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ANNEX 5.12

HUMAN RESOURCES

GUATEMALA HEALTH SECTOR ASSESSMENT

November 1977

TABLE OF CONTENTS

I.	DESCRIPTION OF PROBLEM	1
	A. Introduction	1
	B. Quality and Availability of Health Manpower and Training Information	5
	C. Distribution of Manpower	7
	D. Inventory of Training Resources	12
	E. Personnel Policies and Job Classification	26
II.	ANALYSIS OF THE SITUATION	28
	A. Introduction	28
	B. Government of Guatemala Health Manpower Projections	32
	C. Production of Manpower	37
	D. Numbers of Persons Eligible for Health Training Programs	39
	E. Doctors and Other Health Professionals	44
	F. Health Auxiliaries	48
	G. Traditional Medicine and Its Practitioners	76
	H. The Implication of Constant Fertility on Health Facilities and Manpower	80
	I. The Inter-American Development Bank Loan for Improvement of Rural Health Services	84
III.	RECOMMENDATIONS AND RATIONALE	89
IV.	REFERENCES	101
	Appendix 1	105
	Appendix 2	122

Annex 5.12

HUMAN RESOURCES

I. DESCRIPTION OF THE PROBLEM

A. INTRODUCTION

"It must be recognized that the shortage of all categories of health personnel and their inadequate distribution is one of the major obstacles to the development and upgrading of health services and that, as a result, these shortages constitute a threat to the success of national health planning."<sup>1</sup>

This statement, found in the National Plan for Health, 1975-1979, clearly characterizes the views of the Government of Guatemala regarding the deficiencies of health manpower and their effect on the success of any effort to improve the efficiency and outreach of health services.

Additionally, the National Plan for Health defines a series of imperatives which address the problems and deficiencies which exist in the current manpower training and deployment techniques. For example:

1. "The production of human resources must be closely coordinated between the training institutions and those employing their graduates."

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Secretaría General del Consejo Nacional de Planificación Económica, Plan Nacional de Salud, 1975-1979.

This statement recognizes the disparities between the numbers and kinds of personnel being trained and the numbers and kinds of personnel needed. At present some categories of health personnel, such as physicians, are unemployed while others, such as social workers, sanitary inspectors, and nutritionists are seriously deficient in numbers. The problem is compounded by the geographic maldistribution of available health workers, particularly those able to freely choose their working locations (i.e. doctors, dentists, veterinarians, and sanitary engineers).

2. "There must be established by law, within the Civil Service Commission, a system of career advancement for health workers."

The current system of promotion are inadequate and inappropriate. For example, in the case of the auxiliary nurse, the most numerous category of health worker, virtually no opportunity exists for advancement with increased pay and responsibilities. Consequently morale sinks and there is no incentive towards self-advancement and improvement.

3. "The production and assignment of human resources must be based on development planning on a national level and particularly on the needs of those programs addressing basic health needs of the population."

The growing effort to provide health care outreach to remote rural areas, will require increased emphasis on the training of intermediate-level auxiliaries and village health workers,

and decreased emphasis on the production of doctors with high pay expectations, graduate nurses and other top-level medical professionals.

4. "It is necessary to establish a system of continuing education for all service personnel so that they are familiar with adjustments to the national health plan and so that they are abreast of technological advances in health care."

Except for occasional seminars and meetings on administration-related topics little consistent effort has been made to provide post-graduate and continuing education for health personnel at all levels. A growing interest in self-instructional materials is being addressed through the current development of a program to provide self-instruction to auxiliary nurses working in rural health posts. These types of programs, together with periodically conducted regional and area seminars, are needed to achieve an acceptable level of technical competence, to build morale and to reiterate the "health team" philosophy.

5. "Prepare human resources specially adapted for each level of the health care delivery system."

Although technical competence is an important determinant of the success of a health care delivery system, the single most important determinant is the quality of available human resources. Quality, in this sense, embraces dedication, honesty,

sensitivity, altruism and a sense of service. The term technical competence when applied to health workers, implies a level of capability and performance that matches the technical requirements of the task to the technical abilities of the performer. This does not imply that persons qualified to perform technically demanding jobs should be employed to undertake tasks requiring lower levels of technical skills, nor does it imply that persons technically qualified in one field are necessarily so qualified in another.

6. "Particular emphasis must be given to the training of auxiliary health workers in order to achieve the coverage of the rural population at a realistic cost."

This statement constitutes an endorsement of the usefulness and practicality of auxiliary health workers, such as the rural health technicians (TGRs), health promoters and rural auxiliary nurses, in the extended coverage of health services. It also acknowledges the favorable cost-effectiveness ratios attainable in programs which use these types of workers. Given that, in Guatemala, between five and seven auxiliaries can be trained for the cost of producing one physician and three to four auxiliaries can be employed full-time for the cost of employing one physician for 4 hours per day, the rationale of the Government's human resources policy is apparent.

B. QUALITY AND AVAILABILITY OF HEALTH MANPOWER  
AND TRAINING INFORMATION

Data are deficient on the numbers of trained personnel in the health sector and the outputs of training programs.

Professional organizations in medicine, dentistry and nursing provide basic data regarding the numbers of registered professionals. An annual registration requirement, such as that for nurses, provides relatively up-to-date information on location of personnel.

However, for medical auxiliaries, the data available are almost totally confined to employees of the MOH and IGSS, with virtually no information available regarding auxiliaries working in the private sector.

Although data now exist on the number and location of private, non-governmental programs which train health auxiliaries, information on the numbers graduating from the programs, on attrition rates, and on their places of work remains deficient.

Relatively little data can be found on training costs and no systematic studies have been made of the costs of educating physicians, dentists and graduate pharmacists. The problem is complex because the prorating of "service" functions versus "education" functions become an important point of economic analysis in studies of health sector costs.

Economic data are lacking about employment costs in the private sector. However, wages and salaries are generally higher than those paid by the MOH and IGSS for corresponding jobs, which causes a flow of trained health workers from the public to the private sector. Because no significant production of health personnel exists in the private sector, the public sector (MOH) bears the costs of training individuals eventually employed in the private sector.

Training curricula have been periodically revised for length and relevance. In recent years, the length of training for auxiliary nurses has been reduced from 14 to 8 months and the level of education needed for admission has been reduced to completion of the first year of secondary school. A training program specifically designed for rural auxiliary nurses has also resulted from the realization that an auxiliary nurse trained primarily in a hospital setting is inappropriately trained for work in rural health posts.

Data are lacking also on field performance of personnel, on their levels of efficiency and the extent to which the training curricula have proved appropriate. A performance-evaluation project<sup>1</sup> has been in operation at the health post level for a little over a year, but conclusions cannot be drawn from the data available at this time. Data will become available in early 1978; a fully institutionalized and ongoing data

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<sup>1</sup> This project is being conducted, with USAID grant assistance, by the Guatemalan Academy of Medical, Physical and Natural Sciences in collaboration with the Ministry of Health (MOH).

collection and evaluation system should be in operation by 1981.

While data on numbers of students entering and graduating from training programs under the supervision of the Department of Human Resources tend to be lacking, in recent years an increase has occurred in the amount and the reliability of data regarding graduate and auxiliary nurses. A register of graduate nurses now exists in the Division of Education, National School of Nursing, which shows the name of each graduate and the location at which he/she is working. Registration is mandatory each year so that records are relatively up-to-date. A register of auxiliary nurses also exists but annual registration is not mandatory.

#### C. DISTRIBUTION OF MANPOWER

The distribution of health workers by category within the metropolitan area (Guatemala City) and by department<sup>1</sup> is shown in Table 1.

Table 2 and Table 3 indicate that both absolute and relative (per 10,000 population) maldistribution exists for all categories of health workers. Even auxiliary nurses, which are the backbone of existing rural health services, and the most numerous category of health worker, are found predominantly (53%) in the metropolitan area. The maldistribution of auxiliary nurses is even more marked on a "population" based ratio, i.e. 12.5 per 10,000 in the metropolitan area and 2.61 per 10,000 in the rest of the country.

**TABLE 1**  
**DISTRIBUTION OF HEALTH WORKERS**  
**BY DEPARTMENT, INCLUDING THE METROPOLITAN AREA**  
**1973**

Health Areas	Doctors	Dentists	EPS <sup>a</sup>	Nurses	Aux. Nurses	Sanit. Inspect.	Social Workers	Laboratorists	X-Ray Tech's	Nutritionists	Statisticians	Pharmacists	Other Personnel	Total Personnel
Metropolitana	505	50	118	311	1,463	60	47	143	50	6	4	7	2,526	5,290
So. Acepéquez	18	2	3	13	56	4	1	3	1	0	1	0	99	201
Chimaltenango	2	0	11	3	26	4	1	2	0	0	0	0	16	65
Amatitlán	16	2	2	16	79	2	1	4	2	0	2	0	101	227
Escuintla	15	3	4	4	74	8	1	5	1	0	1	1	73	190
Zacapa	18	1	11	10	67	6	2	5	2	1	1	1	84	209
Progreso	4	1	0	2	17	3	0	2	0	0	0	0	12	41
Izabal	20	3	0	23	54	7	2	7	2	0	1	3	194	316
Chiquimula	10	2	6	8	44	6	1	4	2	0	0	0	37	120
Jutiapa	13	1	8	7	67	6	2	4	1	1	1	0	58	169
Jalapa	8	1	3	2	40	3	1	1	1	0	1	0	34	95
Santa Rosa	3	1	5	1	19	4	0	2	0	0	0	0	9	44
Suchitepéquez	18	1	9	10	73	6	2	5	1	1	2	1	65	194
Tiquisate	10	0	0	5	40	3	0	4	1	0	1	0	48	112
Retalhuleu	12	1	3	6	57	4	1	2	1	0	1	0	43	131
Costa Occidental	9	1	5	6	64	4	1	4	1	0	1	0	52	148
Quezaltenango	40	3	15	28	108	3	2	8	5	1	2	1	176	392
Huehuetenango	12	2	8	7	77	5	1	7	3	0	1	0	68	191
Sololá	4	2	8	4	42	3	1	2	1	0	0	0	26	93
San Marcos	7	1	8	4	40	3	1	2	0	0	0	0	24	90
Quiché	7	1	11	3	59	5	0	3	1	0	0	0	35	125
Totonicapán	6	1	4	4	32	4	0	2	1	0	0	0	34	88
Alta Verapaz	11	2	11	7	70	7	1	2	1	0	0	0	59	172
Baja Verapaz	6	1	5	4	32	5	0	4	0	0	0	0	28	86
Petén	7	1	5	9	47	3	1	4	2	0	1	0	49	129
I.C.S.S.	489	31	0	256	1,007	0	54	81	38	2	15	12	1,162	3,147
<b>Total Republic</b>	<b>1,270</b>	<b>115</b>	<b>263</b>	<b>753</b>	<b>3,754</b>	<b>168</b>	<b>124</b>	<b>312</b>	<b>118</b>	<b>12</b>	<b>38</b>	<b>26</b>	<b>5,112</b>	<b>12,065</b>

Source: National Plan for Health 1975-1979, Institutional Report.

<sup>a</sup> Ejercicio Profesional Supervisado: Supervised Professional Practice; Senior medical students performing a 6-month rural-health service and a 6-month hospital service required prior to graduation.

TABLE 2

MOH PERSONNEL: PERCENTAGE DISTRIBUTION  
BY METROPOLITAN AREA AND  
ALL OTHER AREAS

	<u>Metropolitan Area</u> (19% of the population)		<u>All other Areas</u> (81% of the population)	
Doctors	505	65%	276	35%
Dentists	50	60%	34	40%
Graduate Nurses	311	63%	186	37%
Auxiliary Nurses	1,463	53%	1,284	47%
Sanitary Inspectors	60	36%	108	64%
Ray Technicians	50	63%	30	37%
Physicists	6	60%	4	40%

RCE: Department of Human Resources, MOH 1974.

TABLE 3

MOH PERSONNEL: NUMBER OF HEALTH WORKERS  
PER 10,000 POPULATION  
(METROPOLITAN AND ALL OTHER AREAS)

	<u>Metropolitan Area</u> (19% of the population)	<u>All other Areas</u> (81% of the population)
Doctors	4.3	0.56
Dentists	0.4	0.07
Graduate Nurses	2.7	0.38
Auxiliary Nurses	12.5	2.61
Sanitary Inspectors	0.5	0.22
Ray Technicians	0.4	0.06
Physicists	0.05	0.01

RCE: Department of Human Resources, MOH 1974.

Guatemala has an estimated 1,639 doctors of which approximately 70% practice in Guatemala City. Of these, many are employed part time at the Ministry of Health or Guatemalan Institute for Social Security (IGSS) hospitals and clinics, or in the central administrative offices. In addition, these doctors see paying patients in their private clinics. Some are affiliated with group practices that own their own premises and operate laboratory, X-ray and ancillary medical facilities. Additionally, a doctor may have hospital privileges at one of the private in-patient hospitals.

Thus, the metropolitan area, with a population of 1,228,800 persons, is served by 1,157 physicians, a ratio of one doctor per 1,062 people. Of these, no more than half can afford private medical care, thus the effective doctor/patient ratio drops to 1 per 531. The ratio is further reduced when adjustment is made for those doctors who are referral specialists and not the first contact between patient and physician.

The maldistribution of physicians has at least two deleterious effects: (1) that areas outside of the metropolitan area are seriously under-doctored and (2) that because of oversaturation in the metropolitan area, employment is unavailable for newly qualified doctors and doctors in private practice cannot find enough paying patients. The subsequent effect on the quality of medical practice, including over-medication, unnecessary procedures, iatrogenic disease and needless referrals cannot be overlooked.

Finally, the quality of training programs and their graduates must be considered. "Quality" includes more than the ability to transmit knowledge, skills and attitudes; it includes the relevance of the training to the duties to be performed, to the environment which exists and to the facilities available, as well as to the needs, wants, social mores and conventions of the population to be served. It is time-consuming and subjective to evaluate "quality" when it is used in this sense. However, given the burden of disease, suffering and malnutrition that afflicts many people, especially rural dwellers, one questions health centers and health posts with few or no patients, maternity beds lying empty despite a high birth rate and laboratories and X-ray facilities with low usage patterns.

While this situation can be attributed partially to lack of equipment or medical supplies, it relates more directly to the image of the facilities and their staff, and to the attitude toward their usage, which have developed in the community. However, periodically marked changes occur in usage patterns - a clinic, previously scarcely used, becomes crowded; a laboratory with a low activity rate becomes over-worked; a community, previously apathetic towards self-help programs, becomes enthusiastic. These changes frequently can be traced to changes in medical personnel and almost never to new equipment, facilities or buildings.

Thus, the "quality" of personnel and the programs that train them are a prime determinant of utilization of the successful extension of health services into the community.

In summary, health manpower problems are caused by:

1. Maldistribution of personnel, with the possible exceptions of village health promoters, midwives and rural health technicians.
2. Mismatch of personnel and jobs; health workers may be overqualified, underqualified or trained inappropriately to undertake their tasks.
3. Training and attitudes which do not meet the tacit needs and wants of the clientele.

D. INVENTORY OF TRAINING RESOURCES

A variety of health manpower training resources exist in Guatemala.

1. The Ministry of Public Health and Social Assistance(MOH)  
"The Division of Human Resources is a dependency of the General Directorate of Health Services. It is responsible for the establishment of targets, the direction and supervision of programs having as their purpose the more effective provision of health services and in implementing the policies and strategies regarding health personnel outlined in the National Health Plan." <sup>1</sup>

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<sup>1</sup> Reference 3

The lines of responsibility and the principal program activities of the Division of Human Resources within the Ministry of Health, are shown in Figure 1. Tables 4 and 5 provide specific information on students entering and graduating from the principal MOH training programs.

The training facilities supported by the Ministry of Health include:

- (a) A nursing school adjacent to the Roosevelt Hospital, the national reference hospital in Guatemala City.

The School, in operation since the late 1940's, trains graduate and auxiliary nurses. The Director of the Nursing School advises the Ministry of Health on the training and use of nurses and is responsible for the staffing and operation of the other schools of nursing in the Republic. Additionally, the staff of the MOH Division of Human Resources, to whom the Director of Nursing Services is responsible, is physically housed at the nursing School.

Training in hospital patient care takes place at the Roosevelt hospital, a 976-bed complex constructed in 1942 with departments of medicine, surgery, obstetrics and pediatrics. In addition, a Cancer Institute, Rehabilitation Center, Nutritional Rehabilitation Center for Children and a Center for the Training of Retarded Children are located within the Roosevelt Hospital complex.

