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HEALTH ASSESSMENT OF THE DEPARTMENT OF LA PAZ, COCHABAMBA AND SANTA CRUZ, BOLIVIA

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ABBREVIATIONS

ACEM	Malaria Control and Eradication Program
CODEX	Consorcio de Expertos Consultores
CSH	Centro de Salud-Hospital
DAN	Department of Feeding and Nutrition
INAN	National Institute on Food and Nutrition
IPV	Inpatient Visits
MCH	Maternal-Child Health Program
MOH	Ministry of Health
OPV	Outpatient Visits
PAHO	Pan American Health Organization

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INTRODUCTION

The fieldwork for this report was conducted from June 30 to August 31, 1982. The month of September was devoted to the preparation of the written report.

The USAID Mission in Bolivia is in the process of researching and preparing a socioeconomic evaluation of a region of Bolivia that has been labeled the "corridor." The corridor, roughly defined, encompasses the departments of La Paz, Cochabamba, and Santa Cruz. For this reason, the information provided in this assessment applies only to the departments of La Paz, Cochambamba, and Santa Cruz.

Data were collected by interviewing health planners, practitioners, and managers at the national level and at the regional health offices of La Paz, Cochabamba, and Santa Cruz. Despite constant labor strikes during the preparation of this report, sufficient data were available to assess the status of the Ministry of Health delivery system. Secondary sources of information were used to write this report; however, due to the paucity and inaccuracy of some data, interviews and cross-checks were necessary.

Bolivia is the fifth largest country in South America. This landlocked republic of approximately 424,000 square miles is surrounded by Peru, Brazil, Paraguay, Argentina and Chile. According to the 1976 census, the Bolivian population reached nearly 5 million people, of whom 50.7 percent are female and 49.3 percent are male. In 1980 the population was projected at 5.57 million people. Over 50 percent of the total population is Indian, the majority belonging to the Quechua or Amara-speaking cultures. About 90 percent of Bolivians profess to be Roman Catholic; however, the Catholic Church has not been a powerful political or social institution in Bolivian history. According to a 1971 survey, the top 5 percent on the income scale received almost 36 percent of total national income, and the poorest 20 percent received approximately 4 percent.[1] The majority of the higher income families are located in Santa Cruz due to the petroleum and natural gas industries. In 1979, the gross domestic product was valued at US$1.9 million according to 1970 prices, and the per capita income was estimated at US$362. In 1979, the rate of growth dropped to roughly 1.9 percent after an average growth rate of 5.1 percent during the 1974-78 period.[2] This decline in growth was provoked, in part, from a deterioration in the mining and petroleum industries, work stoppages, expanded fiscal deficits, and a rise in inflation. During the time at which this assessment was conducted, the economy was in crisis. There were severe shortages of foreign exchange, labor strikes, political unrest, wide speculation in

the floating market on the value of US dollar, and stagnant production. The crude birth rate for Bolivia has been computed at 40 births per 1,000. Depending upon which survey data and age interval are used, the fertility rate ranges from 5.5 to 6.8. There are approximately 14.7 deaths per 1,000 persons and, according to indirect calculations published by the Population Labs at the University of North Carolina at Chapel Hill, the infant mortality rate is 120 deaths per 1,000 live births.[3] This rate varies considerably depending upon the age of the mother and the survey data employed. The authors of the 1975 Health Sector Assessment for Bolivia estimate an infant mortality rate up to 250 infant deaths per 1,000 live births in rural areas of Bolivia.[4]

Bolivia can be divided into several ecological-geographic zones. The Andes, which run down the western coast of South America, broaden in Bolivia to their widest expanse. In Bolivia, the Andes branch into two major ranges, one which runs from Lake Titicaca through the department of Potosi and the other extending through the department of Cochabamba and south through the departments of Chuquisaca and Tarija. Elevations are 13,000 feet and higher and temperatures are often below freezing.

Between these two mountain ranges is a high plain extending some 500 miles called the altiplano. The average elevation of the altiplano is between 12,000 and 14,000 feet. Lake Titicaca, the highest body of navigable water in the world, and major cities such as La Paz and Oruro are located on the altiplano. The soil of the altiplano is easily eroded and the minimal rain which falls is quickly drained off. Generally the altiplano is bare of vegetation and has limited agricultural potential. In 1970, 56 percent of the population lived on the altiplano; 43 percent of the land under cultivation is located on these high plains, yet it yields only 34 percent of the nation's agricultural product.

Below the altiplano are fertile valleys found in the departments of Chuquisaca, Tarija, Cochabamba, and eastern Potosi. The Yungas in the department of La Paz and Cochabamba also can be considered as part of the valleys, although at some points the Yungas are highly elevated and descending lateral plains cannot sustain much agricultural production. Generally the valleys are warm and capable of great agricultural productivity. The valleys of the Yungas, for example, are considered to have the most fertile soils in Bolivia. The valleys comprise about 16 percent of the land, 30 percent of the population, 33 percent of the nation's cultivated land, and over 40 percent of agricultural production. Much of the area referred to as "the corridor" lies within this region.

The eastern part of the country is made up of lowlands. To the north in the departments of Pando and Beni, are tropical rainforests with average annual temperatures of 80° F and heavy rainfall in the summer. Tall hardwood trees are abundant, but much of the area is swampy due to poor drainage. Further south in the northern section of the department of Santa Cruz and parts of the department of Cochabamba are low, rolling plains with rich soil. Here annual temperatures average 75° F and annual rainfall ranges from 40 to 60 inches. The vegetation is characteristic of a semideciduous rainforest--woodlands mixed with areas of natural grasses and low vegetation. This area has not been exploited agriculturally but promises to yield a high proportion of agricultural production.

In the southeastern part of Bolivia are low, drier plains referred to as the Chaco. Temperatures are lower and precipitation less than on the more northern plains. Vegetation consists of dry forest, thin scrub, and coarse savannah grass.

II. MORBIDITY AND MORTALITY

MORBIDITY AND MORTALITY

Morbidity - General Discussion

In Bolivia, morbidity statistics are based on inpatient and outpatient records. The cause of morbidity of an inpatient is determined by the diagnosis of the individual upon discharge. These data are provided by a physician and submitted by each hospital to the regional health office for coding and tabulation. Patients who are admitted to a hospital and subsequently die are reflected in mortality statistics.

The causes for outpatient visits are recorded on individual records or on monthly logs. Outpatient data are provided by medical and paramedical personnel, depending upon which level of the health system care was delivered. If a patient visits the outpatient clinic of a hospital or a medical post, data are recorded by a physician or graduate nurse. Outpatient care provided at a health post (puesto sanitario) however, is recorded by a nurse auxiliary. Traditionally, these personnel are empirically trained and prepared to detect signs and symptons of illness but have limited capability to reach reliable diagnoses. Morbidity information recorded by nurse auxiliaries is processed differently in the regional health offices of La Paz, Cochabamba, and Santa Cruz. The regional health office of La Paz, for example, includes morbidity reported by nurse auxiliaries in its annual reports of leading causes of illness. The regional health offices of Cochabamba and Santa Cruz request monthly morbidity reports from nurse auxiliaries, but these data are not tabulated with those provided by physicians and graduate nurses working in hospitals, health centers, and medical posts.

There is a paucity of information on the prevalence and nature of morbidity among Bolivians--especially those living in rural areas. As noted in the se on on utilization, the demand for Ministry health services is te low. It is estimated that the health system attends only a small percentage of the health needs of rural Bolivians.[5] Theoretically, the rural poor should be the greatest consumers of health care services, given their high degree of risk; however, they seldom visit Ministry health facilities. The majority of illnesses are treated by the private practitioners, pharmacists, traditional healers, the family, or individual or are left untreated.

Morbidity statistics are fraught with other problems. Until the present, regional health offices employed different classification systems for causes of morbidity. In 1980, the regional office of Cochabamba applied the ninth edition of the international classification system; the La Paz regional office used the same system but added two other causes to the basic list of 55. Biostatisticians from the Santa Cruz regional office adapted an earlier edition of the international classification system to code 1981 morbidity data.

Another problem is the under-reporting of morbidity data. Among the reasons given are that records were lost in transit from a facility to the regional office, the doctor was absent from the hospital or medical post, or the clinic was not open for service. Diagnoses made by practitioners in rural areas also are not always accurate, since there is an acute lack of diagnostic equipment in rural hospitals and medical and health posts. As explained in the section on communicable diseases, most rural physicians rely solely on clinical judgment in determining the cause(s) of illness, without any laboratory verification.

Although the Ministry of Health has standardized the forms and intervals at which data are collected and coded, each regional office has followed a different schedule for editing, coding, and summarizing data. For these reasons, since 1979 there has not been a nationwide report on morbidity. Morbidity statistics from 1980 for the department of La Paz, for example, have been submitted to the regional office. Due to personnel shortages and lack of processing equipment, these data have not been tabulated. Only six months of the 1981 morbidity statistics have been tabulated and classified, but they correspond only to visits made to rural facilities. In Cochabamba and Santa Cruz, on the other hand, 1980 statistics have been edited, tabulated, and coded; however, 1981 data are not available.

Because morbidity statistics from the departments of La Paz, Cochabamba and Santa Cruz are based on different years and are reported by different types of health practitioners, it is difficult to draw comparisons. To avoid making spurious conclusions, morbidity data from each regional office will be examined separately. Discussions of morbidity patterns in each department will consider urban[6] versus rural differences, inpatient versus outpatient data, and age-specific morbidity.

Department of La Paz

The sole source of morbidity data for 1979 are hospital records; morbidity seen in outpatient services was not published. The leading causes of illness are listed in table 1. They include injuries, pregnancy complications, respiratory

diseases, gallbladder ailments, intestinal infections, and abortion-related problems. If one disaggregates inpatient visits by rural versus urban facilities, subtle differences emerge. The causes for seeking inpatient care are similar in rural and urban facilities; however, the ranking is different. In urban facilities, the leading causes of hospitalization were injuries, pregnancy complications, and abortion-related conditions. Respiratory illnesses, injuries, and intestinal infections were the three principal reasons for seeking inpatient care in rural areas. In urban and rural facilities, normal births accounted for a high percentage of hospitalizations, but only in urban areas were there a significant number of admissions due to abortion-related problems. Rural women who terminate their pregnancies and develop complications seem to prefer to go to urban hospitals or traditional practitioners. Gallbladder ailments are more commonly found among people using rural facilities. Local physicians have suggested that the prevalence of gallbladder disease may be linked to the high fat content of the Bolivian diet.

The tables that follow describe the leading causes of illness registered during the second semester of 1981. They are based on morbidity statistics provided by medical and paramedical staff working in rural inpatient and outpatient facilities. Data from urban institutions have been sent to the regional health office but are not coded or tabulated. Outpatient data were obtained from 34 rural hospitals (centros de salud-hospital CSH), 22 rural medical posts (puestos medicos) and 124 health posts; inpatient statistics were derived from patient records from 34 rural hospitals.

As shown in table 2, respiratory illnesses, ailments of the digestive tract, and injuries were the leading causes of morbidity as reported by inpatient and outpatient services of rural health facilities. Other important causes of sickness seen in outpatient clinics and posts were skeletal-muscular problems, infectious and parasitic ailments, intestinal infections, skin conditions, viral illnesses, and disorders related to the mouth and eyes. Inpatient facilities reported intestinal and urinary tract disorders as significant reasons for seeking care.

Tables 3 through 8 describe the leading causes of morbidity for six age categories in rural areas of the department of La Paz.

Summary, Morbidity - Department of La Paz

Respiratory infections were the major reason for visiting rural facilities in the department of La Paz, regardless of

TABLE 1

MAJOR CAUSES OF MORBIDITY, ALL AGES

Department of La Paz

1979

Based on Inpatient Records

Causes[a]	Number	Percentage of Total Cases
Injuries (fractures, burns, lacerations, etc.)	1,295	6.6
Pregnancy complications	1,047	5.3
Respiratory (T.B., pneumonia, etc.)	1,026	5.2
Cholelithiasis/Cholecystitis	601	3.0
Intestinal Infections	680	3.4
Abortion-related	--	2.8
Sub-Total:	5,207	26.4%
Other Causes	14,528	73.6%
Percent total cases	19,735	100%

a. Normal pregnancy accounted for 26.4 percent of inpatient visits.

Morbilidad-Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979, Division Nacional de Bioestadisticas, MPS/SP, La Paz, 1980.

age. Intestinal infections are important reasons for seeking care among children 14 years old and younger. Starting with children 5-14 years and continuing through late adulthood, injuries disable significant numbers of individuals. From an early age until old age, Bolivians living in rural areas engage in manual labor--mostly farming-related. Unsafe farming implements and equipment produce a substantial number of physical injuries. Burns, probably caused by hazardous cooking sites, also are a problem in rural areas. As rural Bolivians in the department of La Paz mature, one notes more cases of skeletal-muscular problems, digestive disorders and conditions related to child-bearing. It has been suggested that disorders of the digestive system are related to the abnormally long large intestine common to ethnic Bolivians and the Quechua and Aymara Indians. Dermatological problems and morbidity related to the mouth, gums, and jaw are problems treated in outpatient services only. Among adults 45 years and older, urinary tract disorders, circulatory problems, eye conditions, and hypertension become more prevalent.

Department of Cochabamba

The most recent morbidity data available are from 1980. These statistics are based on inpatient and outpatient visits in rural and urban health establishments. Morbidity information applies only to visits made to facilities staffed by physicians. Visits made to the nurse auxiliary at the health post (puesto sanitario) are not included. Inpatient visits occurred in one urban hospital, Viedma[7], and 18 rural centros de salud-hospital (CSHs). The facilities offering outpatient services in 1980 were one urban health center, one urban hospital, one urban polyclinic, four urban medical posts, 18 CSHs and 15 rural medical posts. The number of cases seen in inpatient and outpatient facilities is the sum of initial and repeat visits.

The leading causes of morbidity according to outpatient records were respiratory illnesses (15.8 percent), intestinal infections (7.0 percent), nutritional deficiencies (4.3 percent), eye problems (3.8 percent), nutritional deficiencies (3.2 percent), and skin conditions (3.0 percent). Of the 140,857 outpatient visits registered in 1980, 39.2 percent were made for "other reasons," such as routine exams, well-baby, etc. Comparing outpatient visits in rural versus urban facilities, one notes that respiratory illness and intestinal infections were leading causes of illness in urban and rural areas; however, intestinal infections contributed almost 50 percent more to the number of OPV in rural areas as compared with urban areas. Nutritional deficiencies, injuries, and dermatological problems also were more significant reasons for seeking outpatient care in rural facilities. Urban facilities reported eye diseases and female genital problems as important causes of

TABLE 2

MAJOR CAUSES OF MORBIDITY

Department of La Paz, 1981[a]

Rural Facilities

All Ages

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	14,302	25.6	625	17.6
Injuries	6,660	11.9	669	18.8
Digestive	5,676	10.1	351	9.9
Skeletal-muscular	3,272	5.8	--[b]	--
Other infectious-parasitic	3,185	5.7	n/d	n/d
Intestinal infections	3,030	5.4	179	5.0
Skin conditions	2,456	4.4	--	--
Mouth, salivary, glands, jaw	2,334	4.2	--	--
Viral	2,276	4.1	--	--
Eye	1,685	3.0	--	--
Urinary tract	--	--	113	3.2
Other causes	13,285	23.8	1,622	4.5
Total	55,885	100.0	3,559	100.0

a. Second semester

b. Dashes indicate that given cause accounted for less than 3 percent of visits.

Unpublished data, Unidad Sanitaria - La Paz, MPS/SP, 1982.

TABLE 3

MAJOR CAUSES OF MORBIDITY

Department of La Paz, 1981[a]

Rural Facilities

Children Under 1 Year

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	1,487	40.0	49	32.2
Intestinal infections	1,171	31.3	52	34.2
Skin Conditions	224	6.0	--[b]	--
Other infectious-parasitic	152	4.1	n/d	--
Endocrine disorders	--	--	15	9.9
Perinatal illnesses	--	--	7	4.6
Other Causes	713	18.6	29	19.1
Total	3,747	100.0	152	100.0

a. Second semester of 1981

b. Dashes indicate that given cause accounted for less than 3 percent of visits.

Unpublished data, Unidad Sanitaria - La Paz, MPS/SP, 1982.

TABLE 4

MAJOR CAUSES OF MORBIDITY

Department of La Paz, 1981[a]

Rural Facilities

Children 1-4 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	3,000	34.5	111	32.1
Intestinal infections	1,438	16.6	42	12.1
Digestive tract disorders	823	9.4	42	12.1
Other infectious -parasitic	766	8.8	n/d	n/d
Injuries	457	5.3	27	7.8
Skin conditions	375	4.3	12	3.5
Viral illnesses	349	4.0	17	4.9
Endocrine disorders	--[b]	--	26	7.8
Nutritional deficiencies	--	--	17	4.9
Other causes	1,478	17.1	52	15.0
Total	8,681	100.0	346	100.0

a. Second semester of 1981

b. Dashes indicate that given cause accounted for less than 3 percent of visits.

Unpublished data, Unidad Sanitaria - La Paz, MPS/SP, 1982.

TABLE 5

MAJOR CAUSES OF MORBIDITY

Department of La Paz, 1981[a]

Rural Facilities

Children 5-14 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	2,680	29.0	84	24.8
Viral	1,188	12.9	22	6.5
Injuries	1,089	11.8	94	27.7
Other infections-parasitic	934	10.1	n/d	n/d
Digestive	670	7.3	33	9.7
Other communicable diseases	--[b]	--	22	6.5
Dermatological	490	5.3	16	4.7
Eye conditions	315	3.4	--	--
Other causes[c]	1,871	20.3	68	20.0
Total	9,237	100.0	339	100.0

a. Second semester of 1981

b. Dashes indicate that given cause accounted for less than 3 percent of visits.

c. Ill-defined conditions comprised 3.7 percent of all OPV and 5.3 percent of all IPV.

Extrapolated from unpublished data, Unidad Sanitaria, La Paz, 1982.

TABLE 6

MAJOR CAUSES OF MORBIDITY

Department of La Paz, 1981[a]

Rural Facilities

Adults 15-44 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	5,075	21.3	270	13.2
Injuries	3,604	15.2	262	12.8
Digestive	2,682	11.3	273	13.3
Skeletal-muscular	1,533	6.4	--	--
Mouth (jaw, gums)	1,337	5.6	--	--
Other infectious-parasitic	1,089	4.6	n/d	n/d
Skin conditions	1,071	4.5	--	--
Female genital disorders	892	3.8	--	--
Abortion-related	--	--	98	4.8
Other causes[b]	6,488	27.3	1,231	60.5
Total	23,771	100.0	2,042	100.0

a. Second semester of 1981

b. Normal deliveries accounted for 18.8 percent of IPV and other obstetrical procedures produced 7.9 percent of IPV; 3.2 percent of IPV and 6.2 percent of OPV were due to "ill-defined" causes.

Unpublished data, Unidad Sanitaria - La Paz, MPS/SP, 1982.

TABLE 7

MAJOR CAUSES OF MORBIDITY

Department of La Paz, 1981[a]

Rural Facilities

Adults 45-64 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	1,559	19.8	89	17.5
Digestive	1,072	14.4	143	28.0
Skeletal-muscular	1,169	14.8	26	5.1
Injuries	1,121	14.3	64	12.5
Eye conditions	310	3.9	--[b]	--
Mouth (gums, jaw, salivary glands)	294	3.7	--	--
Urinary tract	242	3.1	23	4.5
Circulatory	--	--	19	3.7
Other causes[c]	2,098	26.7	146	28.6
Total	7,865	100.0	510	100.0

a. Second semester of 1981

b. Dashes indicate that given cause accounted for less than 3 percent of visits.

c. 2 percent of OPV and 5.9 percent OPV were made for "ill-defined" morbid conditions.

Unpublished data, Unidad Sanitaria - La Paz, MPS/SP, 1982.

TABLE 8

MAJOR CAUSES OF MORBIDITY

Department of La Paz, 1981[a]

Rural Facilities

Adults 65 Years and Older

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	501	19.4	37	22.0
Skeletal-muscular	481	18.6	--[b]	--
Digestive	334	12.9	35	20.8
Injuries	269	10.4	25	14.9
Eye conditions	137	5.3	--	--
Hypertension	81	3.1	--	--
Urinary tract	--	--	13	7.7
Endocrine system	--	--	8	4.8
Nervous system	--	--	6	3.6
Other causes[c]	781	30.2	44	26.2
Total	2,584	100.0	168	100.0

a. Second semester of 1981

b. Dashes indicate that given cause accounted for less than 3 percent of visits.

c. 6.4 percent of outpatient visits were for ill-defined reasons.

Unpublished data, Unidad Sanitaria - La Paz, MPS/SP, 1982.

morbidity whereas this is not the case in rural areas. The presence of ophthalmological services in cities rather than small towns explains why the bulk of eye problems are seen in urban facilities.

Inpatient statistics from 1980 revealed that the major cause for hospitalization throughout the department was injuries. This [cause of illness] is followed in ranking by respiratory illnesses (7.4 percent), disorders of the digestive system (6.7 percent), intestinal infections (6.1 percent), and abortions (5.7 percent). A comparison of reasons for procuring inpatient versus outpatient care suggests that nutritional, ophthalmological and dermatological problems are usually treated on an outpatient basis, whereas respiratory, intestinal, and digestive illness do develop serious sequelae which require hospital care. It also is noteworthy that 26 percent of all physical injuries and 100 percent of all abortion-related pathology were treated in hospitals.

There were no major differences in the type of morbidity treated in urban versus rural inpatient facilities. For both areas, physical injuries and respiratory ailments ranked as the first and second most common cause for seeking inpatient services. Digestive disorders, intestinal infections and abortions were also important; however, in urban areas, abortions accounted for a higher proportion of inpatient visits than in rural areas.

The tables that follow list the major causes of illnesses treated in outpatient and inpatient facilities in urban and rural areas for each age category.

Summary, Morbidity, Department of Cochabamba

Respiratory and intestinal diseases account for the majority of inpatient and outpatient visits made by children under 1 to urban and rural facilities during 1980. Nutritional deficiencies also produced a significant percentage of rural, outpatient visits and inpatient and outpatient visits in urban areas. Other illnesses treated in urban and rural hospitals were endocrine, perinatal and congenital ailments and injuries.

