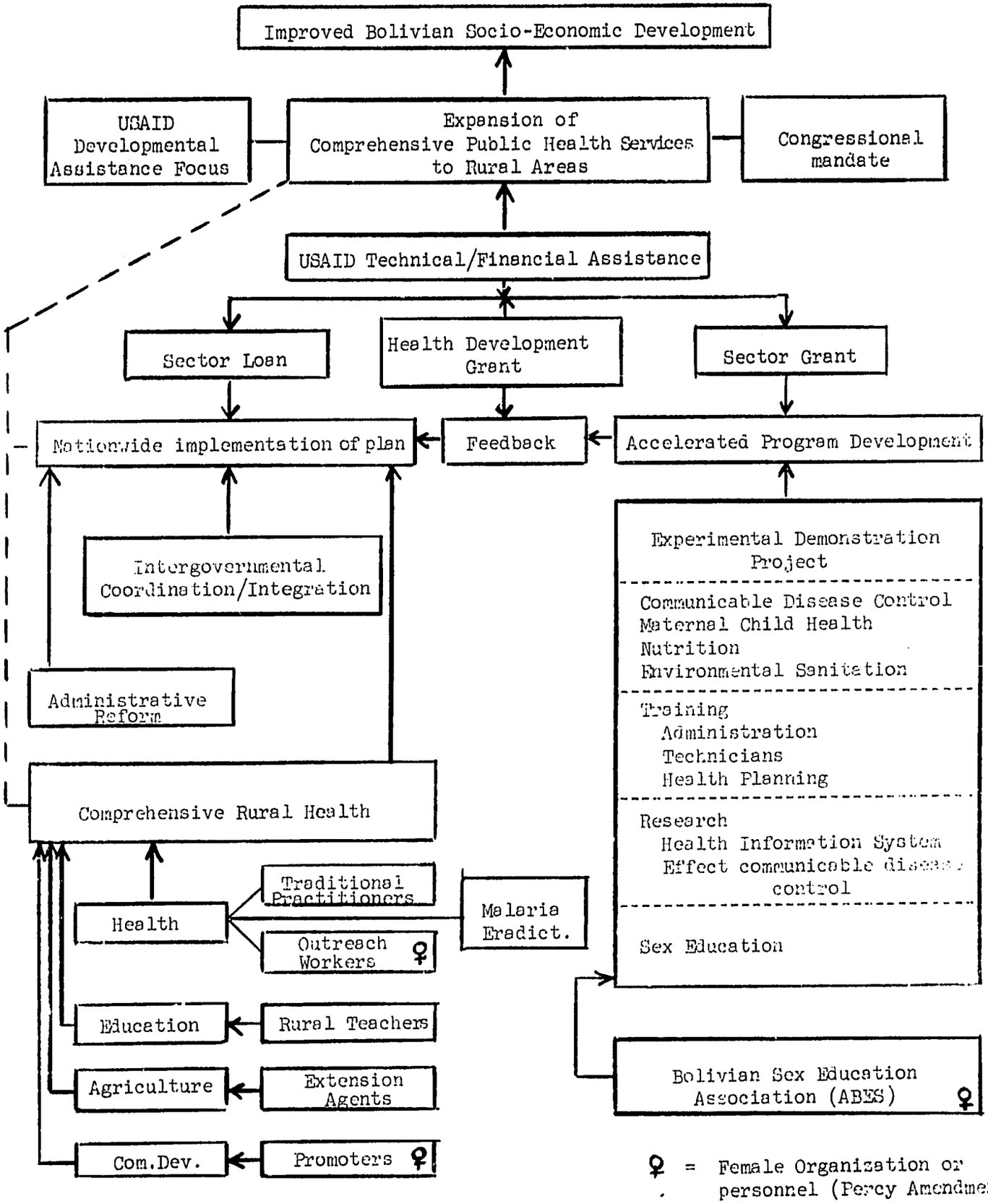
b. Rural Health Delivery Services (RHDS) grant and loan - FY-1976

The purpose of these projects would be to implement in the area of geographic focus the program set up under the EDP grant and to continue the program to improve the central MOH's ability to analyze and plan. The relationship between the EDP grant and potential Health Sector Grant and Loan is given in Figure 10.7. The operational concepts are illustrated in Figures 10.8 and 10.9. The program would be undertaken only after some experience had been gained from the EDP.

(1) Delivery system component:

The heart of the program would be a mix of services composed of the Integrated School-Community Center (ISCC), Health Center Hospital (CSH), Medical Posts (PM) and Sanitary Posts (PS), and mobile units, with the Unidad Sanitaria being responsible for their coordination and supervision. (For a description of the Unidad Sanitaria and its place in the MOH system see Chapter V). This would require the preparation or retraining and deployment of a cadre of rural outreach workers composed of: malaria eradication personnel, health promotors, practical mid-wives, and the traditional practitioners. Supporting elements would

Figure 10.7 - Schematic Outline of Mission's Rationale and Strategy for Health Sector Interventions



♀ = Female Organization or personnel (Percy Amendment)

asl 1974

Figure 10.8 - The Relationship Between USAID Inputs to the GOB Health Hierarchical Structure and Expected Health Outputs