FIGURE 1

RESPONSIBILITIES AND PROGRAMS  
MOH DIVISION OF HUMAN RESOURCES

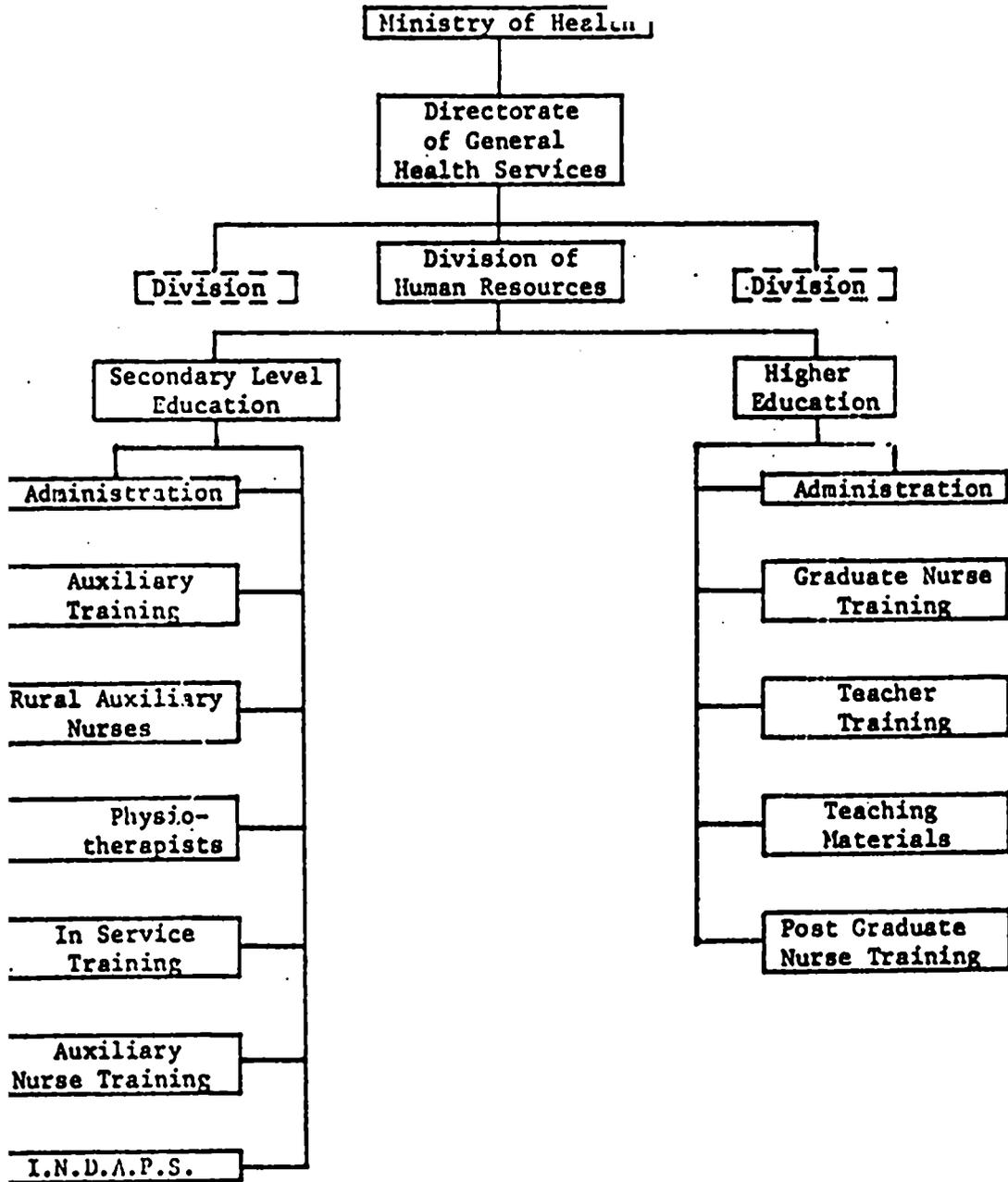


TABLE 4

STUDENTS ADMITTED TO AND GRADUATED FROM  
THE TRAINING PROGRAM AT INDAPS, QUIRIGUA  
1972 to 1977 and Projected to 1980

	1972	1973	1974	1975	1976	1977 <sup>(2)</sup>	1978	1979	1980
<b><u>RURAL HEALTH TECHNICIANS</u></b>									
Admitted	36	41	63	60	60	110	110	110	110
Graduated			32	38	56	57			
<b><u>MEDICAL MAINTENANCE TECHNICIANS</u></b>									
Admitted		18	20						
Graduated		18	20						
<b><u>RURAL AUXILIARY NURSES</u></b>									
Admitted					60	60	120	120	120
Graduated						58			
<b><u>AUXILIARY NURSES</u></b>									
Admitted		40	52	50					
Graduated			92	50					
<b><u>OTHER COURSES</u></b>									
Traditional Midwives <sup>(1)</sup>		22							
Supervisors		16							
Health Promoters <sup>(1)</sup>			15						

Source: INDAPS: Instituto de Adiestramiento de Personal de Salud - The Health Personnel Training Institute, Quirigua.

(1) Since 1974, training of these personnel has taken place in villages surrounding INDAPS. Numbers trained not available.

(2) Beginning with 1977, two groups of students per year will begin studies.

TABLE 3

**NUMBERS OF STUDENTS ENTERING AND GRADUATING FROM NON TRAINING PROGRAMS**  
**PERCENT LOSS OF STUDENTS AND AVERAGE COSTS**  
**FROM 1972 WITH PROJECTIONS TO 1980**  
 (Data excludes the Quirigua training program)  
 and  
**SANITARY INSPECTORS IN NON TRAINING INSTITUTIONS**  
**FROM 1975 AND PROJECTED THROUGH 1978**

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1977 BUDGET	AVERAGE COST PER GRADUATE
<b>GRADUATE NURSES</b>											
<b>Guatemala City</b>											
Admissions: Year 1				48	56	106	(80)	(80)	(80)	\$ 157,208	\$ 4,030
Year 2				43	47	50	(100)	(75)	(75)		
Year 3				46	40	41	(45)	(95)	(70)		
Graduates:				46	40	(41)	(45)	(95)	(70)		
Loss %:						(17%)	(11%)	(10%)	(13%)		
<b>Quetzaltenango</b>											
Admissions: Year 1				23	44	70	(40)	(40)	(40)	\$ 99,300	\$ 7,093
Year 2				16	20	40	(65)	(35)	(38)		
Year 3				21	14	14	(35)	(60)	(30)		
Graduates:				19	14	(14)	(35)	(60)	(30)		
Loss %:						(39%)	(20%)	(14%)	(25%)		
<b>AUXILIARY NURSES</b>											
<b>Guatemala City</b>											
Admissions:			75		87	90				\$ 45,790	\$ 610
Graduates:				64		(75)					
Loss %:				15%		(15%)					
<b>Quetzaltenango</b>											
Admissions:					26	24					
Graduates:						22	(23)				
Loss %:						15	(42)				
<b>Mazatenango</b>											
Admissions:	74		57	75	69	40	57				
Graduates:						47%	17%				
Loss %:		58									
		22%									
			52								
			9%								
<b>Jutiapa</b>											
Admissions:							60				
Graduates:								(51)			
Loss %:								(15%)			
<b>Cobán</b>											
Admissions:							(40)				
Graduates:								(34)			
Loss %:								(15%)			
<b>SANITARY INSPECTORS</b>											
<b>Guatemala City</b>											
Admissions:				26	19	50	(40)	(40)			
Graduates:				26	19	(50)	(40)	(40)			
Loss %:				0%	0%	0%	0%	0%			
<b>Cobán</b>											
Admissions:							(30)				
Graduates:								(30)			
Loss %:								(0%)			

Figures in parentheses are estimates.

Training also takes place at the Hospital San Juan de Dios (an MOH regional hospital) of 1,250 beds that serves the northern metropolitan region.

(b) A training program for cyto-technologists in the detection of uterine cancer.

This program, conducted in the Roosevelt Hospital, began in 1970, and provides both theoretical and "on-the-job" training to personnel from the Central American countries. The specimens examined are obtained through the family planning program of the Ministry of Health. USAID grant support, once received by the program, has now terminated.

(c) A nursing school in Quetzaltenango.

This school, located 250 kilometers from the capital in Quetzaltenango, the second largest city in Guatemala, trains graduate and auxiliary nurses and provides short-term topic-specific training courses. Training facilities include a 500-bed regional hospital, soon to be rebuilt. Project HOPE is presently upgrading the hospital and training facilities by providing hospital and laboratory equipment along with U.S. medical and administrative specialists.

(d) A Nursing School located in Mazatenango in the Department of Suchitepequez, on the Pacific Coastal Plain.

This school, constructed in 1970, is adjacent to the 385-bed regional hospital and trains only auxiliary nurses.

(e) A Nursing School in Jutiapa in the Department of Jutiapa in the eastern part of the country.

The school is temporarily housed in rented quarters pending construction, with funds available under AID Loan 520-L-021, of a building on the grounds of the 300-bed regional hospital. The school, which will train auxiliary nurses, should be ready for occupancy in March, 1976.

(f) Institute for Training Health Personnel (INDAPS)

This institute is located at Quiriguá, a community of 3,000 people, in the Department of Izabal in the eastern part of the country, 203 kilometers from the capital. It began operation in 1971 and has been supported by USAID grants and loans. The premises, originally a 250-bed hospital constructed in 1913<sup>1</sup> by the United Fruit Company, were abandoned from the late 1950's until 1970, when the old hospital, its grounds and staff houses were donated by the United Fruit Company to the Ministry of Health. It was renovated and now serves as a training institute for several categories of health auxiliaries including maintenance technicians, auxiliary nurses and rural auxiliary nurses (see Table 4); short courses are provided for field medical supervisors, public health physicians, area medical directors and nurses. It is the only institution that trains the rural health technician category of health auxiliary. Table 4 depicts the numbers of students admitted and graduated for the years 1972 to 1976, with projections to 1980.

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1 References 4 and 5.

The institute contains living accommodations for 250 students, housing for 50 staff, an auditorium for 200, a library, a preparation laboratory, and a visual aids division including a printing shop, garage, workshops, a warehouse, a teaching health post, a nutrition rehabilitation center and community education buildings. There are no inpatient facilities.

One wing of the institute, damaged during the 1976 earthquake, is being repaired, and students and teachers now occupy temporary quarters. An extension to the institute's teaching facilities, soon to be constructed, will include new classrooms, teachers' offices, and administration and audio-visual aids facilities. These extensions will be financed under AID Loan 520-L-021.

Thirty surrounding villages are used for training auxiliaries in community development, preventive medicine, sanitation, agriculture and simplified curative medicine.

(g) A School of Occupational, Physical and Special Therapy.

This school, located at the IGSS Rehabilitation Hospital in Guatemala City, trains physiotherapists, occupational therapists and speech therapists.

The 1976 graduates included one graduate in occupational therapy, two in speech therapy and seven from a 3-year physiotherapy program. In this same year, students enrolled in occupational therapy included one in the third year of study, two in the second year, and six in the first year. Students of physiotherapy included eight in their third year, thirteen in their second year and seventeen

in their first year. Nine students were enrolled in the first year of speech therapy studies.

Since the regional hospitals of the Ministry of Health do not have Departments of Physical, Occupational or Speech Therapy, virtually all of these graduates are absorbed into the IGSS system, with a few going to the private sector.

(h) A clinical laboratory auxiliary training program.

This program, in operation since 1959, is jointly operated by the MOH Division of Human Resources and the Department of Laboratories of the General Directorate of Health Services.

The ten-month course enrolls and graduates approximately twenty students annually. Teachers are provided by the School of Chemical Sciences and Pharmacy of the University of San Carlos. Senior-year pharmacy students provide a teaching-service function as part of their Supervised Professional Practice (EPS)<sup>1</sup> program.

2. School of Social Services, IGSS

The School of Social Services, under the jurisdiction of the Instituto Guatemalteco de Seguridad Social, IGSS, was founded in 1949.<sup>2</sup> In January 1975 it became affiliated with the School of Social Work of the University of San Carlos and has been chartered to award academic qualifications. Since the affiliation, students in the 3-year social service program

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<sup>1</sup> Ejercicio Profesional Supervisado, a program in which senior medical students are required to serve 6-months in a rural area and 6-months in a hospital setting prior to graduation.

<sup>2</sup> Reference 6.

complete their first year of training at the School of Social Work of the University and their final two years at the School of Social Services of IGSS. By 1977, the school had graduated 627 social workers and approximately 40 continue to graduate annually.<sup>1</sup>

### 3. University of San Carlos

The national university, located in Guatemala City was founded in 1681, and is one of the oldest universities in Latin America. The first medical graduate obtained his license to practice in 1703.

The University today includes Faculties of Medicine, Pharmacy, Dentistry, Veterinary Medicine and Zoology and Schools of Psychology and Social Work.<sup>2</sup> Table 6 depicts the number of enrolled students and the annual budgets of these faculties.

TABLE 6

UNIVERSITY OF SAN CARLOS FACULTIES AND SCHOOLS PRODUCING HEALTH RELATED PERSONNEL AND ANNUAL COST PER STUDENT.

	<u>Number of En-rolled Students</u>	<u>Annual Budget</u>	<u>Annual Cost per Student</u>
Medicine	4,199	\$938,017	\$ 223
Pharmacy	873	465,100	533
Dentistry	765	488,353	638
Veterinary Medicine	564	451,042	800
Psychology	850	82,789	97
Social Work	246	45,000	183

1 Informe Anual de Labores del IGSS. 1975.

2 Reference 7.

This table would depict that the annual expenditure for the training of a veterinary student is almost four times that of a medical student. However, it should be noted that the pro-rated costs of medical and dental education that takes place in a hospital or clinic setting are not included, and are difficult to determine since the students perform "services" as part of their training experiences. Additionally, the large amount of attrition that occurs, especially after the first and second years of study, make the cost of training a graduate proportionately larger. For example, in 1976 approximately 220 students graduated from the eight-year medical curricula, while over 2,000 students entered as first-year students. Linear extrapolations applied to these figures would suggest that the cost of educating one medical graduate is approximately \$ 4,700. Only 40 of these 220 graduates were able to obtain jobs, probably no more than eight outside of the metropolitan area, while the remainder simply added to the pool of unemployed physicians in which their medical skills contribute nothing. Thus, it can be argued that the cost of producing one doctor to work in an understaffed-area is approximately \$ 130,000.

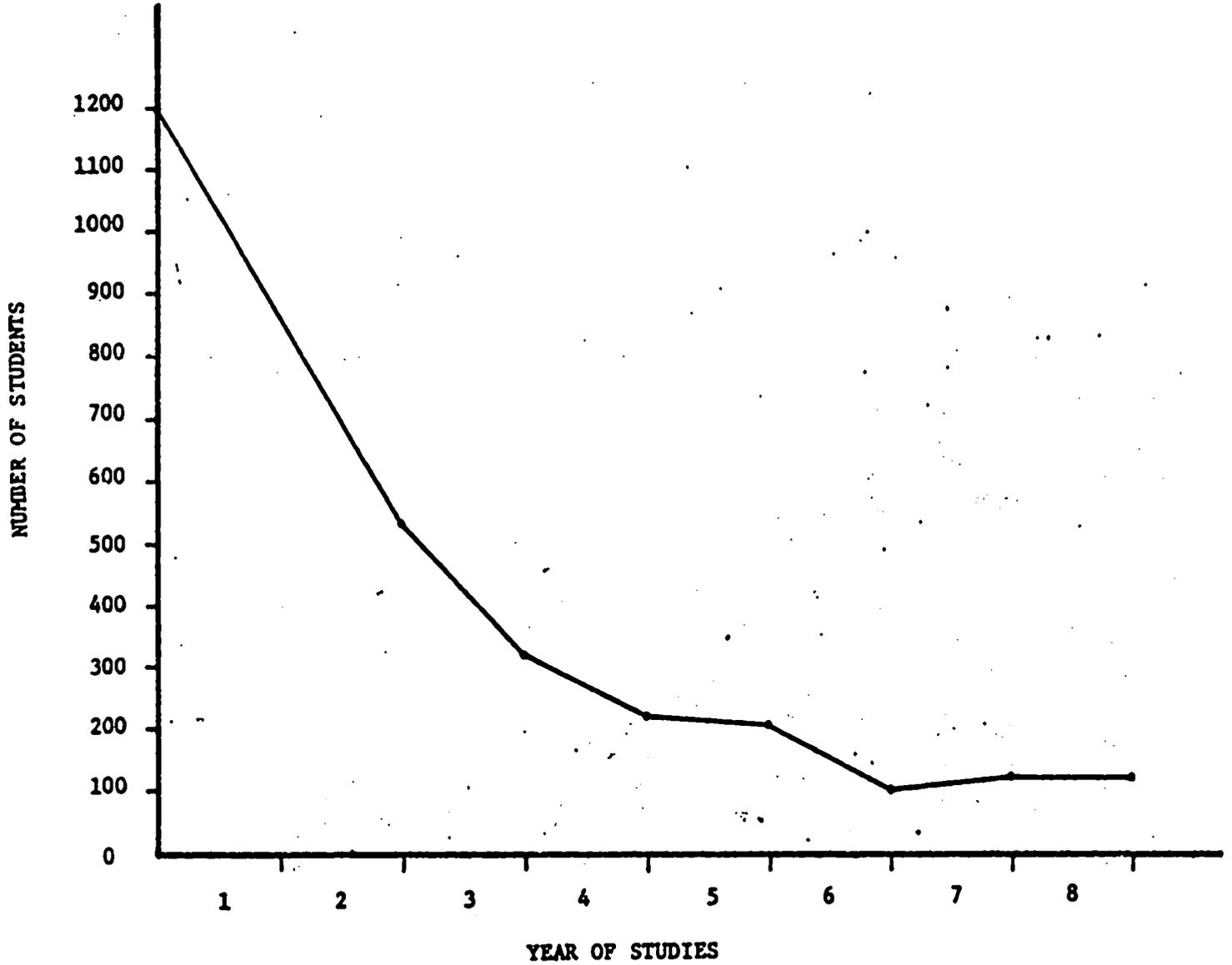
Figure 2 indicates the attrition of medical students and represents averaged data for 1971-1973. It is notable that a 73% loss occurs between those enrolling in the first year and those entering the third year of studies. Throughout the 8-year curricula, there is an average loss of 90% of the first-year

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FIGURE 2

UNIVERSITY OF SAN CARLOS  
NUMBER OF MEDICAL STUDENTS  
BY YEAR OF STUDIES  
1971 - 1973

Data Averaged



student body.<sup>1</sup>

During the final year of medical education, medical students are required to participate in a University-wide program known as Supervised Professional Practice (Ejercicio Profesional Supervisado, EPS). Their participation requires a six-month period of service in an urban hospital, and a similar period in a health center or health post serving a rural area. A total of 140 locations throughout the country are identified as training sites. Students are required to make epidemiological surveys of the area to which they are assigned as well as to provide curative and medical services.

#### 4. Military Hospital

A 236-bed military hospital, operated and staffed by the Military Medical Service of the army, provides medical care for members of the armed forces free-of-charge and for dependants according to an established fee-scale.

A ten-month nurse-auxiliary training program began in May 1976 using essentially the curriculum approved by the Ministry of Health with certain additions related to military needs.<sup>2</sup> Seventy students entered the program and in March 1977, 29 graduated. Attrition was attributed to marriage, illness and inability to meet the academic standards. A second course with 58 students, began in June, 1977.