Among children aged 1 to 4 years, one notes similar morbidity patterns to those described for children under 1 year. Most inpatient visits in urban hospitals were caused by respiratory diseases, whereas in rural hospitals, the highest proportion of visits was due to intestinal infections.

Physical injuries began to make an impact as children grow older and become involved in various forms of manual labor. In the 5 to 14 year age group, respiratory illnesses and intestinal infections are still problematic. Nutritional deficiencies were

a significant cause for inpatient care in the city of Cochabamba; in rural areas, most nutritional problems were seen in outpatient services. Infectious/parasitic diseases were an important reason for seeking outpatient care in the city and the provinces; however, most eye conditions were seen in urban facilities, not rural ones.

Respiratory illness also plagued adults aged 15 to 44. Intestinal and skin conditions are major reasons for seeking medical care in rural areas but are less significant in the city. These urban-rural distinctions also persist among adults 45 years and older. Injuries are more frequent in rural areas compared with the city due to accidents associated with agricultural activities. The percentage of skeletal-muscular complaints seen in rural areas probably also can be explained by degree of manual labor among rural dwellers. Women in this age group, visit outpatient and inpatient facilities for deliv ries and abortion-related and genital problems. Digestive tract disorders, such as obstructions and hernias, account for a significant number of urban inpatient and rural inpatient and outpatient visits. Because of the presence of specialists in the city, most eye-related problems are attended in urban facilities.

Adults aged 45-64 years have most of their respiratory diseases treated on an outpatient basis. This may be explained by the numbers of adults who received tuberculosis treatment from outpatient clinics. The leading reason for being hospitalized in urban facilities was digestive disorders; in rural hospitals, most individuals were admitted for injuries. Another difference in morbidity in urban versus rural areas was the proportion of hospitalizations for mental health reasons in urban facilities and the number of heart conditions treated in rural hospitals. Important reasons for outpatient visits to urban facilities were eye, digestive, skeletal-muscular, female genital, and ear problems. In rural areas, skeletal-muscular, intestinal, skin, and nervous system conditions produced significant numbers of outpatient visits. Physical injuries were a major reason for procuring outpatient services in urban and rural facilities.

Respiratory diseases continued to debilitate older adults in 1980 in urban and rural areas. Skeletal-muscular problems moved up the scale of causes as rheumatism and arthritis set in. Inpatient and outpatient services saw significant numbers of old people with digestive disorders and injuries and, in urban areas, many users of outpatient services had eye-related conditions. Among the 65 year and older age group, chronic diseases begin to appear in greater numbers.

TABLE 9

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Urban and Rural Facilities

All Ages

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	22,235	15.8	1,175	7.4
Intestinal	9,802	7.0	962	6.1
Nutritional	6,058	4.3	--[a]	--
Injuries - traumas, fractures, burns, poisoning	5,559	3.9	1,965	12.4
Disorders - eyes	5,336	3.8	--	--
Other Disorders - digestive tract	4,501	3.2	1,056	6.7
Dermatological	4,196	3.0	--	--
Abortions	--	--	903	5.7
Other causes[b]	83,770	59.0	9,725	61.6
Total	140,857	100.0	15,786	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 39.3 percent of OPV were for "other reasons" (e.g., well-baby, blood tests, etc.); 4.7 percent of IPV were for "ill-defined" causes; 32.3 percent were for normal births, and 8.7 percent for "direct obstetrical causes."

Extrapolated from "Informe Estadistico Actividades, Ano 1980," U.S. - Cochabamba, MPS/SP, 1981.

TABLE 10

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Urban Facilities

Children Under 1 Year

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	3,442	18.6	52	14.9
Intestinal infections	1,500	8.1	174	50.0
Nutritional	776	4.2	20	5.7
Injuries	--[a]	--	26	7.5
Congenital	--	--	14	4.0
Other causes[b]	13,938	75.4	62	17.8
Total	18,490	100.0	348	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. "Other reasons" and "ill-defined conditions" constituted 49.4 percent of all outpatient visits.

"Informe Estadistico Actividades, Ano 1980," Departamento Bioestadisitico U.S. - Cochabamba, MPS/SP, 1981.

TABLE 11

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Rural Facilities

Children Under 1 Year

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	2,159	28.5	44	45.4
Intestinal infections	1,537	20.2	22	22.7
Skin conditions	432	5.7	--[a]	--
Nutritional	394	5.2	--	--
Endocrine/immunological	--	--	7	7.2
Injuries	--	--	4	4.0
Perinatal	--	--	3	3.1
Other causes[b]	3,062	40.4	17	17.5
Total	7,582	100.0	97	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 26.4 percent of OPV were for "other reasons."

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 12

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Urban Facilities

Children 1-4 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	3,027	18.6	63	14.0
Intestinal infectious	1,547	9.5	152	33.8
Nutritional	1,122	6.9	48	10.7
Other infectious-parasitic	556	3.4	--[a]	--
Injuries	--	--	90	20.0
Other causes[b]	10,030	61.6	97	21.6
Total	16,282	100.0	450	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 49 percent of OPV were for "other reasons," e.g., routine exams, tests.

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 13

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Rural Facilities

Children 1-4 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	2,732	19.2	44	40.4
Nutritional	2,493	17.5	6	5.5
Intestinal infection	1,862	13.1	28	25.7
Other infectious-parasitic	623	4.4	--[a]	--
Skin conditions	473	3.3	8	7.3
Endocrine	--	--	7	7.3
Injuries	--	--	7	7.3
Other causes[b]	6,023	42.4	16	14.7
Total	14,206	100.0	109	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 33.8 percent of OPV were for "other reasons."

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 14

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Urban Facilities

Children 5-14 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	794	14.5	10.2	21.6
Eye disorders	562	10.3	--[a]	--
Intestinal infection	361	6.6	65	13.8
Other infectious-parasitic	289	5.3	--	--
Ear infections	281	5.1	--	--
Injuries	265	4.8	140	29.7
Nutritional	--	--	48	10.2
Digestive	--	--	20	4.2
Skeletal-muscular	--	--	17	3.6
Other causes[b]	2,920	53.4	60	12.7
Total	5,472	100.0	472	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 30.8 percent of OPV were for "other reasons."

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 15

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Rural Facilities

Children 5-14 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	1,288	16.2	44	20.3
Nutritional	1,049	13.2	--[a]	--
Intestinal infection	641	8.0	63	29.0
Other infections-parasitic	437	5.5	--	--
Injuries	409	5.1	43	19.8
Skin	325	4.1	--	--
Other causes[b]	3,809	47.9	67	30.9
Total	7,958	100.0	217	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 24.9 percent of OPV were for "other reasons."

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 16

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Urban Facilities

Adults 15-44 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	3,248	8.8	301	3.9
Female genital	2,547	6.9	--[a]	--
Eye disorders	2,289	6.2	360	4.2
Digestive	--	--	360	4.7
Injuries	1,623	4.4	741	9.6
Abortion-related	--	--	658	8.5
Other causes[b]	27,203	73.7	5,284	68.6
Total	36,910	100.0	7,704	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 49.6 percent of OPV were for "other causes," and 3.1 percent for "ill-defined" causes; 42.4 percent of IPV were for normal births.

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 17

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Rural Facilities

Adults 15-44 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	2,629	13.8	134	4.8
Injuries	1,937	10.2	366	13.2
Intestinal	1,229	6.5	167	6.0
Digestive	1,402	7.4	128	4.6
Skin conditions	796	4.2	--[a]	--
Female genital	689	3.6	--	--
Skeletal-muscular	567	3.0	--	--
Abortion-related	--	--	139	5.0
Other causes[b]	9,770	51.4	1,834	66.2
Total	19,019	100.0	2,768	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 27.9 percent of OPV were for "other reasons", and 50.9 percent of IPV were for "normal deliveries."

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 18

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Urban Facilities

Adults 45-64 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	1,003	17.3	103	11.3
Eye disorders	660	11.4	--[a]	--
Digestive	354	6.1	240	26.4
Skeletal-muscular	343	5.9	--	--
Female genital	321	5.5	--	--
Injuries	283	4.9	165	18.2
Ears	256	4.4	--	--
Mental	--	--	32	3.5
Other causes[b]	2,594	44.6	369	40.6
Total	5,814	100.0	909	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 17.7 percent of OPV were for "other reasons";5.3 percent of IPV were for "ill-defined" conditions.

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 19

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Rural Facilities

Adults 45-64 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	732	19.3	86	20.4
Digestive	592	15.6	68	16.1
Injuries	509	13.4	101	23.9
Skeletal-muscular	318	8.4	15	3.6
Intestinal	242	6.4	36	8.5
Skin conditions	161	4.2	15	3.6
Nervous system	139	3.7	--[a]	--
Heart	--	--	20	4.7
Other causes	1,094	28.9	81	19.2
Total	3,787	100.0	422	100.0

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 20

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Rural Facilities

Adults 65 Years and Older

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	565	26.8	57	21.9
Digestive	291	13.8	54	20.8
Skeletal-muscular	218	10.4	10	3.8
Injuries	152	7.2	27	10.4
Intestinal infections	110	5.2	29	11.2
Nervous system	87	4.1	--[a]	--
Heart	79	3.8	15	5.8
Skin conditions	--	--	15	5.8
Endocrine/immunological	--	--	8	3.1
Urinary	--	--	9	3.5
Other causes	604	28.7	41	15.8
Total	2,106	100.0	260	100.0

a. Dashes indicate the given cause accounted for less than 3 percent of visits.

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

TABLE 21

MAJOR CAUSES OF MORBIDITY

Department of Cochabamba, 1980

Urban Facilities

Adults 65 Years and Older

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Eyes	314	18.8	39	9.2
Respiratory	294	17.6	53	12.5
Skeletal-muscular	128	7.7	--[a]	--
Digestive	125	7.5	81	19.1
Ears	113	6.6	--	--
Injuries	79	4.7	62	14.7
Male genital	--	--	27	6.4
Heart	--	--	17	4.0
Cerebrovascular	--	--	16	3.8
Other Causes	620	37.1	128	30.3
Total	1,673	100.0	423	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

"Informe Estadistico Actividades, Ano 1980," Unidad Sanitaria - Cochabamba, Departamento Bioestadisitico, MPS/SP, 1981.

Department of Santa Cruz

Statistics have been published on hospital morbidity reported for the department of Santa Cruz in 1979. For 1980, the data available for the department include outpatient visits; however, the information is not disaggregated as to the location of the facility to which visits were made. The 1980 statistics should be more reliable than those from La Paz and Cochabamba, as a special team from the Santa Cruz regional office with assistance from a PAHO advisor checked morbidity statistics against patient records. The information encompasses all physician visits registered in the department's five regional hospitals, 33 CSHs, 47 medical posts, and 114 health posts.

According to the 1979 hospital records, the primary cause of illness seen in urban facilities were pregnancy complications and, in rural hospitals, intestinal infections. Intestinal problems ranked as the second cause of illness in urban hospitals and pregnancy complications were the second most important reason for seeking hospital care in rural areas. Injuries and appendicitis were significant in both urban and rural hospitals. In urban areas, abortion-related problems caused significant numbers of women to be hospitalized; this was not the case in rural areas. It would appear that women preferred to go to the Percy Boland hospital in the city of Santa Cruz for obstetrical services. Rural hospitals, on the other hand, recorded digestive and gallbladder ailments as important causes of illness.

The ranking of the principal causes for seeking inpatient and outpatient care in 1980 is given in table 22. Unlike the other two departments, genitourinary disorders were a major cause of morbidity. This may be explained partly by differences in the classification systems employed. The system used in Santa Cruz groups various genitourinary illnesses, whereas the regional health offices the system used by La Paz and Cochabamba divides these illnesses into smaller categories.

Summary, Morbidity - Department of Santa Cruz

Respiratory illness was a prominent cause of illness for all age groups in 1980. Most intestinal problems occurred among children under 14 years, although a leading cause of hospitalization among adults 45 years and older was intestinal infections. Children less than 1 year saw physicians in outpatient services for skin conditions, influenza, injuries and other infectious-parasitic infections. Infants were hospitalized most often for respiratory, intestinal, perinatal and immunological/endocrine conditions, and injuries.

Children from 1 to 4 years of age also visited physicians for respiratory, intestinal, and other infectious diseases. The

proportion of visits due to injuries is higher than for the under 1 age group, as children 1 to 4 years begin walking and become more active. Nutritional deficiencies appeared more prominently in this age group; however, most problems were handled on an outpatient basis. Immunological and endocrine imbalances were seen in this age group, but among older individuals this disease category is not a significant reason for seeking medical care.

Among children 5 to 14 years old, respiratory and intestinal disorders drop in importance as physical injuries take a greater toll. In this age group, one notes the presence of skin conditions, appendicitis, problems of the urinary tract, typhoid fever, and various digestive complaints. The latter four disease categories were serious enough to warrant hospitalization.

Injuries also debilitated adults ages 15 to 44 as did genitourinary, respiratory, and digestive complaints and appendicitis. Since this age grouping encompasses women of reproductive age, one finds a significant number of hospitalizations due to normal pregnancy and abortion-related problems.

Like younger adults, individuals in the 45 to 64 age category suffered from injuries, and respiratory and digestive problems. As the aging process sets in, however, one observes a greater percentage of visits caused by chronic illnesses such as arthritis, hypertension and circulatory problems. This group of adults also was afflicted by various genitourinary and intestinal ailments.

Chronic complaints appeared more noticeably in outpatient and inpatient records for adults 65 years and older. Other problems which emerged were related to the lungs, eyes, skin, and digestive and urinary tracts. Most cases were treated by outpatient services. A significant number of hospitalizations were caused by varices, appendicitis, hyperplasia of the prostatic gland and intestinal ailments. It may be noted that varices, appendicitis and prostatic hyperplasia are not listed as causes of morbidity in the departments of La Paz and Cochabamba. The classification system used in those two departments does not include specific categories for these illnesses.

Morbidity, General Summary

Comparing morbidity statistics available in the departments of La Paz, Cochabamba, and Santa Cruz with those from other developing countries, one finds a similar epidemiological profile: a high prevalence of acute communicable disease and

TABLE 22

MAJOR CAUSES OF MORBIDITY

Department of Santa Cruz, 1980

All Ages

Outpatient and Inpatient Records

Causes	No. Visits	Percentage of Total Visits
Respiratory (TB, Bronchitis, Emphysema)	79,417	17.5
Injuries, Traumas, Fractures, Burns Poisoning	49,281	10.8
Intestinal Infections	34,537	7.6
Genitourinary	27,970	6.2
Dermatological	19,383	4.3
Parasitic/Helminths, Other Infections	17,668	3.9
Other Digestive	21,160	4.7
Other Causes[a]	204,357	45.0
Total	453,773	100.0

a. Normal births accounted for 3.3 percent of visits; routine visits accounted for 7.9 percent and 2.7 percent were due to "ill-defined" conditions.

Unpublished data, Unidad Sanitaria, Santa Cruz, 1982.

TABLE 23

MAJOR CAUSES OF MORBIDITY

Department of Santa Cruz, 1980

Urban and Rural Facilities

Children 1-4 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Respiratory	25,103	28.5	819	23.9
Intestinal	15,175	17.2	936	27.4
Injuries	11,632	13.2	449	13.1
Other infectious/parasitic	7,022	7.9	--[a]	--
Nutritional	6,481	7.4	104	3.0
Endocrine/immunological	--	--	204	5.9
Other causes[b]	22,701	25.8	908	26.5
Total	88,114	100.0	3,420	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 5.1 percent of OPV were for routine checkups, tests, etc., and 3.1 percent were made for "ill-defined" reasons; 3.3 percent of IPV were for "ill-defined" reasons.

Unpublished data, Unidad Sanitaria-Santa Cruz, 1982.

TABLE 24

MAJOR CAUSES OF MORBIDITY

Department of Santa Cruz, 1980

Urban and Rural Facilities

Children Under 1 Year

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Respiratory	34,487	33.6	693	14.3
Intestinal	14,557	14.2	2,012	41.4
Skin conditions	6,465	6.3	--[a]	--
Influenza	4,879	4.7	--	--
Injuries	4,721	4.6	145	3.1
Other infectious/parasitic	3,404	3.3	--	--
Perinatal	--	--	679	13.9
Immunological/metabolic	--	--	244	5.0
Other causes[b]	34,206	33.3	1,089	22.4
Total	102,717	100.0	4,859	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. 6.9 percent of OPV were routine checkups or tests.

Unpublished data, Unidad Sanitaria-Santa Cruz, 1982.

TABLE 25

MAJOR CAUSES OF MORBIDITY

Department of Santa Cruz, 1980

Urban and Rural Facilities

Children 5-14 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Injuries	19,587	26.3	684	21.3
Intestinal	14,970	20.1	275	8.6
Respiratory	13,458	26.3	684	21.3
Other infectious	6,741	9.1	144	4.5
Skin conditions	4,582	6.2	97	3.0
Appendicitis	--[a]	--	242	7.6
Urinary	--	--	115	3.6
Typhoid/paratyphoid	--	--	104	3.2
Other digestive[b]	--	--	96	3.0
Other causes[c]	15,047	20.2	961	30.0
Total	74,385	100.0	3,204	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. Does not include hernias or ulcers.

c. 4.4 percent of OPV were for "ill-defined" causes and 3.9 percent were for routine checkups; 3.6 percent of IPV were for "ill-defined" conditions.

Unpublished data, Unidad Sanitaria-Santa Cruz, 1982.

TABLE 26

MAJOR CAUSES OF MORBIDITY

Department of Santa Cruz, 1980

Urban and Rural Facilities

Adults 15-44 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Injuries	27,646	6.6	2,970	8.5
Other Genitourinary[b]	27,430	6.5	--[a]	--
Respiratory	17,693	4.7	1,363	3.9
Digestive[c]	13,878	3.3	1,810	5.2
Abortion-related	--	--	2,304	6.6
Appendicitis	--	--	1,200	3.4
Other causes[d]	332,712	78.9	26,921	77.2
Total	421,359	100.0	34,868	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. Does not include the following categories: illnesses of the urinar tract; hyperplasia of the prostate, salpingitis, and coforitis; an uterovaginal prolapsus.

c. Does not include ulcers and hernias.

d 8.2 percent of OPV were for "other reasons" such as routine checkups, test, etc. 42.9 percent of IPV were for normal deliveries, and 12.1 percent were for direct obstetric interventions.

Unpublished data, Unidad Sanitaria-Santa Cruz, 1982.

TABLE 27

MAJOR CAUSES OF MORBIDITY

Department of Santa Cruz, 1980

Urban and Rural Facilities

Adults 45-64 Years

(Based on outpatient and inpatient visits)

Causes	Outpatient		Inpatient	
	No. Visits	% OPV	No. Visits	% IPV
Injuries	4,483	10.8	427	9.8
Respiratory	4,088	9.9	415	9.5
Digestive[b]	3,607	8.7	729	16.7
Skeletal-muscular	3,493	8.4	148	3.4
Circulatory	2,873	6.9	142	5.5
Hypertension	1,862	4.5	160	3.4
Other Genitourinary[c]	1,213	4.4	--[a]	--
Intestinal	1,317	3.2	247	5.6
Other causes[b]	19,154	46.3	2,001	45.8
Total	41,373	100.0	4,368	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.

b. Does not include ulcers and hernias.

c. Does not include the following categories: illness of urinary tract; hyperplasia of the prostates; salpingitis and coforitis.

d 4.5 percent of IPV were for "ill-defined" causes.

Unpublished data, Unidad Sanitaria-Santa Cruz, MPS/SP 1982.

TABLE 28

MAJOR CAUSES OF MORBIDITY

Department of Santa Cruz, 1981
Urban and Rural Facilities
Adults 65 Years and Older

(Based on outpatient and inpatient visits)

Causes	Outpatient No. Visits	Outpatient % OPV	Inpatient No. Visits	Inpatient % IPV
Hypertension	1,007	9.1	104	4.6
Skeletal-muscular	1,007	9.1	--[a]	--
Digestive[b]	993	8.9	190	8.4
Respiratory	990	8.9	204	9.0
Other circulatory[c]	973	8.8	--	--
Injuries	841	7.6	184	8.1
Skin conditions	799	7.2	--	--
Eye disorders	387	3.5	--	--
Urinary	380	3.4	--	--
Varices[d]	--	--	245	10.8
Appendicitis	--	--	115	5.1
Hyperplasia-prostatic	--	--	114	5.0
Intestinal	--	--	109	4.7
Other Causes[e]	3,688	33.3	1,003	44.2
Total	11,065	100.0	2,268	100.0

a. Dashes indicate that given cause accounted for less than 3 percent of visits.
b. Does not include ulcers and hernias.
c. Does not include cardiovascular, myocardial infarcts, varicose veins or chronic heart diseases.
d Applies to lower extremities.
e. 4.4 percent of OPV and 4.9 percent of IPV were due to "ill-defined" causes.

Unpublished data, Unidad Sanitaria-Santa Cruz, MPS/SP 1982.

their secondary effects and injuries. One may anticipate that, if health statistics in Bolivia were more complete, one would find the same or similar rank ordering of diseases but a much higher volume of cases (e.g., higher prevalence and incidence rates). Morbidity statistics from the three departments in the corridor reveal similar causes for seeking health care across age groups. Relatively few Bolivians suffer from chronic diseases; most illnesses are brought on by infections and viruses.

An analysis of outpatient records from selected health facilities in the corridor (table 29) demonstrates the high percentage of morbidity caused by influenza, respiratory illnesses, skin conditions, parasites and intestinal infections, and hematological problems. At the CSH in Chipiriri and Villa Tunari, a large number of hospital admissions were attributed to intestinal, respiratory, and dermatological conditions and accidents. Twenty percent of hospital admissions to the CSH Villa Tunari were to treat burns, fractures, poisonings and other traumas. The health facilities in the Yungas (Nor and Sud) saw the same types of diseases--respiratory, gastrointestinal, infections, and skin conditions--during the first half of 1981. Accidents are not as frequent a cause for hospital treatment in the Yungas; however, data on average length of stay reveal that patients who are admitted to the hospital for tuberculosis, bronchitis, intestinal infections, typhoid fever, and traumas have relatively serious cases. It is likely that individuals from rural areas wait until their symptoms are advanced before seeking inpatient care. One may also hypothesize that self-limiting conditions such as influenza, measles and otitis media, tend to take a higher toll on children due to their tenuous nutritional status, substandard living conditions, and poor access to health services.