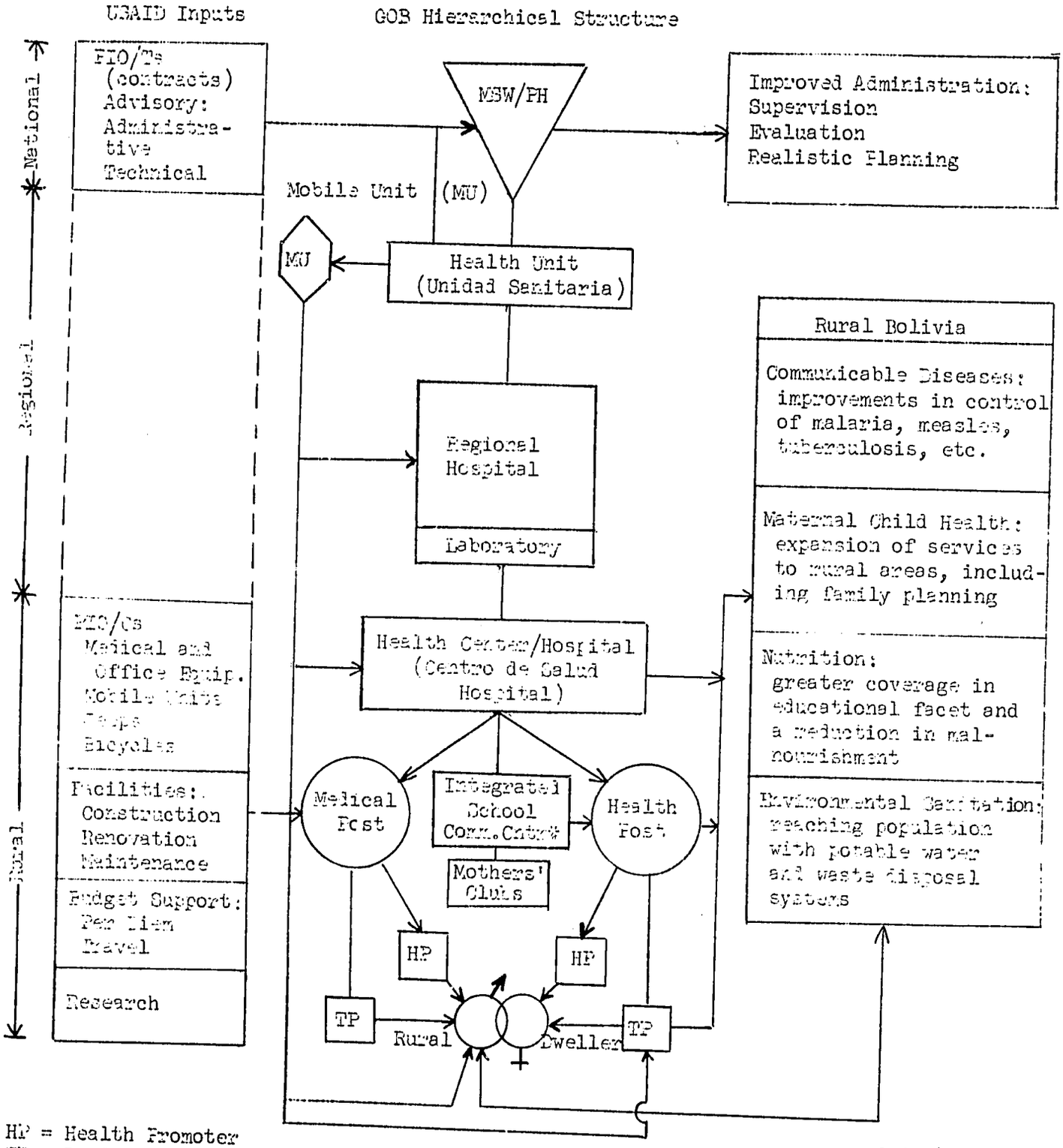
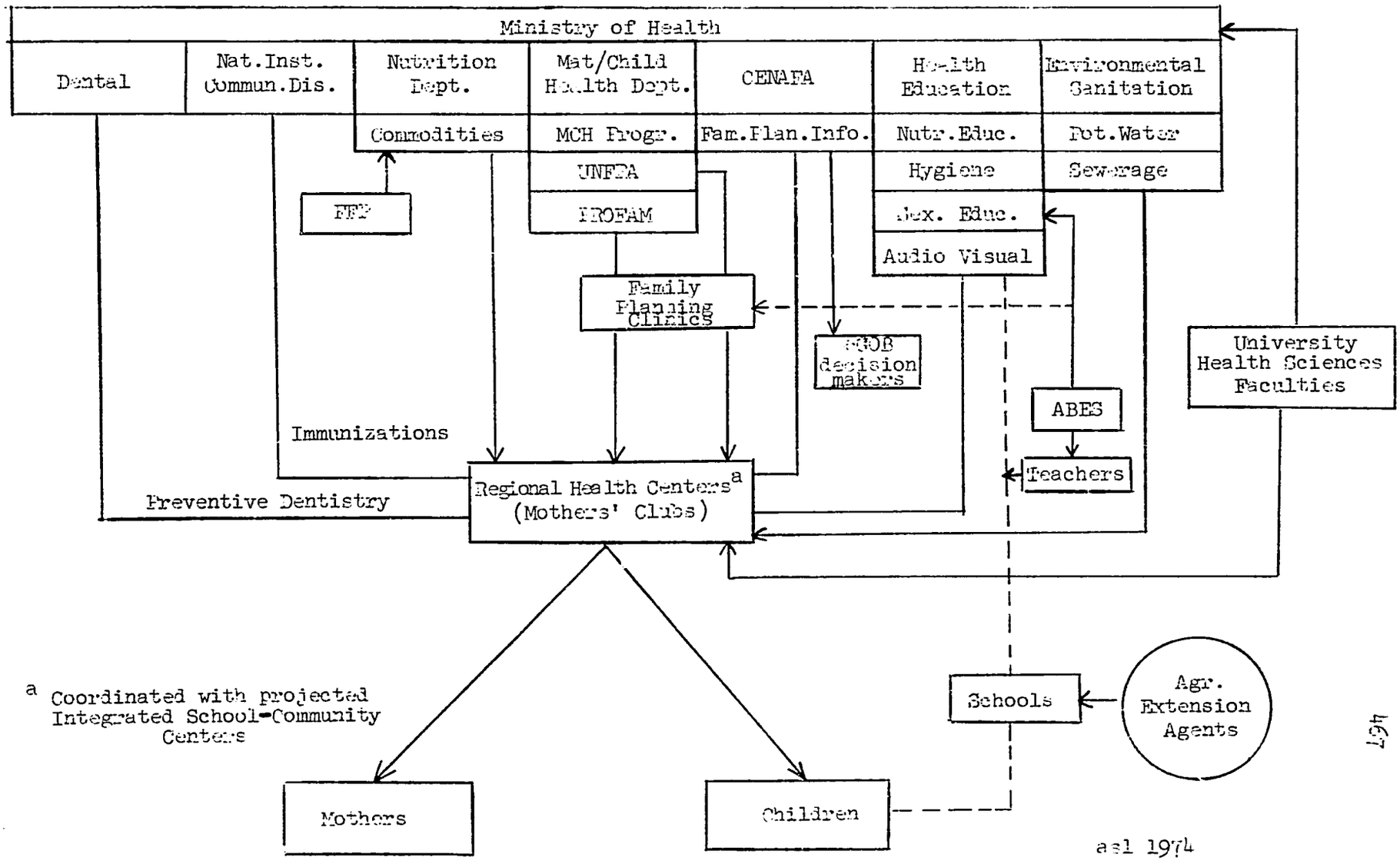