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<sup>1</sup> Reference 8.

<sup>2</sup> Reference 9.

### 5. Institute of Nutrition of Central America and Panama (INCA)

The Institute of Nutrition of Central America and Panama was inaugurated in 1949 to study the nutrition problems of Central America and Panama and to seek means to solve them. The Institute undertakes basic and applied research in nutrition, provides technical assistance to member countries,<sup>1</sup> and trains nutritionists and dietitians at the post-graduate level for work in Central America and Panama. The INCAP School of Nutrition and Dietetics is recognized as a training center by the University of San Carlos which awards academic credit for participation in INCAP's educational programs.

The institute also collaborates with the Ministry of Education in the content of nutrition education for primary and secondary schools and with the Ministry of Health in training programs for nurses and social workers. In addition to providing nutrition education materials for primary and secondary school teachers, INCAP produces nutrition education materials for use by home economic teachers, nurses, agricultural education.

The Institute is under the jurisdiction of the Pan American Health Organization and receives its financial support by contributions from member governments and by grants.

### 6. Private Hospitals

Nursing education in Guatemala began in 1922 at the "American Hospital", a mission hospital which opened in 1913

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<sup>1</sup> Reference 10.

operated by the Presbyterian Board of Foreign Missions. The program was terminated in the mid-1940's when government training of nurses began. The hospital, staffed largely by U.S. physicians and nurse educators, trained about 200 graduate nurses<sup>1</sup> who subsequently attended night classes in order to be officially certified under the government training program. The hospital has since passed from the control of the Mission Board and now operates as a private medical facility under the name Hospital "Latino Americano."

No officially recognized, formally taught training programs for nurses or other auxiliary health personnel take place in any of the private hospitals in the Capital or elsewhere.

#### E. PERSONNEL POLICIES AND JOB CLASSIFICATION

In recent study, the National Economic Planning Council (CNPE) identified 243 categories of personnel working in the public health sector (Table 7). The National Civil Service Office, a dependency of the Presidency of the Republic, is responsible for these positions as a part of its responsibility for the implementation of Congressional Decrees 1748, II-73 and 28-70, the Civil Service Law, and the laws regulating salaries of the administration and retired persons. This office analyzes

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<sup>1</sup> Reference 11.

TABLE 7

CATEGORIES OF HEALTH WORKERS  
IN THE PUBLIC SECTOR

TECHNICAL PERSONNEL		111
Doctors	8	
Medical Auxiliaries	20	
Technical Specialists	76	
Others	7	
ADMINISTRATIVE PERSONNEL		71
Doctors	18	
Technical	45	
Others	8	
OTHER PERSONNEL		<u>61</u>
TOTAL		243

and classifies positions and assigns salary levels, determines salary increments, and handles legal and jurisdictional matters related to employment in public and private sectors. The 1976 budget of this office was \$317,000.<sup>1</sup>

## II. ANALYSIS OF THE SITUATION

### A. INTRODUCTION

The data presented in the preceding section may be summarized in a four-compartment matrix (Table 8) which depicts the approximate distribution of the population and MOH health personnel in the metropolitan area and the remainder of the country and the relative level of expenditures in these areas for preventive and curative services.

TABLE 8

#### THE HEALTH CARE DELIVERY MATRIX

	Metropolitan Area	Remainder of Country	MOH Expenditures
Population	20%	80%	
MOH Health Personnel	64%	36%	
Curative Programs	++++	+++	78%
Preventive and Promotive Programs	++	+	22%

<sup>1</sup> Reference 3.

These resources appear to be maldistributed since the majority of the population (80%) live outside of the metropolitan area, and since the solutions to many health problems, especially those of infectious diseases and malnutrition, can be most cost-beneficially addressed by promotive and preventive services, including the improvement of environmental hygiene.

Two basic solutions are apparent. One would redistribute personnel and resources to achieve more realistic and effective services reaching larger populations. In effect this means reducing the level of investment in the metropolitan and non-metropolitan hospitals and increasing the level in other types of services in the non-metropolitan area. This solution is not viable because it implies a reduced level of service in terms of quality and quantity of personnel.

The second solution would increase investments in the most deficient area, that compartment formed in Table 8 by the intersection of the categories: Remainder of Country with Preventive and Promotive Programs. The health manpower plan being analyzed in this study attempts to adopt this alternative.<sup>1</sup>

From the point of view of manpower, this alternative presents two problems: (1) the salary costs involved assume a disproportionate part of the MOH total budget and (2) the numbers of needed health personnel is not commensurate with the production capacity of the available training institutions.

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<sup>1</sup> Reference 12.

Given that the program set in motion by the IDB Loan will result in heavy manpower demands, the situation in 5-10 years, without intervening remedial or counter-balancing policies or actions, may be predicted as follows:

1. In order to staff the new facilities, projected MOH staffing patterns will be severely curtailed. Duties, now the responsibility of one category of personnel, will necessarily be subsumed by lesser trained and qualified personnel with concomitant deterioration in the level and quality of service.
2. Because it will be necessary to redirect resources to the training and salaries of essential medical staff, all non-urgent programs will be postponed, curtailed or eliminated. These include maintenance programs for facilities, equipment and vehicles, data collection systems, educational seminars, and decentralized administration.
3. In order to continue curative, hospital-based services which are the most obtrusive, politically sensitive and in public demand, reductions will be made where services are less so, such as in the rural areas, especially villages and dispersed populations. The savings realized by curtailing programs which serve the rural populations will be invested to keep high-cost personnel and facilities operating.

4. The effort to generate more health personnel will result in lowered educational standards for entrance into training programs, shortened duration of training programs, and diminished quality of institutional services and educational aids. This will enable more personnel, commanding lower salaries, to be produced and the per-capita training cost to be diminished.

5. To effect savings of resources and personnel, programs of supervision and evaluation will be curtailed, followed by a deterioration of services. It is likely that the clandestine practice of medicine on a fee-for-service basis by unqualified health workers, and the sale of government medicines and disposal or substitution of government supplies and property, will result from the lack of accountability and supervision.

6. The MOH, in an attempt to keep salary scales as low as possible in order to employ the maximum number of personnel, will thus place itself in an even more unfavorable situation compared with the private sector. Better qualified, more enterprising and effective personnel will seek better-paying jobs in the private sector and/or in the metropolitan area. In an attempt to alleviate this, contractual obligations may be imposed by the MOH on graduates of training programs requiring them to serve a certain period of time in government services.

7. As conditions in hospitals and health centers deteriorate, the population will lose confidence and become more reluctant to seek medical care, and the response to preventive services, such as the vaccination campaign, will deteriorate. The effect will be (a) an increase in the use of private sector health services by those who can afford them, (b) an increase in the lucrative incentive to clandestine practitioners and (c) an increase in the inclination of the Indian population to seek traditional medicines and to re-institute discarded traditional practices.

B. GOVERNMENT OF GUATEMALA HEALTH MANPOWER PROJECTIONS

In 1974 the MOH conducted a health manpower study<sup>1</sup> which projected until 1980 the need for seven categories of health manpower and for supervisory teams. The rationale was normative with projections based on population growth, improved levels of health care outreach, and improved efficiency. Table 9 shows the estimated number of new jobs that will be needed and the concomitant costs, and Figure 3 shows these cost data on a cumulative basis. The projections are linear with an anticipated first year (1975) investment of \$11 million and five annual increments. At the end of the quinquennium, the additional costs attributable to the employment of 10,820 persons plus 88 supervisory teams will be approximately \$30 million per year.

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<sup>1</sup> Reference 12.

**TABLE 9**  
**HEALTH PERSONNEL PROJECTIONS FOR MDN**  
**INDICATING NUMBER OF MDN JOBS AND SALARY COSTS ANNUALLY**  
**1975-1980**  
**Metropolitan Area Excluded**

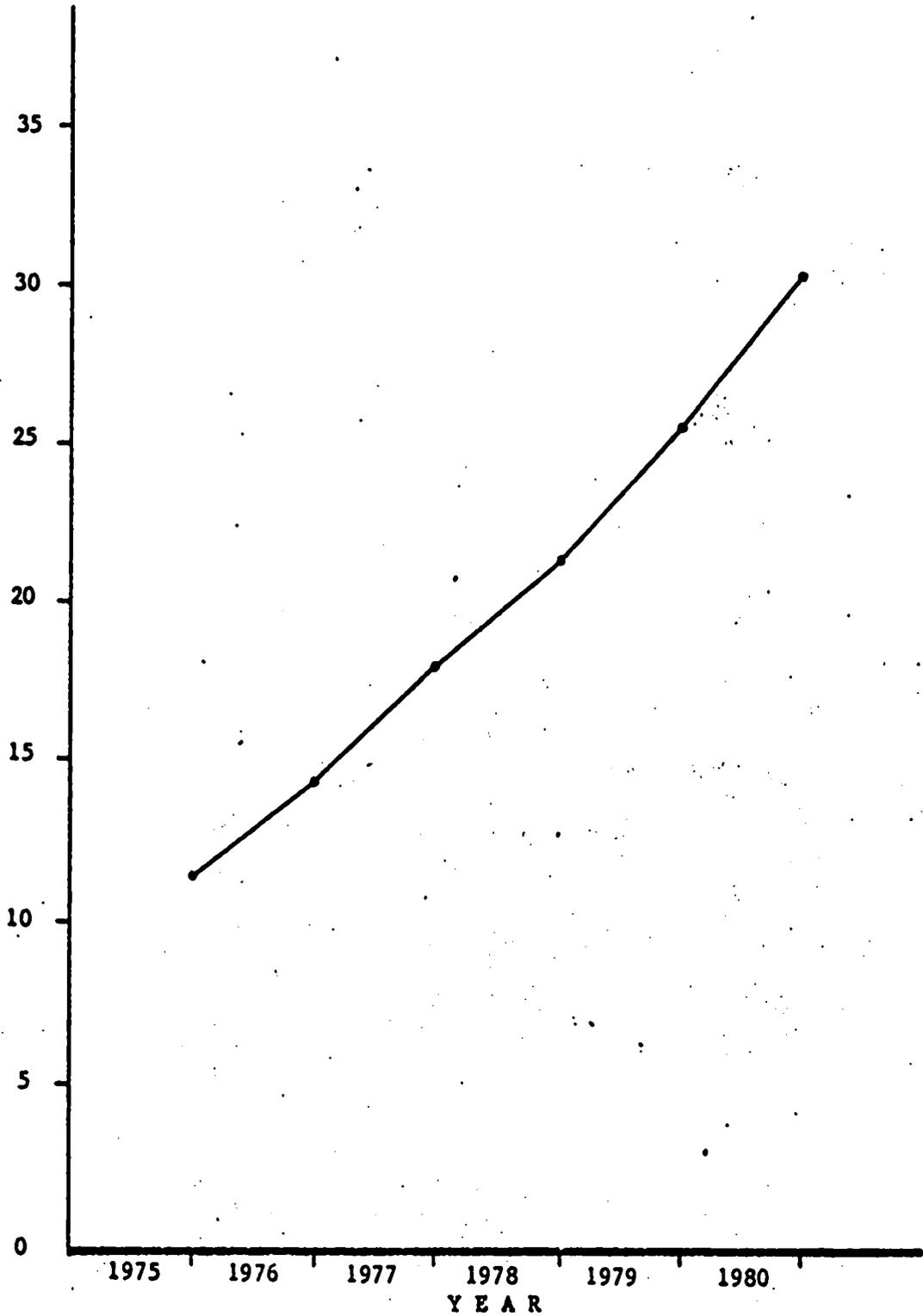
CATEGORY & SALARY	NUMBERS OF PERSONNEL AND ANNUAL COSTS						TOTAL
	1975	1976	1977	1978	1979	1980	
<b>Doctors</b>							
\$100/Mr. Week	Number	617	24	7	6	2	658
4 Hrs. Daily	Number	213	43	54	52	59	480
8 Hrs. Daily	Cost \$	3,006,400	328,000	352,000	328,000	376,000	7,766,400
<b>Graduate Nurses</b>	Number	380	188	200	239	289	1,606
\$250/Month	Cost \$	1,140,000	564,000	600,000	717,000	867,000	4,818,000
<b>Auxiliary Nurses</b>	Number	2,101	539	584	659	686	5,327
\$120/Month	Cost \$	3,025,440	776,160	840,960	948,960	987,840	7,670,880
<b>Sanitary Inspectors</b>	Number	380	188	200	239	289	1,606
\$250/Month	Cost \$	1,140,000	564,000	600,000	717,000	867,000	4,818,000
<b>Rural Health Technicians</b>	Number	143	145	148	149	146	881
\$200/Month	Cost \$	343,200	348,000	355,200	357,600	350,400	2,114,400
<b>Laboratory Technicians</b>	Number	48	11	10	13	11	111
\$200/Month	Cost \$	115,200	26,400	24,000	31,200	26,400	266,400
<b>Dentists</b>	Number	67	13	16	18	16	151
\$300/Month	Cost \$	643,200	124,800	153,600	172,800	153,600	1,449,600
<b>SUB-TOTAL TECHNICAL PERSONNEL</b>	Number	3,949	1,151	1,219	1,375	1,498	10,820
	Cost \$	11,413,440	2,931,360	3,125,760	3,472,560	3,828,240	28,903,620
<b>Supervisory Units (1)</b>	Number	14	14	15	15	15	88
	Cost \$	196,560	196,560	210,600	210,600	210,600	1,235,520
<b>SUB-TOTAL ANNUAL INCREMENT</b>	Number	3,963	1,165	1,234	1,390	1,513	10,908
	Cost \$	11,610,000	3,127,920	3,336,360	3,683,160	4,038,840	30,139,200
<b>CUMULATIVE TOTALS</b>	Number	3,963	5,128	6,362	7,752	9,265	10,908
	Cost \$	11,610,000	14,737,920	18,074,280	21,757,440	25,796,250	30,139,200

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(1) This category includes: doctors, nurses, drivers and vehicles.

FIGURE 3

PROJECTED INCREASE IN NOH EXPENDITURES  
BASED ON HEALTH MANPOWER PLAN  
1975-1980



The study examined the implications of extending services to all parts of the country excluding the Capital-Metropolitan area, and of improved staffing in 22 regional hospitals and approximately 100 health centers and 400 health posts. The data should be compared with those which consider the manpower implications of the IDB Loan, which will finance improved resources in 7 of the 22 departments, and whose estimated annual costs for personnel salaries, when the project is fully developed, is \$ 4.4 million.

In effect, the majority of the increase in the manpower force and budget projected by the MOH in the 1974 study will be needed just to staff the facilities to be completed under the IDB Loan. Unless additional resources are obtained, funds to pay additional manpower for improved staffing of facilities in the remaining 15 departments will be in short supply until 1981. A lower level of staffing in the new IDB-financed facilities would result in a more equitable distribution of health personnel.

Table 9 (page 33) and Table 10, which relate costs of salaries and geographic distribution of seven categories of health manpower, indicate that expenditures on "high-cost" manpower (e.g. doctors, dentists, graduate nurses), who provide predominantly but not exclusively curative medical services in hospitals and health centers, is disproportionate to expenditures on "low-cost" manpower (e.g. auxiliary nurses,

TABLE 10

NUMBER AND CATEGORIES OF NEW HEALTH MANPOWER POSITIONS  
TO BE CREATED BY 1980, BY HEALTH AREA  
 (Based on Health Manpower Plan)

A R E A	Doctors		Graduate Nurses	Auxiliary Nurses	Rural Health Technicians	Health Promoters	Laboratory Technicians	Dentists	T O T A L
	4 Hours	8 Hours							
Amatitlán	13	7	25	73	6	57	2	3	186
Escuintla	58	46	150	422	18	176	10	14	894
Sacatepéquez	13	9	30	103	7	69	2	3	236
Chimaltenango	25	18	60	204	42	417	4	4	774
Zacapa	17	12	38	123	26	261	3	3	483
Chiquimula	24	19	62	211	76	762	4	6	1,164
El Progreso	11	8	24	85	35	351	2	2	518
Izabal	31	23	77	290	40	405	5	7	878
Santa Rosa	20	13	46	156	26	268	3	4	536
Jalapa	16	11	36	123	39	388	3	4	620
Jutiapa	33	23	80	283	80	808	6	8	1,321
Suchitepéquez	35	26	94	287	9	93	6	8	558
Tiquisate	20	17	54	184	1	12	4	5	297
Retalhuleu	27	21	68	232	8	81	5	7	449
West Coast	48	35	114	390	18	178	8	11	802
Quetzaltenango	30	22	72	346	19	190	5	7	691
San Marcos	31	23	75	356	72	720	5	7	1,289
Huehuetenango	53	37	123	420	110	1,110	9	12	1,874
El Quiché	45	32	123	365	67	667	7	11	1,317
Sololá	17	12	40	136	19	193	3	4	424
Totonicapán	25	18	59	202	16	162	4	6	492
Alta Verapaz	44	33	106	364	84	846	7	10	1,494
Baja Verapaz	16	12	40	137	46	465	3	4	723
Petén	6	3	10	35	17	165	1	1	238
T O T A L	658	480	1,606	5,527	881	8,844	111	151	18,258

rural health technicians, health promoters) who perform predominantly but not exclusively promotive and preventive functions. Approximately 89% of the projected costs is to pay salaries of "high-cost" personnel and others working in hospitals and health centers, such as laboratory technicians. Approximately 11% is assigned to TSRs and auxiliary nurses working in health posts. Village health promoters are volunteers, therefore only their training costs are included. In terms of numbers of positions, hospitals and health centers account for 7,453, health posts for 1,762 and villages health promoters for 8,844. Including graduate nurses, there are 21.4 auxiliary health personnel per "full-time equivalent" doctor; excluding the village health promoter, there are 10 auxiliary health personnel per "full-time equivalent" doctor. Considered in the hospital-health-center setting, the ratio becomes 8.16 per "full-time equivalent" doctor.

These ratios may be considered low from the point of view of providing a better quality service but must be considered quite disproportionate in terms of health care outreach.