The humid lowlands which span the "corridor" provide an epidemiological zone somewhat different from the altiplano and valleys. Because surveillance systems are weak, there are not much data on the incidence and prevalence of tropical disease in this zone. Although the data are not forthcoming, it is probable that residents of the tropical lowlands are at a greater risk of gastrointestinal infections, leishmaniasis, dermatological conditions, yellow fever, malaria, Chagas' disease, and nutritional deficiencies.

The majority of illnesses affecting Bolivians can be reduced substantially through public health interventions, such as the introduction and use of potable water and sewage systems, improved nutrition and food handling, better family hygiene, and maternal-child health services. Presently the Bolivian public health system is accessible to individuals living in urban areas and larger towns. Bolivia's limited resources have not been stretched to the very large percentage (60) of rural inhabitants

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residing in scattered communities of less than 2,000 people.[8] It is in those areas where health services are meager that one would anticipate the highest incidences of infectious diseases.

Mortality

Hospital records and civil registration of deaths are the main sources of mortality statistics in Bolivia. The information contained in this subsection is based on a nationwide summary of causes of death in 1979. Because the methodology was uniform for all departments, the data lend themselves to comparisons.

It is estimated that only 5 percent of deaths occur in hospitals and not more than 30 percent of total deaths are recorded at the Registro Civil.[9] Deaths which are registered are not always verified by a physician, rendering the information from death certificates on cause(s) of death unreliable. One reason given for the lack of registration of deaths is unwillingness or inability of families to pay the registro's fee. Another reason may be the inconvenience of traveling to a town where there is a registro or the perceived unimportance of filing a death certificate.

Given the high proportion of women who deliver their children at home, it is reasonable to assume that the majority of neonatal deaths are never reported. A crude analysis of data from Cochabamba reveals that there may have been roughly 31,000 live births in the department in 1980 (total department population times birth rate). The regional office in Cochabamba has information on only 10,606 births, leaving a gap of roughly 20,394 unrecorded births. Given an infant death rate of between 154 and 250 deaths per 1,000 live births, the projected number of infant deaths in Cochabamba in 1980 should have been between 4,774 and 7,700. The number of deaths for which the unidad sanitaria of Cochabamba has data is 604.[10]

The age distribution of hospital deaths in urban and rural regions of Bolivia in 1979 was as follows:[11]

Age Group	Percentage Total Deaths	
	Urban	Rural
Under 1 year	19.6	21.5
1-4 years	14.9	19.9
5-14 years	4.3	6.7
15-44 years	27.3	25.5
45-64 years	18.6	14.5
65 years and older	10.6	10.4
No data	4.6	1.5

A breakdown of major causes of death or all age categories reveals a high percentage of deaths due to infectious diseases, nutritional disorders, and accidents. It is interesting to note that a leading cause of death in rural and urban areas is "heart disease"; however, the etiology or type are not given.

Leading causes of hospital deaths in rural areas of Bolivia that were not as important a cause in urban areas were meningitis, which comprised 4.1 percent of all rural deaths in 1979, and tetanus, which caused 3.8 percent of rural deaths.

Children Under One Year

In 1979 infants from the departments of La Paz, Cochabamba, and Santa Cruz died from similar causes. Diarrheal, respiratory, and bacterial diseases accounted for 54.8 percent of total infant deaths in La Paz, 50.4 percent in Cochabamba and 41 percent in Santa Cruz. Heart diseases accounted for 13 percent of infant deaths in Cochabamba, whereas in the other two departments, heart conditions were not a significant cause of death. The infant mortality rate in 1980 in urban Cochabamba was estimated at 58.5 per 1,000 live births; whereas the rate is believed to be over 200 deaths per 1,000 in rural communities. In urban Cochabamba, 48.1 percent of infant deaths were brought on by respiratory, intestinal bacterial, and nutritional diseases. The other major causes of death stem from congenital and perinatal etiologies.[12]

Children, 1-4 Years

In 1979, 86 children ages 1 to 4 years died in hospitals throughout the department of La Paz; 47.9 percent of these diseases were caused by intestinal and respiratory infections and viruses.

Hospitals in the department of Santa Cruz registered 191 hospital deaths among children in this age group in 1979. Intestinal and nutritional disorders accounted for 51.2 percent of deaths; meningitis was the cause of 6.8 percent of deaths in this age group.

Children 5-14 Years

In all three departments, a substantial proportion of deaths among children in the 5-14 age category were due to bacterial infections. Injuries caused a significant number of deaths in Cochabamba and Santa Cruz; however, in La Paz hospitals did not record physical injuries as a leading cause of mortality. Only in Santa Cruz did a substantial proportion of children die of heart diseases and meningitis. No explanations were given for these regional variations in causes of death.

TABLE 30

LEADING CAUSES OF HOSPITAL DEATHS

Bolivia, Urban and Rural

1979

Causes	Percentage Total Deaths Urban	Percentage Total Deaths Rural
Respiratory	14.9	14.5
Diarrheal diseases	8.9	9.6
Heart	7.2	10.3
Bacterial	5.7	--
Accidents	4.4	4.1
Nutritional	3.2	4.2
Other Causes	55.7	57.3
	100.0	100.0

TABLE 31

LEADING CAUSES OF HOSPITAL DEATH,

Departments of La Paz, Cochabamba and Santa Cruz

Children Under 1 Year

1979

Causes	Number Deaths	Percentage Infant Death
LA PAZ		
Diarrheal	26	21.8
Respiratory	20	16.8
Bacterial	19	15.9
COCHABAMBA		
Bacterial	12	2.6
Diarrheal	4	8.7
Heart disease	6	13.0
Respiratory	4	8.7
SANTA CRUZ		
Diarrheal	40	13.6
Bacterial	46	15.6
Tetanus	39	13.3
Meningitis	26	13.3
Respiratory	34	8.8

Extrapolated from "Mortalidad - Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1980.

Adults 15-44 Years

As the population ages, chronic diseases begin to take a toll on human life. In all three departments, heart diseases caused a significant proportion of deaths in the 15-44 age category. Infectious diseases, however, continue to cause the majority of deaths in young and middle-aged adults. Injuries also produced a significant percentage of fatalities in Santa Cruz and Cochabamba.

Adults 45-64 Years

Respiratory and heart diseases were the most frequent causes of death in 1979 in the 45-64 age group in all three departments. Cirrhosis and digestive disorders caused a significant percentage of fatalities in the department of La Paz and Cochabamba. Injuries did not produce a significant percentage of deaths in La Paz and Santa Cruz. An interesting departure from the overall pattern for this age group is the high proportion of deaths in Cochabamba in 1979 due to intestinal obstructions.

Adults 65 Years and Older

In general, people over 65 become ill and die from causes similar to those which afflict adults aged 44-64 years. One difference is that cirrhosis is not a major cause of death among this age group, whereas cancer and stroke are.

TABLE 32

MAJOR CAUSES OF HOSPITAL DEATH,

Children 5-14 Years

1979

Causes	Percentage of Total Deaths/Department		
	La Paz	Cochabamba	Santa Cruz
Respiratory	11.4	--	--
Bacterial	4.5	17.6	9.3
Injuries	--	11.7	6.9
Heart	--	--	13.9
Meningitis	--	--	9.3

Mortalidad - "Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979," Division Nacional de Estadistica, MPS/SP, La Paz, 1980.

TABLE 33

MAJOR CAUSES OF HOSPITAL DEATH,

Adults 15-44 Years

1979

Causes	Percentage of Total Deaths/Department		
	La Paz	Cochabamba	Santa Cruz
Respiratory	20.5	13.4	15.1
Heart disease	4.5	10.4	7.9
Head injuries	--	8.5	13.4
Diarrheal	--	--	4.6
Digestive	6.3	4.9	--
Cirrhosis	3.1	5.5	--

Mortalidad - "Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1980.

TABLE 34

MAJOR CAUSES OF HOSPITAL DEATH,

Adults 45-64 Years

1979

Causes	Percentage of Total Deaths/Department		
	La Paz	Cochabamba	Santa Cruz
Respiratory	15	11.7	11
Cirrhosis	6.3	10.0	--
Heart disease	15	6.6	16.5
Digestive	3.8	9.2	--
Intestinal obstruction	--	9.2	--

Mortalidad - "Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1980.

TABLE 35

MAJOR CAUSES OF DEATH,

Adults 65 Years and Older

La Paz, Cochabamba, and Santa Cruz

1979

Causes	Percentage of Total Deaths/Department		
	La Paz	Cochabamba	Santa Cruz
Respiratory	15.6	16.9	12.85
Cerebrovascular	12.2	--	--
Heart	11.1	13.8	18.6
Cancer	5.5	--	--
Intestinal obstruction	--	12.3	--
Digestive	5.5	--	--

Mortalidad - "Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1980.

III. COMMUNICABLE DISEASES

COMMUNICABLE DISEASES

Statistics published by the Division of Epidemiology of the Ministry of Health are collected at all levels of the public health system by medical and auxiliary personnel. Suspected cases of disease are reported to the regional offices of the Ministry and subsequently sent to the Division of Epidemiology in La Paz by mail and via radio. After the preliminary notification has been made, regional officials should verify reported cases and submit a second report to La Paz to correct misdiagnoses. According to the Division of Epidemiology, approximately 60 percent of suspected cases are followed up by regional medical personnel. In certain unidades sanitarias, such as Cochabamba, this percentage is much lower, as the regional office does not have the physical and human resources to do laboratory testing and perform careful clinical examinations. Cases detected at the puesto sanitario level are diagnosed by the nurse auxiliary, who has limited diagnostic skills. The auxiliary can take samples for TB, malaria, and streptococcyl testing to confirm her initial diagnosis; however, laboratory capabilities are extremely restricted and most clinical diagnoses are not subjected to laboratory testing. Supervision of auxiliaries by area physicians is spotty, causing clinical followup of suspected cases to be highly irregular.

The following list provides information on the diagnostic techniques employed in rural areas by Ministry personnel for different disease categories.

Disease Category	Diagnostic Method(s)
Plague	Laboratory testing
Yellow fever	Clinical, wait for laboratory confirmation before reported; 20 percent probability reported without lab confirmation.
Polio	60 percent cases confirmed through tissue culture samples sent outside Bolivia for testing; 3 month delay.
Diphtheria	100 percent cases confirmed by bacteriological examination.
Typhus	100 percent cases undergo serological testing.
Whooping cough	Majority cases through clinical diagnosis.

Measles	95 percent cases through clinical diagnosis.
Parotitis (mumps)	100 percent clinically
Influenza	100 percent clinically
Tuberculosis	100 percent, chest X-ray or examination of sputum
Diarrheal disease	85 percent clinically
Hepatitis	90 percent clinically
Typhoid fever	55 percent serologically tested
Blennorrhagia	40 percent laboratory tested (probably lower)
Malaria	100 percent serologically tested
Venereal disease	Testing diagnosis was not standardized until 1981; since this time prevalence of cases on the rise; much of diagnosis still clinical.
Tetanus	90 percent cases diagnosed through clinical exam.

In most cases the diagnosis is clinical, which implies that the data published by the Division of Epidemiology are fairly unreliable. Vertical programs such as malaria and yellow fever, on the other hand, have a stronger statistical base since these programs have greater laboratory and human resources and do not rely solely on clinical decisions.

Another problem with the available information on the incidence and prevalence of different communicable diseases in Bolivia is the lack of community outreach and surveillance. The majority of cases of disease reported by the Ministry of Health Division of Epidemiology are patients who contact the health delivery system seeking care. Individuals who have infectious disease but do not seek treatment through the Ministry are not reflected in these statistics. It is believed that roughly 60 percent of Bolivia's total population has access to health services, which suggests that the statistics published by the Division of Epidemiology provide an epidemiological profile for only a segment of the total population.

Vertical programs such as malaria, yellow fever, Chagas', etc., also yield more reliable incidence data since these

programs have personnel at the community level actively searching for new cases. A comparison of the number of cases of malaria reported by the Division of Epidemiology and the malaria control and eradication program (ACEM) illustrates the problem of unreliable data. According to the Division of Epidemiology, for example, 43 and 189 cases of malaria were detected to Cochabamba in 1980 and 1981. During the same two years, the more active, vertical program, ACEM, positively confirmed 1,243 and 543 cases through community surveillance, sample-taking and laboratory testing.

Another factor which weakens the reliability of the incidence rates is the irregularity of reporting from the puestos sanitarios, puestos medicos, and centros de salud-hospital. For the first four weeks of 1982, for example, 67.2 percent of the health facilities in La Paz filed reports, 87.4 percent in Cochabamba and 52.9 percent in Santa Cruz.

Table 36 presents a list of selected infectious diseases and the number of reported cases per 10,000 persons for 1980 and 1981. The major communicable illnesses as reported by the Division of Epidemiology were influenza, diarrheal diseases, tuberculosis, whooping cough, parotiditis, malaria, and venereal diseases. Unfortunately these data are not disaggregated into age groups except in Cochabamba. Statistics from Cochabamba indicate that most cases of whooping cough occur among children under 5 years of age.

Diarrheal Diseases

The Pan American Health Organization has estimated that in Bolivia, 30 percent of mortality among children between the ages of 0-4 years is due to diarrheal diseases.[13] For the department of Cochabamba, diarrheal diseases accounted for 25 percent of total outpatient visits in 1979 and 12 percent in 1980. Data from Santa Cruz reveal the following utilization of outpatient services due to diarrheal diseases.[14]

Portachuelo Hospital	14.2 percent of all outpatient visits, all ages
Yapacani Hospital	10 percent of visits for children under 6 years
Montero-Childrens'	14.2 percent of visits for children under 6 years
Camiri, province	35.1 percent of visits for children under 6 years

There were 11,882 visits in 1980 and 12,755 in 1981 made by children because of diarrheal diseases according to data

provided by 19 health facilities in Santa Cruz. Of these visits, 84 percent were made by children under 5 years old. For the children under 5, those less than 2 years of age were particularly plagued by diarrheal diseases due to the introduction of weaning foods which are not prepared or stored hygienically. The incidence of diarrheal disease and number of visits by age group are given in tables 40 and 41. These statistics demonstrate the need to target diarrheal prevention and control activities toward young children.

According to area studies[15] conducted in 1980 by the Department of Feeding and Nutrition (DAN) in the Ministry of Planning and Coordination, 44 percent of women interviewed, answered affirmatively to the question, "Did any of your children who died have diarrhea?." A study[16] conducted by the Center for Tropical Diseases in Santa Cruz in 1976 revealed that, for 36 percent of cases of diarrhea in Montero and Santa Rosita, the etiology was unknown and that 34.7 percent cases were caused by bacterial infections.

Tuberculosis

Tuberculosis, a chronic disease which can severely debilitate individuals if left untreated, accounts for 1 to 4 percent of all deaths in Bolivia. The prevalence rate of tuberculosis is calculated at 1.4 percent, and there are believed to be at least 80,000 active cases. The majority of cases reside on the altiplano. Commonly, the age group hit hardest by this disease is children under 15 years.

TB control services are available in approximately 65 percent of Ministry hospitals and 40 percent of the centros de salud throughout the country. In La Paz, a total of 32 facilities participated in the TB program, 23 in Santa Cruz, and 32 in Cochabamba. Rough calculations place the percentage of the population with access to TB services at 60 percent. The Ministry claims that in 1980, 23.2 percent of the rural population in La Paz were covered by the program, 58.4 percent in Cochabamba, and 49.8 percent in Santa Cruz. A total of 4,412 cases were diagnosed in 1980 through chest X-rays and/or bacteriological exams. Of this total, 1,611 cases are in the department of La Paz, 655 in Cochabamba, and 598 in Santa Cruz.[17] The total number of patients under treatment in 1980 (previous and new cases) was 2,573 for La Paz, 528 in Cochabamba, and 477 in Santa Cruz.

The Ministry of Health's approach to the prevention and control of tuberculosis has been multiple. It consists of institutional inoculation of newborns, immunization campaigns for children under 15 years, chemotherapy for 100 percent of detected cases, detection and confirmation of new cases, and the

TABLE 36

PREVALENCE RATES OF SELECTED COMMUNICABLE DISEASES
(Per 10,000)

Departments of La Paz, Cochabamba and Santa Cruz

1980 and 1981

	La Paz		Cochabamba		Santa Cruz	
Communicable Disease	1980	1981	1980	1981	1980	1981
Diarrheal diseases	48.4	60.3	100.0	63.9	79.8	116.8
Influenza	33.3	52.7	120.0	750.0	45.0	56.3
Tuberculosis	57.8	99.6	26.0	15.0	59.9	18.6
Parotiditis	0.86	6.4	5.0	20.0	2.9	
n/d						
Venereal disease	1.9	4.0	13.0	4.5	1.5	1.5
Malaria	0.29	1.3	9.0	2.6	30.0	10.0
Whooping cough	1.7	6.7	4.7	2.8	10.0	9.0
Measles	0.55	8.0	6.8	23.3	7.8	12.4
Blennorrhagia	0.85	1.3	6.9	4.5	4.7	7.0
Typhoid	4.0	2.5	5.5	4.0	7.0	1.7

Boletin Epidemiologico, No. 68 and 81, Division of Epidemiology, MPS/SP, La Paz, 1981 and 1982.

TABLE 37

MORTALITY FROM SELECTED INFECTIOUS DISEASES
Bolivia and Departments of La Paz, Cochabamba and Santa Cruz
1979

Location	Number Deaths	Percentage Total Deaths
BOLIVIA - URBAN		
Diarrheal diseases	239	8
TB	206	7
Pneumonia	195	7
Other bacterial illnesses	154	5
BOLIVIA - RURAL		
Diarrheal diseases	62	9
Pneumonia	59	9
TB	44	6
Tetanus	25	3
LA PAZ - DEPARTMENT		
TB	72	9
Diarrheal diseases	57	7
Pneumonia	56	7
Other bacterial illnesses	44	5
COCHABAMBA - DEPARTMENT		
Pneumonia	40	7
Bacterial illnesses	39	7
Diarrheal diseases	36	6
TB	34	6
SANTA CRUZ - DEPARTMENT		
Diarrheal diseases	97	10
Pneumonia	68	7
Bacterial illnesses	67	6
TB	61	6
Meningitis	45	4

"Mortality - Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1980.

TABLE 38

HOSPITAL ADMISSIONS FOR SELECTED COMMUNICABLE DISEASES
Department of La Paz, Cochabamba and Santa Cruz
1979

Department	Number of Admissions	Percentage Total Admissions
LA PAZ - URBAN		
TB	485	3
Diarrheal diseases	386	2
RURAL		
Diarrheal diseases	312	5
Pneumonia	273	4
TB	268	4
COCHABAMBA - URBAN		
Diarrheal disease	505	4
RURAL		
Pneumonia	229	6
Diarrheal diseases	138	3
Paratyphoid/Salmonellosis	125	3
Typhoid fever	124	3
TB	95	2
SANTA CRUZ - URBAN		
Diarrheal diseases	1,513	6
RURAL		
Diarrheal diseases	1,004	7

"Morbilidad - Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1980.

eventual integration of TB control activities with other primary care services. During 1980-81 progress was made in this program. New cases were detected through proper diagnostic procedures, cases were placed under control regimens, and over 50,000 neonates and 101,000 children were immunized.

Venereal Disease

Very little information is available on the incidence or prevalence of venereal diseases. According to statistics published by the MSP/SP's Division of Epidemiology, various forms of venereal disease (blennorrhagia included) ranked as the sixth most common communicable disease. In 1980 there were 1,531 reported cases of VD in La Paz, 407 in Cochabamba, and 513 in Santa Cruz; in 1981 the number of cases was 814, 696, and 50, respectively. To date surveillance systems have been poor to nonexistent for this disease. The Unidad Sanitaria of Cochabamba is beginning to survey the prevalence of VD in urban areas. It has been reported but not confirmed that in some rural areas of Cochabamba (near Capinota and Aiquile) the prevalence of venereal disease is extremely high.

Malaria

Malaria does not take a toll on human productivity and life to the degree that tuberculosis does; however, it is a communicable disease which, if left uncontrolled, can adversely affect approximately 40 percent of Bolivia's population. Its effect on pregnant women and malnurished children can be severe. Due to climatic and ecological conditions, over two-thirds of Bolivia territory is potentially malarious. The three affected zones are the valleys, Chaco and the Amazon. Due to ineffective vector control and surveillance activities in the late seventies, there was a marked rise in the prevalence of the vectors and the disease. With the inflow of P.L. 480, Title III resources, which were invested in intradomiciliary spraying and surveillance, the prevalence of malaria in Bolivia has diminished.

In 1980 there were 7,639 cases in the three departments; the following year the caseload dropped to 3,648. Overall since 1980 there has been a 40 percent decrease in the incidence of malaria (see table 42). The majority of cases are traced to the vector P. vivax, whose main focal point is in the department of Tarija. There is a small percentage of cases of falciparum malaria, which can be life threatening[18], whereas vivax malaria is not. The P. falciparum vector, however, is not found in the corridor but is concentrated in Guayaramerin in the department of the Beni. In 1981 23.5 percent of total cases of malaria were found in Santa Cruz; 8.5 percent in La Paz; and in the Department of Cochabamba 5.5 percent of total cases were detected. Table 43 describes the focal areas for the parasite P. vivax and the incidence of malaria in the corridor.

TABLE 39
DISTRIBUTION OF DIARRHEAL DISEASES BY AGE GROUP,
Santa Cruz
1976

	0-5	6-11	12-23	24-35	36-42	48-59	Total
Etiology not demonstrated	8	12	21	6	2	3	52
Bacteriological	9	10	13	11	4	3	50
Parasitological	1	1	3	6	3	3	17
Parenteral	6	8	10	1	0	0	25
Total	24	31	47	24	9	9	144

"Estudio de diarreas agudas en ninos menores de 5 anos en Montero y Santa Rosita," Boletin Informativo del CENTROP, Vol. 2, No. 5, 1976, p. 19.

TABLE 40

PREVALENCE AND INCIDENCE OF DIARRHEAL DISEASES

(Based on Ambulatory Visits)

Rates per 1000 children

Unidad Sanitaria-Santa Cruz

Age Groups	Prevalence	Incidence
Year - 1980		
Less than one year	167.4	119.2
1-4 years	41.8	30.1
5-14 years	8.1	5.6
Year - 1981[a]		
Less than one year	167.2	138.7
1-4 years	44.9	36.6
5-14 years	6.5	5.0

[a] (Based on 6 months reporting)

"Situacion de las Enfermedades Diarreicas en el Departmento de Santa Cruz 1980-1981," Division Materno-Infantil Regional Santa Cruz, Unidad Sanitaria-Santa Cruz, 1981.