Figure 10.9 - GOB Inputs Required for a Comprehensive and Integrated Rural Health Delivery System



include commodities (such as a health kit, simple audio-visual materials, and limited transportation facilities, i.e., bicycle or motorcycle), and a financial input for training, deployment (per diem and travel costs with salaries supplies by the GOB) and supervision (namely, per diem and transportation).

The operational unit and chain of command is shown in Figure 10.8. It comprises the central level, regional health units, medical and sanitary posts--with the latter three components linked by a mobile unit. The latter, in addition to providing services in communicable disease control, maternal and child health (family planning, nutrition and health education), would also serve as a transportation unit for supervision and evaluation--elements which are virtually non-existent at present.

The system would address its efforts to the 803,000 target persons (60 percent) who live in the Departments of Cochabamba, Santa Cruz and Chuquisaca (five Provinces) or 18.9 percent of the rural population of Bolivia. It would focus on the youth component by bringing some public health services, such as communicable disease control, to approximately 334,000 children under 14 years of age, which represents 41.6 percent by this target group.

(2) Key development problems to be addressed:

(a) Improved management and comprehensive health planning

The experience gained by the MOH's national, regional and local managerial, as well as planning staffs, would be in the context of systems management. Specifically, this means a broad range of functions, the major components of which are MOH entities' coordinated and other health institutions' integrated planning and budgeting activities. This would be followed by joint institutional participation, as a committee, in the organizational, operational and evaluation phases to permit wide geographic implementation in an efficient manner. These experiences would be reinforced by the grant and loan activities of this project.

(b) Personnel and rural health institutional development

An extension of and complementary action to the development of the managerial/planning staffs mentioned would be the creation of a rural health outreach mechanism. Health outreach workers (essentially females) would be selected and trained and malaria eradication technicians would be retrained in health delivery services. These two elements would form the basic outreach team, but community development promoters, rural

extension agents, and traditional practitioners would be added whenever and wherever feasable. This team, operating out of the Unidad Sanitaria would provide health, nutritional and family planning education, plus some services (such as vaccinations) to the population, in coordination with the Postas Médicas and Sanitarias.

(c) Reorganization of technical infrastructure

The basic thrust would be the conversion of the Malaria Eradication program into a broader operation to include the control of other communicable disease (plague and perhaps Chagas' disease), the implementation of mini-vaccination campaigns, and the dissemination of health, nutritional and family planning information.

(d) Sanitary facilities improvement

The health outreach mechanism would stimulate local activities in simple environmental sanitation measures, in the areas not served by existing facilities. Elsewhere, it would provide the health education component to the rural sanitation systems.

(e) Nutrition improvement

In conjunction with agricultural and educational loan outputs health sector activities would be oriented to the reduction of protein and calorie malnourishment. An example would be support for school gardens and small animal production (rabbits, guinea pigs, etc.) to facilitate protein and calorie intake.

The dissemination of nutrition education would be expanded by the outreach mechanism and educational sector efforts.

(f) Expanded family planning services, and better maternal and child health

The dissemination of information and provision of contraceptive services throughtout the hierarchical structure of the MOH (Unidades Sanitarias, Postas Médicas and Sanitarias) supported by the mobile units which would perform similar functions would contribute materially to an expansion of family planning activities to the rural areas.

Improved maternal and child health would include well-baby clinics, postpartum control and referral services from the outreach workers mechanism.

(g) Critical disease abatement

Expanded malaria eradication efforts, and the control of infectious diseases (e.g., mini-vaccination campaigns for measles, or treatment of tuberculosis) would receive priority attention.

(3) AID inputs:

(a) The grant of about US$1.77-million would finance the provision of technical assistance in FYs 1976 to 1979.

(b) The loan of approximately US$5.0-million would finance technical assistance, the renovation of construction of health facilities, the provision of supporting commodities and supplies (drugs, vaccines, laboratory/medical equipment, and mobile units, an important component).

It is expected that these inputs will permit the MOH to convert its planning and management operation from the purely central level to the regional. This can be more readily and quickly attained by focussing on the central highland and lowland Departments which have the highest population density for the technical impact but are progressive oriented (as in the case for Cochabamba, Santa Cruz and parts of Chuquisaca) for the managerial impact.