#### C. PRODUCTION OF MANPOWER

At this stage it is appropriate to examine health manpower production to ascertain how it relates to anticipated needs. Table 4 (page 15 ) indicates rates of production of graduates and auxiliary nurses. Laboratory auxiliaries, presently produced at the rate of about 20 annually, will be produced at the

rate of 30 annually when the School of Laboratory Technology, currently under construction at Chiquimula, becomes functional in late 1977.

Approximately 60 graduate nurses are produced annually, 300 auxiliary nurses (expected to increase to 360 in 1978) and 57 rural health technicians (expected to increase to 110 in 1978).<sup>1</sup>

In 1973, 753 graduate nurses worked in the public sector. If the number of additional jobs contemplated in the national plan had been provided (i.e. 380 in 1975, 188 in 1976 and 200 in 1977), 768 new nursing positions would have become available.

However, at present production rates, only about 210 graduate nurses would have become available during this period (1975-1977). Even if all had obtained jobs in the public sector, a deficit of approximately 560 nurses would have resulted. At the present rate of production, it would take, conservatively, 3 years to fill this deficit, not to mention the 1,200 jobs additional that were proposed between 1976 and 1980.

The plan proposes to increase the annual number of graduates of the two Schools of Nursing to 90 each and to begin training graduate nurses at INDAPS, Quirigua, at a rate of 90 year, thus training a total of 270 graduated nurses per year. The cost of the increase is estimated at \$514,000 annually, plus the costs of physically enlarging the nursing school at Quetzaltenango. If the increased production rates

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<sup>1</sup> References 3, 5, 12, 13, 14, 15.

were in effect in 1978, 810 nurses would be available by 1981, not including retirements and resignations. This number is only half of the 1,606 nurses called for in the plan.

The plan also calls for the training of 8,844 village health promoters during the 1975-1980 quinquennium at a cost of \$30 each, or \$53,000 annually. This number, based on the provision of one promoter for every community under 2,000 inhabitants, would concentrate promoters in the Departments of Huehuetenango (1,110 promoters), Alta Verapaz (864), Jutiapa (808), Chiquimula (762), San Marcos (720) and El Quiché (667). Since the village health promoter is an unpaid volunteer, no salary costs are implicit in this part of the plan.

#### D. NUMBERS OF PERSONS ELIGIBLE FOR HEALTH TRAINING PROGRAMS

Figure 4 illustrates the Guatemalan education system and Table 11 depicts the number of persons qualified for health professional and auxiliary health personnel training programs based on minimum educational requirements for admission.<sup>1</sup> The data include numbers of students in national, public and private schools who have completed the necessary grades of formal education which would permit a student to enter a training program in the health sector.

Graduates of rural schools are considered desirable recruits for health training programs leading to service in the rural areas. However, the data would imply that virtually

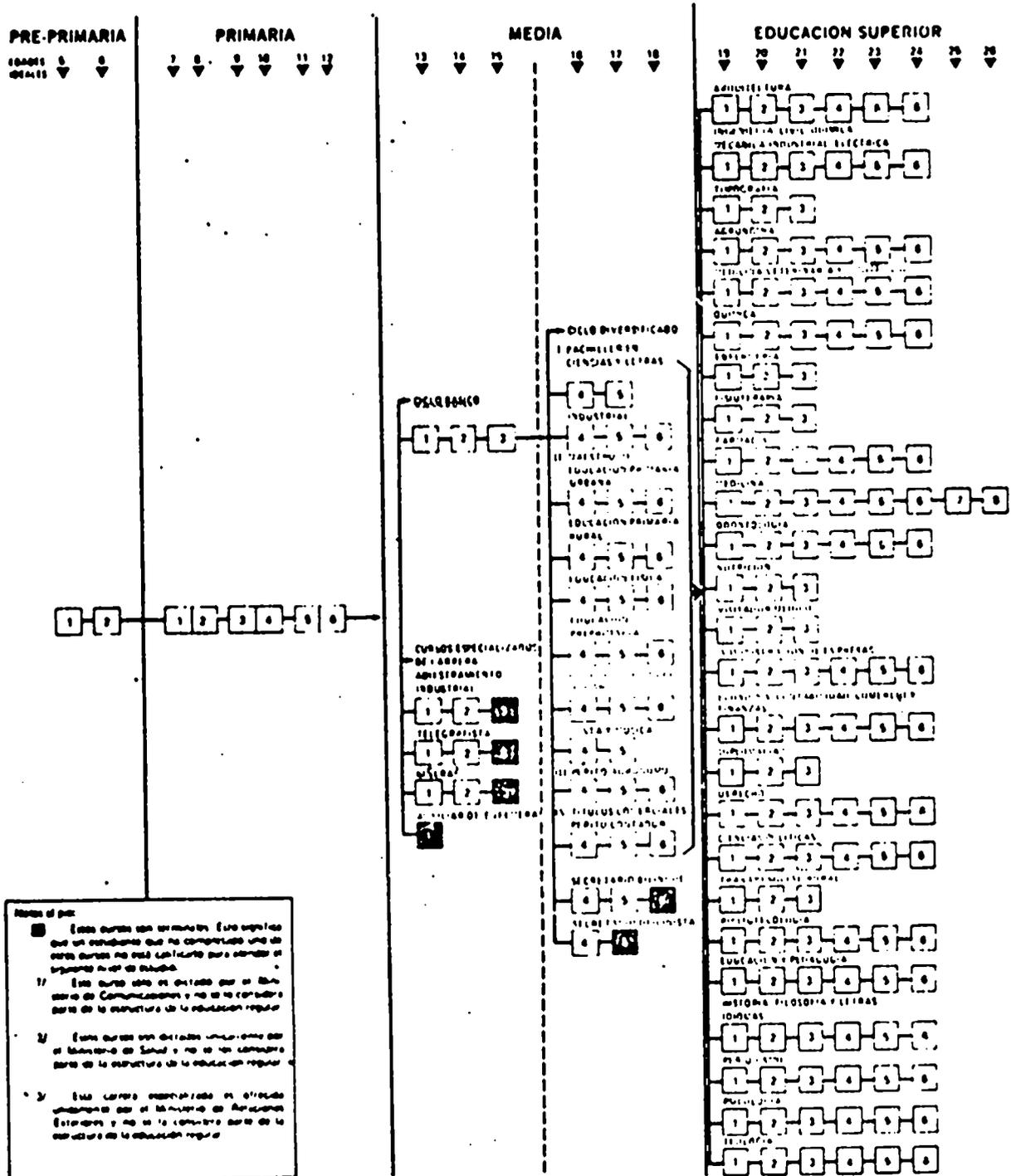
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<sup>1</sup> Reference 7.

FIGURE 4

THE EDUCATIONAL SYSTEM OF GUATEMALA  
(since June 1973)

El Sistema Educativo de Guatemala  
(A partir de junio de 1973)



Source: Statistics for the Education Sector Assessment, Report Prepared by the Sector Analysis Division with Data Furnished by the Government of Guatemala, USAID, 1975.

TABLE 11

NUMBERS OF PERSONS QUALIFIED FOR HEALTH PROFESSIONAL AND AUXILIARY HEALTH PERSONNEL TRAINING PROGRAMS  
BASED ON MINIMUM EDUCATIONAL REQUIREMENTS FOR ADMISSION  
1969

Health Personnel Category	Minimum Educational Level for Admission	Numbers* in Corresponding Pool		
		Rural	Urban	Total
Doctor	Secondary School, Grade 12			9,000
Dentist	Secondary School, Grade 12			9,000
Graduate Nurse	Secondary School, Grade 12			9,000
Auxiliary Nurse	Junior High School, Grade 7			45,000
Laboratory Technician	Secondary School, Grade 12			9,000
Pharmacist	Secondary School, Grade 12			9,000
Rural Health Technician	Junior High School, Grade 9			25,000
Health Promoter	Primary School, Grade 2	104,000	117,000	221,000
Sanitary Inspector	Secondary School, Grade 12			9,000

\* Data on specific numbers in the urban and rural "pools" are available only for persons completing the second primary grade.

all education beyond the primary level is "urban". This inaccurate representation of the situation occurs because the word "urban", as used here, embraces the metropolitan area, and all departmental and municipal capitals, without regard to population size. The majority of the municipal capitals have less than 5,000 people, therefore to consider their degree of "urbanization" as equivalent to that of the Capital City misrepresents the situation.

Figure 5 shows the distribution of secondary schools by the population size of the towns in which they are located. Twenty-nine secondary schools are located in towns of 5,000 or less inhabitants. Thus the graduates of these schools are likely to be "rural" in outlook and lifestyle and can be viewed as among the most desirable recruits for future rural health workers.

Village health promoters are required to be literate, with a minimum of two years of basic education. Rural schools annually graduate one hundred and four thousand and urban schools 117,000 students with this level of education.

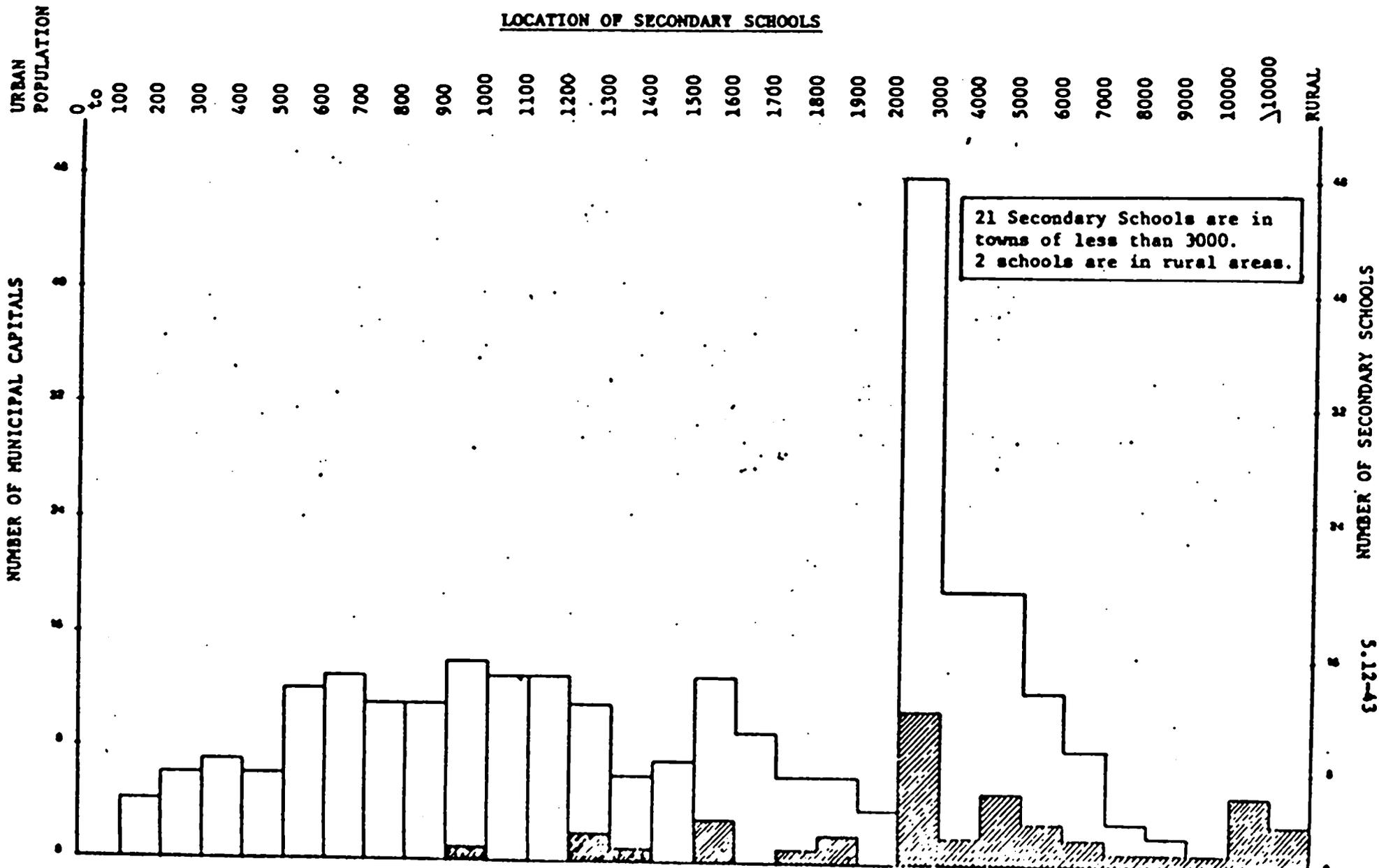
Rural Health Technicians are required to have completed the third grade of Junior High School (Ciclo de Estudios Básicos) to be eligible to enter the training program. In 1977, when the sixth group of TSRs were being recruited, approximately 1,500 academically qualified applicants were eligible for 60 training spaces. This disproportionately large number

FIGURE 5

POPULATION OF MUNICIPAL CAPITALS\*

GUATEMALA 1970

LOCATION OF SECONDARY SCHOOLS



\* Data exclude the Department of Guatemala

of applicants (6% or more of the entire pool) suggests that not only is the effective "pool" size a function of the numbers of educationally qualified applicants, but that it is also a function of the attractiveness of the program for which they are being recruited.

## E. DOCTORS AND OTHER HEALTH PROFESSIONALS

### 1. Doctors

A total of 2,326<sup>1</sup> physicians were registered in Guatemala in 1976. Approximately 900 work full or part-time in the Ministry of Public Health, and 600 work full or part-time in IGSS.<sup>2</sup> It is common for a doctor to hold two or even three positions simultaneously on a part-time basis, therefore it is impossible to compute from these data the number of doctors working full-time in the private sector.

Table 12 lists the occupations of registered physicians by specialities.<sup>3</sup> The stated speciality does not necessarily imply additional advanced qualifications. No post-graduate degrees or qualifications are awarded in Guatemala, so physicians who wish a higher qualification must necessarily study abroad. Further, a doctor may claim specialities in more than one branch of medicine; therefore the number of specialists and generalists cannot be obtained by addition of the individual categories.

<sup>1</sup> Records of the Colegio Médico, as of July 1977. Of those registered only about 2,000 physicians are actively practicing.

<sup>2</sup> Reference 15.

<sup>3</sup> Reference 16.

TABLE 12  
DOCTORS IN THE CAPITAL AND IN ALL OTHER  
AREAS, BY SPECIALTY, 1976

<u>SPECIALITY</u>	<u>IN CAPITAL</u>	<u>ALL OTHER AREAS</u>	<u>TOTAL</u>
General Medicine	109	253	362
General Surgery	125	38	163
Allergy	5	0	5
Anesthesiology	24	0	24
Cardiology	20	0	20
Pediatric Surgery	2	2	4
Maxillo facial Surgery	1	0	1
Orthopedia	5	0	5
Plastic Surgery	11	0	11
Thoracic Surgery	7	0	7
Vascular Surgery	6	0	6
Dermatology	18	0	18
Endocrinology	9	0	9
Infectious Diseases	3	0	3
Epidemiology	4	0	4
Gastroenterology	14	0	14
Geriatrics	2	0	2
Obstetrics and Gynecology	117	15	132
Hematology	6	0	6
Physical Medicine and Rehabilitation	9	0	9
Forensic Medicine	4	0	4
Internal Medicine	100	9	109
Nuclear Medicine	2	0	2
Preventive Medicine	3	0	3
Tropical Medicine	2	0	2
Microbiology	2	0	2
Nephrology	5	0	5
Pneumonology	16	1	17
Neurosurgery	8	0	8
Neurology	6	0	6
Nutrition	9	0	9
Ophthalmology	27	1	28
Oncology	16	0	16
Otolaryngologist	16	1	17
Pathology	12	0	12
Pediatric	157	16	173
Proctology	5	0	5
Psychology	5	0	5
Psychiatry	30	0	30
Radiology	18	0	18
Rheumatology	4	0	4
Public Health	22	8	30
Tuberculosis	30	1	31
Traumatology	34	3	37
Urology	15	1	16
<b>Total Specialties</b>	<b><u>1,047</u></b>	<b><u>349</u></b>	<b><u>1,396</u></b>

Of the 1,396 specialties practiced in the nation, 1,047 (75%) are practiced in the Capital and 349 (25%) in the remainder of the country. General Medicine is the only category in which more doctors (70%) practice in the remainder of the country than in the Capital City (30%).

## 2. Other Health Professionals

In 1976, there were:

190 registered veterinarians of which all but 19 (10%) reside in the capital.

207 registered pharmacists of which 186 (90%) reside in the Capital and 21 (10%) in the remainder of the country.

75 registered clinical biochemists of which 72 (69%) reside in the Capital, 2 in Quetzaltenango, the second largest city and 1 in the remainder of the country.

7 registered nutritionists, 1 botanist and 9 chemists, all resident in the Capital.

Table 13 depicts the numbers of seven categories of health professional graduated between 1960 and 1970 and the average annual increment for each between 1969 and 1970.

**TABLE 13**  
**NUMBER OF HEALTH PROFESSIONAL GRADUATES 1960 - 1970**  
**&**  
**AVERAGE ANNUAL INCREMENT 1960 - 1970**

<u>C A T E G O R Y</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>Average Annual Increment 1969 - 1970</u>
Doctors	54	30	34	94	90	64	74	56	46	60	120	8.3
Dentists	4	12	6	18	16	8	15	19	27	19	19	16.7
Graduate Nurses	37	42	54	35	10	31	22	19	69	45	50	3.1
Pharmacists	4	8	2	11	7	5	5	4	3	5	1	-12.9
Health Sciences	99	92	96	158	123	108	116	98	145	129	191	6.8
Veterinarians	--	--	3	4	7	6	9	10	11	21	4	3.7

Statistics for Education Sector Assessment.  
 USAID/Guatemala, 1975.

5.12-47

Between 1971 and 1976, 1,184 health promoters were trained in the MDH program. These promoters now work as volunteers in 19 of 22 departments. The seven departments having the highest concentration of promoters are those predominantly affected by the 1976 earthquake disaster, i.e., El Quiché (248 promoters, 21%), El Progreso (190, 16%), Baja Verapaz (183, 16%), Guatemala (140, 12%), Jutiapa (137, 11%), Totonicapán (131, 11%), Quetzaltenango (110, 9%). Of these, 63% are men and 37% women.