TABLE 41

CHILDREN'S VISITS TO MINISTRY HEALTH SERVICES

DUE TO DIARRHEAL DISEASES

Department of Santa Cruz[a]

1980 and 1981

Year and Ages	Number of Visits	
	Urban	Rural
1980:		
Under 1 year	1,889	3,309
1-4 years	1,770	3,013
5-14 years	518	1,383
1981:		
Under 1 year	4,307[b]	1,245[c,d]
1-4 years	4,171[b]	1,414[c,d]
5-14 years	997[b]	623[c,d]

a. Only 19 of 52 health facilities reporting.

b. Increase in visits in 1981 explained by shift in data collection from regional office of Santa Cruz to maternal-child health division in 1981.

c. Based on 6 months of reporting.

d. No data available on provinces of Velasco and Sandoval.

"Situacion de las Enfermedades Diarreicas en el Departamento de Santa Cruz 1980 - 1981," Division Materno-Infantil Regional Santa Cruz, Unidad Sanitaria - Santa Cruz.

Chagas' Disease

In its acute stages, Chagas' disease can be diagnosed by fever, malaise, and inflammation and, in advanced cases, life-threatening sequelae include cardiac damage and meningoencephalitis. Chagas' is transmitted to humans via infested bugs, especially triatoma, which deposit infectious protozoa in conjunctiva, mucous membranes, or skin wounds. In Bolivia the vector, triatoma infectans, thrives in the valleys and lowlands and potentially can affect 80 percent of Bolivia territory and 45 percent of the population.

Area studies have revealed varying rates of vector infestation and disease incidence. Household surveys in Irpa (Cochabamba) and Santa Rosa (La Paz) revealed 43 percent positive serums. In a barrio of Santa Cruz, Santa Rosita, a 30 percent infestation rate was computed. CENETROP, a research and treatment center for tropical diseases, has conducted prevalence studies in the Department of Santa Cruz. Table 44 summarizes CENETROP's research on acute Chagas' and the infestation rate of the vector triatoma.

At present the Ministry of Health does not have special activities to arrest the spread and severity of Chagas' disease. Through the Title III programs, house searchers for triatomes are being conducted and suspected victims are subjected to electrocardiograms and serology exams. At this stage it is difficult to calculate incidence rates of this disease; however, the rates shown in table 44 indicate a high prevalence in certain areas of Bolivia. Of interest will be the data which are currently being collected by the Percy Boland hospital in Santa Cruz on the incidence of congenital Chagas'.

TABLE 42

BLOOD SAMPLES TAKEN AND NUMBER POSITIVE CASES OF MALARIA

Cochabamba, La Paz and Santa Cruz

1979-81

Location/Year	Blood Samples Taken	Positives
1979		
Cochabamba	19,397	620
La Paz	13,009	2,768
Santa Cruz	19,817	2,311
1980		
Cochabamba	21,683	1,243
La Paz	15,869	2,312
Santa Cruz	30,079	4,084
1981		
Cochabamba	27,581	543
La Paz	16,288	839
Santa Cruz	30,207	2,302

P.L. 480, Title III, Annual Report, 1981, p. 145.

TABLE 43

FOCAL AREAS OF VECTOR P. VIVAX AND INCIDENCE OF MALARIA

Cochabamba, La Paz and Santa Cruz

1981

Department	Province	Incidence Rate
Cochabamba	Carrasco	12.1 percent
	Mizque	23.0 percent
	Campero	56.2 percent
La Paz	Larecaja	24.2 percent
	Nor Yungas	24.2 percent
	Sud Yungas	17.7 percent
Santa Cruz	Vallegrande	23.5 percent
	Ibanez	8.0 percent
	Florida	30.7 percent

Servicio Nacional de Malaria,"El Problema de Malaria en Bolivia," MSP/SP, March 1982, Map 10.

TABLE 44

PREVALENCE OF CHAGAS' DISEASE AND PRESENCE OF INFECTED VECTOR
Santa Cruz
1981

Area/Province	Prevalence	Infestation, triatoma	Morbidity/ cardiac
TRIGAL/Villegrande	42.0%	37%	11.7%
CHACO/Western Cordillera	70.5%	70%	9.5%
LLANO/Ibanez	52.7%	26%	12.3%

Interview with Dr. Balderama, epidemiologist, Center for Tropical Diseases, Santa Cruz, July 29, 1982.

IV. NUTRITIONAL STATUS OF BOLIVIAN CHILDREN

NUTRITIONAL STATUS OF BOLIVIAN CHILDREN

Nutritional Status

In the previous section on mordibity and mortality, statistics were presented on reported cases of nutritional deficiencies treated in inpatient and outpatient facilities. In addition, the Bolivian Government conducted special studies to gain a better understanding of the extent and nature of malnutrition among Bolivia's children. In 1981, the National Institute of Food and Nutrition (INAN) spearheaded a national survey which included the nutritional status of children 6 to 59 months old.[19] A random sample of 5,880 children drawn from six diverse sampling zones of Bolivia revealed retarded growth among a large percentage of children. In urban areas, depending on location, 27.1 percent to 45.8 percent of children had low anthropomorphic values and 35.1 percent to 56.3 percent of rural children had below normal growth. These low values on the Waterlow scale indicate chronic malnutrition, mostly due to protein--calorie deficiencies. Malnutrition was observed among children as young as 6 months; however, the greatest prevalence of malnutrition was discovered in the 1 to 2 year age group. This group is most vulnerable due to the introduction of weaning foods, which are not always in adequate supply, and young children's high suspectibility to infectious diseases -- especially diarrhea.

Rural children from families of low socioeconomic status and those living on the altiplano were especially affected by poor dietary practices. Approximately 50 percent of rural children under 5 years suffer from chronic malnutrition and many never reach normal height. Urban children fare better than their rural counterparts, however, children living in large towns on the altiplano had the lowest values of all urban children. When weight for age scales were employed, the greatest deficits were found among children 12 to 23 months.

The study also revealed that acute malnutrition and Vitamin A deficiency are not widespread on a national scale. There was, however, a prevalence of night-blindness, a disease caused by the lack of Vitamin A, of 2.4 percent in rural Santa Cruz and 1.9 percent in urban Santa Cruz.

In 1981, a national study was conducted to determine the prevalence of goiter among Bolivian school children.[20] A random sample of 547,540 children was drawn from three strata--children living in cities, in towns of 2,000 to 20,000 inhabitants, and those living in rural communities of under

2,000 residents. The survey revealed a 60.8 percent prevalence of goiter among this population. Girls 12 years and older had the highest prevalence (65.8 percent). The most common form of goiter discovered (99.8 percent) was diffuse while 0.2 percent of the sample had nodular goiter.

In the corridor, the department of La Paz had an overall prevalence rate of 61.6 percent with a prevalence rate for rural school children of 55.9 percent. Roughly 64 percent of the children studied in the department of Santa Cruz had goiter, and in rural Santa Cruz, there was a 68.7 percent prevalence rate. The Department of Cochabamba had a prevalence of 58.5 percent, and in rural communities, 70.1 percent of the children studied had goiter. The chief etiology of this disease is iodine deficiency.

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TABLE 46

PREVALENCE OF GOITER IN
SELECTED RURAL BOLIVIAN COMMUNITIES

1981

Location	Prevalence Rate (Percentage)	
La Paz		
Santa Fe, Nor Yungas	70.9	
Ocobaya, Sud Yungas	70.8	
Santa Cruz		
Torno, Ibanez	90.9	(Grade II - 36.4)
Los Tajibos, Ibanez	68.9	
Mineros, Santiesteban	54.8	
San Carlos, Ichilo	72.9	(Grade II - 14.3)
Buen Retiro, Ichilo	74.3	(Grade II - 19.3)
Trigal, Vallegrande	77.2	(Grade II - 17.8)
Cochabamba		
Tiquipaya, Quillacollo	90.5	
Higuerani, Capinota	85.3	(Grade II - 13.2)
Pisorga, Carrasco	83.1	(Grade II - 9.5)
Tiraque, Carrasco	54.3	
Pto. Villarroel, Chapare	64.6	
Arani, Arani	55.2	
Ucurena, Jordan	37.8	
Santa Rosa, Arce	60.8	
Aiquile, Campero	74.2	(Grade II - 5.2)

Vera, Ruth, et al., "La prevalencia de bocio endemico en la poblacion escolar de Bolivia", Ministry of Planning and Coordintion, INAN, La Paz, 1981.

V. UTILIZATION OF THE PUBLIC HEALTH CARE SYSTEM

UTILIZATION OF THE PUBLIC HEALTH CARE SYSTEM

Data presented in table 47 illustrate the low level of utilization of health services in the departments of La Paz, Cochabamba and Santa Cruz. The average number of inpatient and outpatient visits per individual in 1980 in the department of La Paz was between 0.22 and 0.17; in the department of Cochabamba the average number of visits in 1981 was 0.2 visits/person and in the department of Santa Cruz the average was between 0.86 and 0.64 per person. These rates fall significantly below the goal of at least two outpatient visits per year per person stipulated by the Pan American Health Organization (PAHO). According to the Bolivian Ministry of Health, children under one year of age should use outpatient services at least three times a year. Bolivian infants visit Ministry of Health facilities only between 0.9 and 1.65 times per year.

Another indicator, discharges per year, points to the underutilization of Bolivian hospitals. PAHO recommends 10 discharges per 100 persons as a reasonable target for Latin America. In the department of La Paz, the ratio was 1.4 discharges per 100 population; in Cochabamba, it was 2 per 100 for 1980; and in Santa Cruz, there were roughly 7 discharges per 100 persons in 1981.

Although Bolivia has one of the lowest hospital beds to population ratios in the hemisphere, more beds are not required. Tables 48, 49 and 50 demonstrate that in various provinces of La Paz, Cochabamba, and Santa Cruz, occupancy and admission rates are very low. More beds will not improve utilization and productivity; however, enhanced management, more consistent staffing patterns, better interpersonal relations, and more resources would stimulate demand for public health care services.

The variables affecting utilization of Ministry health services were identified in the 1975 Health Sector Assessment (USAID/Bolivia). These determinants are applicable in 1982. Some of the factors which seem to depress demand for services in rural areas are (1) lack of confidence in Western medicine; (2) medical care is poorly delivered due to lack of resources and the incongruity of staff; and (3) health services are inaccessible because of geographic, economic, and cultural-linguistic barriers. According to the 1975 Assessment, cost did not seem to be a major deterrent to the use of health services. At present, however, Bolivia is experiencing a serious economic crisis; wages cannot keep up with prices and the public health system is severely under-budgeted. Health

consumers can feel this economic squeeze. Hospitals are without essential drugs and supplies. Individuals requiring surgery and other procedures must procure commodities at private drugstores before being treated. Operating rooms lack equipment: X-ray machines need film, developers, and other accessories; and supplies are scarce.

Inpatient Utilization Rates

A superficial analysis of occupancy rates of rural hospitals suggests that hospitals managed by nongovernment groups are more frequently used. These institutions usually maintain a stock of drugs, have more permanent staff, and are better equipped and managed. CSH Saavedra (Maryknoll), Jorochito (Sisters of Charity), Reyes-Balderas (Methodists), and San Martin de Porres (Dominicans) in the department of Santa Cruz are examples of rural hospitals run by nongovernment groups whose occupancy rates are over 50 percent.

In rural hospitals of Cochabamba, occupancy rates are uniformly low, as is the admission rate per 1,000 inhabitants (table 49). Rural hospitals tend to be underequipped which may explain, in part, low utilization rates. As noted in the section on ancillary services, rural hospitals in Cochabamba are not equipped to do diagnoses or surgery. In urban areas, admission and occupancy rates are higher as there is a higher concentration of human and physical resources in the city.

The availability of rural beds does not seem to affect admission rates (e.g., Punata has the highest ratio of rural beds to population but an occupancy of 17.7 percent) since the lack of diagnostic and curative equipment and supplies prohibits the proper delivery of care. Of all provinces, Chapare attends a relatively higher ratio of people; nevertheless, utilization rates are low (17.45 percent). CSH Quillacollo had the highest number of admissions of all rural hospitals as it is located in an important commercial nexus; occupancy rates were kept down, however, due to short average lengths of stay (2 days). Urban institutions in Cochabamba had substantially higher lengths of stay (e.g., Hospital Viedma - 15 days), whereas the average length of stay for rural centers was 3 days. Among the suggested reasons for the differences in the length of inpatient stays in urban versus rural hospitals are: (1) more complicated cases are referred to urban centers; (2) urban hospitals are inefficient and make patients wait for diagnostic procedures, test results, etc.[21]; (3) rural people resist being kept hospitalized; and (4) the inability of the rural CSH to deliver inpatient care for conditions requiring other than custodial or routine care.

There are four Ministry hospitals in the province of Nor Yungas (department of La Paz) with a total of 59 beds (table 50). Overall the occupancy rate for the province is low (37.5

TABLE 47

UTILIZATION RATES FOR INPATIENT AND OUTPATIENT SERVICES

Departments of La Paz, Cochabamba and Santa Cruz

	La Paz	Cochabamba	Santa Cruz
Total Population	1,465,078 ('76)	776,333 ('80)	710,724 ('76)
Total Visits	320,880 ('80)	156,643 ('80)	610,434 ('80)
Total OPV[a]	299,070 ('80)	140,857 ('80)	557,447 ('80)
Total IPV	21,810 ('80)	15,786 ('80)	52,987 ('80)
Average Visits Per Year by Age Group			
- 1 yr	n/d	.9	1.65
- 1-4	n/d	.34	
- 5-14	n/d	.07	.40
- 15-44	n/d	.20	.86
- 45-64	n/d	.11	.68
- 65+	n/d		.70
Rural Dweller	0.17		.36
Urban Dweller	0.28		.4
Person (regardless age or residence)	0.22/.17[b]	0.2	0.86/.64[c]

a. For La Paz, this includes visits made to the puesto sanitario, for Cochabamba and Santa Cruz it does not include visits to puestos.

b. The first figure (0.22) was calculated using 1976 census figures, whereas the second was computed using 1981 population estimates.

c. 0.86 was calculated using 1976 census data, and 0.64 was calculated according to 1982 projections.

Unpublished data, National Division of Statistics, MPS/SP, 1982; "Informe Estadistico Actividades, Ano 1980," Dept. Bioestadistico, U.S.-Cochabamba, 1981; Unpublished data, U.S.-Santa Cruz Division of Planning, MPS/SP, 1982; "Resultados del Censo Nacional de Poblacion y Vivienda, 1976," Instituto Nacional de Estadistica, Vol. 7, La Paz, 1981.

percent), however, the hospitals in Caranavi and Coripata have higher rates (50.2 percent and 66.8 percent respectively). Caranavi had a high volume of inpatients, given the modest size of the hospital (23 beds). Officials with the unidad sanitaria claim that Caranavi is receiving a significant number of migrants from the altiplano. These patients are cut off from their traditional sources of care (diviners, bone-setters, and herbalists) and, upon entering an unfamiliar ecological zone, easily contract tropical and other infectious diseases.

In the province of Sud Yungas, there are a total of 71 beds distributed among three hospitals. Utilization rates are fairly low; although for the centro de salud-hospital Irupana, the occupancy rate is slightly higher. The reason for the difference between occupancy rates at the CSH Chulumani (27.4 percent) and CSH Irupana (44.5 percent) is not apparent, for both have between 30 and 40 beds, surgical capability, and functioning X-ray machines. One difference, however, is that the hospital in Urupana is administered by Colombian nuns, whereas the Chulumani facility is run by the Ministry of Health.

Outpatient Visits

Utilization of medical services in the department of Cochabamba in 1980 was well below the standard recommended by the Pan American Health Organization of at least two outpatient visits per individual per year. The average number of ambulatory visits per person in Cochabamba ranged from 0.4 in the province of Mizque to 0.06 in the provinces of Arce and Campero.[22] In addition to the reasons for low utilization discussed earlier, it is noteworthy that Campero and Arce are provinces with very dispersed populations. The hospital in Aiquile (Campero) attracts people from the town, but those living outside of Aiquile are hampered by poor roads and considerable distances. Sacaba, the capital of the province of Chapare, on the other hand, has a dense population and is a commercial nexus. Of all rural hospitals, the one in Sacaba had the highest volume of outpatient visits in 1980. Officials from the Cochabamba regional office contend that seasonal farmers working elsewhere in the Chapare prefer to wait until they travel to Sacaba on market days to use outpatient services rather than to use facilities in the areas in which they work.

Total outpatient visits for peripheral clinics in the city of Cochabamba (Condebamba, Cerro Verde, Huayra Kasa and Temporal) had less than 50 percent of the number of visits registered at an urban parish clinic, Calacala, administered by the Maryknoll nuns. The Cerro Verde clinic, for example, had one physician working five half-days per week and produced 2,525 visits. The volunteer physician at Calacala works three-half days per week and had greater productivity; 10,925 people came

through its doors in 1980. As suggested earlier, clinics with private resources and management deliver better and more expedient care since these facilities are less plagued by chronic shortages of diagnostic and treatment materials. It also has been observed that poor patients feel that they will be treated more humanely at a private health facility.

In the Nor and Sud Yungas, utilization rates for outpatient services were low in 1981; the average number of visits per person from the Nor Yungas was 0.2 while in the Sud Yungas it was slightly higher--0.25 visits. CSH Caranavi produced the highest volume of outpatient visits in the province of Nor Yungas (3,260) and, in the Sud Yungas, Irupana hospital had roughly 3,135 ambulatory visits in 1981.

Santa Cruz residents, on the average, make less than one ambulatory visit per year. The provinces with relatively higher utilization rates in Santa Cruz were the same ones with greater inpatient activity (e.g., Ibanez, Santiesteban and Caballero). Ibanez has a high concentration of health facilities and consequently higher utilization rates. The presence of various nongovernment groups in Santiesteban and Caballero may explain, in part, the comparatively higher demand for outpatient services in these two provinces.

Utilization of Dental Services

In 1980 there were 34,493 dental visits recorded in the unidad sanitaria of Cochabamba. Of these visits 52 percent were for consultations, 29 percent were to extract teeth, 7.5 percent were for treatment, 8 percent were for obturations, and the remaining 3.5 percent of visits were for oral hygiene and other reasons. Roughly 51 percent of the visits occurred in urban facilities, and the other 47 percent were made to rural hospitals or medical posts. Only 12 operations were performed in 1980, all of which occurred in the Viedma Hospital in the city of Cochabamba. Aside from general consultations, the majority of rural visits were made to have teeth extracted. Residents of rural areas tend to contact the health care system when their teeth are severely decayed and they are pulled. Another reason for the high percentage of extractions is that rural dental facilities are very limited and the most expedient procedure is an extraction.

In the unidad sanitaria of La Paz, there were a total of 46,969 dental visits in urban areas, 92,483 in rural areas, and 24,991 school children were seen by a Ministry dentist. The number of dental visits in urban La Paz was 43,509 in 1981. During this year, there were 79,946 rural visits and 22,265 school visits. Dental visits conducted on school premises usually allow the dentist to do quick mouth examinations and to teach children methods of oral hygiene. An administrator of a rural hospital in the Department of La Paz observed that the

TABLE 48
UTILIZATION OF INPATIENT SERVICES
Santa Cruz
1981

Province	No. of Functional Beds	Functional Beds/1,000 Inhabitants	Total Admissions	Admission per 1,000 Inhabitants	Occupancy Rates
Ibanez	836	1.7	29,816	62.8	66.3
Warnes	12	0.3	392	10.0	43.7
Velasco	113	4.3	1,353	51.6	63.4
Ichilo	61	1.2	1,503	28.8	28.4
Chiquitos	78	2.2	1,053	29.0	44.4
Sara	43	1.3	1,197	35.5	27.0
Cordillera	107	1.7	1,405	23.0	22.8
Vallegrande	51	1.8	741	25.8	22.6
Florida	13	0.5	61	2.5	6.4
Santiesteban	164	1.4	6,308	52.9	34.6
N. de Chavez	74	2.0	1,719	47.5	24.8
A. Sandoval	26	2.8	--	--	--
Caballero	44	3.3	773	57.8	60.1
	(1)	(2)	(3)	(4)	(5)

Unpublished data, Division of Planning, U.S.-Santa Cruz, MPS/SP, 1982.

TABLE 49

UTILIZATION OF INPATIENT SERVICES

Department of Cochabamba

1980

	Total Beds	Beds/1,000 Inhabitants	Total Admissions	Admissions/ 1,000 Inhabitants	Occupancy Rate[a]
Cercado	419		11,833		70
Hospital Viedma	266		4,269		63.2
Maternidad	7		6,182		84.0
Pediatria	79		1,382		62.8
Campero	20	0.5	282	8.2	14.8
CSH Aiquile					
Chapare	50	0.8	1,156	18.6	17.45
CSH Colomi	6		49		6.0
CSH Chipiriri	12		238		13.8
CSH Sacaba	17		391		14.8
CSH V. Tunari	15		478		35.2
Capinota	12	0.47	134	5.2	7.2
CSH Capinota					
Jordan	13	0.46	269	9.6	16.3
CSH Cliza					
Carrasco	17	0.34	169	3.4	7.5
CSH Pocona	3		27		7.0
CSH Tiraque	6		53		7.9
CSH Totora	8		89		7.7
Ayopaya	17	0.28	126	2.1	7.35
CSH Independencia	10		94		12
CSH Morochata	7		32		2.7

Table 49 continued

Mizque	12	0.41	117	3.9	8.2
CSH Mizque					
Punata	40	1.1	552	14.5	17.7
CSH Punata					
Quillacollo	29	0.35	815	9.9	22.7
CSH Quillacollo	23		697		30.3
CSH Sipe Sipe	6		118		15.1
Arce	7	0.22	179	5.7	24.1
CSH Tarata					
Arani	18	0.44	128	3.1	6.8
CSH Arani					

a. Occupancy rates for the province are an average of the rates of the CHSs within each province.

b. Provinces without hospital beds: Tapacari and Arque

Extrapolated from "Informe estadistico Actividades," Depto. Bioestadistico, Unidad - Sanitaria, Cochabamba, 1981.