Finally, the advisory services, training of personnel and some commodity support to be provided by PAHO and/or UNICEF would materially complement the USAID efforts in the geographical regions mentioned.

c. Rural Sanitation loan - FY-1976

One of the essential components of a comprehensive public health delivery system is environmental sanitation because the potential beneficial effects of reduced communicable diseases, improved maternal and child health and better nutrition could be neutralized or undone by poor environmental sanitation.

Consequently, our proposed strategy includes a loan of about US$6-million which is expected to reach rural communities of 2,000 inhabitants or less. The target group consists of somewhat more than 700,000 individuals or 50 percent of the population at risk, in the Department of Cochabamba and the more populated parts of the Department of Santa Cruz, and the northern provinces of the Department of Chuquisaca. The areas of implementation coincide with agricultural, education, and health sector major efforts. The coverate would be limited to centers of population with no less than 100 persons to obtain a favorable density impact.

Ideally the Rural Sanitation and Health Delivery Services loans should be implemented in the same areas, but there will be cases where the mobile unit or outreach system can reach groups too isolated for the cost efficient provision of potable water services. Probably 40 percent of the population will not be reached by either health services or environmental sanitation; and, of the remaining 60 percent, there will be an overlap of both facets in 50 percent of the cases.

The MOH would be the executing agency for the loan with the National Community Development Service (NCDS) as a participating institution. The operating arm of the MOH would be the Division of Environmental Sanitation (División de Sanidad Ambiental, DSA) which has had appreciable experience in designing, and installing small scale water systems in Bolivia. These activities will be complemented by health education measures included in the program. PAHO will provide advisory services in environmental sanitation (water supplies) and UNICEF will finance some training and commodities including a water analysis laboratory. The Canadian government is expected to donate US$1-million for water supplies for 64 communities, with 87,741 inhabitants and UNICEF will monitor this operation.

d. National nutrition program - FY-1977

Another important component of the USAID design for an effective health delivery system is nutrition. The CRHDS program has taken this into consideration, but in rather limited ways--i.e., the dissemination of nutrition education and possibly the sponsoring of local school gardens.

However, this is not intended to be nor is it a substitute for the formulation of a national nutrition program involving the coordinated efforts of the agriculture, education and health sectors. Such an effort would require a more complete study to provide substantial data for the appropriate design of the program. Thus, the latter cannot be defined fully at this time. However, the major element probably would be an investment in nutritional institutional development. This would require a loan possibly in the order of magnitude of US$3 to US$4-million to design and develop an Institute of Nutrition. The objective would be to establish a GOB institutional capability for the clinical and nutritional assessment of the maternal, infant and child component of the population and for the implementation of remedial measures. An example of the latter would be to promote the regional development of flour enrichment by the addition of soya or quinua--which have high protein contents.

In 1973, UNICEF sponsored research to help GOB define a national nutritional policy; but, excepting for the publication of the study, no additional action appears to have been taken.

e. Title II - FYs 1975-1977

Food for Peace (FFP) has been active in Bolivia for 20 years. Catholic Relief Services, with its counterpart Caritas, has distributed approximately 177,027,000 pounds valued at US$21,327,000. Of this quantity, 53,445,897 (worth US$8,512,000) were distributed during the half decade, 1969-73. The recipient categories were, in order of numerical importance: rural school feeding--breakfasts, which have been in a phase-down status since FY-1971 with termination planned for FY-1975 and lunches which have reached increasing levels, since FY-1971--national child health care, and two relatively small components, namely Food for Work and Other Child Feeding.

In the beginning, the FFP operation was strictly of a humanitarian nature as a supplementary feeding device. However, about four years ago, the nutritional education aspect attained importance and was incorporated into the program. The mechanism was the creation of Mothers' Clubs, wherein the Title II commodities which were provided served as the essential ingredient or cement that held the groups together. This facilitated the dissemination of health and nutritional education to rural women, in conjunction with the provision of rather limited public health services. However, the potential of the mechanism has not been fully recognized nor adequatly utilized. It is intended in the CRHDS to capitalize on the potential of the Mothers' Clubs by augmenting the number of existing units and tieing them, insofar as possible, to the projected Integrated School-Community Center units. This would create a more cohesive entity which could serve as a base for the rural outreach system and receive and transmit technical inputs from the agricultural, educational and health sectors--e.g., agricultural extension agents for home economics type of advisory services; rural teachers for hygiene and limited health education; plus the outreach workers for malaria eradication, community development and responsible parenthood information.

At this point in time, the vagarities of commodity prices and degree of availability do not permit prognostication on the scope of Title II inputs for the future. However, we do believe that the size and duration of the program should be tied closely to the development and implementation by the GOB of a national nutrition improvement program. We believe such a program is feasible and that there is a good chance of its adoption. Therefore, we are projecting that the value of the commodities required for this program to be about US$5.5-million for the next three fiscal years.

f. Family planning programs - FYs 1975-1977

Since 1968, the Mission has provided approximately US$1.4 million to promote institutional development in family planning. The basic objectives of the program have been to:

i) make the GOB decision-makers aware of the negative impact of accelerated population growth on the socio-economic development of Bolivia; and

ii) promote the development of a Maternal and Child Health Department in the MOH to be a base for family planning services--in the anticipation the GOB would eventually become involved.

The mechanisms used in this program have been the National Family Center (Centro Nacional de Familia or CENAFA); the MOH's Maternal and Child Health Department (MCH), and the Preventive Medicine Departments at three major Bolivian universities.

CENAFA's basic responsibilities were and are, to carry out research on Bolivian demographic and family planning questions for dissemination to GOB decision-makers and the population at large. It also has become the coordination agency for all family planning international assistance offered to the GOB.

The MCH Department was created in 1971. It became operational in a very limited way in 1974, and has been given financial assistance for starting five family planning clinics in urban areas and for the support of maternal and child health clinics in which family planning services eventually should be made available.