A recently conducted study indicates that approximately 70% are subject to some form of regular supervision, either periodic visits by a supervisor or attendance at monthly meetings conducted at a convenient health center.

Despite serious losses of up to 50% during the formative years of the program (1971-1972), the work force has stabilized.

Health promoters conduct both curative and preventive activities. Curative services are provided for a 15-cent charge and medicines are purchased from a local pharmacy or provided by the local health post. Despite this financial incentive, the promoters do not appear to be devoting a disproportionate time to remunerative clinical activities, to the detriment of preventive actions.

Training programs are held sporadically at health centers serving rural areas and last approximately six weeks. The instructors comprise the rural health team, including graduate nurse, rural health technician, social worker, sanitary inspector and physician. Training costs are estimated at \$50 per

promoter (travel and living allowance) and cost of bag equipped with medical supplies is \$60.

Table 14 names twenty-four other entities who train health auxiliary personnel including health promoters.<sup>1</sup> Although data on these programs are deficient, conservative estimates indicate that about 500 health promoters have been trained and are working as a result of these programs. Certain of the health-related private voluntary programs which train promoters enjoy a close relationship with the MOH programs (e.g., Save-The-Children, Quiché; Hospital de Jacaltenango (Maryknoll), Huehuetenango; Centro Apostólico, Morales) and utilize curriculum approved by the Ministry of Health. In total, approximately 1,700 village health promoters are now working in Guatemala, the majority in the non-urban settings.

### 3. Village Midwives

In 1972, interest developed in the training of traditional village midwives, who attend more than 80% of all deliveries in Guatemala. Deliveries in the metropolitan region and several of the larger towns are likely to be attended by a

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<sup>1</sup> Reference 19.

TABLE 14

NON-GOVERNMENTAL ORGANIZATIONS  
INCLUDING PRIVATE VOLUNTARY ORGANIZATIONS  
TRAINING PERSONNEL TO WORK IN HEALTH SECTOR

Organization and Location (Department)	Training Program Begin	Health Promoters		Auxiliary Nurses		Midwives	
		Trained Per Course	Total Trained (1974)	Trained Per Course	Total Trained (1974)	Trained Per Course	Total Trained (1974)
Boca del Monte, Guatemala							
Behrhorst Clinic, Chimaltenango	1963		40-50				
Clínica Santiaguito, (Project Concern), Sololá	1968						
Clínica San Pedro La Laguna, Sololá							
El Novillero, Sololá	1963	<10					
Catholic Relief Services, Totonicapán							
Clínica Evangélica Mam, Quetzaltenango	1973	<10					
Hospital de Jacaltenango (Maryknoll), Huehuetenango	1960	<10			<10		
Uspantán Health Promoter Program, Quiché							
Save-the-Children, Quiché	1976						
Centro de Integración Familiar, Baja Verapaz							
Cubulco Clinic, Baja Verapaz							
Parroquia de Santo Tomás de Castilla, Izabal	1969		>50				
Centro Apostólico San José, Izabal							
Clínica Parroquial El Estor, Izabal							
Madres de St. Joseph, Zacapa	1973	11-25					
Dispensario Bethania, Chiquimula	1974	11-25					
Clínica Parroquial San Lucas Totolmán, Sololá							
Clínica Parroquial Samayac, Suchitepéquez							
Clínica Maxeña, Suchitepéquez							
Hospital Nuevo Progreso, San Marcos							
Hospital Nacional, Huehuetenango							
Evangelical Good Samaritan Hospital, Quiché							
Madres Benedictinas, Cobán, Alta Verapaz							

physician; however, virtually all the deliveries in the rural areas are attended by traditional midwives or are unattended. In 1975 it was estimated that 16,000 village midwives were practicing in the country.

The midwife-training programs are taught by MOH nurse-midwives in health centers and hospitals which serve the rural areas. After the 6-week training program, the trainee is awarded a certificate, and a bag containing towels, dressings, tape and antiseptics, or a cash payment to purchase these items.<sup>1</sup>

Midwives are required to register each year and to receive additional training. However, no national midwife registry exists since records are maintained only at the health center level.

#### Supervisory Teams for Health Auxiliaries

Units of Medical Assistance Training and Supervision (UMATS), each of which include a doctor and a graduate nurse, have been educated to supervise auxiliary health workers in the rural areas, to train village midwives and health promoters and to provide a level of health care to villages and health posts on a periodic basis. Table 15 depicts the number of village midwives, health promoters and supervisory teams trained during period between 1971 and 1974. In 1973, two courses of instruction were held at INDAPS, Quiriguá and a total of 8 UMATS teams trained at this location.

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<sup>1</sup> Reference 20.

Recommendation 6: STUDIES SHOULD BE CONDUCTED WHICH LEAD TO PROGRAMS THAT INCORPORATE APPROPRIATE ELEMENTS OF THE TRADITIONAL MEDICAL SYSTEM INTO THE CARE PROVIDED BY THE PUBLIC SECTOR HEALTH OUTREACH SYSTEM. DETERMINATION SHOULD BE MADE OF THE STATE OF TRANSITION FROM TRADITIONAL TO MODERN MEDICAL PRACTICE AS PART OF THE BASE LINE STUDIES OF A COMMUNITY.

SUCH A STUDY OF THE EXISTING INDIAN AND LADINO TRADITIONAL BELIEFS SHOULD INCLUDE (a) THEIR POSSIBLE POINTS OF COINCIDENCE AND CONFLICT WITH MODERN MEDICINE, (b) A DETERMINATION OF THOSE ASPECTS THAT COULD BE INCORPORATED INTO AUXILIARY TRAINING, (c) METHODOLOGIES OF TEACHING THESE APPROPRIATE ASPECTS AND (d) METHODOLOGIES FOR EVALUATING THE EFFECTIVENESS OF THE TEACHING AND THE UTILIZATION OF SUCH INFORMATION IN HEALTH CARE DELIVERY.

Indigenous medicine has deep, traditional roots, and applies both to the Indian population and the Ladino population living in the rural areas. Several thousand practitioners exist whose methodologies include use of herbs, casting spells, and advice on diet and care as it relates to the nature and characteristics of disease. Many times, modern medical care, with its armamentarium of powerful drugs, conflicts with the traditional beliefs.

If modern medicine is to be made more effective and the credibility of other health programs, such as environmental

sanitation, is to be increased, it is important to recognize the presence of a powerful, ingrained and active indigenous system and to explore in what ways conflicts arise.

A Model for Determining the State of Transition from Tradition to Modern Medical Practice.

The design and modification of a health care delivery system cannot be based solely on data describing numbers and kinds of inpatient and out-patient services. To be maximally useful, health status should be assessed at the community level using two fixed points as baseline.

The data collection instrument proposed to accomplish this consists of an interview questionnaire that measures four categories of well-being and medical care:

1. Subject is well.
2. Subject is treating him/herself.
3. Subject is receiving treatment from local indigenous practitioner.
4. Subject is receiving treatment at public sector institutions.
5. Subject is receiving care from other source.

The primary interview will establish the first baseline point. By comparison with it, the second will measure the changes that may have come about and indicate the direction of the dynamics of the process.

Data collected from the two interviews, separated by an appropriate time period, will be collated in the form of a matrix:

FIRST VISIT		SECOND VISIT					
STATUS	NUMBER IN CATEGORY	WELL	SELF TREATMENT	INDIGENOUS TREATMENT	INSTITUTIONAL TREATMENT	OTHER	TOTAL
1. Well							
2. Self Treatment							
3. Indigenous Treatment							
4. Institutional Treatment							
5. Other							
Total							

Information gathered in this manner can be utilized in two ways to determine the active health care vectors:

1. Over a short time interval of 8 to 10 days, behavior patterns can be determined for a particular health episode. Such questions could be answered as:

- a) How many patients treating themselves have subsequently been treated by an indigenous medical practitioner?

- b) Does one treatment pattern continue or change?
- c) At what level does primary medical care begin?
- d) How many people have changed their health status, e.g. the well becoming ill and vice versa.

2. Over a longer time period of one to two years, the behavioral trends in a target population can be determined such as rate at which indigenous medicine is being abandoned for "modern" medical care and the increasing use of private practitioners.

Recommendation 7: A REVIEW SHOULD BE CONDUCTED OF EMPLOYMENT CONDITIONS OF HEALTH WORKERS IN THE PUBLIC SECTOR AND SHOULD INCLUDE A RE-EVALUATION OF THE APPROPRIATENESS OF EXISTING JOB DESCRIPTIONS AND THE EXTENT TO WHICH THEY REALISTICALLY REFLECT TASKS PERFORMED. PAY SCALES, CLASSIFICATIONS, BENEFITS, WORKING HOURS, VACATIONS, SICK LEAVE AND OPPORTUNITIES FOR CAREER ESCALATION AND ADDITIONAL TRAINING SHOULD BE REVISED IN LIGHT OF THE EXISTING ECONOMIC SITUATION AND THE DEMANDS PLACED BY CHANGING PATTERNS OF HEALTH CARE DELIVERY.

The changing character of health care delivery, with increased emphasis on the training and use of low-cost auxiliary personnel who will carry health services to the hitherto unreached rural areas, has caused changes in roles and functions of many health workers. New methods of control and treatment of infectious diseases, including tuberculosis, and increased

interest in prevention as opposed to curative services, all have contributed to these changes. In addition to new techniques, change is contributed to by the pool of trained health workers being used more by the growing health industry in the private sector, the increased awareness of the value of a healthy worker in the industrial sector, and the extended outreach of social security services.

New patterns of health worker training with emphasis on practical field experiences, new modalities for assessing effectiveness, and new decentralized health administration in the public sector, all contribute to the changes that affect every functional health unit. These changes imply altered roles for existing health workers, careers for categories of health workers that did not previously exist, increased responsibility for some levels and decreased or changed responsibilities for others.

Salaries in the public sector must be competitive with those in the private sector if the most talented and motivated workers are to be obtained and retained. Opportunities for further education and career advancement must be created, employee benefits, working hours, vacations, sick leave, work norms and job descriptions must be re-evaluated and re-adjusted. In short, personnel, their recruitment, training, jobs, and working conditions must be realigned in accordance with the new directions of health care delivery.

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Appendix 1

RURAL HEALTH TECHNICIAN  
TRAINING CURRICULUM  
INDAPS, QUIRIGUA

CONTENTS

METHODOLOGY

Unit No.1 The Quiriguá School

1. Concept	1. Initial Evaluation of Concepts (Directed Test)	1	Hr.
2. Philosophy	2. Conference (Global)	3	
3. Antecedents	3. Work Groups (Global Theme)	8	
4. Organization	4. Group discussion	8	
5. Resources	5. Final Evaluation of Concepts (Directed Test)	4	
6. Teaching Systems		24	Hrs.
7. Evaluation Systems			
8. Final Objective			
Responsible: Dr. Juan Jacobo Erdmenger			
Substitute: Eng. Julio Pablo Peña			May 17, 18 & 19

Unit No.2 The Community and its Environment

1. Communication Techniques	1. Bibliographical Review	1	5.12-105
1.1 Interviews	2. Work Groups	4	
1.2 Home Visit	3. Group discussion	2	
1.3 Inquiries	4. Inside Practical Exercise	2	
	5. Outside Practical Exercise	6	
2. Introduction and Identification with the Community	1. Conference	2	
2.1 Information	2. Groups meeting	2	
2.2 Awareness	3. Participation in Cultural Activities	-	
2.3 Oral Participation	4. Interviews	4	
2.4 Communication			
3. Drawing of Plans	1. Conference	-	
3.1 Principles of Topography	2. Practical Exercises	40	
3.2 Training Assistants	3. Field Work	-	
	4. Execution	20	

4. Taking of a Census	1. Conference	1	Hr.
4.1 Population	2. Work Groups	7	
4.2 Social	3. Group Discussion	4	
4.3 Economic	4. Inside Practical Exercise	1	
4.4 Cultural	5. Outside Practical Exercise	12	
4.5 Education	6. Execution	20	
4.6 Sanitation	Collection		
4.7 Services	Tabulation		
4.8 Resources	Interpretation		
4.9 Migration			
4.10 Checking or Making of forms			
4.11 Calculating Resources			
4.12 Training Assistants			
4.13 Study of Plans and Principles of Statistics			
5. Knowing the Health Situation	1. Conference		
5.1 Checking Books of Civil Registry (10 years mortality)	2. Execution	4	
6. Community Organization	1. Investigation	12	
	2. Work Groups	3	
	3. Group Discussion	2	
7. Integral Diagnosis of the Community	1. Work Groups	8	
	2. Group Discussion		
	3. Execution		
		<hr/>	
		157	5.12-106 Hrs.

Responsible: Lic. Carlos E. Gómez

Substitutes: T.S. Ma. Elena Soto

Prof. Carlos A. Robles

Unit No.3 The Individual, His Environment & Community

1. The Man		
1.1 Biological Aspect	1. Review of Bibliography	1
1.1.1 Anatomy	Conferences	8
1.1.2 Physiology	Group Discussion	4
2. The Man	2. Review of Bibliography	1
2.1 Psychic Aspect	Conferences	8
2.1.1 Conduct	Work Groups	4
2.1.2 Personality	Exercises (Picture)	4
2.1.3 Mental Hygiene	Conferences	6
	Group Discussion	4

3. Principles of Social Anthropology,  
Human Relations and Rights and Obligations

4. Concept of Leadership and Recognizing  
Leaders

5. Techniques of Social Organization

6. A. Encouragement of Self Effort and  
Firm Mutual Help  
B. Agricultural & Livestock Production  
and Crafts

7. Encouragement for Responsibility and  
Awareness of Family and Community Welfare

8. Promoting the Active Participation of  
the Community for its Development

Responsible: T.S. Ma. Elena Soto  
Dr. Danilo Aldana M.  
Prof. Julia I. Toledo

3. Review of Bibliography  
Conferences  
Work Groups  
Group Discussion

4. Review of Bibliography  
Group Discussion  
Work Groups  
Conferences  
Outside Practical Exercise  
Inside Practical Exercise

5. Review of Bibliography  
Conferences  
Work Groups  
Group Discussion  
Outside Practical Exercise

6. Review of Bibliography  
Work Groups  
Group Discussion  
Practical Exercise

7. Review of Bibliography  
Conferences  
Work Groups  
Groups Discussion  
Practical Exercise

8. Field Work

7 Hr.  
5  
3  
3  
1  
3  
2  
1  
6  
3  
1  
5  
4  
3  
12

A	B
1	4
2	12
3	9
8	70
	95

1  
1  
2  
2  
6

30  
244 Hrs.

June 27-Aug. 22

5.12-107

Unit No.4 Administration

1. Present Health System	1. Conference	2	Hrs.
2. Health Statistics	2. Conferences	4	
2.1 Reports	Work Groups	6	
2.2 Paper-work	Group Discussion	6	
2.3 Collection	Exercises	12	
2.4 Tabulating and graphs			
2.5 Filing			
2.6 Interpreting			
2.7 Remittance			
3. Health Planification	3. Conferences	12	
	Exercises		
4. Preparing the Budget	4. Conferences	12	
	Work Groups		
	Group Discussion		
	Exercises		
5. Supplies	5. Conferences	12	
5.1 Orders	Work Groups		
5.2 Storeroom Control	Group Discussion		
5.3 Inventory	Exercises		
6. File and Kardex	6. Conferences	12	
	Exercises		
7. Maintenance and Personnel Control	7. Conferences	12	
7.1 Assignment of Duties	Work Groups		
7.2 Delegation of Duties	Groups Discussion		
7.3 Supervision	Exercises		
8. Maintenance	8. Practical Work	12	
8.1 Periodical Inspection			
8.2 Repairing			
8.3 Substituting			
8.4 Maintaining			
9. Controls	9. Work Groups	15	
9.1 Documents	Groups Discussion		
9.2 Correspondence	Exercises		
9.3 Accounting			
9.4 Purchasing			

5.12-108

Responsible: Ing. Julio Pablo Peña Díaz.  
Substitutes: E. H. Isabel Vásquez  
Dr. Juan Jacobo Erdmenger  
Dr. Jorge Melgar  
Cont. Sonia Hurtado  
Sec. Aracely Urdóñez

117 Hrs  
Aug.23-Sept.21

Unit No.5 Human Development

<b>I. Pre-nuptial</b>	<b>Anatomy and Physiology</b>	<b>I. Review of Bibliography</b>									<b>1 Hrs.</b>
1. Sexual Education	of sexual organs	Conference									12
	Responsible Paternity	Work Groups									6
	Sexual Hygiene										
2. Lab Examinations		Group discussion									4
VDRL, Blood type and Rh		Exercises									6
		Conference & Lab practice									12
<b>II. Prenatal</b>		<b>II. Review of Bibliography</b>									2
1. Normal Pregnancy		Conferences									30
1.1 History (Conception and Evolution of Pregnancy)		Work Groups									8
2. History		Groups Discussion									4
3. Physical Examination		Practice									20
3.1 Anthropometry (Pelvimetry)											
3.2 General Clinical											
4. Education		<b>4. Review of Bibliography</b>									
4.1 Feeding		Conference									
4.2 Personal Hygiene		Work Groups									
4.3 Mental Hygiene		Group Discussion									
4.4 Clothing Hygiene		Practical Exercise									
4.5 Activity											
5. Laboratory Examination		<b>5. Review of Bibliography</b>									
V.D.R.L.		Conference									
H.G.		Practice									
Hto.											
Urine											
6. Treatment of Pregnant Woman		<b>6. Conference</b>									
		Practice									
7. Prevention and Treatment of Miscarriage		<b>7. Conference</b>									
		Group Discussion									
8. Immunization		<b>8. Conference</b>									
		Exercises									
<b>III. Birth</b>											
1. Labor		<b>1. Review of Bibliography</b>									
		Conference									
		Practice									
2. Education (Preparation)		<b>2. Review of Bibliography</b>									
		Conference									
		Practice									

	<b>Nutr.</b>	<b>Nurse</b>	
	1	1	2
	2	3	5
	3	2	5
	2	2	4
	6	6	12

5.12-109

TABLE 15

VILLAGE MIDWIVES, HEALTH PROMOTERS AND SUPERVISORY TEAMS  
TRAINED BY THE MINISTRY OF HEALTH  
1972 - 1974

	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>Total</u>
Village Midwives	127	926	564	1,617
Health Promoters	67	283	506	856
Supervisory Teams	1	22	18	<u>41</u>
				<u>2,514</u>

Source: UNICEF: Guatemala Area Office, Annual Reports: 1972, 1973, 1974.