TABLE 50

UTILIZATION OF INPATIENT SERVICES

Provinces of Nor and Sud Hungas, La Paz

1981

Province/ Facilities	Total Beds	Beds/1,000 Inhabitants	Total Admissions	Admissions/ 1,000 Inhabitants	Occupancy Rate
Nor Yungas	59	0.9	1,386	22.1	37.5
CSH Borg	19		490		27.5
Caranavi	23		730		50.2
Coripata	7		80		66.8
Coroico	10		86		5.5
Sud Yungas	71	1.2	824	14.6	35.9
CSH Chulumani	38		402		27.4
CSH Irupana	30		422		44.5
CSH Palos Blancos	3		--		--

Extrapolated from "Diagnostico de la Situacion de Salud," Regional Planning Office, Unidad-Sanitaria, La Paz, MPS/SP, 1981.

number of dental visits in rural facilities may be underreported since rural dentists frequently charge for visits without reporting them. This practice allows the dentist to generate some extra income.

Statistics on the utilization of dental services in Santa Cruz are not disaggregated into urban and rural visits. In 1980 there were 1904 outpatient visits for the entire department. The majority of the visits (64 percent) were made by adults, 15-44 years of age. Twenty-nine people were hospitalized in 1980 for dental care; the majority of them (72 percent) were between 15-44 years old. A possible reason for the relatively lower utilization of dental services in Santa Cruz is the relatively higher number of private dentists who practice on Ministry of Health premises. Enterprising dentists work out of or near Ministry facilities and provide their own equipment and supplies and attend patients. No utilization statistics are available for this group of dentists.

Utilization of Maternal-Child Health Services

A description of the Ministry of Health maternal-child health program (MCH) provides some insight into utilization patterns and the quality of utilization data. The MCH program does not operate in all health facilities, only those listed in Annex A. In rare cases does the MCH program function at the puesto sanitario (health post) level. Puesto auxiliaries attend women and children; however, these services are not formally incorporated into the MCH program and therefore are not reflected in the statistics presented in this section. At participating centros de salud hospital (CSH) and puestos medicos (PM), the staff physician manages the MCH program. Ideally, MCH services should be offered as a series of interventions (e.g., nutrition, health education, potable water) to improve the survivability of young children and the health of fertile women. In practice this integrated approach is seldom achieved.

The utilization of services offered through the MCH program is low and uneven considering the number of potential beneficiaries and the high degree of pregnancy and infant risk found in Bolivia. It is hard to determine just how low utilization is since the size of the catchment area for each delivery unit is not given (e.g., the number of pregnant women in the district of the rural hospital of Corocoro). The lack of reliable census data for each health district or areas makes calculations of the average number of visits per women and child conjectural. In 1981, for example, the CSH Rurrenabaque registered five well-baby visits. While this figure is low it is unclear how low since the number of infants living in Rurrenabaque in 1980 is not given. The MCH Division of the Ministry of Health does have, however, statistics on the total

TABLE 51

UTILIZATION OF OUTPATIENT SERVICES

Department of Cochabamba

(Based on Physician Visits)

1980

Province/ Facility	Total No. Visits per Facility	Total No. Visits per Province	Average No. Visits per. Inhab. per Province
Cercado		68,681	3.50
Centro de Salud	35,765		
PM Condebamba	1,516		
Cerro Verde	2,525		
Huayra Kasa	1,484		
Temporal	365		
INET		6,772	
Clinica Sucre	2,7[illegible]		
Hosp. Maternidad	9,714		
Hosp. Pediatria	5,475		
Hosp. Viedma	18,646		
Hosp. Broncopulmonar	661		
Campero		1,978	0.06
CSH Aiquile	1,978		
Arani		1,702	0.04
CSH Arani[b]	1,027		
PM Vacas[c]	675		
Arque		473	0.02
PM Arque[c]	473		
Chapare		20,604	0.33
CSH Coloni	2,300		
Chipiriri	2,160		
Sacaba	6,381		
V. Tunari	5,603		

Table 51 continued

Province/ Facility	Total No. Visits per Facility	Total No. Visits per Province	Average No. Visits per. Inhab. per Province
Chapare (cont'd.)			
PM Pto Villarroel	841		
Ivirgarzama	1,195		
14 de Septiembre	2,124		
Punata		3,343	0.1
CSH Punata	3,343		
Quillacollo		9,365	0.11
CSH Quillacollo	4,207		
Sipe Sipe	1,535		
PM Suticillo[c]	701		
Tiquipaya	1,931		
Vinto	991		0.03
Arce		1,965	0.06
CSH Tarata	1,965		

Province/ Facility	Total Med. OPV Facility	Total Med. OPV Vis./Prov.	Average No. Vis. Nhn. Bov.
Tapacari		788	0.3
PM Tapacari[b]	788		
Capinota		2134	0.8
CSH Capinota	2,134		
PM Santivanez	n/d		
Jordan		3,852	
CSH Cliza	5,270		0.14
PM Ucurena	1,339		
Chilligchi	243[a]		
Carrasco		5,242	0.11
CSH Pocona	462		
Tiraque	1,789		
Totora[c]	660		

PM Pasorapa	614
Pojo	566
Chimore	1151

Province/ Facility	Total Med. OPV Facility	Total Med. OPV Visits/ Province	Average No. Visits Inhab. Bolivia
Ayopaya		2,191	0.04
CSH Independ.	715		
Morochata	1,315		
PM Cocapata[c]	161		
Mizque		1,051	.41
CSH Mizque	1,051		

a. Only 7 months of activity reported.
b. Only 10 months of activity reported.
c. Only 11 months of activity reported.

Extrapolated from "Informe Estadistico de Actividades, Ano 1980," Departamento Estadistico, U.S.-Cochabamba, 1981

TABLE 52

UTILIZATION RATES FOR SELECTED PROVINCES

INPATIENT AND OUTPATIENT VISITS

Province	Total Population	Year	Total Visits	Year	Average No. Visits/Pers
Nor Yungas, La Paz[a]	62,591	81	12,610	81	0.20
Sud Yungas, La Paz	56,157	81	13,050	81	0.25
Chapare, Cochabamba	62,107	80	20,604	80	0.33
Ibanez, Santa Cruz[b/c]	316,410	76	166,590	81	0.53
Warnes, Santa Cruz	30,916	76	6,055	81	0.20
Ichilo, Santa Cruz	37,793	76	16,481	81	0.44
Sarah, Santa Cruz	28,519	76	6,859	81	0.24
Cordillera, Santa Cruz	54,252	76	13,612	81	0.25
Vallegrande, Santa Cruz	30,291	76	11,657	81	0.38
Florida, Santa Cruz	21,390	76	43,397	81	0.55
Santiesteban, Santa Cruz	78,616	76	43,397	81	0.55
Caballero, Santa Cruz	13,099	76	6,981	81	0.53

a. Total outpatients for the Nor and Sud Yungas are estimates; figure were calculated by doubling the total number of visits for the second semester of 1981.

b. Population for Santa Cruz for 1981 is higher than the number giver in this table; therefore, the ratio of visits to population is lo in reality.

c. For Santa Cruz, total outpatient visits includes medical and "oth visits whereas, for Cochabamba, visits to nurse auxiliary are excluded.

number of potential beneficiaries and the number of women and children seen by the program in 1980 (tables 53 and 54).

From tables 53 and 54, it is clear that among all subgroups (e.g., urban children less than one year), less than 50 percent of potential beneficiaries were reached in 1980. New mothers in urban and rural areas in all three departments are especially low users of MCH services. Rural children and pregnant women also benefited less from the existence of this program. The percentage of women and children seen in the city of La Paz is low considering the fact that these patients have better access to Ministry health services than do rural inhabitants. The presence of a variety of other service deliverers such as the social security clinics and private practitioners may explain why relatively few urban women and children used Ministry MCH services in 1980.

It is important to note that the number of "actual" beneficiaries may have been inaccurately calculated. For this number to be correct, the doctors at rural and urban facilities participating in this program would have to keep meticulous records of the name and identification number of each patient. Given the inexperience of doctors in recordkeeping, the problems with a flow of information from the delivery unit level (e.g., puesto medico) to the regional or national offices, one may suspect that patient identification numbers were duplicated or deleted. In the department of La Paz, for example, there were a total of 21,235 "new" visits for children under 1 year. The number of children under 1 year covered by the program ("actual" beneficiaries) was 1,606. If these statistics are correct, this would mean that each of the 1,606 children reached by the program made an average of 13.2 visits in 1980. Such high utilization on the part of a minority of the potential users is very improbable; it is more likely that the total number of actual beneficiaries in the department of La Paz is underestimated.

Prenatal, postnatal and pediatric visits for the MCH program are displayed in tables 55 and 56. For each type of patient, (e.g., pregnant women, new mother, infant, etc.), the visit is classified as new or repeat and preventive or curative. Each new episode of illness, regardless of whether it is manifest in the same person during a given month, is counted as one new visit. If a child visits a CSH in May with diarrhea and later in the month with measles, this is counted as two new curative visits. Preventive visits refer to standard prenatal or postnatal checkups and well-baby or child visits. The Ministry recommends that expectant mothers have one prenatal visit per trimester and three postpartum visits. For children, the established norm suggests four checkups for infants, three checkups for children 1 through 3 years and two annual checkups

for children over 4 years of age. It is clear from the statistics presented in this section that the Ministry is far from achieving this goal. In urban areas where women have relatively better access to health services, the average number of visits per pregnant woman or new mother is more than 25 percent below the Ministry's goal. From table 57 one notes that the average number of prenatal and postpartum visits made by rural women from Santa Cruz is extremely low. The lack of accessibility to primary care services, particularly in the eastern part of the department, is a major problem.

Tables 55 through 57 demonstrate that there is less of a demand for preventive care among rural women and children (note "normal" women and "well" child). Since rural women are accustomed to delivering their children at home, they have less of an incentive to see a physician for prenatal care or to bring the newborn for a checkup unless disturbing symptoms appear. Also working against the appropriate use of prenatal services are cultural attitudes surrounding illness, social barriers between indigenous women and physicians who do not speak Quechua or Aymara, reservations about treatment received from the public health system, and economic disincentives. The few women who seek prenatal care usually do not return for the desired two followup visits; only in urban La Paz do women tend to have one prenatal visit per trimester. It is interesting to note that pregnant women with health problems seldom return for a followup visit. Either their conditions are self-limiting or, if the women remain ill, they seek inpatient care, nongovernment health care providers, or choose to stay at home.

In each of the three departments certain puestos and centros are used more frequently by women and children. MCH officials identified several factors which may enhance the acceptability of these facilities: (1) nongovernmental groups are responsible for administration; (2) the physician is dedicated and develops rapport with the communities; (3) the community is more organized and has been brought more into decisionmaking about health services; and (4) available services have been well advertised. The relatively higher utilization of services in CSH Colquiri, for example, is attributed to the presence of nuns who provide greater continuity, efficiency, and, in some instances, concern for the needs of the rural poor.

Three centros in the Chapare administered by religious orders attend a significantly higher number of women and children (Chimore, Chipiriri, and Ibuelo).

In many facilities there has been little effort made to promote MCH services, nor are special hours or days assigned to care for women and children. In many cases a program has been created on paper without the necessary allocation of resources

and administrative support to enable an integrated set of services to be delivered in the rural areas. The staff physician in Pucarani, for example, recognizes the importance of a MCH program but is without the time and material resources to implement the program. Another problem which adversely affects utilization is the absence of the physician. Monthly centro and puesto records reveal one or two months per year when activities have been suspended due to the absence of the physician.

Another characteristic of the MCH program is the fluctuation in the number of visits within a given year for a given facility. In 1981, for example, the staff of the CSH Morachata observed a jump in well-child visits for the 5-14 age groups from zero in April to 296 in July. A few possible explanations for these fluctuations in demand are: (1) food was distributed during pediatric visits for several months (e.g., CSH Charazani, 1981); (2) there were outbreaks of communicable illness (e.g., measles, CSH Pucarani, August 1981) and (3) the physician made school visits to immunize and examine children (e.g., CSH Guaqui, 1980, ages 5-14).

TABLE 53

POTENTIAL AND ACTUAL BENEFICIARIES OF MCH SERVICES

WOMEN

1980

	Pregnant Women			New Mothers		
	Potential[a]	Actual[b]	Percentage	Potential	Actual	Percentag
Bolivia						
Urban	61,077	21,257	35	44,527	3,427	7
Rural	47,414	11,676	25	26,345	1,636	6
La Paz						
Urban	28,662	5,917	21	25,796	413	1
Rural	8,829	1,517	17.2	7,946	95	1
Cochabamba						
Urban	13,138	4,176	32	1,432	493	3
Rural	20,084	3,665	18	3,640	325	8
Santa Cruz						
Urban	14,947	4,194	35	13,452	1608	12
Rural	21,559	255	4	19,403	272	1

a. Potential beneficiaries refer to the total number of pregnant women and new mothers living in a given urban or rural area during 1980; actual refers to the number of women who received medical care through the Maternal Child Health program.

b. According to the Unidad Sanitaria of Cochabamba, the actual number of pregnant women reached in rural areas was 1,138 and the number of new mothers (rural) was 141.

Unpublished and untabulated data, Division of Maternal Child Health, MPSSP, La Paz, 1980.

TABLE 54

POTENTIAL AND ACTUAL BENEFICIARIES OF THE MCH PROGRAM

CHILDREN

1980

Department	Potential[a] Beneficiaries	Actual Beneficiaries	Percentage Reached
		Children Under 1 Year	
La Paz			
Urban	19,490	514	2.6
Rural	6,004	1,092	18.0
Cochabamba[b]			
Urban	8,931	4,212	45.2
Rural	16,374	1,326	8.1
Santa Cruz			
Urban	10,164	1,415	14.0
Rural[b/c]	14,660	535	3.6
		Children 1-4 Years Old	
La Paz			
Urban	71,656	3,084	4.3
Rural	22,074	1,292	5.8
Cochabamba			
Urban	32,846	2,898	8.8
Rural	60,226	2,668	4.4
Santa Cruz			
Urban	37,368	845	2.2
Rural	4,398	421	9.5
		Children 5-14 Years Old	
La Paz			
Urban	147,898	1,817	1.2
Rural	45,561	2,287	5.0

Table 54 continued

Department	Potential[a] Beneficiaries	Actual Beneficiaries	Percentage Reached
Cochabamba			
Urban	67,796	1,347	1.9
Rural	124,266	1,897	1.5
Santa Cruz			
Urban	77,127	249	0.3
Rural	111,244	379	0.2

a. Potential beneficiaries refer to the estimated number of children living in a rural or urban areas; actual beneficiaries are children who were attended by the Ministry's Maternal-Child Health program in 1980.

b. Alternate data published by the Unidad Sanitaria of Cochabamba on potential and actual beneficiaries in rural areas yield the following levels of coverage:

	Potential	Actual	Percent Reached
Children under 1 Year	16,374	475	2
Children 1-4 Years	60,226	889	1
Children 5-14 Years	124,266	655	—

c. These statistics are based on 9 months (January-September) of activity.

Unpublished and untabulated data, Division of Maternal-Child Health, MPS/SP, 1982.

TABLE 55

UTILIZATION BY PREGNANT WOMEN AND NEW MOTHERS

1980

	NORMAL				ILL			
	Prenatal		Postnatal		Prenatal		Postnatal	
	New	Repeat	New	Repeat	New	Repeat	New	Repeat
La Paz								
Urban n=8	5,939	12,385	413	106	446	616	72	15
Rural n=5	1,607	1,938	93	9	217	23	58	7
Cochabamba								
Urban n=6	4,176	3,031	493	51	274	148	138	25
Rural n=26	3,081	737	281	80	446	75	146	26
Santa Cruz								
Urban n=13	4,151	2,958	1,613	182	796	55	499	55
Rural n=11	262	6	70	6	59	1	11	1

n = number of participating facilities.

Unpublished data, MPSSP, Division of Maternal Child Health, La Paz, 1980.

TABLE 56
UTILIZATION BY CHILDREN UNDER 15 YEARS
1980

	Well Child						Sickness Present					
	Under 1 Year		1-4 Years		5-14 Years		Under 1 Year		1-4 Years		5-14 Years	
	N	R	N	R	N	R	N	R	N	R	N	R
La Paz												
Urban n=8	5,235	3,419	3,084	1,851	1,817	607	12,977	3,907	13,562	4,282	8,704	1,610
Rural n=37	510	96	1,298	158	2,340	75	2,513	118	4,049	153	3,576	175
Cochabamba												
Urban n=6	4,212	6,958	2,782	4,578	1,347	199	4,517	3,145	3,549	3,233	1,289	679
Rural n=26	1,204	554	2,668	1,326	1,897	670	4,703	755	6,697	1,249	4,066	--
Santa Cruz												
Urban n=14	2,209	2,282	1,448	1,007	317	281	9,033	2,040	8,336	3,047	6,055	3,163
Rural n=8	535	47	421	47	379	2	5,491	934	5,081	1,826	2,876	765

Untabulated data, Division of Maternal Child Health, MPSSP, La Paz, 1980

TABLE 57

PRENATAL AND POSTNATAL VISITS AND AVERAGE

NUMBER OF VISITS PER WOMAN

1980

	Total Prenatal	Potential Benef.	Average Number Visits Benef.	Total Post-Natal Visit	Potential Benef.	Average Number Visit/ Benef.
La Paz						
Urban	19,386	28,662	0.67	516	25,796	0.02
Rural	3,785	8,829	0.42	167	7,946	0.02
Cochabamba						
Urban	7,629	13,138	0.58	707	1,432	0.49
Rural	4,339	20,084	0.21	533	3,640	0.14
Santa Cruz						
Urban	7,960	14,947	0.44	2349	13,452	0.17
Rural	328	21,559	0.01	88	19,403	0.17

Source: Untabulated data, Division of MCH, MPSSP, La Paz, 1982.

REGIONALIZED HEALTH SYSTEM

The country is divided into 11 regional health offices (unidades sanitarias), which are organized and function as microcosms of the national Ministry of Health. Each has its own planning, biostatistics, logistics, protocol, medical care, nursing, and other divisions, which function somewhat autonomously. During the past year very little of the unidades budget was centrally funded; most revenue was generated by local services.

At the time of this writing, the public system is organized into unidades sanitarias (US). In essence the unidades or regional health offices, are microcosms of the national Ministry of Health. The following organizational chart for the regional office of La Paz describes the structure of a typical unidad sanitaria.

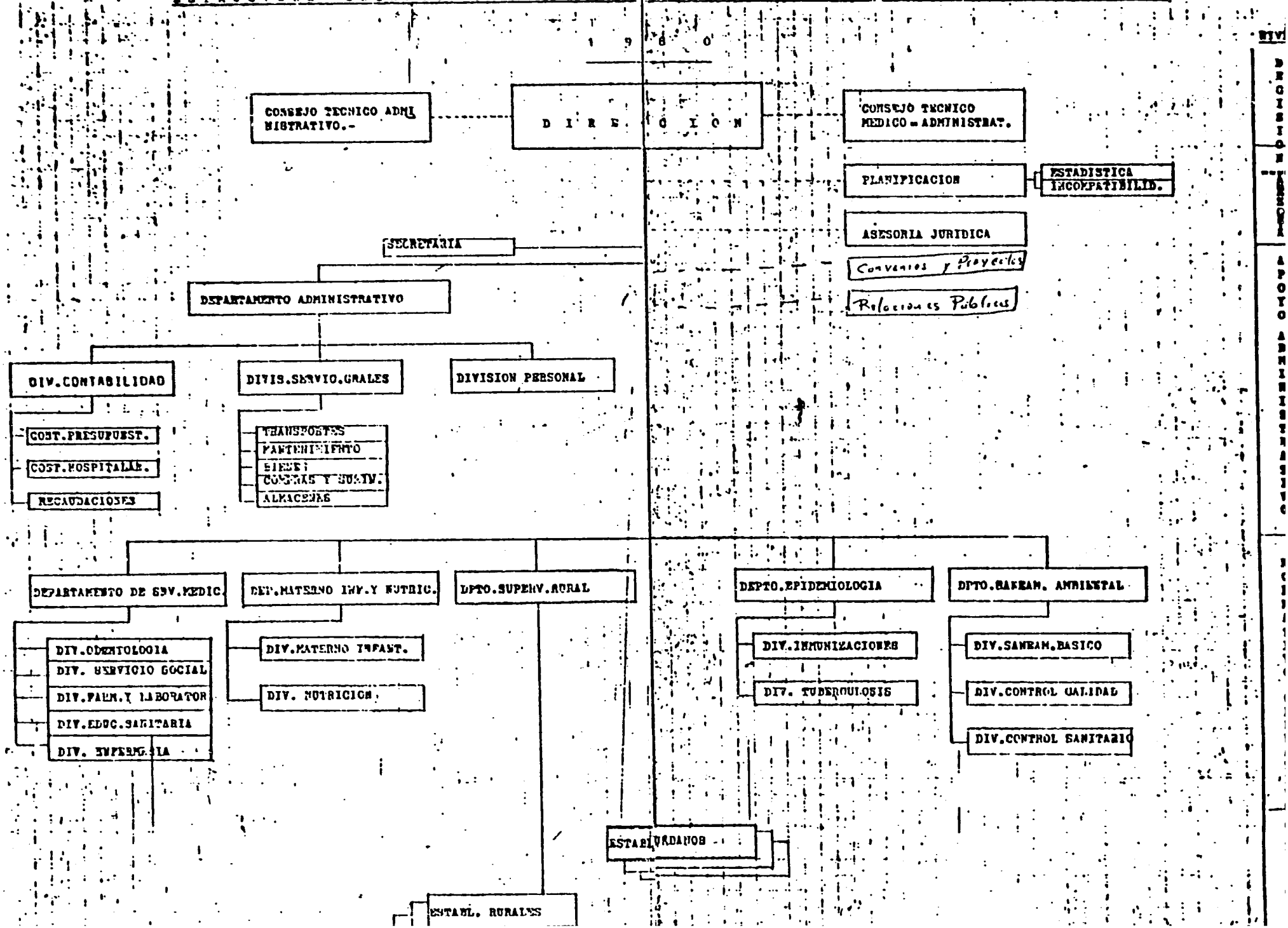
The Ministry of Health (PS/SP) is in the process of planning and establishing a regionalized health care system. This administrative and service model was tested in Bolivia, on a smaller scale, in Santa Cruz in the late 1970s in the USAID-funded Montero Rural Health project. Due to economic constraints and other management personnel problems, this system has not been put into place. Due to economic constraints and other management personnel problems, this system has not been put into place.