The University Preventive Medicine Departments attained our objectives by modifying their curriculae to include demographic/family planning subjects in order to prepare young physicians who were community-medicine oriented to serve in the future in GOB and/or private family planning clinics.

PAHO and UNFPA have been involved in the planning of future UNFPA participation in Bolivia's family planning operations. Two short-term PAHO advisors recently helped the GOB prepare a proposal for a project which would begin in 1976. It would include: financial assistance for in-service training for para-medical personnel and volunteer workers; provision of contraceptive materials and audio-visual, statistical, and office equipment; and technical assistance from the UNFPA. However, it is not yet clear whether that project will be accepted by the UNFPA.

International Planned Parenthood Federation (IPPF) and the Pathfinder Fund jointly have assisted PROFAM, (a private Bolivian family planning institution), to establish two demonstration family planning clinics in La Paz. No information is available presently as to the coverage, but it is conservatively estimated to be less than 1,500 fertile females.

Given the efforts described in earlier chapters, we believe the stage is now set for a substantial increase in the provision of family planning clinical services. The basis strategy of our activities in favor of family planning from their inception has been to assist the GOB to develop a solid base for family planning services within a Maternal and Child Health context. We believe that strategy is still valid. Thus, we shall continue through FY-1975 our limited financial support for five MOH Maternal and Child Health Clinics which provide family planning services in order to assure the continuity of the operation until the proposed UNFPA program can be initiated. We shall provide addition funding if that program does not go forward. We shall prepare with the GOB a more detailed strategy paper for family planning once the position of the UNFPA in future activities in Bolivia is clarified.

5. Role of women

The Foreign Assistance Act of 1973 calls for action which will stimulate the integration of women into national economics. It specifically states that "the right to exercise control over one's fertility-- whether and when to have a child-- is essential to improve the status of women and to enable them to participate equally in the social, economic and political life of their family, community and nation. Family planning information, education and services should be available to women to allow them to exercise this right." The MOH component of the CRHDS will meet the above requirement by providing information and services to the rural population, at the regional health units, medical and sanitary posts. The Family Planning Program will reinforce these efforts.

Since one of the outreach mechanism will be the projected Integrated School-Community Center entity, with a Mothers' Club component, this will provide a medium for continuing the promotion of female participation in health related activities. In addition, it is anticipated that most of the rural health outreach workers will be women. Then too, the program will promote the development of female physicians, and family planning/health educators for incorporation in the rural health service by offering participant training, both short-term and long-term to selected candidates from among the GOB health employees. It will also encourage MOH to hire promising female medical and health studies students for incorporation into the normal and outreach structure-- with the future goal of training these persons.

6. Financial plans and resources

The USAID and GOB financial inputs are expected to be as follows:

	(US$ 000)							
	FY-1975		FY-1976		FY-1977		TOTAL	
	USAID	GOB	USAID	GOB	USAID	GOB	USAID	GOB
Loans:								
(1) Rural Health Delivery Services	-	-	5,000	2,600	-	-	5,000	2,600
(2) Rural Community Sanitation	-	-	6,000	1,200	-	-	6,000	1,200
(3) National Nutrition Program	-	-	-	-	3,000	800	3,000	800
Sub-total	-	-	11,000	3,800	3,000	800	14,000	4,600
Grants:								
(1) Experimental Development Project	150	60	150	60	-	-	300	120
(2) Family Planning	250	200	150	300	150	500	550	1,000
(3) Health Resources Development	-	-	320	100	760	200	1,080	300
(4) Technical Support	100	-	50	-	50	-	200	-
Sub-total	500	260	670	460	960	700	2,130	1,420
PL 480 Title II (FFP)								
(1) Maternal and Child Health and Other	1,020	230	1,420	260	1,470	290	3,910	780
Total all projects	1,520	490	13,090	4,520	5,430	1,790	20,040	6,800

The above table represents the full amount of each loan project in the year the disbursements are scheduled to begin. The grant and PL 480 projects show total obligations expected in the years indicated.

7. Commitments to be sought from the GOB

a. Managerial

In support of the effective utilization of programs in the health sector, the GOB should take appropriate corrective measures to reduce and/or eliminate insofar as possible certain managerial and technical constraints. Consequently, we shall seek commitments from the Ministry of Health to use a "systems analyses" approach to health planning and concomitantly to:

(1) achieve an agreed upon division of labor among all GOB entities active in the sector;

(2) streamline its budgetary documentation by developing a design that will provide the data required for informed policy decision making;

(3) recruit its administrative and technical personnel by a merit system technique;

(4) greatly strengthen and broaden in scope its supervisory and evaluation processes;

(5) develop a health manpower policy with emphasis on the requirements for implementing a low-cost, rural health delivery system, including:

(a) the promulgation of the required legislation or decrees to permit the incorporation of traditional practitioners and outreach workers into the system;

(b) the establishment of a manpower planning unit for the sector in the Planning Office of the MOH;

(c) the development of health resources' inventories for personnel; and

(d) the incorporation of rural health outreach workers into the health delivery system.

(6) reduce the under-utilization and duplication of health facilities by:

(a) the establishment of a sector-wide facilities planning unit in the Planning Office of the MOH;

(b) the development of health resources' inventories for facilities and equipment; and

(c) the application of strategic standardization techniques including climate, cultural and infrastructure analyses.