#### 4. Maintenance Technicians

Before 1972 no training programs were conducted on a regular basis to train service technicians in preventive maintenance and repair.<sup>1</sup> Trained technicians were employed to work in the MOH metropolitan and regional hospitals on an "as-available" basis. Frequently, the budget did not permit employment of a trained mechanic and no individuals were available with experience in medical equipment maintenance. The general pattern was to transport the equipment to the capital for servicing, or to refer maintenance and repair needs to the representative of the equipment manufacturer, who after lengthy delays, might dispatch a technician to undertake the needed repair.

<sup>1</sup>

Chapter 4.3 of the Health Sector Assessment: Maintenance Services Requirements, and Annex 5.11: Health Facilities Maintenance discuss health facility maintenance and

In July 1973, a four-month training course was conducted for eighteen students at INDAPS, Quiriguá. Each student was an employee of a regional hospital and the course was designed to provide a general medical-equipment service capacity. Another course on servicing equipment and electrical motors was offered for eleven students in April, 1974. Five students from the 1973 course also attended the 1974 course. Since that time, a number of informal courses have taken place at the Roosevelt Hospital, and currently almost every departmental hospital has at least one minimally-trained technician<sup>1</sup>(Table 16).

In 1977, the Technical Training Institute, INTECAP (Instituto Técnico de Capacitación y Productividad), a semi-autonomous dependency of the Ministry of Labor began discussions with the Ministry of Health to ascertain the latter's interest in, and capability for developing, a more formal educational program and to explore its possible interest in operational responsibility.

It is estimated that the facilities to be constructed under IDB Loan 468-SF/GU will require a maintenance staff of 84 persons, encompassing 4 categories of skill and function, at an annual salary cost of \$ 155,700. The project does not address the training of this staff.

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<sup>1</sup> Reference 2.

TABLE 16

NUMBER OF PERSONNEL TRAINED IN MAINTENANCE COURSES BY HOSPITAL

Hospitals	First Course	Second Course	Total
Zacapa	2	1	3
Puerto Barrios	1*	1*	2
Chiquimula	2		2
Cobán	1		1
Salamá	1		1
Jalapa	1*	1*	2
Jutiapa	1*	1*	2
Escuintla	1		1
Tiquisate	1*	1*	2
Hazatenango	1		1
Quetzaltenango	1*	1*	2
Huehuetenango	1		1
Amatitlán	1	1	2
Totonicapán	1		1
El Quiché	1		1
San Benito Petén	1	1	2
Retalhuleu		1	1
Coatepeque		1	1
Sololá		1	1
<b>TOTALS:</b>	<b>18</b>	<b>11</b>	<b>29</b>

\* Same person trained in both courses.

## 5. The Rural Health Technician (TSR)

The Rural Health Technician, TSR (Técnico en Salud Rural) is a man or woman between 18 and 46 years of age who, after training, assists as a health team member in the upgrading and extension of health care in the rural areas.

The use of these intermediate-level medical auxiliaries in Guatemala followed lengthy discussions based on a developing interest, nationally and internationally, in the use of alternative strategies<sup>1</sup> for extending the outreach of health care.

Until the early 1960's, the almost-universally adopted classical model saw health care delivery and its centrifugal extension as functions largely of the medical and nursing professions. The solution was believed to lie in a) the recruitment and training of more doctors and graduate nurses, b) inclusion in the curricula of experiences in rural areas where the practice of community medicine could be demonstrated and experienced, and c) the indoctrination of students with the idea that "community practice" had its unique merits, satisfactions, and rewards. However when these latter precepts were propounded by their professors, medical students were singularly unconvinced, recognizing that the professors themselves were not living and working in the rural areas.

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<sup>1</sup> References 21 and 22.

Indeed, it was readily apparent that the practice of a hospital or clinic-based medical or surgical specialty attracted prestige, intellectual satisfaction, research potential, relatively regular hours of duty, and not inconsiderable economic rewards. These were accompanied by congenial living conditions, social amenities, desirable educational opportunities for children, and opportunities for sophisticated living and entertainment.

On the other hand, community medical practice in rural areas offered poor economic rewards, the absence of social amenities, primitive living conditions, virtually no intellectual stimulation, relatively poor educational facilities for children and 24-hour-a-day, 7-day-a-week "on call" schedules.

Under these circumstances, it is surprising that extension of health services has proceeded at all, albeit slowly. Despite incentives, persuasion and coercion directed toward influencing physicians to take up practice outside the metropolitan area, there are now more doctors competing for patients in the Capital City. Unemployment causes them to seek alternative income sources and the standards of medical education and practice have deteriorated.

Graduate nurses, always in short supply, feel little or no pressure to work in rural areas when they can be absorbed easily into the private sector under financially attractive conditions.

Table 17 which depicts the distribution of selected health professionals by the size of the communities in which they work, demonstrates the reality of the situation.

An alternative strategy, subsequently adopted by the Ministry of Health in the face of vociferous opposition by medical and nursing professional organizations and training institutions, contemplated the formation of a new, intermediate-level health worker trained to address the root causes of the majority of illnesses afflicting the largely juvenile rural population. Studies were designed, implemented and completed to determine the need for, acceptance of, and the role to be played by the new health worker, as well as the support systems required for him to function effectively.

Following visits, in 1968, to medical auxiliary training programs in the United States, Africa, India, the Far East and New Guinea, a program was designed to train and deploy medical auxiliaries, to be known as Rural Health Technicians. It was intended that the program and its graduates would provide a major improvement of rural health care and extensive national coverage within a seven-to-ten-year period.

A former 200-bed hospital, constructed by the United Fruit Company in 1913 and subsequently abandoned in 1960, was selected as the site for a training institute, and rehabilitated. Classes began in 1971, and despite tremendous political, attitudinal

TABLE 17

DISTRIBUTION OF DOCTORS AND AUXILIARY PERSONNEL  
BY POPULATION OF TOWNS IN WHICH LOCATED  
1972

Population	999	1000 to 1999	2000 to 2999	3000 to 3999	4000 to 4999	5000 to 5999	6000 to 6999	7000 to 7999	8000 to 8999	9000 to 9999	10000 to 14999	15000 to 20000	20000 to 29999	TOTALS
<u>HOSPITALS</u>														
Doctors		3	2		8	2	5	6			34	45	462	567
Graduate Nurses		4	3		17	1	2	5			18	40	322	412
Auxiliary Nurses		11	15		7	13	17	44			163	176	1,413	1,859
<u>HEALTH CENTERS</u>														
Doctors	1	12	14	4	7	14	4	4	2		13	13	51	139
Graduate Nurses		8	6		4	10	2	1	2		8	7	34	82
Auxiliary Nurses	3	45	49	13	18	81	7	12	4		40	38	267	577
<u>HEALTH POSTS</u>														
Auxiliary Nurses	110	91	38	14	12	9	7	1	2	1	6	1	4	296
<u>TOTALS</u>														
Doctors	1	15	16	4	15	16	9	10	2		47	58	513	706
Graduate Nurses		12	9		21	11	4	6	2		26	47	356	494
Auxiliary Nurses	113	147	102	27	37	103	31	57	6	1	209	215	1,684	2,732
<u>PERCENTAGES</u>														
Doctors	1	2	2	7	2	2	1	1	2		7	8	74	109
Graduate Nurses		2	2		4	2	1	1	5		5	10	73	105
Auxiliary Nurses	4	5	4	1	1	4	1	2			8	8	62	100

5.12-59

and conceptual hurdles<sup>1</sup> the two-year program continues to train and deploy approximately 50 TSRs annually.

#### Antecedents

The present program for training intermediate level medical auxiliaries is the most comprehensive in Guatemala and in all likelihood, the first government-sponsored program of its kind in Latin America. However, the concept is not totally without precedent in Central America.

From the early part of the 16th century, medical auxiliaries, trained in Seville, served the fleet plying the Spanish Main in voyages to and from the New World. Subsequently a great need developed for their services in Guatemala, which was racked with the diseases of New Spain, including yellow fever, cholera, smallpox, malaria and measles. Then, as now, the number and distribution of medical services and personnel in Guatemala were inadequate to resolve the health problems.

In the early 1800's, Dr. Nicolas Esparragoza y Gallardo, a distinguished Guatemalan physician, administrator, innovator and reformer of medical education, designed a program to train Indian youths in the principles of medicine and surgery. They were to return to their villages and alleviate the sufferings

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<sup>1</sup>

An unpublished case study of these obstacles was undertaken by the Instituto Centro Americano de Administración de Empresas (INCAE). - Reference 23.

caused by the uncontrolled spread of infectious diseases, both endemic diseases and those imported from Europe and elsewhere.<sup>1</sup> No government financing was provided to train the students or to pay their salaries, thus the provision of both was left to the doctor's personal resources. He was not able to support the program more than a few years, and it ended.

Shortly after 1909, the United Fruit Company received permission from the Government of Guatemala to farm large tracts of land in the Motagua Valley. The valley at that time was one of the most malarious areas of Central America and "Motagua Fever" (Blackwater Fever) was responsible for the sparse, sickly population that inhabited the valley prior to 1909.

The Company's medical division mounted a campaign to control malaria and to provide health services to the workers, many of whom were imported from the West Indies. The Medical Director, Dr. Neil P. Macphail, organized a health service and trained "sick-camp attendants", whose responsibilities included curative medicine aimed at the most common infirmities, preventive care and malaria control measures.<sup>2</sup> The malaria control measures developed in Mississippi by the Rockefeller Foundation a few years earlier were used, and the prevalence of malaria was reduced to manageable proportions within five years. Subsequently, only a few cases per year were diagnosed although the potential from massive outbreaks exists to this day.

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<sup>1</sup> Reference 24.

Role of the TSR

"The TSR must be capable of gaining the confidence of the community, helping to improve the sanitary environment, reducing the prevalence of disease and modifying the traditional social, economic and educational systems, while making planned use of resources in order to achieve integrated development."<sup>1</sup>

The duties of a TSR include community organization for self-help projects, assessment of wants and needs, community health education including nutrition and family planning, improvement in the sanitary environment including promotion of hygienic practices related to the use and storage of potable water and the sanitary disposal of human wastes, development of congenial working relationships with the village midwife, supervision, and sometimes training, of village health promoters, and simplified curative medicine and first aid.

The TSR function of supervision and training of village health promoters emphasizes the intermediate role of the TSRs. Many of the TSR activities have end-results in rural communities, while other characterize him as a bridge between the farthestmost outreach of the formal health care delivery system, i.e. the health post, and the communities in its vicinity.

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<sup>1</sup> Reference 5.

Delegation of this latter important role to a medical auxiliary is, in effect, tacit admission that doctors attached to health centers and graduate and auxiliary nurses attached to health centers and health posts are unwilling or unable to extend health care at the community level.

The presence of the TSR admits in effect that primary health care should be delivered to the target population. On the other hand, the former model utilizing more sophisticated medical personnel to staff health centers implied that, if the community wanted health care, it should be sought individually by travelling to where the desired level of care was available.

A common question, with no clear response is "How many TSRs are Indians?" An Indian is defined as one who speaks an Indian language, retains the traditional Indian life-style, including customs and clothing, and bears an Indian name. It is difficult to say how many of these criteria can be met by a young man or woman who has completed 6 years of Primary Education, 3 Years of Secondary Education and 2 years of training as a TSR.

Of the TSRs recruited from and working in the predominantly Indian departments of the highlands, approximately 30% speak an Indian language, have Indian names and bear Indian features. None live an Indian life-style (although all live simply by Western criteria), all are necessarily fluent in Spanish, and only a few of the women TSR graduates wear Indian clothing.

TSRs are selected for service in the predominantly Indian areas based on their proximity to the Indian culture and their potential to identify with it and influence Indian leadership. In this, the TSRs are successful; however, they cannot be identified as Indian, in accordance with the criteria mentioned above.

#### Recruitment

Information regarding the career of a TSR, its obligations, rewards and selection criteria is disseminated by local radio, communications sent to schools and local government officials and in response to individual enquiries. Those interested are encouraged to communicate with the Office of the Program for Strengthening Rural Health Services in the Capital City where additional information, a written description of the course, and application forms are available.

#### Selection

The specific selection criteria which must be met before an applicant will be considered as a potential student in the TSR training program, are:

1. That the applicant have been born and have resided in the rural areas.
2. That he or she has completed satisfactorily 6 years of primary education and three years of secondary education.
3. That he or she have a sincere interest to serve in the rural areas and an evident capacity to do so effectively.

In addition, ability to speak one of the 22 Indian dialects is an important ancillary qualification. Letters of recommendation attest to the applicants' qualities and desire to serve.

Preliminary applications of 1500 to 2,000 applicants are reviewed, and reduced to between 100 and 200. The final selection procedure, which identifies 60 students to begin training, includes psychometric tests (General Aptitude, Otis "A" and MMPI),<sup>1</sup> a medical examination, an interview with the staff and the Director of INDAPS, and a socio-economic enquiry.

#### Curriculum

After a rigorous analysis of problems, priorities, resources and health objectives, a two-year curriculum was developed in 1971 which, after some changes in methodology, remains appropriate and practical for use today.

The educational-unit content is formulated around a series of problems or objectives relevant to the improvement of primary medical care. The curriculum, subject content, teaching methodology and hours assigned is detailed in Appendix 1.

The Socratic-dialogue type of instruction is aimed at eliciting from the students themselves, aided by the faculty, the formulation of problems, solutions and implementation strategies. Seventy percent of the instruction is in a "field" context and 30% in a classroom or institutional setting. The final six months of the two-year curriculum is conducted in one of thirty villages surrounding the training institute

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<sup>1</sup> References 26 and 27.

where students, in pairs, conduct community surveys, organize self-help committees and in general develop a program for health improvement similar to that which they will develop when they are graduated and assigned to a field post.

A visiting faculty member supervises at weekly or bi-weekly intervals. In the more remote locations, where faculty visits can be made less frequently, radio communication is used. All students return to the parent Institute approximately once a month for meetings of 2 or 3 days at which they exchange experiences and discuss problems with the faculty.

The curriculum is under continuous review and changes are incorporated as field experiences dictate. It is anticipated that further curriculum changes, designed to increase its efficiency and appropriateness, will occur when the Rural Health Evaluation Project of the Guatemalan Academy of Medical, Physican and Natural Sciences becomes fully operational and provides quantitative feed-back based on observations made in the field.

#### Faculty

Based on the concept that the medical doctor and graduate nurse generally tend to visualize training in terms of their own concepts and educational experiences, it was determined that it is appropriate for medical auxiliaries to be trained by other categories of medical auxiliaries, whenever possible.

Thus, the teaching staff of the training institute is constituted as follows:

1 M.D. Public Health Specialist (Director)

1 Psychologist

1 Agronomist

1 Nutritionist

2 Sanitary Inspectors

1 Nurse-midwife

5 Auxiliary Nurses

3 Rural Health Technicians

1 Dentist

4 Graduate Nurses

2 Social Workers

1 Photographic Technician

1 Laboratory Technician

1 Visual Aid Technician

1 Commercial Artist

1 Librarian

Graduates

Table 4 (page 15) shows the actual and anticipated outputs of the TSR, and other auxiliary health workers trained concurrently at INDAPS, since the inception of the program in 1971. Attrition losses in the TSR program are approximately 10%, i.e., out of a total class of 60, about 6 students are lost

to the program. Attrition, almost never due to academic failure, is generally the result of an inability to communicate with the village leaders, drunkenness, womanizing, or personality problems. As experience accumulates, better selection methods diminish losses due to these causes.

Table 18 illustrates the distribution of TSR graduates by department. In accordance with the MOH priorities, the predominantly Indian departments of the highlands receive priority, although personnel are now becoming available to begin coverage of the non-Indian department of El Petén and the eastern part of the country.

#### Assignment

One study made prior to the beginning of the program in 1971, addressed the important question of community acceptance of a medical auxiliary. The study affirmed that while an auxiliary health worker would be acceptable to provide several types of needed community health services, he should not be assigned to that area in which he was born and grew up; his credibility was likely to be less in a community that had known him since infancy. For this reason, a TSR is recruited from the department or culturally holistic region in which he will work but he is invariably assigned to a different village or municipality than that from which he came.

TABLE 18

LOCATION OF TSR GRADUATES  
BY DEPARTMENT

<u>Departments</u>	<u>TSR</u> <u>Graduates</u>
Totonicapán	8
El Quiché	21
El Petén	3
El Progreso	13
Zacapa	15
Alta Verapaz	16
Baja Verapaz	13
San Marcos	13
Chiquimula	11
Ruehuetenango	8
Quetzaltenango	24
Chimaltenango	17
Sacatepéquez	10
Sololá	8
Jutiapa	7
Suchitepéquez	4
Jalapa	4
Izabal	4
Guatemala	1
INDAPS, Quiriguá	5
Academy of Medical, Physical and Natural Sciences	3
Division of Human Resources, MOH	<u>1</u>
TOTAL	209

This illustrates a difference between the intermediate-level health worker (TSR), whose role is educational, supervisory and advisory, and that of the village health promoter, whose role is interpretative and action-oriented. To be effective at the extra-community level, cultural sensitivity is necessary but identity is not. To be effective at the intra-community level, identity is necessary and sensitivity is built-in.