As part of the strategy to extend the coverage of rural health services and to approach the goal of health for all by the year 2000, each unidad sanitaria is developing or has developed a regional health plan. The Cochabamba plan is completed. The La Paz plan is in its final stages of revision by the unidad sanitaria and the Development Corporation of La Paz. In Santa Cruz, the plan will be a comprehensive development strategy to be completed around October 1982. (Research for the Santa Cruz plan was financed by a small grant from the Inter-American Development Bank.) When the plans are completed, each unidad sanitaria has the responsibility of seeking resources for its implementation. When a given unidad sanitaria has secured outside financing, its planning division and projects will develop an agreement with the respective donor(s). A tentative format for these regional agreements has been circulated among various donors for their comments. Subsequently, the MPS/SP intends to promulgate a ministerial resolution requiring all donors to adhere to this format and negotiation procedure.

The regional health plans are built around health districts, not provinces. The unidad sanitaria of Cochabamba, for example,

ESTRUCTURA ORGANICA UNIDAD SANITARIA LA PAZ

1980



will have eight health districts, thereby splitting the province of the Chapare into two districts, II and V. These two districts will engulf territory from other provinces as well, so that it will not be a clean division of one province but sections of various areas depending upon the distribution of health care resources, population density, geography, and degree of need.

Within each district there will be a pyramidal service structure of five tiers. At the base (Level I) will be the promoter, who will work in small rural communities of roughly 300 inhabitants. His/her functions will include health promotion, community organization, detection and referral of diseases, community surveys (for demographic information, number and location of indigenous practitioners, and of houses and sanitation systems), community health education, first aid, and followup of patients on medication (e.g., TB, malaria).

The health post or puesto sanitario is the next level (Level II) of the rural health system. It consists of a simple structure without beds and staffed by one or two nurse auxiliaries. The nurse auxiliaries are responsible for surveys of morbidity and mortality, registration of vital statistics, maternal-child health clinics, detection of dental decay, normal deliveries, basic health care, education and promotion, supervision of the promoter and work with indigenous practitioners, referrals, and the carrying out of physicians' orders. The nurse auxiliary also is charged with the administration of the health post.

Level III has been designated the area health center (centro de salud-hospital de area). This facility should have about 10-30 beds and be staffed with a full-time medical director, one or two part-time physicians, one part-time dentist; one or more registered or intermediate-level nurses and several nurse auxiliaries; and assorted technicians in statistics, X-ray, and laboratory and environmental sanitation plus administrative staff. The area health center is to be equipped with a basic laboratory, small X-ray, small operating room and a delivery room. The size of the target population of the area health center ranges from 1,000-10,000 people. This facility will offer general medicine, obstetrics and gynecology, pediatrics, minor surgery, and emergency medicine. The target daily inpatient census should be 13 people (occupancy rate of roughly 45 percent) and approximately 23 outpatients should be attended daily. The social worker, nutritionist aide, environmental sanitation technicians, and nurse auxiliaries will be dispatched into the field to do preventive medicine and outreach work. They should work in a coordinated manner with the personnel at the puesto sanitario and community level to plan and execute disease prevention projects. On the administrative side, the

REGIONALIZED SYSTEM FOR DELIVERY

RURAL HEALTH SERVICES

Levels		
V	Regional Hospital 20,000+ persons subspecialties- dermatology, surgery, psychiatry, neurology, ophthalmology	
IV	District Hospital +30 beds 10,000-20,000 persons	Gen. Medicine Gen. Surgery Pediatrics GYN-OB Emerg. Medicine Nursing
III	Area Hospital 10-30 beds 1001-10,000 persons	Medicine Nursing Dentistry Pharmacy Lab X-ray Environmental San.
II	Health Post 501-3,000 persons	Nurse Auxiliary Primary Health Care
I	Community 150-500 persons Herbalists, Midwives, Bone-setters	Health Promoter Promotion, Prevention, Detection

area health center personnel will supervise the staff from levels I and II and review and process data from the health posts. For patients who were referred to Level III and return to their communities, there should be communication and the flow of medicines or other supplies from Level III to Level II to ensure the complete recovery of the discharged patient.

The district hospital (Level IV) is the headquarters of the rural health system and should oversee the coordination of resources and activities among and between Levels IV through I of the district. For this reason, it would be desirable for the district medical director to have training in public health. The curative services provided by the district hospital are similar to those offered by the area hospital, but are more specialized. Laboratory facilities will be equipped for more complex analysis including X-ray equipment of greater milliampers; general surgery will be performed; and the hospital will have full-time specialists in OB-GYN, pediatrics, and internal medicine. In addition, the district hospital will have on staff one full-time anesthesiologist, one full-time dentist, two to four registered nurses, one full-time biochemist, and various technical personnel. The district hospital should serve between 10,000 and 20,000 people and be equipped to handle 30 inpatients at any given time. As with Level III, staff from the district will support and supervise personnel from lower levels of the health system. For environmental sanitation projects, for example, technical staff from Level IV will assist in costing out projects, advise in the selection of technologies, and assist in procurement and the designing and administration of the project and its future maintenance.

The regional hospitals or institutes (Level V) are located in urban areas and provide services for [advanced] pathologies which cannot be handled by the other tiers of the rural health system. Some of the specialty services offered at the regional level include psychiatry, neurology, ophthalmology and dermatology. Regional health plans such as the ones being developed in Cochabamba, Santa Cruz, and La Paz are developed at this level, and it is the responsibility of the regional staff to plan budgets, allocate resources within the unidad sanitaria and monitor the implementation of the regional plan.

For each unidad sanitaria it will take 5 years or more to implement the regionalized health system. The search and/or generation of funds, training of personnel, development of management, maintenance, information and other subsystems, procurement of equipment, and construction of facilities will require considerable time. In some cases, subsystems will have to be upgraded and expanded (e.g., supervision) and, in others, entire subsystems will have to be created, such as maintenance (norms, personnel, tools, equipment, shops, transportation, and referral system).

A brief examination of what the unidad sanitaria of Cochabamba must accomplish to develop a regionalized system serves as a general illustration of what "regionalization" entails. At the present time, the unidad sanitaria of Cochabamba estimates that the current staffing pattern is, for the most part, inadequate to provide personnel for the five levels of the rural health system. Approximately 37 percent of current health facilities have sufficient staff and the remaining 63 percent are under- or nonstaffed. With the advent of the area health centers/hospitals, the elimination of the medical posts (puestos medicos), and the construction of new hospitals and health posts, the unidad has estimated it will need 564 new positions by 1986. This calculation does not include the personnel needed for the maintenance subsystem. In the district of Chapare Tropical, the unidad sanitaria hopes to construct staff and equip 11 health posts and train and supply 89 promotores. Construction, renovation, and equipment costs for Chapare Tropical are estimated at $b5,440,000 pesos bolivianos,[23] with investments of 5 percent during the three successive years. Chapare Valle Puna (District V) requires three more health posts, 46 promotores and an initial investment of $b3,000,800 pesos, with 3 percent of the initial investment for subsequent years to cover depreciation. Assuming that the system is implemented on schedule, the Ministry calculates that $b 396,400 will be needed in Chapare Tropical for medicines during the first year of regionalization, and Chapare Valle Puna will need roughly $b 436,000 for pharmaceuticals during year one.

The implementation of the regionalization plan for the unidad sanitaria of Cochabamba is about a year behind schedule. If the unidad is able to generate or secure financial resources, the regional plan will be implemented first in the districts of Valle Alto and Chapare Tropical. The first phase will be to create the subsystems of supervision, information, and referral. Given the current economic situation and likelihood of a very slow recovery, it is probable that the implementation of regionalized services will be partial, very staggered, and uneven within districts. Even if selected unidades sanitarias are successful in obtaining substantial inflows of capital, there will be difficulties in keeping up with recurring costs. Another problem one may anticipate is that unidades sanitarias will experience problems in designing and negotiating projects with donors. In the planning offices of the three unidades sanitarias, there are limited personnel with planning and evaluation skills or the time to design and negotiate agreements. Eventually the Ministry of Health will have to deal with this potential bottleneck.

PHYSICAL RESOURCES

Ministry of Health Facilities

This section describes the distribution of Ministry of Health facilities in the departments of La Paz, Cochabamba, and Santa Cruz. The types of facilities listed correspond to the current system of health services and do not enumerate facilities according to the proposed regionalized system discussed in the previous section. The main difference between the two systems is that, in most cases, medical posts, or puestos medicos, are to become centros de salud-hospital de area (Level III), and centros de salud-hospital will become either Level III (area) or Level IV (district) hospitals. The rural CSH functions as a small-to-medium size hospital which provides primary and, in some cases, secondary care. Centros de salud (CSH) or health centers have been divided into rural and urban facilities. As noted in the charts included in the section ancillary services, rural hospitals have minimal to no diagnostic equipment and have limited surgical capability. Urban centers, on the other hand, can handle a wider array of pathologies due to the existence of diagnostic and curative equipment. All rural CSHs have hospital beds, whereas urban centers may or may not offer hospitalization. La Paz urban centros, for example, have beds while the urban centros in Cochabamba and Santa Cruz offer only outpatient services.

The medical posts in urban areas usually are located in marginal neighborhoods on the rim of large cities. The charts which follow also distinguish between urban and rural medical posts (puestos medicos). Rural medical posts are located throughout the provinces. These posts are staffed by physicians fulfilling their one-year requirement of social service, whereas urban posts tend to have permanent medical staff. Urban medical posts are used strictly for ambulatory primary care. The posts located in rural areas also offer only primary care; however, a few, such as the ones situated in Campamento and El Carmen in Santa Cruz, have beds. Puestos sanitarios, or health posts, are staffed by nurse auxiliaries and are described in the preceding section.

Social Security Facilities

Social Security health services are available to Bolivian employees whose employers pay into the social security system. Dependents of employees also are eligible users of the system. Other people who can use social security health services are war veterans and disabled or retired employees. The number of

TABLE 58

DISTRIBUTION OF HEALTH CARE FACILITIES

UNIDAD SANITARIA LA PAZ

1981

Provinces	Reg/ Spec. Hosp.	CSH Urban	CSH Rural	PM Sub-urban	PM Rural	PS	Non-gov.
Murillo	5	4	-	10	1	5	43
Omasuyos	-	-	2	-	2	8	-
F. Tamayo	-	-	1	-	-	2	-
Aroma	-	-	2	-	2	2	-
Manco Kapac	-	-	2	-	-	3	-
Pacajes	-	-	2	-	-	21	-
Inquisivi	-	-	3	-	-	11	-
Ingavi	-	-	3	-	5	13	-
Los Andes	-	-	1	-	4	10	-
Loayza	-	-	1	-	1	6	-
Camacho	-	-	3	-	2	2	-
Iturralde	-	-	-	-	1	3	-
G. Villarroel	-	-	-	-	-	5	-
Ballivian	-	-	4	-	-	2	-
B. Saavedra	-	-	-	-	1	2	-
Larecaja	-	-	3	-	2	3	-
Nor Yungas	-	-	4	-	-	12	-
Sud Yungas	-	-	3	-	1	17	-
Total	5	4	34	10	22	124	43

"Recursos Fisicos," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1981.

TABLE 59

DISTRIBUTION OF HEALTH CARE FACILITIES

UNIDAD SANITARIA COCHABAMBA

1981

Provinces	Reg/ Spec. Hosp.	CSH Sub-urban	CSH Rural	PM Sub-urban	PM Rural	PS	Non-gov.
Cercado	4[a]	2[a]	-	6	-	1	40
Chapare	-	-	4	-	3	15	1
Carrasco	-	-	4	-	3	9	3
Campero	-	-	1	-	-	1	2
Arani	-	-	1	-	1	3	-
Capinota	-	-	1	-	1	2	-
Quillacollo	-	-	2	-	3	8	3
Jordan	-	-	1	-	2	2	-
Mizque	-	-	1	-	-	3	-
Ayopaya	-	-	2	-	1	6	-
Punata	-	-	1	-	-	4	-
E. Arce	-	-	1	-	-	2	-
Arque	-	-	-	-	1	2	-
Tapacari	-	-	-	-	1	-	-
Total	4	2	19	6	15	60	49

"Recursos Fisicos," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1981 and interviews with personnel from the Unidad Sanitaria of Cochabamba, August 2-4, 1982.

TABLE 60

DISTRIBUTION OF HEALTH CARE FACILITIES

UNIDAD SANITARIA SANTA CRUZ

1981

Provinces	Reg/ spec. hosp.	CSH Urban	CSH Rural	PM Sub-urban	PM Rural	PS	Non-gov.
Ibanez	5	2	2[a]	15	5	14	35
Warnes	-	-	1	-	1	6	-
Vallegrande	-	-	1	-	2	8	-
Gutierrez/Sara	-	-	2	-	-	5	1
Cordillera	-	-	5	-	2	9	1
N. de Chavez	-	-	3	-	6	12	-
Velasco	-	-	3	-	6	16	-
Chiquitos	-	-	3	-	3	7	-
Santiesteban	-	-	5	-	2	15	2
Ichilo	-	-	3	-	4	14	2
Florida	-	-	1	-	1	4	-
Caballero	-	-	1	-	-	3	-
Sandoval	-	-	1	-	-	1	-
Total	5	2	31	15	32	114	40

a. The Dermatological Hospital in Jorochito treats leprosy.

"Recursos Fisicos," Division Nacional de Bioestadistica, MPS/SP, La Paz, 1981.

people covered by the social security health plan in 1981 was 1,085,300. There were 735,037 outpatient visits in La Paz, 361,378 in Cochabamba, and 309,274 in Santa Cruz. The average number of outpatient visits per eligible person was 1.5 in La Paz, 2.4 visits in Cochabamba, and 2.6 visits in Santa Cruz. In La Paz, 16,351 social security eligibles were hospitalized; there were 8,905 persons hospitalized in Cochabamba and 5,325 in Santa Cruz.

Auxiliary Services

The following tables (63-65) provide a general description of the distribution of X-ray, laboratory, pharmacy, and surgical services in the three departments.

Rural and urban hospitals generally are unable to meet patients' needs for drugs. Physicians must send their patients to private pharmacies to have prescriptions filled. Those hospitals however, that maintain a small stock of drugs, usually are administered with nongovernment funds (e.g., CSH Jorochito in Santa Cruz and CSH Pucarani in La Paz).

Most laboratories in rural hospitals are rudimentary; they can perform sputum exams, blood counts, and analyses of parasites. With the current economic crisis, regional health offices are responsible for generating revenue to maintain laboratory equipment and supplies. Due to extremely limited financial resources, laboratories often are hampered by defective microscopes and centrifuges and a lack of materials such as slides, dyes, etc. Due to limited laboratory facilities rural physicians rely primarily upon clinical indicators to reach a diagnosis.

X-ray machines are more widely distributed in the department of La Paz than in the other two departments. Nine of the machines in La Paz were donated by a European country but are without chassis or developers. The regional health office is seeking funds to procure the missing components. Regional offices also have difficulty securing sufficient stock of film and other expendables to develop the X-ray plates.

Secondary and tertiary hospitals in the urban center of the three departments receive the bulk of demand for surgical services. All city hospitals can perform surgery and the tertiary institutions, such as the cancer institute in Santa Cruz and ophthalmological center in La Paz, offer specialized services. Urban hospitals, although better equipped than rural ones, also experience shortages of such items as spare parts for surgical lamps and sterilizing equipment, sheets for beds, and surgical gloves and other disposables. In Santa Cruz, all rural provinces save Warnes, Ichilo, and Florida have at least one hospital that offers basic surgery. Hospitals in the provinces

TABLE 62

DISTRIBUTION OF BEDS

SOCIAL SECURITY SYSTEM

La Paz, Cochabamba, and Santa Cruz

1981

La Paz	Beds
Hospital Obrero	488
Clinica Hospital	130
Maternity Hospital	58
Pediatric Hospital	62
Psychiatric Hospital	33
General Hospital (Milluni)	15
General Hospital (Chojlla)	30
Total, La Paz	816
Santa Cruz	
General Hospital	44
Pediatric Hospital*	34
General Hospital, SJD*	50
Maternity Hospital*	24
Mental Health Clinic*	5
Camiri Hospital (rural)*	10
Vallegrande Hospital (rural)*	4
Total, Santa Cruz	172
Cochabamba	
General Hospital #2	255
Bronchopulmonary*	32
Punata Clinic	1
Total, Cochabamba	288

These beds were rented by the Social Security system from the Ministry of Health.

"Anuario Bioestadistico, 1981," Departamento de Planificacion, Caja Nacional de Seguridad Social, La Paz, 1981

TABLE 63, DISTRIBUTION OF AUXILLARY RESOURCES
By Province and Facility, La Paz, 1982

Province / Facility	1 X-ray	2 Lab	3 Pharmacy	4 Surgery	5 Spec. Surg.	Comments
URBAN						
Hospital de Niños	X	X	X	X	X	
Hospital de Clínicas	X	X	X	X	X	
Inst. Nac. Torax	x	x	x	x	x	
Inst. Nac. Oftalmología		x	-	x		
Inst. Nac. Gastroenter.	x	x	-	x	x	
Health Post San Gabriel	x	x	x	x	-	
Hlth. Post Villa Victoria	-	x	x	-		3. inventory maintained by priests
Hlth. Post 20 de Octubre	-	x	being develop	-	-	
Hlth. Center No. 1	x	x	x	x	-	
RURAL						
Larecaja						
CSH Sorata	x	x	-	-	-	1. Has 2 units of 15 m.a & 20 m.c.
Tipuani-Cangalli	-	-	-	-	-	4. not equipped for surgery
PM Guanay	x		-	-	-	1. unit without chassis and developm
Pacajes						
CSH Caquiaviri	x	-	-	-	-	1. one, portable unit (20 m.a.)w/o chassis & developer
Corocoro	x	-	-	-	-	1. one, portable unit (15 m.a.) w/o developer & chassis
Franz Tamayo						
CSH Apolo	x	x	-	-	-	1. 1 unit (20 m.a.) complete - 2.limited supplies - 4. could be for surgery
Aroma						
Ayo Ayo	x	-	-	-	-	1. requires developer - 2. was budgeted but no funds appropriated
Los Andes						
Pucarani	x	x	x	-	-	1. room needs conditioning - 2. good lab
Omasuyos						
Achacachi	x	x	x	x		1. have 2 units, one functional - 4. underequipped
Omacho						
Escoma	x	-	-	-	-	1. requires some parts
Manco Kapac						
Copacabana	z	-	-	-	-	1. unit (20 m.a. incomplete
Barco Hospital	x	x	x	-	-	1. unit (20 m.a.) incomplete
Bolivian						
Teven	x	-	-	x	-	4. needs improvement
Larecaja						
Larecaja	x	-	-	x	-	4. poor conditions
Santa Rosa	x	-	-		-	1. incomplete unit 4 needs improvement
San Borja	x	-	-		-	
Nor Yungas						
Caranavi	x	x	x	x	-	1. needs film (25 m.a.)
Coroico	x	x	x	-	-	1.incomplete (20 m.a.)
Berg	x	-	-	x	-	1. needs maintenance (15 m.a.)
Sud Yungas						
Chulumani	x	x	-	x	-	1. Two units, 1 functional - Other requires mainten.
Irupana	x	x	-	x	-	
Inquisivi						
Inquisivi	z	-	-	-	-	1. Incomplete
Quime	x	-	-	-	-	1. lacks film 4. under construction needs equipm.
Colquiri	-	-	-	x	-	
Coripata	-	x	-	-	-	
Loayza						
Luribay	x	-	-	-	-	1. incomplete
Ingavi						
Viacha	x	x	-	x	-	2. assisted by Rotary Club
Corpa	x	-	-	-	-	

Interviews with officials of Cochabamba regional health office; August 2-4, 1982.

TABLE 64

DISTRIBUTION OF AUXILIARY SERVICES

UNIDAD SANITARIA COCHABAMBA, 1982

Province/Facility	X-ray	Lab	Pharmacy	Surgery	Special Surgery	Comments
Centro de Salud - CBB	x					
Hospital Viedma	x	x	x	x	x	4, 5 Hospital Viedma has surgical facilities which are shared with the Maternity (G. Urquidi, Pediatric (Villarroel); Broncho-pulmonary hospitals.
Hospital Maternidad G. Urquidi		x	x			2 for cytology
Gastroenterology Institute	x	x	x	x	x	
Rural						
Aiquile (Campero)	x	x		x		1 X-ray doesn't work; 4 capable of handling C-Section, appendectomy, etc.
Capinota (Capinota)		x		x		4 all other CSHs on this list can only handle minor surgery.
Chipiriri (Chapare)		x				
Ibuelo (Chapare)		x				
Punata (Punata)	x	x				1 w/o technicians
Sacaba (Chapare)		x				
Villa Tunari (Chapare)		x				
Quillacollo (Quillacollo)		x				
PM Vinto (Quillacollo)		x				2 minimal

Interview with Director of Planning Office, U.S.-Cochabamba, August 3, 1982.

TABLE 65, DISTRIBUTION OF AUXILLARY RESOURCES
UNIDAD SANITARIA - SANTA CRUZ, 1982, by Province and Facility

	X-Ray	Lab.	Surgery	Specic. Surgery	Dental	
URBAN						
S.J. de Dios Hospital	x	x	x	x		
Hosp. de Niños	x	x	x	x		
Inst. Maternidad				x		
Inst. Oncológica	x	x		x		
Medical Posts						
El Pary	x			x		Private 5./Dentist "volunteers" his services; not assigned by MOH; charges
San José Obrero					x	" " "
El Trompillo					x	" " "
San Rafael					x	" " "
Willy Lemeitre					x	" " "
Villa Sta. Rosita		x			x	" " "
1ro. de Mayo		x			x	" " "
Barrio Lindo					x	" " "
RURAL Hospital (CSH)						
Ibañez						
Jorochito	x	x		x		4. for leprosy
Virgen de Cococa	x	x	x			
Warnes						
Warnes		x				
Santiesteban						
G. Saavedra	x	x	x		x	5. rudimentary equipment
Montero	x	x	x	x	x	
Montero - Niños	x	x				
Sagrado Corazón	x	x	x			
Mineros		x	x			
Cordillera						
Camiri		x				Being equipped by German Franciscans
Boyuibe		x				
Gutierrez		x	x			
La Brecha		x	x			
Charagua		x				
Sara						
Portachuelo	x	x	x		x	5. rudimentary equipment
Ichilo						
Ichilo		x			x	2. equipped by Salesians
Buena Vista						2. not functional yet
Caballero						
San Martín de Porres	x	x	x			
Chiquitos						
San José	x	x	x			
Roboré		x	x			
Puerto Suarez	x	x	x		x	5. rudimentary
Valle Grande						
Señor de Malta	x	x	x		x	5. rudimentary
Florida						
Florida		x				2. small
M. de Chavez						
Concepción	x	x	x		x	1. two units, one too powerful for local energy supply; one functional
Guarayos		x	x			
San Javier		x	x			
Velasco						
San Ignacio	x	x	x			

Source: Interviews with personnel from Santa Cruz regional health office and idrector of laboratories at CENETROP, July 1982

of Nor and Sud Yungas can meet some of the demand for surgery, whereas in Cochabamba only the Aiquile hospital offers general surgical services. Other rural hospitals in Cochabamba are capable of performing minor surgery only.