(7) give high priority to the development of a health information system, with emphasis on:

(a) the definition and integration of vital statistics requirements;

(b) the prompt reporting and processing of epidemiological data, with priority attention to diseases with a potentially severe socio-economic impact; and

(c) the centralization of all health and vital statistics within the sector.

b. Budget

To complement the removal of the managerial constraints mentioned above, it will be important that the GOB take remedial measures to reduce and/or eliminate to the greatest extent possible certain budgetary constraints. Therefore, we shall seek commitments from the GOB to:

(1) increase the MOH budget by 17 percent of the 1974 level by 1980;

(2) give emphasis to the health requirements of the rural areas;

(3) establish balance between expenditures for preventive and curative measures which reflects the program strategy adopted; and

(4) take into consideration the need for better remuneration for trained personnel.

c. Technical program emphasis

To assure an efficient operation of the programs proposed we shall seek commitments from the MOH to employ certain technical innovations and concomitantly to:

(1) develop and expand epidemiological surveillance systems;

(2) convert its malaria eradication organization from a single-facet orientation to a multi-facet communicable disease control unit;

(3) effect an integration of communicable disease, maternal and child health, nutrition and environmental sanitation programs; and

(4) expand the dissemination of nutritional education through the lowest levels of rural health delivery infrastructure.

8. Fiscal implications of proposed programs

The total GOB counterpart to the proposed programs (including grant program) during the years CY1975-CY1979 amounts to about US$ 6.8-million. Of that amount we should estimate that approximately US$3.75-million would be additional to the level of the 1977 budget, and would be required over the six year period CY1975 through CY1980. The bulk of the counterpart would be needed in CY1977 through CY1979.

The following table projects the increase in the Treasury budget in real terms from a 1973 base. The Ministry of Health's budget is projected to maintain the same percentage of the total as in 1974. The increased budgetary requirements associated with the proposed sector program would be roughly 38 percent of the cummulative incremental increases in the years 1975 through 1979. In no year would the increase in budget support required for the program exceed five percent of the Ministry's budget.

The projection of the Treasury revenues through 1979 assumes the following factors:

(1) volume of petroleum products and exports will triple by 1978 to 150,000 barrels per day for petroleum, and continue to grow thereafter at an average annual rate of 20 percent;

(2) production and export of minerals will maintain an average annual increase of ten percent;

(3) price of petroleum will be US$13 per barrel, gas about US$0.70 per cubic feet and mineral prices will be about ten percent lower than 1974 levels; and

(4) present tax structure or rates will not be modified but rather, there will be continued improvement in tax administration.

The projection of GOB expenditures is made, in real terms at an average annual rate of 15.1 percent, reflecting increases in:

(1) salaries of ten percent (also in real terms);

(2) external public debt amortization of two percent; and

(3) current account items of six percent.

Assumptions governing expenditures are somewhat problematical with substantial deficits implied in 1977-78 which may be unreasonable. However, it is not unreasonable to expect that the GOB would meet its investment and development goals through tax measures by 1977.

GOB Treasury and MOH[a]

(Millions of constant 1973 pesos)

Year	Revenues	Expenditure	MOH	Project Requirements[b]	Percentage of Total
1973	2,425	2,822	220	-	8
1974	3,625	3,600	334	-	9
1975	3,700	4,032	351	-	9
1976	3,980	4,556	410	-	9
1977	4,438	5,148	463	20.0	9
1978	5,116	5,817	524	25.0	9
1979	5,700	6,100	549	30.0	9

a This estimate is made on basis Treasury Resources only. The MOH budget as derived from this data is distinct from Table 6.3, Chapter VI which excludes decentralized agency budgets which are governed by the MOH.

b Estimate of GOB (Treasury) Budget allocations to carry out programs in Rural Sanitation and Health Services Delivery projects not included in 1974 MOH allocations. Excluding grant related expenditures by GOB which will be extremely small.

Source: USAID/Bolivia, Economic Office, based on unpublished data of the National Treasury, 1974.

The US$6.8-million GOB contribution represents only the amounts to be provided through the GOB budget process and does not include community nor in-kind contributions. Of the total GOB contribution, approximately US$3.75 (in 1974 dollars) is to be provided as new budget appropriations in support of USAID projects. The remaining US$3-million will be covered by current budget appropriations (adjusted for inflation).

Of the US$3.75-million to be provided as new budget support of the health projects approximately US$1-million will be provided for the costs of meeting the GOB's commitments during the period CY1975-CY1979 (as distinct from direct project support). We estimate that the continuing cost of the commitments after the disbursement period will be US$0.5-million additional per year. That would be an increase in the MOH budget of approximately two percent over the budget for 1979. The increase for the MOH budget to the level shown as achieved in CY1979 would be made a commitment in itself.

Should the assumptions lying behind our overall revenue figures prove to be optimistic or should the GOB not take the fiscal measures necessary to maintain the level of expenditure anticipated, the GOB might have to increase the relative share of the budget going to the health sector in order to carry out the proposed programs. However, given the relative small amounts involved, any such shift by reason of the proposed programs would be under one percent. In view of the foregoing we believe that it is well within the fiscal capacity of the GOB to provide proper support to the programs proposed.

REFERENCES

Books

Ahlfeld, Federico E., Geografía Física de Bolivia, Editorial "Los Amigos del Libro", La Paz, 1973

Cochrane, Thomas T., Potencial Agrícola del Uso de la Tierra de Bolivia: Un Mapa de Sistemas de Tierra, Editorial Don Bosco, La Paz, 1973

Muñoz Reyes, Jorge, Geografía de Bolivia, Academia Nacional de Ciencias, La Paz (in print)

Osborn, Harold, Bolivia: A Land Divided, Royal Institute of International Affairs, (3rd. ed. rev.), London, 1964

Pamparia, Emilio, Erradicación de la Malaria, RTAC Mexico, 1966

Weil, Thomas E., Area Handbook for Bolivia, U.S. Government Printing Office, Washington, D.C. 1974

Whitaker, Morris D. and E. Boyd Wennergren, The Status of Bolivian Agriculture, Praeger, Inc., New York (in print)