#### Experiences.

In 1976, a program designed to provide a detailed quantified evaluation of the rural health outreach program, with emphasis on the Rural Health Technician was planned and funded.<sup>1</sup> The program, conducted jointly by the Guatemalan Academy of Medical, Physical and Natural Sciences and the Ministry of Health, plans to conduct, over a 6-year period, an observational task analysis, studies of supervisory and logistical support systems, basic data-gathering and information-processing and a component of impact analysis. Since outputs have not been demonstrated yet, an evaluation of the program to date must necessarily be brief, subjective and anecdotal.

After approximately two-and-a-half-years of field experiences, impressions vary from positive, (enthusiastic acceptance, effective deployment, good liaison with other health workers, major impact on community health) to negative

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<sup>1</sup> Reference 28.

(poor acceptance, ineffective or incorrect use of the TSR, poor communication with frequent quarrels and misunderstandings and insignificant impact on community health). In fact, both extremes probably exist and all combinations between them.

There is no question that some communities are resistant to innovations proposed by TSRs, that some supervisors do not supervise, that problems of status and authority (particularly between medical students, Sanitary Inspectors and TSRs) exist and that Health Area Medical Supervisors have misused TSRs as clerks to health centers, nurses and errand boys.

Perhaps the single most significant indicator of the general success and recognized value of the TSR came about following the disastrous earthquake of February 1976, when more than 25,000 persons lost their lives and over 110,000 were injured. Over 25% of the country was affected, predominantly the Indian areas where TSRs are most heavily concentrated.

The Ministry of Health immediately moved all TSRs to the affected areas where they worked for four to six months. No other group of health workers had the capacity for organizing the devastated communities, identifying leaders, forming community action committees, performing first aid and establishing liaison with other assistance efforts, and with the central government, through which relief efforts could be appropriately directed.

A survey of the activities of TSRs in normal times would reveal that the program in the highlands, predominantly in the Indian department of El Quiché, is among the most successful, best organized and effective. Due to the efforts of a Health Area Medical Supervisor who has public health training, loves the rural areas and shows cultural sensitivity, the program in this department has great acceptance, is effective and is extending outreach. Twenty-one TSRs work in the 5 districts into which the department is administratively divided. Three of the TSRs with the greatest aptitude and experience have been appointed as supervisors.

Four programs to train village health promoters have been held and approximately 500 village health promoters are now working. Seventeen health units, minimal buildings equipped with medicines and first aid supplies, have been constructed by community action for use by the health promoters. In addition, approximately 150 village midwives have received additional training. The department is served by one regional hospital, 5 health centers and 14 health posts, with plans in progress to construct 9 new health centers and 37 new health posts.

In Quiché, a pilot community development project,<sup>1</sup> conducted by a private voluntary organization in collaboration with

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<sup>1</sup> Guatemala Health Sector Assessment 1977, Annex 5.4: Environmental Sanitation describes this project.

the Ministry of Health, proposes to install 42 gravity-fed potable water systems and approximately 2,500 latrines. The two-year project requires community participation, and uses the TSR as the key link between the community and the project personnel. This ensures excellent liaison with the community and enhances the role of the TSR in the eyes of the community.<sup>1</sup>

In these programs, the TSR has earned good acceptance and in fact, competition and jealousies have developed because one municipality was assigned a TSR and another was not.

In the Department of Chimaltenango, excellent working relationships have developed between the TSRs, the local private voluntary organizations working in primary health care and promoter training, and the regional medical supervisor.

The single most important determinant of the success of the TSR as a community developer for better health appears to be the attitude, understanding and imagination of the Health Area Medical Supervisor. When suspicion, hostility and misunderstanding exists on the part of the supervisor, the dedication of the TSR cannot ensure a successful program. However, when the reverse is true, the degree to which TSRs can penetrate the rural areas and catalyze community self-help programs for health is virtually unlimited.

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<sup>1</sup> Reference 29.

Problems

The most frequently encountered major impediments to the effectiveness of TSRs are:

Problems of Administration:

1. Pay and allowances may be delayed.
2. Gas coupons for motorcycles may not be available.
3. Capacity not provided for servicing and maintenance of motorcycles.

Problems of Attitudes:

1. The TSR may not be accepted by the community.
2. The Health Area Medical Chief may not understand or may not agree with the role for which the TSR has been trained.
3. There may be competition, misunderstandings and struggles for domination with the auxiliary nurse, the TSR co-worker at the health post.
4. The Supervised Professional Practice Programs (EPS), designed to provide medical students with exposure to rural health programs, ignores the TSRs. Consequently the medical students and the TSRs have problems related to their roles, pay and status.

**Problems of Back-up and Support:**

1. In general adequate supervision is lacking, especially when physicians are the appointed supervisors of TSRs because (a) they are not trained in supervisory techniques and tend to equate "supervision" as an informal chat, and (b) physicians are unwilling to spend several days traveling in rural areas to visit a few TSRs. This problem is gradually being overcome by the appointment of senior TSRs as supervisors.
2. Support facilities, such as supplies, medicines, vaccines, gasoline, oil, are provided irregularly and in insufficient amount. Although the curative services performed by the TSR are restricted to 20% of his time, basic medical supplies and medicines are needed if he is to be effective.

**Career Escalation**

It was recognized from the inception of the TSR program that a career ladder would be necessary if TSRs were to be retained in the services of the MOH and if they were to achieve job satisfaction. Therefore, it has been determined that upon completion of two years of training at INDAPS and four years of satisfactory service in the field, the TSR be awarded the equivalent of high school diploma (Bachillerato Degree) in public health. With this qualification, admission to the University (including admission to the national medical school) becomes a possibility.

Five senior TSRs have been appointed as instructors in the TSR training program at INDAPS, five have been assigned as district supervisors, three have been assigned to the Rural Health Evaluation Project and one has been attached to the Division of Human Resources.

The arrangements for the award of the Bachillerato Degree need to be completed and the program for use of experienced and qualified TSRs as teachers and district supervisors must be expanded.

#### The TSR and Family Planning

An original justification for the TSR program was that the creation of a health care infrastructure would allow other important health programs, including family planning to experience extended outreach.

The TSR training curriculum includes approximately 400 hours of instruction in demography, sex education, family planning and reproductive physiology. The national family planning association sends guest lecturers and holds discussions and demonstrations about contraceptives, their indications and usage.

It is regrettable that the national policy does not yet permit the trained TSR to utilize his population-family planning knowledge. At present he is only permitted to give advice and to refer patients to a local health center for family planning services.

During recent months, a nation-wide contraceptive distribution program has been approved that will make family planning supplies available at all MOH clinics. This will extend eventually to the health post level and the TSR can be expected to extend family planning services further and to expand the distribution system to the most remote areas.

G. TRADITIONAL MEDICINE AND ITS PRACTITIONERS

Any study of the human resources available in the health sector cannot ignore the single most numerous component, the traditional medical practitioners. These practitioners are looked upon by the medical professionals as clandestine, dangerous and illicit, thus little data exist regarding their numbers, kinds, types of practices, income, and so forth. Their numbers are large and it is probable that at least one indigenous practitioner exists in each village or small community, particularly in the Indian areas. This suggests the existence of between 2,000 and 3,000 traditional medical practitioners, although others have made higher estimates. Male traditional healers of various types are estimated at 9,000; untrained midwives are estimated at 16,000. Since neither the healers nor the midwives work full-time, the full-time equivalent of these two is estimated at 6,000. They comprise the largest single group of practitioners in Guatemala.

Consideration of this component of medical manpower is important because (1) the practitioners are numerous and influential, (2) an ingrained system of medical beliefs with cultural roots extending over generations exists in the country, and (3) continuous confrontations occur between indigenous and modern medicine (that probably diminish the effectiveness of both).

An understanding of the problem necessitates an examination of the roots of indigenous medicine in Guatemala and the role its practitioners play.<sup>1</sup>

The medical beliefs of the Maya Indians have been the subject of a number of studies.<sup>2</sup> The beliefs surround the three cardinal ways in which disease can be caused and its cure influenced, i.e., by winds, by the hot-cold classification of foods and drugs, and by spells and incantations. Modification of these beliefs has allowed incorporation of modern medications into the traditional system of classification, as Table 19 indicates.

TABLE 19

LIST OF COMMON PROPRIETARY AND PRESENTED  
MEDICINES ACCORDING TO TEMPERATURE(3)

<u>HOT</u>	<u>COLD</u>
Aspirin	Alka-Seltzer
Vick's Vapor Rub	Sal Andrews
Vitamins	Vegetable Oil
Kaopectate	Sulfonamide
Sucrose	Milk of Magnesia
Alcohol	Penicillin
Piperazine	Tetracycline
	Bicarbonate of Soda

(1) See Appendix 2 for more complete description of the origins and basic elements of indigenous medicine in Guatemala.

(2) References 30 through 37.

(3) Reference 36.

The author of this table points out that the administration of penicillin as a cure for bronchitis would be unacceptable since penicillin is a "cold" medicine and bronchitis, a "cold" illness. For the same reason penicillin would not be acceptable in the treatment of meningitis. He proposes some action to be incorporated into the health system to help ensure the acceptability of treatment. These suggestions are all directed toward the physician, even though physician contact with patients is limited and uncommon unless a seriously ill patient is referred for consultation.

However, it is possible that a medical regimen could be constructed that is acceptable to the patient and to the health promoter or medical auxiliary who is more likely to be in contact with rural patients.

Large numbers of superstitions and beliefs about disease, its cause and cure, also exist among the rural non-Indian (Ladino) population. Further study of these beliefs could lead to a more culturally acceptable regimen of treatment for use by the health auxiliaries working in the non-Indian regions of the country.

H. THE IMPLICATION OF CONSTANT FERTILITY  
ON HEALTH FACILITIES AND MANPOWER

In 1969, USAID sponsored a study designed to predict the impact of fertility upon the social services and the economy of Guatemala.<sup>1</sup> Linear projections were made for the health sector and for health manpower based on incremental improvement of services, and the 1965 conditions were projected upon the year 2,000. The base conditions were

	<u>1965</u>	<u>2000</u>
Population	4.3 Million	
Constant Fertility, per annum	3.2%	3.4%
Declining Fertility, per annum	3.2%	2.3%

Data on the number of medical personnel and hospital beds, per 10,000 population in 1965, were obtained from a ODECA-CELADE report and checked against U.N. data. Table 20 shows the projections for the year 2,000 of the numbers of selected medical personnel and hospital beds required by constant and declining fertility assumptions and by constant and improved levels of service. Improved services are represented by a modest increment of 10% every 5 years in the number of medical personnel per 10,000 people, and by a doubling of the number of hospital beds by the year 2,000. The requirements for total medical personnel and beds under the declining fertility case is 68 percent of that required by the constant fertility case. No data were available on personnel training

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<sup>1</sup> Reference 38.

and salaries or on hospital construction and maintenance costs, thus cost projections were not made.

TABLE 20

**TOTAL PERSONNEL AND FACILITIES REQUIRED**  
**FOR HEALTH SERVICES IN 1965**  
**AND PROJECTED TO THE YEAR 2000**  
**FOR CONSTANT AND IMPROVED LEVELS OF SERVICE**  
(in thousands)

	Year 1965	Y E A R 2 0 0 0			
		<u>Constant Fertility</u>		<u>Declining Fertility</u>	
		<u>Fixed Level of Services</u>	<u>Improved Services</u>	<u>Fixed Level of Services</u>	<u>Improved Services</u>
Physicians	0.8	2.5	6.2	1.7	4.2
Nurses	0.4	1.2	2.5	0.8	1.7
Nurse Auxiliaries	2.0	6.2	12.4	4.2	8.4
Technicians <sup>1</sup>	0.4	1.2	2.5	0.8	1.7
Hospital Beds	9.8	31.0	62.0	21.1	42.2

<sup>1</sup>This category includes sanitary inspectors, sanitary engineers, laboratory chiefs and laboratory technicians.

Tables 21 and 22 depict the demand for new medical personnel and services in the year 2,000 at the 1965 level of service, and at improved levels of service.

TABLE 21

DEMAND FOR NEW MEDICAL PERSONNEL AND FACILITIES  
IN THE YEAR 2000(1)  
ASSUMING 1965 LEVEL OF SERVICE

	Constant Fertility	Declining Fertility	Ratio of Declining/Constant
Physicians	0.8	0.4	.50
Nurses	0.5	0.3	.60
Nurse Auxiliaries	2.7	1.6	.59
Technicians <sup>(2)</sup>	0.5	0.3	.60
Hospital Beds	9.1	4.6	.51

1

This category includes sanitary inspectors, sanitary engineers, laboratory chiefs and laboratory technicians.

2

The projections are based on over-simplified assumptions and do not take into account new methodologies for health care delivery, such as the use of new categories of health care workers or changes in disease prevalence.

TABLE 22

DEMAND FOR NEW MEDICAL PERSONNEL AND FACILITIES  
IN THE YEAR 2000 (1)  
ASSUMING IMPROVED LEVELS OF SERVICE

	Constant Fertility	Declining Fertility	Ratio of Declining/Constant
Physicians	2.5	1.4	.56
Nurses	1.2	0.7	.58
Nurse Auxiliaries	6.2	3.7	.60
Technicians <sup>(2)</sup>	1.1	0.6	.55
Hospital Beds	21.8	12.0	.55

1

This category includes sanitary inspectors, sanitary engineers, laboratory chiefs and laboratory technicians.

2

The projections are based on over-simplified assumptions and do not take into account new methodologies for health care delivery, such as the use of new categories of health care workers or changes in disease prevalence.

In the year 2,000, at the 1965 level of service and at constant fertility, approximately \$ 18,000,000 (at 1977 prices) would be required to construct the facilities to provide the 9,100 beds needed and \$ 12,000,000 would be required in annual salary costs. Assuming improved levels of service with declining fertility, approximately \$24,000,000 would be required to provide the 12,000 beds needed and \$18,000,000 would be required in annual salary costs. This represents 133% of construction costs at constant fertility and the 1965 level of service, and 150% of salary costs under same assumptions.

Thus the costs of improved services with declining fertility are not greatly in excess of maintaining the 1965 level of services at constant fertility, that is, the costs of improvement of services is almost entirely offset by the consequence of constant fertility.

I. THE INTER-AMERICAN DEVELOPMENT BANK LOAN  
FOR IMPROVEMENT OF RURAL HEALTH SERVICES

Loan number BID 468-5F/GU between the Government of Guatemala and the Inter-American Development Bank, IDB, officially formulated in October 1976, provides up to \$28 million for health care facilities construction, equipment, training, technical assistance and vehicles in order to improve extension of health care services in seven predominantly rural departments with 47% of the area of the republic, and a combined population of 1.4 million persons.<sup>1</sup> The loan will finance the construction and equipment of three Integrated Health Centers with general hospital facilities and up to 100 beds each, seven health centers with up to 25 beds each and maternity in-patient services, 48 health centers with 6 beds each, and 173 health posts.

This section reviews the human resources needed to staff these facilities and examines the implications of costs and training.

The new facilities will replace existing facilities deemed unsuitable, or in a state of disrepair economically unfeasible to restore, or will replace or enlarge existing facilities. For example, an Integrated Health Center will replace an existing departmental hospital with 86 beds at Salamá, Baja Verapaz, and an existing health center with 25 maternity beds in Chimaltenango will be enlarged to an Integrated Health

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<sup>1</sup> Reference 39.

Center with 100 beds. On the other hand, most of the 173 health posts to be constructed will be located in larger villages where no health care facilities exist.

The implications for new staff, their training and employment are complex. In some cases, an institution to be replaced or enlarged with trained staff now working will need no additional staff, or will need only incremental staff for the enlarged portion of the facility. However, the construction of new health posts implies that a complete new staff must be recruited, trained and employed.

The new staff needed to supplement those existing medical personnel, who can be transferred to work in new and enlarged facilities, was analyzed by the National Economic Planning Council.<sup>1</sup> Table 23 illustrates the categories and numbers of new staff needed, together with an estimate of the salary costs implied. Thus when the program is fully operational approximately 2,300 new positions will have been created with a recurrent annual cost implication of approximately \$ 4.4 million.

Table 24 illustrates the implications for training created by employment of these personnel. Data are presented for the seven most numerically important categories, including 827 auxiliary nurses, 97 graduate nurses and 170 rural health technicians.

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<sup>1</sup> Reference 40.

TABLE 23

ADDITIONAL HEALTH MANPOWER REQUIRED TO STAFF HEALTH FACILITIES  
TO BE CONSTRUCTED BY MOH USING THE IDB LOAN

<u>CATEGORY</u>	<u>NUMBER REQUIRED</u>	<u>INDIVIDUAL MONTHLY SALARY</u>	<u>TOTAL ANNUAL SALARY</u>
Auxiliary Nurses	827	\$ 140	\$ 1,389,360
Rural Health Technicians	170	175	357,000
Doctors	85	500	510,000
Graduate Nurses	97	220	256,080
Dental Assistants	74	140	124,320
Sanitary Inspectors	80	180	172,800
Laboratory Technicians	61	210	153,720
Dentists	13	500	78,000
Social Workers	26	210	65,520
Accountants	13	180	28,080
Statistical Clerks	32	160	61,440
Pharmacy Assistants	19	110	25,080
X-Ray Technicians	13	210	32,760
Laboratory Assistants	39	90	42,120
Medical Directors	13	650	101,400
Nutritionists	6	350	25,200
Administrators	6	300	21,600
Pharmacists	6	320	23,040
X-Ray Assistants	6	110	7,920
Chief of Laboratory	6	500	36,000
Maintenance Technician	13	210	32,760
Maintenance Assistant	19	120	27,360
Sub Total	(1,624)	(5,585)	(3,571,560)
Other Staff	662	100	794,400
Total	(2,286)	(5,685)	(4,365,960)

TABLE 24

ESTIMATE OF MANPOWER REPLACEMENT RATES AND TRAINING  
NEEDS REQUIRED AS CONSEQUENCE OF THE CONSTRUCTION OF  
NEW HEALTH FACILITIES BY THE MOH, USING THE IDB LOAN

<u>CATEGORY</u>	<u>NUMBER OF PERSONNEL NEEDED TO STAFF NEW IDB FACILITIES</u>	<u>AVERAGE ANNUAL ATTRITION</u>	<u>NUMBER NECESSARY TO BEGIN TRAINING ANNUALLY</u> <sup>6</sup>
Auxiliary Nurses	827	99 <sup>1</sup>	124 <sup>2</sup>
X Ray Technicians	13	1 <sup>2</sup>	1 <sup>2</sup>
Graduated Nurses	97	12 <sup>3</sup>	15 <sup>4</sup>
Sanitary Inspectors	80	8 <sup>3</sup>	9 <sup>4</sup>
Dental Auxiliaries	74	9 <sup>1</sup>	11 <sup>2</sup>
Laboratory Technicians	61	6 <sup>3</sup>	7 <sup>4</sup>
Rural Health Technicians	170	0 <sup>5</sup>	-

1 Annual attrition calculated at 12%

2 Attrition in training program calculated at 25%

3 Annual attrition calculated at 10%

4 Attrition in training program calculated at 12%

5 TSR's are bonded for 4 years of services after graduation.

6 This is the additional number of staff that must be trained each year to produce the required staff by the time the facilities are ready to begin operation.