HUMAN RESOURCES

Distribution

Physicians

In all three departments, the majority of physicians and graduate nurses are located in urban areas where there is a greater concentration of hospital beds and services. The physician-to-population ratio in the Department of La Paz is 3:10,000 [24]. For rural areas the ratio is 1.2 per 10,000, and in urban areas the ratio is higher--4:10,000.[25] In Cochabamba the overall ratio is 1.9 per 10,000; the ratio of urban doctors to population is 3.5:10,000, and there are roughly 0.86 rural doctors to 10,000 inhabitants. The ratio of Ministry physicians to population in the department of Santa Cruz is 2:10,000. In urban areas, it is 2.2 per 10,000; and in rural areas, the ratio is 1.9.

All departments are well below the physician-to-population ratio of 8:10,000 persons recommended in the Pan American Health Organization 1971-80 plan. Not only are physicians less available in rural areas, but there is also a greater turnover of doctors in rural areas. Most rural facilities are staffed by medical school graduates who are fulfilling their required one-year of social service. It is not uncommon for these young doctors to experience frustration and isolation working in underequipped and underfinanced rural hospitals. This sometimes results in absenteeism and minimal contact with the community. According to the unidad sanitaria in Cochabamba, one reason for low utilization is doctor's lack of rapport with rural communities.

Graduate Nurses

Graduate nurses are found in urban areas or larger towns (e.g., over 2,000 people) such as Caranavi, Viacha, Quillacollo, Sacaba, and Montero. The nurse-to-population ratio in urban areas of La Paz is 2.7:10,000 and is 0.58:10,000 in rural zones. In urban Cochabamba the ratio is 1.8, and there are 0.18 nurses to 10,000 population in rural areas of Cochabamba. For Santa Cruz, the ratio is 1.3 in the cities and 0.4 in rural areas.

Dentists

Dentists also have to complete a year of social service before receiving their diploma. Most dentists found in rural

public hospitals are fulfilling this one-year requirement. The range of tasks they can perform is limited to simple preventive and curative dentistry due to the lack of equipment and supplies. According to dentists in La Paz regional office, most patients from rural areas visit the medical posts of centros de salud-hospital with such decayed teeth that the only treatment is administering pain-killers or extraction. The ratio of dentists to population is 0.5:10,000 in La Paz and roughly 13 dentists to 10,000 persons in Cochabamba and in Santa Cruz.

Nurse Auxiliaries

Nurse auxiliaries are the front-line workers of the public health care system. The health posts managed by the auxiliaries are many individuals' first contact with the Ministry system. In urban La Paz, the ratio of nurse auxiliaries to population is 5.7, whereas in rural areas the ratio is 4.9 per 10,000. In urban Cochabamba, there are approximately 4.5 nurse auxiliaries to 10,000 population; in rural areas, the ratio is 2.4:10,000. In cities and larger towns of Santa Cruz the ratio is 4.9; and for the rest of the department, there are 7.5 nurse auxiliaries to 10,000 population.

Other Personnel

The current number of technicians is satisfactory, given the small number of X-ray machines that are working in within the three unidades sanitarias. If more machines become available, more technicians will be needed. As of the beginning of 1981, for example, the only X-ray technician working in a rural hospital in the department of La Paz was located in Achacachi. If all other X-ray machines are repaired, there will be a potential deficit of approximately 20 technicians in the department.

Although the number of pharmacy auxiliaries working in rural areas is small, there is a limited ability to absorb these technicians due to the paucity of medicines in rural areas. If health posts or rural hospitals have modest drug supplies, they are managed usually by the auxiliary nurse or physician.

Productivity

The analysis of outpatient visits per hour provides a general indication of productivity. From tables 69 and 70, it appears that, in Santa Cruz and Cochabamba, medical and nursing staff spent much of their time performing nonclinical duties, e.g., administrative and community work or personal business. In Santa Cruz, outside of the province of Ibanez, there were between 2.6 (Caballeros) and 0.6 (Cordillera) visits (all types) per hour. It appears that the staff at rural hospitals and medical posts could easily handle more patients, but their

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TABLE 67

DISTRIBUTION OF HUMAN RESOURCES

UNIDAD SANITARIA-COCHABAMBA

1980

Categories	Urban Facilities	Rural Facilities	Regional Health Office/ Malaria Center
Physicians	102	42[a]	15
Dentists	10	13	1
Graduate nurses	54	9	5
Nurse auxiliaries	133	115[b]	10
Laboratory technicians	8	2	3
Biochemists/pharmacists	14	1	1

a. According to the regional plan from the unidad sanitaria of Cochabamba, 37 physicians worked in rural facilities in 1980; 6 were medical directors of centros de salud-hospitalario (rural hospitals) and 31 were fulfilling their one year of social services (ano de provincia).

b. Roughly 66.7 percent have had some type of formal training; the remaining 33.3 percent are empirically trained.

"Informe Estadistico Actividades, Ano 1980" - Departamento Bioestadistico, Unidad Sanitaria - Cochabamba, 1981.

TABLE 68

DISTRIBUTION OF HUMAN RESOURCES

UNIDAD SANITARIA-SANTA CRUZ

1980

Category	Urban	Rural	Regional Health Office
Physicians	107	85	11
Dentists	7	20	1
Graduate nurses	65	54	8
Nurse auxiliaries	247	335	2
Laboratory technicians	n/d	-	-
X-ray technicians	n/d	-	-
Pharmacists	n/d	-	-

Unpublished data, Division Nacional de Estadisticas, MSP/SP, La Paz, 1982 and verified by the Office of Planning, Unidad Sanitaria - Santa Cruz, July 1982.

productivity is low due to lack of demand. As mentioned in the above section, Utilization, demand is a function of various factors--geographic location, economic disincentives, client's acceptance of staff and quality of treatment, and the availability of supplies, drugs, and equipment. In Cochabamba, physicians working at rural hospitals are more productive than those working at medical posts; rural hospital doctors see between 6 and 0.6 patients in one hour, and physicians at medical posts record between 2.8 and 0.2 visits per hour. Medical posts have fewer support staff members and equipment, which means that physicians either have more idle time (e.g., no demand for their services) or they are inefficient because they spend time taking vital signs, histories, and improvising due to lack of equipment and supplies. Physician absenteeism, which is not uncommon in rural areas, also depresses demand and thus diminishes physician productivity.

Training

Graduate Nurses

There are four institutions which train graduate nurses in Bolivia. These universities are located in La Paz, Cochabamba, Tarija, and Sucre.[26] Since 1973, these institutions have graduated approximately 744 nurses. Graduate nurses must complete 4 years of training before receiving their diploma or licenciatura. During the four years, students are taught basic sciences, gynecology-obstetrics, pediatrics, psychiatry, and administrative skills. Their training also includes rotations through area hospitals and health centers. At the Elizabeth Seton Nursing School in Cochabamba, for example, students begin their practical work during their first year and spend over 90 percent of their fourth semester working in public health.

Physicians

Medical training in Bolivia consists of five years of academic work, one year of internship, and one year of social service. On the average, however, it takes a medical student 9 to 10 years to complete his/her training due to university strikes, general unrest, and personal reasons.

In 1978, 285 students graduated from medical schools, and there were 516 graduates in 1979. Data from 1980 and 1981 are incomplete, however, the number of students graduating from the university in Sucre and Cochabamba fell due to strikes. The attrition rate in medical school is high; in Cochabamba, for example, it averages 60 percent. Medical schools have adopted liberal admissions policies and students are not carefully screened before matriculation. Many cannot cope with the rigorous curriculum and subsequently drop out. In the opinion

TABLE 69

PRODUCTIVITY OF HEALTH PERSONNEL

OUTPATIENT VISITS/HOURS

Department of Santa Cruz

1981

Province	Visits/Hour
Ibanez	1.4
Warnes	1.0
Ichilo	0.8
Sara	0.9
Cordillera	0.6
Vallegrande	1.5
Santiesteban	1.5
Caballero	2.6

a. This includes medical and nonmedical visits (e.g., consultas medicas and otras consultas). The hours contracted (numerator) is the number of hours clinical personnel are obligated by contract to serve; clearly not all of the hours contracted are devoted to patient care.

Extrapolated from unpublished data, Unidad Sanitaria, Santa Cruz, 1982.

TABLE 70

PHYSICIAN PRODUCTIVITY
MEDICAL OUTPATIENT VISITS PER HOUR
Department of Cochabamba
1980

Facility		Visits/Hour
Urban		
Hospitals:	Viedma	1.6
	Maternidad	2.9
	Pediatrico	3.2
	Broncopumonar	1.6
Clinics/Health Posts:	Centro de Salud	4.0
	Cerro Verde	3.4
	Cordebamba	4.4
	Huayna Kasa	4.2
	Temporal	1.3
	Clinica Sucre[1]	6.6
Rural		
Health Centers w/beds	Aiquile	1.4
	Arani	1.6
	Capinota	2.1
	Coloni	3.1
	Cliza	3.0
	Chipiriri	2.9
	Independencia	0.95
	Mizque	1.4
	Morochata	1.8
	Pocona	0.6
	Punata	2.2
	Quillacollo	2.8
	Sacaba	6.0
	Sipe Sipe	2.0
	Tarata	2.6
	Tiraque	2.4
	Totora	0.9
	V. Tunari	3.7
Medical Posts:	Arque	0.7
	Cocopata	0.2
	Chilljchi	0.6
	Chimore	1.5
	Pojo	0.8
	Pto. Villarroel	1.1

of one rector, if there were more vocational schools, enrollment in the first year of medical school would decline and high attrition would not be as great a problem.

Medical and dental students study the same curriculum of basic sciences for the first five semesters. Beginning with the sixth semester, medical students begin their rotations in obstetrics, general medicine, surgery, etc. Two years ago, the medical school in Cochabamba instituted a program to stem the problem of high attrition rates. Under this program, students may elect to become physician assistants or tecnicos asociados de salud. After five semesters of basic sciences, tecnicos shift to a one-year course of study in primary health care. It is anticipated that this new human resource will serve in rural areas; however, a manpower plan which includes the tecnico asociado has not been developed and no positions have been budgeted. There is a need to define the responsibilities, roles, and level of authority of these paramedics, especially their relationship to the graduate nurse and the tecnica media, a mid-level nurse.

Nurse Auxiliaries

Aside from the Ministry of Health, there are four other institutions currently training nurse auxiliaries--the Sisters of Jesus Maria in Oruro, the Red Cross in La Paz, the Hospital Juan XXIII in La Paz, and the Bolivian social security system. A ministerial decree promulgated in January 1982 requires all training institutions to obtain a certificate from the Ministry of Health prior to the initiation of classes. The Ministry certifies that the institution employ training norms, will permit Ministry of Health supervision, and has adequate facilities, teachers and resources.

The Ministry of Health trains auxiliaries at the public health school in La Paz and at the Santa Cruz (sites--Santa Cruz, Montero and San Ignacio Velasco) and Riberalta regional health offices. There are plans to develop training programs within the unidades sanitarias in Potosi and Sucre. Nearly 80 percent of the auxiliaries being trained by the Ministry are personnel who have been working for different unidades sanitarias as empirical nurse auxiliaries. A recent manpower survey revealed that between 30-50 percent of urban auxiliaries have had no formal training, and between 50-70 percent of the auxiliaries working in rural areas are empirically prepared only. In Oruro, the majority of the trainees enrolled in the Sisters of Jesus Maria program are empirical auxiliaries working for the Oruro regional health office. The Red Cross and social security system are training auxiliaries both for their own programs and for other potential employers.

Official supply figures for nurse auxiliaries are not available at this time. The average number of students enrolled in each class at the public health school in La Paz is 30; Hospital Juan XXII trained 49 students in 1981 and will graduate 38 auxiliaries this year. The Red Cross had 36 graduates in 1981 and will produce 34 nurse auxiliaries this year. Riberalta graduates roughly 12-14 students in each class, and Santa Cruz averages 15-20 students per class. Each course lasts six months and the training institutions usually graduate three classes every two years.

At the public health school, auxiliaries working in urban areas carry 910 hours of study. Rural auxiliaries are required to complete 1,050 hours, which include 1 month of community work. Both groups of students must complete modules in promotion and community service, maternal-child health and epidemiology, first aid, inpatient care for the child and adult, common illnesses, and basic principles of administration and statistics. The curriculum is 30 percent didactic and 70 percent practical training.

New Categories of Intermediate-Level Personnel

The Technical Public Health School in Cochabamba was built and equipped with grant funds from the Japanese Government. In January 1982 the school was officially recognized by the Ministry of Health and the first class was matriculated in August 1982. The school will train approximately 20 nursing technicians (tecnicos de enfermeria), 20 clinical technicians (X-ray and laboratory), and 20 environmental sanitation technicians. Some of the criteria employed in the election of students are completion of high school, prior residence in rural areas, and willingness to serve in rural areas. Each category of student must complete the 2-year program of study before receiving a diploma. The curricula are modular and should be integrated with fieldwork. The core curriculum for the three types of students has the following components: orientation, first aid, biological samples, health education, epidemiology, research methods and administration. After covering these modules, the students devote themselves to their respective disciplines. The Ministry hopes to assign the nursing technicians to Levels II and III (health post and area hospitals) of the health system. The clinical technician will work at the district level and the sanitation technician will work at the community, health post, and area hospital levels.

The school has an impressive staff and physical plant; however, there are several unresolved problems. For one, the relationship of the nursing technician to the graduate nurse, tecnico asociado, and nurse auxiliary has to be clearly defined so as to reduce role conflicts. The laboratory and X-ray equipment at the school is very sophisticated and there may be a

problem of overtraining clinical technicians for the type of equipment and work they are likely to encounter in the field. A third problem is the lack of funds to sponsor rural fieldwork for the students. As the school is located in an urban area and the objective is to train students for rural service, it is important that funds be made available to transport and support students in rural areas.

TABLE 71

NUMBER OF HEALTH PROFESSIONALS GRADUATED

FROM BOLIVIAN UNIVERSITIES

1973-81

Graduate Nurses	1973	1974	1975	1976	1977	1978	1979	1980	1981
UMSF	28	8	27	30	13	11	12	n/d	28
UMSA	-	19	-	-	14	7	10	20	n/d
UMSS	16	10	-	-	discontinued		-	-	-
UJMS	-	-	7	5	1	1	6	1	16
UCB	-	-	-	-	28	19	48	n/d	-
Total	44	37	34	35	56	38	76	21	44
Physicians									
UMSF	80	65	60	77	168	87	291	114	88
UMSA	85	213	119	71	75	86	94	n/d	n/d
UMSS	82	106	84	141	143	112	131	-	87
Total	247	384	263	289	386	285	516	114	175
Dentists									
UMSF	8	23	12	25	16	7	17	2	10
UMSA	24	15	28	15	13	19	22	n/d	n/d
UMSS	-	25	22	32	11	11	22	-	-
UJMS	12	21	36	8	11	3	9	-	5
Total	44	84	98	80	51	51	48	2	15

UMSF - Universidad Mayor de San Francisco - Sucre
UMSA - Universidad Mayor de San Andres - La Paz
UMSS - Universidad Mayor de San Simon - Cochabamba
UJMS - Universidad Juan Misael Saracho - Tarija
UCB - Universidad Catolica Boliviana - Cochabamba

Unpublished data, Consejo Ejecutivo de la Universidad Boliviana, La Paz, 1982.

HEALTH ACTIVITIES OF PRIVATE ORGANIZATIONS

This section briefly describes different nongovernment groups who are working in Bolivia to improve the health status of the medically indigent. As indicated in the section on regionalized health services, the Ministry of Health has begun to develop procedures and policies to ensure better coordination between nongovernment donors and programs and the state system. This initiative taken by the Ministry of Health was prompted after many years of loose coordination with nongovernment agencies. Not only is the Ministry seeking to legislate procedures for negotiating agreements between regional health offices and nongovernment donors, but also to establish the terms and necessary components of future health programs.

There is a great deal of variety in the way in which private groups manage and finance their health programs. Many religious institutions, such as the rural hospital in Saavedra, Santa Cruz, and the Calacala Clinic in Cochabamba, generate funds through patient fees and receive cash, equipment, and medicines from the country in which their religious order is based (e.g., U.S. Franciscan priests versus the Franciscans from Italy). The Calacala Clinic, for example, received about $5,000 from the Maryknoll Mission in New York and generated roughly $6,000 from patient visits in 1981. The health cooperative for roughly 1,300 women and their children, organized and managed by the Maryknolls, finances health services through revenue created from sales of woolen goods. No funds are received from outside of the knitting cooperative. The following table gives a general picture of the types of health programs supported by the Catholic Church in the corridor (see also Annex B). Most of these facilities listed are owned by the Ministry of Health but receive substantial inputs from the Catholic Church.

In most of the facilities, nuns or priests act as administrators and may provide clinical and/or supervisory services. If there exists an agreement with the government, the Ministry of Health usually covers salaries of Bolivian clinical staff and may provide some funds for hospital feeding. Supplies and equipment are usually secured through donations or through revenue generated by the hospital. With the recent devaluation and scarcity of foreign exchange, religious and other private groups are experiencing more difficulty in purchasing drugs. Some parish clinics have been successful in the past in negotiating a reduced rate with commercial pharmacies.

The Mennonites have a 3-year agreement with the Ministry of Health, which expires in February 1986. The Mennonite Central Committee works in the provinces of Ibanez, Warnes, Sara, and Ichilo in the department of Santa Cruz. Their work focuses primarily in disease prevention, community health education and promotion, nutrition, and the training of health promoters. The

majority of the MCCs 12 to 15 health workers are registered nurses. Nurses are working in the communities of San Carlos, Galilea, Huayta, San Jose, Surrutu, and Buena Vista. The Mennonite nurse in Galilea provides patient services (patients come from as far as 25 kilometers away), whereas the one in San Jose devotes her time to education and community activities. From 1978-81, the MCC trained 20 promotors. The promotors receive a 2-day training course every 4 months; the MCC sells each promotor a small stock of essential drugs which, he/she is responsible for replenishing through commercial pharmacies. Until the Ministry of Health developed a manual for promotors, the Mennonites used their own methodology and curriculum. In the future, the MCC will probably be required to conform to the Ministry system. Financial support for MCC activities is exclusively provided through the MCC in the United States; the Ministry does not contribute. The MCC does coordinate, however, with the Ministry in communicable disease control and other community health activities.

The Canadian Baptists are working in the Alto Beni, Chapare, and the city of Santa Cruz. They have a registered nurse in Yapacani, but she does not manage any health activities. The Canadian Baptists receive funds from the Church and the Canadian Development Agency, CIDA. They have received US$200,000 for 4 years from CIDA. The Baptists have signed an agreement with the national and regional offices of the Ministry of Health. In the Alto Beni, there are two registered nurses; one auxiliary nurse, and one sanitation technician working in San Miguel, Huachi, San Antonio, and Puerto Carmen. They have trained 39 promotors, using educational materials developed by PROVADENIC (evangelic health program in Nicaragua) David Werner, and others. In Huatajata, the Canadians administer and supply a health post. The Bethesda clinic in Villa Tunari has 10 beds, a laboratory, a pharmacy and a staff of one physician, one graduate nurse, and three auxiliary nurses. The focus of this project is strictly curative. In addition, a development team consisting of a graduate nurse, health promotors, and an agronomist do outreach work in the Chapare. A floating clinic operates along the Mamore River providing curative services. In the city of Santa Cruz the Canadians operate an eight-bed hospital, which is staffed by a physician, a graduate nurse, five nurse auxiliaries, and one public health nurse.

FEPADE, a Bolivian ecumenical organization, works in Eteramasana in the province of Chapare. This organization receives funds from multiple sources--World Vision, Inter-American Foundation, AID (central funds), and others. FEPADE has trained more than 30 health promotors and has a clinic with several beds, which is staffed by a physician. The clinic offers primary care services including environmental sanitation and community health education. FEPADE does not work with the Ministry of Health.

CODEX, Consorcio de Expertos Consultores, has been working in Valle Ivirza of the Chapare since 1975. This organization is managed and staffed by Bolivian professionals. The director, Jorge Agreda, is a sociologist trained in Belgium. CODEX manages a four-bed clinic in Valle Iverza, which has a pharmacy, examination room, and dental chair. There is a full-time physician, a part-time dentist, various rotating medical students, and several nurse auxiliaries from the region who received 2 years of training from CODEX. Drugs and physicians fees are charged according to a sliding fee scale; however, 50 percent of patients do not pay. The activities sponsored by the Valle Ivirza clinic are immunizations (in coordination with EPI), TB detection and control, yellow fever control, leishmaniasis and malaria control, school health, promotor training and maternal-infant health. In 1981, the CODEX medical post had 4,791 medical visits and 165 dental visits (see Annex C). CODEX also has developed an algorithmic system of treating the six most common ailments. This diagnostic and treatment system has facilitated the training and supervision of auxiliary personnel and reduced the numbers of drugs ordered. CODEX coordinates closely with the unidad sanitaria of Cochabamba but receives all of its funds from outside sources. Grants have been awarded by the Inter-American Foundation, a private Dutch agency and the Belgium Government.

RECOMMENDATIONS

1. Encourage biostatisticians in the central and regional offices of the MOH to apply one cause of illness/cause of death classification system for the reporting of health statistics.

2. With PAHO and INE, assist MOH in the development and implementation of a methodology to analyze a sample of outpatient and inpatient records so that data are available for program evaluation and planning.

3. Encourage central or regional health offices to conduct small-scale, simple studies of the etiologies of physical traumas by age categories. Preventive measures can be initiated depending upon the findings of such a study. Personnel also could receive additional training in emergency medicine, if indicated, and each district could be equipped to handle the most common physical injuries.