Articles

Aguirre Beltran, Gonzalo, "Medicina y Magia", Colección de Antropología Social, Instituto Nacional Indigenista, Mexico, 1963

Marshall, C.S., R.E. Brown and C.H. Goodrish, "Improved Nutrition vs. Health Services as Major Determinants of World Population Growth". Clinical Pediatric, July 1971, Vol. 10, No. 7

McDermott, Walsh, "Modern Medicine and the Demographic Disease Pattern of Overly Traditional Societies: A Technologic Misfit", Manpower for the World's Health, Association of American Medical Colleges, Washington, 1966

Schrimshaw, Nevin, "Myths and Realities in International Health Planning", American Journal of Public Health, Vol. 64, No. 8, 1974

Taylor, Carl and M. Hall, "Health, Population and Economic Development", Science, 757:651, 1967

Tschopik, Harry, "The Aymara of Chucuito Perú", Anthropological Papers of the American Museum of Natural History, Vol. 44, New York, 1951

Government Documents

Bolivia. Banco Central, Boletín Estadístico del Banco Central, No. 272, Marzo, 1974

Bolivia. Caja Nacional de Seguridad Social, Bioestadística, 1972, Dirección Médica Nacional, La Paz, 1973

Bolivia. Centro de Estudios de Población y Familia, Condiciones Socio-culturales de la Fecundidad en Bolivia, La Paz, 1969

Bolivia. COMIBOL, Anuario Bio-Estadísticas, 1972, Departamento de Sanidad, La Paz, 1973

Bolivia. CONEPLAN, Estrategia Socio-Económica del Desarrollo Nacional, 1971-1991, La Paz, 1972

_____, Estudio para la Definición de una Política Nacional de Alimentación y Nutrición en Bolivia, (3 vols.), La Paz, 1973

_____, Plan Nacional de Desarrollo de los Recursos Humanos, 1969-1980, La Paz, 1969

_____, Plan Quinquenal de Desarrollo Económico y Social, 1972-1976, (Versión Global), La Paz, 1973

_____, Plan Regional de Desarrollo Económico-Social Chuquisaca-Tarija: Informe de Planificación Regional, Imprenta Tupac Catari, Sucre, 1972

Bolivia. Consejo Nacional de Educación Superior, Encuesta Sobre el Mercado Profesional, Dirección de Planificación y Estadística Universitaria, La Paz, 1973

Bolivia. Dirección Nacional de Coordinación y Planeamiento, División Política de Bolivia, La Paz, 1968

Bolivia. Instituto Boliviano de Seguridad Social, Diagnóstico Financiero del Seguro Social Obligatorio Administrado por la Caja Nacional de Seguridad Social, La Paz, 1971

Bolivia. Instituto Geográfico Militar, División Política de Bolivia, La Paz, 1968

Bolivia. Instituto Nacional de Estadística, Bolivia en Cifras, 1972, La Paz, 1974

Bolivia. Instituto Superior de Administración Pública, El Sistema de Presupuesto, La Paz, 1973

Bolivia. Ministerio de Educación y Cultura, Diagnosis Integral de la Educación, Dirección Nacional de Planificación Educativa, La Paz, 1973-1974

Bolivia. Ministerio de Finanzas, Presupuestos Generales de la Nación, (Annual), La Paz, 1967-1973

Bolivia. Ministerio de Previsión Social y Salud Pública, Informe Anual: Estadísticas de Salud, Departamento de Bio-Estadística, La Paz, 1970

_____, Informe del S.N.E.M., La Paz, 1973

_____, Plan Nacional de Salud, 1973-1978, La Paz, 1973

_____, Situación de Salud en Bolivia, La Paz, 1970

Bolivia. Ministerio de Trabajo, Estudio Sobre la Seguridad Social Boliviana, La Paz, 1969

Bolivia. Ministerio de Urbanismo y Vivienda, Corporación de Aguas Potables y Alcantarillado (CORPAGUA), Memoria Anual, La Paz, 1973

Bolivia. Servicio Nacional de Desarrollo de la Comunidad, Plan General de Actividades y Financiamiento Programado para el Año 1974, La Paz, 1974

USAID Mission to Bolivia. Estadísticas Económicas: 1973, No. 14, La Paz, 1973

U.S. Department of Defense. Interdepartmental Committee on Nutrition for National Defense, Bolivian Nutrition Survey, Washington, D.C. 1964

U.S. Department of Health, Education and Welfare. Office of International Health, Syncrisis of the Dynamics of Health: An Analytic Series on the Inter-actions of Health and Socio-economic Development, Washington, D.C., 1972

U.S. National Research Council. Food and Nutrition Board, Recommended Dietary Allowances, Publication No. 589, Washington, D.C., 1958

Bulletins and Reports

Aguirre, Alfredo, "Regionalización de Area de Influencia de las Facultades de Ciencias de la Salud de Bolivia", Publicación Final, Primer Seminario Nacional de Facultades de Ciencias de la Salud, Cochabamba, 1973

Berg, Alan, "The Nutrition Factor, Its Role in National Development", The Brookings Institute, Washington, D.C., 1973

Berg, Alan, N.S. Scrimshaw and D.L. Call, "Nutrition, National Development and Planning", Proceedings of the International Conference on Nutrition, National Development and Planning, Cambridge, Mass., 1971

Bonifaz Ponce, Miguel, "El Medio Geográfico, la Geopolítica y la Política Externa e Interna de Bolivia", Imprenta de la Universidad Boliviana Técnica de Oruro, Oruro, 1973

CELADE, Boletín Demográfico, Año IV, No. 8, Santiago, Chile, 1971

Chirikos, Thomas, et. al., Human Resources in Bolivia: Problems, Planning and Policy, Center for Human Resources Research, Ohio State University, Columbus, Ohio, 1971

FAO, "Estudio de las Perspectivas del Desarrollo Agropecuario para Sud América", PSWAO/OL, Rome, 1972

IBRD/IDA/WHO, Bolivia Water Supply and Sewerage Sector Study, La Paz, 1974

Interamerican Development Bank, Economic and Social Progress in Latin America, Annual Report, Washington, D.C., 1972

_____, Informe Final del Préstamo, La Paz, 1970

_____, "Policy in the Field of Health", GN-374, Washington, D.C., June 1972

International Labor Organization, "Labor Problems in Bolivia", Montreal, 1943

Instituto Americano de Estadística, América en Cifras - Situación Cultural: Educación y Otros Aspectos Culturales, Organización de los Estados Americanos y Washington, D.C., 1971

Llano Saavedra, Luis, Aspectos Demográficos de Bolivia, CENAFA, La Paz, 1972

_____, Fecundidad Diferencial y Anticoncepción en el Area Urbana de La Paz, CENAFA-CEP, La Paz, 1971

_____, Bolivia: Planificación Familiar, CENAFA, La Paz, 1971

Mettler, N E., "Argentine Hemorrhagic Fever: Current Knowledge", WHO Washington, D.C., 1969

Pan American Health Organization, Annual Reports of the Director, 1965, 1967-1972, Washington, D.C.

_____, Documento Básico de Referencia: Proposiciones de Cambio y Estrategias de Salud para la Década 1971-1980, III Reunión Especial de Ministros de Salud de las Américas, Santiago, Chile, 1972

_____, Official Document No. 129, June 1974

_____, "Epidemiología de la Silicosis", Seminario Regional de Silicosis, Publicación Científica No. 200, Washington, D.C., 1970

Public Administration Service, Advisory Group in Fiscal Reform, Annual Report, La Paz, 1974

Puffer, Ruth R. and Carlos V. Serrano, Características de la Mortalidad en la Niñez, Organización Panamericana de Salud, Publicación Científica No. 262, Washington, D.C., 1973

Schliessmann, D.J. and John Stivers, "Comments on Current and Future Situation of SNEM/Bolivia", Joint PAHO/AID Report, La Paz, 1974

Servicio Cooperativo Interamericano de Salud Pública, Informe de la Conferencia de Evaluación, La Paz, 1957

Slater, Charles, et al., Market Processes in La Paz, Bolivia, Research Paper No 3, Latin American Studies Center, Michigan State University, East Lansing, Michigan, 1969

Sociedad Boliviana de Salud Pública, Foro Nacional de Salud Pública, La Paz, 1973

UNICEF, Annual Report, Lima Area Office, 1971

_____, Bolivia: Programa para la Cooperación de UNICEF, Junio 1974-Mayo 1977, (4 vols.), La Paz, 1973

Unpublished

Albó, Javier, "Situación Presente de Migraciones en Bolivia", Centro de Investigaciones y Promoción Del Campesinado, 1974

Azzi, R., "CENAFA: Entidad de Asesoría y Coordinación de Programas Relacionados con la Atención de la Familia y Población Boliviana", 1974

CONEPLAN, "Coloquio sobre Problemas de Población: Conclusiones y Recomendaciones", La Paz, 1974

Centro de Rehabilitación de Niños Desnutridos de Montero, "Estudio Nutricional en Niños Escolares", Montero, 1973

Consejo de Salud de Yapacaní, "Encuesta de Salud en la Colonia de Yapacaní, Santa Cruz", 1971

Espino, Esperanza, "Informe de la Misión Realizada en Bolivia", Naciones Unidas, La Paz, 1973

Gumiel, Alberto, et al., "Campaña de Control de Enfermedades Respiratorias y Ocupacionales en la Industria en Bolivia", Instituto Nacional de Salud Ocupacional, La Paz, 1969

Gumiel, Alberto and Robert LeBow, "Encuesta Sobre Práctica Médica: Questionario para Médicos Bolivianos", Colegio Médico de Bolivia/USAID/HAD, La Paz, 1974

Montero Community Health Project, "Encuesta Demográfica, Sanitaria y Socio-Económica de la Comunidad de Montero", Montero, 1965, 1966, 1969

Naciones Unidas, Consejo Económico y Social, E/ICEF/P/L. 1602, March 1974

Picardi, A.C., "A Two-Sector Population Growth Model for Bolivia", M.I.T., Cambridge, Mass., 1972

Pinell, Luis, "Análisis y Comentarios de Algunos Indices Epidemiológicos en la Empresas Mineras: Unificada del Cerro de Potosí y San José de Oruro", INSO.

Prost, Marian D., Costumbres, Habilidades y Cuadro de Vida Humana entre los Chacobos, Instituto Linguístico de Verano, Riberalta, Bolivia, 1970

Torrico, J.O., "Factores y Recursos para la Producción de Alimentos", Thesis, Faculty of Geosciences, University of San Andrés, La Paz

Touchard, G., et al., "Resúmen de las Actividades Desarrolladas por el Servicio Cooperativo Interamericano de Salud Pública desde su Iniciación hasta su Terminación", La Paz, 1970

UNICEF, Acción de UNICEF en Bolivia, La Paz, 1974

_____, Asistencia del UNICEF al Sector Salud en Bolivia, Lima March, 1973

UNDP, Country Programme Proposal for United Nations Development Programme Assistance in Bolivia, 1972-1976, La Paz, March, 1973

USAID Mission to Bolivia, Agricultural Development in Bolivia: A Sector Assessment, La Paz, 1974

_____, "Economic Assistance to Bolivia, 1942-1974", Briefing Paper, May, 1974

_____, Education in Bolivia: A Preliminary Sector Assessment, La Paz, 1974