4. Continue support of community-based primary health care projects with an emphasis on potable water and sanitation, immunization, prenatal and well-baby care, nutrition and the early detection of the signs and symptoms of disease.

5. Improve disease surveillance activities by providing Title III funds toward vector and host detection, case outreach, and infrastructure.

6. If Title III funds are reduced, malaria control activities could have a more limited geographic focus and the balance of funds could be invested in combating the rate of infection from tuberculosis. TB debilitates a higher number of Bolivians of all ages than does malaria. As TB drugs are very expensive and the caseload is difficult to manage, it would be advisable to continue BCG immunizations and initiate a national anti-TB campaign.

7. Continue assistance to disease control programs (diarrhea, malaria, TB, etc.), with special attention to means of incorporating disease detection and control tasks into the delivery of primary health care. The means of preventing diarrheal diseases are well known and the Ministry of Health, in conjunction with other agencies, should persevere in its efforts to provide potable water and sanitation to urban and, most

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entails and acquaint them with MOH forms, structures and policies, the epidemiology of the region, traditional practices, other personnel, and nongovernment providers. It would be useful to conduct a short workshop on communication techniques and on physician attitudes toward nonprofessional personnel, ethno-medicine, and rural services.

- Explore ways of creating a professional network for physicians and dentists serving for one year in a rural center or post. The model developed in Cochabamba by CODEX is one such example. Medical and other personnel meet on a regular basis to discuss cases and other problems, which seems to assuage feelings of isolation and frustration.

- Train supervisors of rural nurse auxiliaries, technicians, and physicians to use periodic visits as motivational and educational opportunities, not for control and negative criticism.

- Improve the frequency of supervision.

- Increase the number of health promotors and draft policies or guidelines which delineate the role of the promotors and nurse auxiliaries. Discuss these proposals with promotors and nurses auxiliaries and, when official, disseminate them in an attempt to avoid role conflicts.

- Work with other donors to help the MOH improve its promotion manual, using other pretested handbooks as guides. The current manual has poor graphics and could be better organized.

- Regional health offices should contact a non-MOH group or individual to do a survey of traditional birth attendants to determine number, distribution, and average number of clients per year and beneficial and deleterious practices. These data should be used to prepare a policy for the interpretation of TBAs into the maternal child health program.

11. Currently the health care system is heavily physician-oriented. To correct problems of poor distribution of physicians and underserved areas, steps should be taken to fill the gap with mid-level personnel. A rural manpower policy and plan should be developed to address this point and avoid the proliferation of different categories of personnel.

This plan should gradually phase in new types of manpower so that training programs, logistical support, and full integration with existent personnel can be arranged. In the absence of a cogent policy, various institutions have created new training programs without analyzing the overall manpower picture and without a rational division of responsibilities and tasks.

- There is no simple solution to the problem of the lack of supplies and equipment. These deficiencies work against the appropriate use of the health system. All construction should be halted until the MOH has properly equipped and staffed existing institutions. An inventory should be taken of all facilities, and those that lack minimal supplies and equipment should be temporarily closed down and staff transferred to other facilities or kept in the community to train and supervise village health workers and do community health education. To alleviate the problem of medicines, the MOH should stipulate an essential list of drugs and contract private suppliers to market these generically.

12. The Technical School of Public Health in Cochabamba should be made technologically more appropriate. The type of training equipment for lab and X-ray technicians is too sophisticated and is sure to frustrate students once they are working in the field. Funds generated through the sale or lending of the schools equipment and/or facilities should be used to dispatch students to suburban or rural posts for their practical training. It also would be useful to add a module to the tecnica media and sanitation technician curricula on adult and nonformal education, the development of teaching materials, and how to organize and conduct courses for community groups.

13. A study should be designed and conducted to ascertain physicians' attitudes toward and perceived problems with their year of social service. Such a study could be done on a sample of young doctors during their last month of duty. Of interest would be responses to questions regarding level of support from regional headquarters, degree to which medical school prepares doctor for rural medicine, problems with delivery of care in rural settings, essential deficiencies of facility in which worked, relationships with other staff and community, and ways to improve the year of social service.

14. Examine physicians' reasons for leaving rural service and explore the feasibility of providing incentives for physicians and other professionals to work in underserved areas.

15. In addition to the regional health plans being developed by each unidad sanitaria, the Ministry of Health (at the national level) should be encouraged to monitor and assist the implementation of regional strategies. Backup from the central offices is essential for the success of each regional plan. If each unidad designs and implements these plans independently of the central and other regional offices, lack of coordination and inefficiencies are likely to become problems. Therefore, the central office must become involved in the planning and implementation of regional plans so that economies of scale are sought and so that objectives, information systems, training and other components are coordinated.

    - On a related issue, the Ministry of Health should develop a concise statement of its priorities for prospective donors. If the MOH seeks closer coordination with donors, it must more clearly identify which problems, projects, and geographical areas are of greatest interest. Prospective donors require orientation from the central level if they are to effectively match their resources and objectives with one or more unidades sanitarias.

16. The MOH personnel should receive technical assistance and/or training in management (problem definition, definition of options, selection of solution, planning, budgeting, allocation of resources, personnel policies, pricing, etc.).

17. Personnel from the planning offices of the unidades sanitarias should be offered training in program development and evaluation. If these offices are to be responsible for planning and negotiating project proposals with donor agencies, they require trained personnel.

18. Any information the Mission can receive on regionalization (as experienced in other countries), the training and deployment of mid-level personnel, supervision, health education techniques, etc., should be shared with appropriate regional-level personnel. There is a dearth of information on techniques and lessons-learned from projects in other countries.

ANNEXES

ANNEX A

FACILITIES PARTICIPATING IN MATERNAL-CHILD HEALTH PROGRAM

Departments of La Paz, Cochabamba and Santa Cruz

1980

Department of La Paz

Rural (23 Rural Hospitals and 13 Medical Posts)

CSH	Achacachi	CSH	Guaqui	PM	Guanay
	Polo		Inquisivi		Machacamarca
	Ayo Ayo		Luribay		Palca
	Barco Hospital		MocoMoco		Patacamaya
	Borg		Palos Blancos		Pillapi
	Caranavi		Pucarani		Huata
	Caquiaviri		Quime		Tambillo
	Coripata		Rurrenabaque		Tiahuanaco
	Corocoro		Sica Sica		Tiahuanaco
	Coroico		Tipuani Cangalli		
	Chulumani	PM	Ayata		
	Desaguadero		Batallas		
	Escoma		Carabuco		
			Corpa		
			Charazani		

Urban (1 Hospital, 3 Health Centers and 3 Marginal Medical Posts)

	Hospital del Nino
	Centro de Salud No. 1
	Centro de Salud No. 2
	Centro de Salud No. 3
PM	San Gabriel
	Maria de los Angeles
	Salvador Tejar

Department of Cochabamba

Rural (15 Rural Hospitals, 11 Medical Posts and 2 Health Posts)

CSH	Aiquile	CSH	Tarata	PM	Mairana Todos Santos
	Arani		Tiraque		Ucurena La Guardia
	Capinota		Totora		Vacas
	Colomi		Villa Tunari		Villa 14 de Sept.
	Chipiriri	PM	Cocapata		Vinto
	Mizque		Ivirgarzama	PA	Anacoraire
	Morochata		Pasorapa		Omereque
	Punata		Puerto Villarroel		
	Quillacollo		Patacari		
	Sacaba		Tiquipaya		
	Sipe Sipe				

Urban (2 Hospitals, 1 Health Center and 4 Medical Posts)

Pediatric Hospital
Maternity Hospital
Centro de Salud
PM Huayra Ckasa
Temporal
Condebamba
Cerro Verde

Department of Santa Cruz

Rural (9 Rural Hospitals, 2 Medical Posts and 1 Health Post)

CSH Montero (children)
Minteros
Jorochito
Sara
San Jose
Santiesteban
Saavedra
Guarayos
Yapacani

PM San Ramon
Sagrada Familia
PS Los Chacos (Warnes)

Urban (2 Hospitals, 1 Health Center and 11 Medical Posts)

Maternity Hospital (Boland)
Children's Hospital
Centro de Salud
PM San Jose Obrero
Santa Rosita
Jorge Urenda
El Pary
1 de Mayo
San Rafael
Willy Le Maitre
Pampa de la Isla
Roque Aguilera
3 de Mayo
Anita Leigue

ANNEX B

HEALTH INSTITUTIONS SUPPORTED BY THE CATHOLIC CHURCH

1974

	Location	Sponsor
Prelacy of Aiquile	(embraces the provinces of Mizque, Carrasco, and Campero in the department of Cochabamba)	
Dispensary Juan XXIII	Aiquile/Campero	San Pedro Parish
Dispensary	Aiquile/Campero	Sisters of Christian Schools
Dispensary	Aiquile/Campero	Religious of Jesus Maria
Dispensary	Pasorapa/Carrasco	San Juan Bautista Parish
Dispensary "Nuestro Senor de Burgos"	Mizque/Mizque	San Sebastian Parish
Dispensary (Medical/ Dental)	Pocona/Carrasco	San Francisco de Asis Parish
Dispensary Parroquial	Totora/Carrasco	Francisco
Mobile Clinic	Aiquile	Tierra de Hombres
Promotor Training	Aiquile	Tierra de Hombres
Diocese of Cochabamba	(list includes only facilities located in rural areas; does not identify the numerous parish clinics located within the city of Cochabamba)	
Hospital Viedma	Cochabamba	Sisters of Santa Ana
Hospital E. Seton	Cochabamba	Founded by Sisters ofCharity - Now belongs to Petroleum Soc. Security
Hospital Virgen de Lurdes	Chapare	Franciscans
Hospital Chipiriri	Chapare	Franciscans
Policlinic	Colomi/Chapare	San Isidro Parish
Dispensary	Quillacollo	Parish
Dispensary	Tiquipaya/Quillacollo	Parish

Prelacy of Corocoro	(embraces the provinces of Pacajes, Sicasica, Loayza, and Inquisivi in the department of La Paz)	
Hospital Caquiaviri	Corocoro	Priests - Pasionistas
Hospital	Colquiri	Sisters of Fatima
Hospital	Quime	Parish - Santiago Apostol
Post	Caracato	Parish - Santa Marta
Dispensary	Corocoro	Ascension Nuns
Post	Calamarca	Parish Santiago Apostol
Prelacy of Coroico	(embraces the provinces of Saavedra, Larecaja and Nor Yungas in the department of La Paz)	
CSH Coroico	Coroico	Franciscan Fathers (U.S.)
CSH Borg	Alto Beni	Franciscan Fathers (U.S.)
Clinic	Guanay	Immaculate Conception
Mobile Clinic	Caranavi	Parish
Clinic Bella Vista	Alto Beni	Parish S. Francisco
Dispensary	Coroico	Franciscan Fathers (U.S.)
Dispensary	Sorta	Dominicans
Dispensary	Charazani	Parish
Dispensary	Charazani	Parish - San Juan Bautista
Dispensary	Apolo	Franciscan Fathers
Training - Nursing Aux.	Sorata	Dominicans
Training - Promotors	Bella Vista	Parish - San Francisco
Training - Promotors	Guanay	Parish

Diocese of Santa Cruz	(embraces the provinces of Gutierrez, Ichilo, Santiesteban, Warnes, Caballero, Florida, Ibanez and Vallegrande; does not list the eleven or more urban, parish clinics)	
Hospital Caballero	Caballero	Dominicans
Hospital San Martin (Saavedra)	Caballero	Parish - Concepcion Immaculada
Hospital Jorochito	Jorochito	Sisters of Charity
Hospital Senor de Malta	Vallegrande	Sisters Christian Schools
Hospital Saavedra	Santiesteban	Maryknoll
Hospital Aramayo	Portachuelo	Evangelical
Hospital Mineros	Mineros	Parish San Isidro
Dispensary	Montero	Maryknoll Fathers
Dispensary	Portachuelo	Evangelic
Post (Saavedra)	Santiesteban	Parish
Post	Saipina	Dominican Nuns
Clinic	Caballero	Dominican Nuns
Health Center	Cotoca	Maryknoll
Promotors		Dominicans

Plus approximately 11 urban, parish clinics.

Vicariate of Reyes	(embraces the provinces of Ballivian, Iturralde, Yungas and Larecaja in the department of La Paz)	
Dispensary	Alto Beni	Santa Ana Mission

Archdiocese of La Paz	(does not list urban facilities supported by the church)	
Hospital Viacha	Viacha/Ingavi	Presentation of Tour-nuns
Hospital Irupana	Sud Yungas	Immaculada Concepcion
Hospital Coripata	Nor Yungas	Santiago Priests
Hospital Chulumani	Sud Hungas	Parish
Dispensary	Copacabana	Parish
Dispensary	Tiahuanacu	Parish
Post	Santiago de Huata/ Omasuyos	Parish
Post (4)	Copacabana	Parish
Post	Huarina/Omasuyos	Parish
Post	Santiago de Huata/ Omasuyos	Parish
Post	Pucarani	
Training - Promotors	Viachi/Ingavi	Parish
Training - Promotors	Guaqui/Ingavi	Parish
Training - Promotors	Huarina/Omasuyos	Parish

Definitions

Hospitals: Protect and recuperation of health at least 10 beds - Many belong to MPS/SP but administered by church.

Clinics: Treat a set number of related illnesses - no prevention programs.

Dispensary: Run by medical personnel
Diagnosis and prevention
Distribution of medicines

Posta (Post): Medical personnel
Up to 4 beds
Promotional activities also

ANNEX C

TABLE 73

LEADING CAUSES OF MORBIDITY

Villa Ivirza, Chapare

Department of Cochabamba

1981

(All Visits to CODEX Medical Post)

Cause	No. Visits	Percentage Total Visits
Skin conditions	1,077	22.5
Intestinal parasites; anemias	323	6.7
Injuries	320	6.7
Gastrointestinal diseases	279	5.8
Dental diseases	237	4.9
Respiratory illnesses	237	4.9
Ear ailments	179	3.7
Eye ailments	171	3.6
Arthritis	161	3.4
Malnutrition	150	3.1
Gynecological problems	475	9.9
Total	4,791	100.0

24.7 percent of visits were for prenatal, well-baby, or other checkups.

BIBLIOGRAPHY

Articles and Reports

Centro Nacional de Enfermedades Tropicales. "Estudio de diarreas agudas en ninos menores de 5 anos en Montero y Santa Rosita." Boletin Informativo, Vol. 2, No. 5, 1976.

Division Maternal Infantil. "Situacion de las Enfermedades diarreicas en el departamento de Santa Cruz." Unidad Sanitaria de Santa Cruz, MPS/SP, Santa Cruz, 1981.

Ministerio de Prevision Social y Salud Publica. "Consumo de antidiarreicos en el departamento de Santa Cruz en relacion con el numero de casos de morbilidad por diarrea, 1980 - 1981." Unidad Sanitaria, Santa Cruz, 1981.

Bolivian Government Documents

Bolivia, Instituto Nacional de Estadistica. Resultados del Censo Nacional de Poblacion y nivienda. Departamento de Santa Cruz, Vol. 7, La Paz, 1981.

Bolivia, Caja Nacional del Seguridad Social. Anuario Bioestadistico. Departmento de Planificacion, La Paz, 1981.

Bolivia, Ministerio de Prevision Social y Salud Publica. Alencion Primaria para la Extension de Cobertura con Promotores de Salud. Division Nacional de Salud Materno-Infantil, La Paz, 1980.

_____. Diagnostico de la Situacion de Salud. Oficina Regional de Planificacion. Unidad Sanitaria La Paz, 1981.

_____. Evaluacion del Programa Materno e Infantil, Ano 1981. Unidad Sanitaria Santa Cruz, Programa Salud Familiar, Santa Cruz, March 1981.

_____. Informe Estadistico Actividades, Ano 1980, Unidad Sanitaria Cochabamba, Departamento Bioestadistco, Cochabamba, 1981.

_____. Morbilidad-Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978-1979. Division Nacional de Bioestadistico, La Paz, 1980.

_____. Mortalidad-Diez Principales Grupos de Causas de Mortalidad Hospitalario, 1978-1979. Division Nacional de Bioestadistica, La Paz, 1980.

_____. Normas Nacionales de la Atencion Materno-Infantil Segun Niveles - Nivel II. Division Nacional de Salud Materno Infantil, La Paz, 1981.

_____. Plan Operativo - 1982. Unidad Sanitaria Santa Cruz, Departmento de Planificacion, January 1982.

_____. Plan Regional de Extension de Cobertura, Quinquenio 1982-1986, Vol. 1. Unidad Sanitaria Cochabamba, Departamento Regional de Planificacion y Sistema de Informacion, Cochabamba, November 1981.

_____. Programa de Control de Tuberculosis, 1980 - 1983. Services Nacional de Tuberculosis, La Paz, 1980.

_____. Recursos Fisicos. Division Nacional de Bioestadistica, La Paz, 1981.

_____. Servicio Nacional de Malaria. El Problema de Malaria en Bolivia. March 1980.

_____. Sistema de Prestacion de Servicios de Salud al Area Rural. January 1980.

Bolivia, Ministerio de Planeamiento y Coordinacion. Estado Nutricional de la Poblacion Boliviana - 1981. Instituto Nacional de Alimentacion y Nutricion, La Paz, 1981.

_____. La Prevalencia de Bocio Endemico de la Poblacion Escolar de Bolivia. Instituto Nacional de Alimentacion y Nutricion, La Paz, 1981.

_____. Habitos Alimentarios y Algunas Patrones Culturales Frente a: Alimentacion Complementaria, Lactancia Materna, Diarrea y Bocio en Areas Rurales de Bolivia, La Paz, 1981.

Other Documents

Business International Corporation.- Worldwide Economic Indicators, Annual Comparative Statistics for 131 Countries. New York. Business International Corporation, 1982.

Pan American Health Organization. Health Conditions in the Americas, 1973 - 1976. Scientific Publication No. 364, 1978.

U.S.A.I.D. Mission to Bolivia. Evaluacion Integral del Sector de Salud en Bolivia. September 1978.

Books

United Nations. Economic Survey of Latin America, 1979. Santiago, Chile. Economic Commission for Latin America, 1981.

Weil, Thomas E. et. al. Area Handbook for Bolivia, Washington, D.C. American University, 1974.

INDIVIDUALS CONTACTED

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FOOTNOTES

1 Weil, Thomas et. al., Handbook for Bolivia, Washington, D.C.: American University, 1974, pp. 276-277.

2 United Nations, Economic Commission for Latin America, Economic Survey of Latin American, 1979, Santiago, Chile: ECLA, 1981, pp. 94-111.

3 Pop. Lab., "The 1980 Bolivia National Demographic Survey: A Summary of Results," Laboratories for Population Statistics, Summary Series No. 3, December 1981, pp. 7-15.

4 USAID Mission to Bolivia, Evaluacion Integral del Sector de Salud en Bolivia, September 1978, p. 73.

5 Dr. Gonzalo Fernandez, MPS/SP, Seminar on Interagency Coordination, July 6, 1982, Cochabamba.

6 Urban is defined as those institutions located in departmental capitals, e.g., the cities of La Paz, Cochabamba and Santa Cruz

7 Viedma Hospital encompasses the pediatric, maternity and pulmonary hospitals.

8 Seminar given by Dr. Gonzalo Fernandez at the Technical Public Health School in Cochabamba on July 6, 1982.

9 Interview with Lic. Mario Solis of the National Institute of Statistics, August 1982.

10 Into this rough equation the abortion and stillborn rates have not been calculated. In urban Cochabamba the stillborn rate is roughly 1 percent, in rural areas it is probably higher. Abortion rate data are not available at this time.

11 "Mortalidad-Diez Principales Grupos de Causas de Egresos Hospitalarios, 1978 - 1979," Division Nacional de Bioestadistica, MSP/SP, 1980.

12 "Informe Estadistico Actividades, Ano 1980," Depto. Bioestadistico, US-CBB, 1981.

13 Baker, William H.. Perspectivas de la epidemiologia y control de las enfermedades entericas agudas. PAHO, Washington, D.C., Vol. 2, pp. 93-101.

14 "Estudio de diarreas agudas en ninos menores de 5 anos en Montero y Santa Rosita," Boletin Informativo del CENETROP, Vol. 2, No. 5, 1976, p. 19.

15 Habitos Alimentarios y Algunos Patrones Culturales Frente a: Alimentacion Complementario, Lactancia Materna, Diarrea y Bocio en Areas Rurales de Bolivia. Ministerio de Planeamiento y Coordinacion, DAN, La Paz, 1981.

16 "Estudio de diarreas agudas en ninos menores de 5 anos en Montero y Santa Rosita," Boletin Informativo del CENETROP, Vol. 2, No. 5, 1976.

17 "Programa de Control de la Tuberculosis, 1981-1983," La Paz, 1981, pp. 19-29.

18 In 1980 of 50 hospital deaths, one was caused by malaria (P. falciparum). In 1981 there were 29 deaths registered at the Hospital Buayaramerin, of which two were caused by malaria.

19 Vera Ruth, et. al., Estado Nutricional de la Poblacion Boliviana, Bolivia - 1981, Ministerio de Planeamiento y Coordinacion, Instituto Nacional de Ali mentacion y Nutricion, La Paz, Bolivia, 1981.

20 Vera, Ruth, et. al., "La Prevalencia de Bocio Endemico en la Poblacion Escolar de Bolivia," INAN, Ministry of Planning and Coordination, La Paz, 1981.

21 This reason was given in the Health Sector Assessment prepared in 1975. Landry, A.S. et. al. Bolivia Health Sector Assessment (La Paz: U.S. AID Mission to Bolivia, January 1975) p. 206.

22 In Table 49, several provinces have lower utilization rates than Arce and Campero, however, these facilities will not be used as examples of low demand since they did not report a full eleven or twelve months of activity.

23 This figures is based upon the cost of inputs using the 1981 (November) exchange rate. Today this figure would be significantly higher. In late 1981 the official exchange rate was 25:1, in August 1982 the official rate is 44:1 with a floating rate of over 200:1.

24 The calculation of the total departmental and urban ratios does not include the seven physicians at the unidad sanitaria.

25 For La Paz, 1982 census projections were used; for Cochabamba 1980 census data were employed; and for the Santa Cruz ratios, the 1982 projections were used.

26 The University of San Simon in Cochabamba discontinued its nursing program in 1974.