SOURCE: CNPE

The problem encountered to provide these personnel and maintain the work force includes the consideration of the normal attrition of employees due to retirement, resignation, maternity leave, marriage, and so forth, calculated to be between 10-12% annually. Consideration must also be given to attrition in training programs for all of the above reasons, as well as to academic failure. These losses are calculated at between 12-25%.

Table 24 indicates the initial work force needed in each of the seven categories and the numbers of new recruits needed for training programs to eventually replace trained health workers who leave the MOH services. The problem is most severe with auxiliary nurses, whose present rate of trainee recruitment will have to be increased by 124 annually to maintain the work force. The recruitment and training of graduate nurses will need to be increased by 15 annually. Rural health technicians are contracted for a period of 4 years following their graduation, therefore losses are likely to be negligible and no special replacement implication has been inferred.

The average annual cost of operation (excluding personnel salaries) of the facilities to be constructed under the loan are approximately \$5 million per year (at 1977 prices). Salary costs are approximately \$ 4.4 million. Thus a total of \$ 9.4 million would be needed by 1980 when the project will be fully developed and operational. Projection of the MOH

Budget (Table 25) indicates average growth rate in operational costs, including salaries, of approximately per year between 1975 and 1980.<sup>1</sup> It appears that 64% of the projected increment by 1980 will be consumed by the operational cost and salaries consequent upon the new facilities to be constructed.

### III. RECOMMENDATIONS AND RATIONALE

Recommendation 1: THE HEALTH MANPOWER PLAN FOR THE PUBLIC SECTOR SHOULD BE REVISED. IT SHOULD INCLUDE A THOROUGH ECONOMIC ANALYSIS OF THE COST IMPLICATIONS OF RECOMMENDATIONS FOR THE WHOLE HEALTH CARE DELIVERY SYSTEM AND A REVIEW OF HUMAN RESOURCE DISTRIBUTION SO THAT POLICIES CAN BE DEVELOPED THAT EFFECT A MORE EQUITABLE DISTRIBUTION OF NUMBERS AND KINDS OF PROFESSIONAL AND AUXILIARY HEALTH WORKERS.

Health manpower models based on service, or normative considerations, which do not simultaneously address economic aspects cannot be implemented successfully.

It becomes clear when reviewing the projected manpower budgets for 1975-1980 that the human resources requirements implied to staff health facilities to be constructed under the IDB Loan are likely to consume a disproportionately large amount of the economic resources. Unless additional resources are added, program restriction must take place.

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<sup>1</sup> Reference 39.

**TABLE 25**  
**MOH PROGRAMS, 1975**  
**and**  
**PROJECTIONS FOR THE YEARS 1976-1980**

	1975	1976	1977	1978	1979	1980
Ministry of Health	36,035,367	37,608,675.11	40,890,506.18	44,172,337.25	47,454,168.32	50,735,999.39
Remaining Costs	32,543.687	29,968,941.72	31,815,710.20	33,662,478.68	35,509,247.16	37,356,015.64
Investment	3,491,680	7,639,733.39	9,074,795.98	10,509,858.57	11,944,921.16	13,379,983.75

NOTE: According to the physical investment plan of the Office of the Economic Planning Council, the capital expenditures will increase in the quinquennium 1975-1979 to approximately \$136 million.

Outreach programs served by auxiliaries should be given high priority for funding given their relatively high productivity and their unique capacity to reach the poorest groups in Guatemala. Additionally, based on objective evidence, a decision must be made regarding the most efficient balance between the percentage of total MOH staff that are high-level, high-cost professionals vis-a-vis the percentage of low-cost, lower-level auxiliaries.

A disproportionate percentage of the health care human resources are located in Guatemala City. To improve national health care by improving regional hospitals and other rural facilities will require a more equitable distribution of experienced, technical staff.

Recommendation 2: A REGISTRY SHOULD BE ESTABLISHED BY THE MOH OF ALL AUXILIARY HEALTH WORKERS WHO ARE GRADUATES OF RECOGNIZED TRAINING PROGRAMS AND WHO PERFORM SERVICES IN BOTH THE PUBLIC AND PRIVATE SECTORS. RE-REGISTRATION ON A PERIODIC BASIS SHOULD BE MANDATORY FOR CERTAIN CATEGORIES.

This data would provide an essential base for statistical and economic analysis, manpower projections, planning, task-analyses and to ensure conformity with a code of ethics and behavior in the public interest.

While data exist, accumulated through professional organizations and legally required registries, for the kind and numbers of health professionals, such as doctors, dentists, and graduate nurses, little similar data exist for auxiliary workers, especially in the private sector.

More exact data are necessary to plan human resources effectively, specifically to project outputs of training programs in accordance with needs and employment opportunities. Additionally, such a registry could inform registrants of new legislation, training courses, and employment opportunities, and registrants could communicate conditions of employment and establish norms for peer conduct.

Recommendation 3: TRAINING PROGRAMS IN THE PUBLIC AND PRIVATE SECTORS SHOULD BE ANALYZED AS TASK-ORIENTED SYSTEMS TO ASCERTAIN THEIR APPROPRIATENESS TO ESTABLISHED NEEDS AND THEIR RESPONSIVENESS TO CHANGE.

To be deployed efficiently, human resources need to be generated qualitatively and quantitatively in a manner that ensures that identified needs will be met, that anticipated needs will be provided for and that tasks and the skills to perform them will be complementary.

In the past the admission requirements, length of training, and curriculum of training programs were determined in a largely empirical fashion with ideas and concepts freely

transferred from foreign health care systems. Little attention was directed to determining whether these systems were appropriate models, either from an economic or practical view-point.

The Guatemalan health care delivery system, as it is currently constituted, experiences an imbalance between high-cost, high-level professionals dispensing largely curative medical services and low-cost, intermediate and lower-level auxiliaries devoted largely to promotive and preventive services. When this manpower spectrum is compared with felt wants, established needs and national priorities it becomes clear that deficits exist between training programs and the problems graduates are required to resolve. Training programs should be designed on the basis of a systematical analysis of the health care tasks required by the health care system.

Recommendation 4: THE SYSTEM OF SUPERVISION AND EVALUATION AT ALL LEVELS IN THE PUBLIC SECTOR SHOULD BE REVIEWED AND RECOMMENDATIONS MADE FOR IMPROVEMENT. PREDICTION OF PERSONNEL NEEDED, COSTS AND METHODOLOGIES FOR IMPLEMENTATION AND EVALUATION SHOULD BE INCLUDED.

The National Plan for Health, 1975-1979, emphasizes the need to train auxiliary health workers in order to achieve greater coverage at a realistic cost. Implicit in this policy is the need to provide adequate systems for supervision and evaluation.

A health "professional" is trained in problem-solving strategies, in manipulation of knowledge to resolve problems hitherto unencountered, and to make judgements and decisions based on a range of knowledge, skills and attitudes that permit a problem to be analyzed critically. However, the health auxiliary, trained in technology, does not have the background to make a broad range of decisions requiring a profound analytic capacity. Thus, although he can resolve certain types of problems, his effectiveness and capacity are limited and the range of decision-making for which he is trained is circumscribed. Therefore, supervision and evaluation is of paramount importance to ensure that the auxiliary will not undertake activities, including decision-making, beyond his competence and become a threat, rather than a help to the individual or community he is attending.

Effective supervision implies (1) a logical sequence in which actions are evaluated in terms of agreed upon objectives, competence, timing, judgement and impact, and (2) guidance which requires that the supervisor act to bring about correction and realignment when necessary.

The experience of a small number of supervisory teams, trained for use in the rural health program, indicates that the most acceptable, enthusiastic and sensitive supervisors are former health auxiliaries. This approach should be supported and expanded throughout the delivery system.

Evaluation, the quantified measure of the progress of a program toward its objectives, has already been undertaken for the rural health program by the Guatemalan Academy of Medical, Physical and Natural Sciences in cooperation with the Ministry of Health. The ordered expansion of this project and its institutionalization as an established data-collection, information-processing and interpretative activity will provide a rational basis for projection and planning and a measure of achievement of goals and deviations from them.

Recommendation 5: A PLAN AND A TIME TABLE SHOULD BE DEVELOPED TO ADDRESS AND RESOLVE THE PROBLEMS CREATED BY THE MASSIVE EMPLOYMENT IN THE PUBLIC SECTOR OF UNTRAINED WORKERS FOR POSITIONS IN WHICH THEY CAN NOT PERFORM ADEQUATELY.

In the 1960's, large numbers of auxiliary nurses were recruited and appointed to staff health posts located throughout the rural areas. Many of these auxiliaries had an unacceptably low level of education and training and some had received no training at all.

The problems of upgrading some of these workers is compounded by their inadequate educational backgrounds, by job-tenure based on several years of service and the difficulties of enacting massive compulsory retirement given the insufficient numbers of acceptably trained replacements. Plans are in progress to offer a self-instructional training course, but the ability to promote massive improvement by this means is questionable.

		1	Hr.
3. Delivery	3. Review of Bibliography	4	
	Conference	30	
	Practice	1	
4. Complications of Birth	4. Review of Bibliography	1	
	Conference	4	
	Group Discussion	1	
5. Medicines to be used (Ergonovina)	5. Conference	5	
	Practice		
IV. Post-Natal			
1. Education	1. Review of Bibliography	1	
	Conference	2	
	Practice	12	
2. Puerperium	2. Review of Bibliography	1	
2.1 Normal Puerperium	Conference	3	
2.2 Abnormal Puerperium	Work groups	3	
2.3 Complications	Groups Discussion	2	
2.4 Medicines to be used	Practice	12	
	2.4 Conference	2	
	Practice	10	
3. Lab Examinations	3. Review of Bibliography	1	
B. Blood Count	Conference	3	
Leukocyte Formula	Practice	18	
H.b. Sedimentation			
H.t. Vaginal Rubbing			
V. Newborn			
1. Normal Newborn	1. Review of Bibliography	2	
from 1.1 to 1.5	Conference	6	
	Work Groups	3	
	Group Discussion	2	
	Practice	30	
1.1 Handling and Treatment			
1.2 Binding of the cord			
1.3 Hygiene of the newborn			
1.4 Immunization			
1.5 Prevention of ophthalmia			
1.6 History and Physical Examination	1.6 Conferences	2	
	Practice	6	
1.7 Feeding	1.7 Review of Bibliography	1	
	Conference	2	
	Work Groups	3	
	Group Discussion	3	
	Practice	6	

2. Abnormal Newborn	Review of Bibliography	1	Hr.
Abnormal Newborn	2. Conference	6	
2.2 Prematurity	Work Groups	3	
2.3 Recording of Vital events	Group discussion	2	
	Practice	18	
VI. Infantile and Pre-school	VI. Review of Bibliography	1	
1. Control of Healthy child	Conference	12	
1.1 Physical development	Work Groups	3	
1.2 Psychic development	Group discussion	3	
1.3 Hygiene	Practice	24	
1.4 Education			
2. Feeding and food complements	2. Review of bibliography	1	
2.1 Education	Conference	7	
	Work Groups	9	
	Group discussion	8	
	Exercises	6	
	Practice	30	
3. Immunizations	3. Review of Bibliography	1	
D.P.T. - Polio	Conference	2	
Measles	Work Groups	9	
T.A.B.	Group discussion	2	
Smallpox	Practice	18	
BCG			
4. Recreation	4. Conference	3	
	Work groups	3	
	Group discussion	3	
	Practice	18	
VII. School	VII. Conference	1	
1. Hygiene and Health Education	Work groups	3	
2. Immunizations	Group discussion	2	
D.P.T.	Practice	12	
Smallpox			
Typhoid			
Polio			
3. School Hygiene	3.1 Review of Bibliography	1	
3.1 Feeding	Conference	2	
	Work groups	4	
	Group Discussion	4	
	Practice	12	

3.2 Recreation	3.2 Review of Bibliography	1 Hr.
3.3 Physical Aspect	Conference	1
3.3.1 Anthropometry	Group Discussion	4
3.3.2 Visual sharpness	Practice	12
3.3.3 Oral hygiene		
3.4 Psychic Aspect	3.3 Conference	10
	and 3.4 Practice	44
<b>VIII Adolescent</b>		
1. Physical development	1. Review of Bibliography	1
	Conference	3
	Work groups	4
	Group discussion	4
	Exercise	4
	Practice	12
2. Adolescence Problems	2. Review of Bibliography	1
	Conference	3
	Work groups	4
	Group discussion	4
	Exercises	4
	Practice	12
3. Sexual Education	3. Review of Bibliography	1
	Conference	5
	Work Groups	4
	Group discussion	2
	Practice	12
4. Orientation	4. Work Groups	3
4.1 Hygiene	Group discussion	3
4.2 Social	Exercises	6
4.3 Sexual		
5. Feeding	5. Review of Bibliography	1
	Conference	1
	Work groups	2
	Group discussion	2
	Practice	12
<b>IX. Old age</b>		
1. Old age problems	<b>IX. Conference</b>	3
2. Recreation		
3. Feeding		

<b>I. Family Planning</b>			
<b>1. Demographic Aspects</b>			
1.1 Growth of Population and its effect on:	1.1. Work Groups		6 Hrs.
1.1.1 Social	Group discussion		6
1.1.2 Education			
1.1.3 Production			
1.2 Migration	1.2 Investigation		6
1.2.1 Periods and Causes	Work Groups		6
1.2.2 Sanitation	Group discussion		6
1.2.3 Imported Pathology	Exercises and Practice		12
1.2.4 Shortage of services			
1.2.5 Increase of social problems			
1.2.6 Alteration of Health Programs			
1.3 Birth-rate	1.3 Investigation		6
1.3.1 Principles of Statistics	Work Groups		6
1.3.2 Sanitation			
1.3.3 Biological Effect (Mother & Child)	Group discussion		6
1.3.4 Emotional Effect			
1.4 Death-rate	1.4 Investigation		6
1.4.1 Principles of Statistics	Work Groups		6
1.4.2 Sanitation	Group discussion		6
1.4.3 Prevention and Recuperation			
1.4.4 Education and its importance			
<b>2. Family Planning Methods</b>			
2.1 Rhythm	2. Review of Bibliography		1
2.2 Local	Conference		3
2.3 Oral	Work Groups		3
2.4 Injections	Group discussion		3
2.5 I.U.D.	Practice		12
2.6 Surgical			
2.7 Follow-up of users			
<b>3. Administrative Aspects</b>	3. Conference		18
	Exercise		
<b>4. Detection and Prevention Gynecological Pathology</b>	4. Review of Bibliography		1
4.1 Bacteriological Examinations	Conference		2
4.2 Gynecological Examination	Group discussion		3
4.3 Taking Papnicolau	Practice		30
	Work Groups		3
			<u>3</u>
			Total 943 Hrs.

Date: September 22 - May 21, 1973

Unit No.6 Malnutrition

1. Classification	1. Review of Bibliography	1 Hr.	
Grade I	Conference	2	
Grade II	Work groups	4	
Grade III			
	Group discussion	2	
	Practice	6	
	Sub-total	<u>15</u>	15
2. Diagnosis	2. Review of Bibliography	2	
History	Conference	6	
Physical Examination	Work group	6	
Anthropometry	Group discussion	4	
Inspection	Practice	4	
Palpation			
	Sub-total	<u>30</u>	48
3. Laboratory	3. Review of Bibliography	1	
(Urine and Hg.)	Group discussion	6	
	Practice	6	
		<u>13</u>	13
4. Conditioning Factors and their Prevention			
4.1.1 Production of food .	4.1.1 Review of Bibliography	1	
	Investigation	6	
	Work groups	3	
	Group discussion	3	
	Practice	6	
	Sub-total	<u>19</u>	19
4.1.2 Transportation .	4.1.2 Review of Bibliography	1	
Transport support and promotion	Conference	3	
Marketing techniques	Group discussion	4	
Roadways	Practice	4	
	Sub-total	<u>12</u>	20
4.1.3 Food storage	4.1.3 Review of Bibliography	1	
	Conference	5	
	Practice	12	
	Sub-total	<u>18</u>	18

4.2 Consumption Selection Preparation Distribution	4.2 Investigation Review of Bibliography Conference Work group Group discussion Practice		6 Hrs. 1 4 6 3 6	
		Sub-total	<u>6</u>	26
4.3 Advantage Anatomical Physiological Pathological	4.3 Review of Bibliography Conference Work group Group discussion		1 4 4 2	
		Sub-total	<u>2</u>	11
5. Treatment Complementary Supplementary Sern Substitution Referral of cases Medicines	5. Review of Bibliography Conference Work group Group discussion Practice		2 4 6 3 12	
		Sub-total	<u>12</u>	27
		Total		<u>197</u>

Unit No.7 Health Problematic

I. Introduction	I. Conference Work group Group discussion Exercise		2 3 2 6	
		Sub-total	<u>6</u>	13
II. Pathology Classification Penetration means	II. Work group Group discussion		4 2	
		Sub-total	<u>2</u>	6
2.1 Illness by oral means Definition and Identification Diarrheas Parasitism Typhoid	2.1 Review of Bibliography Work group Group discussion		1 3 2	
		Sub-total	<u>2</u>	6
2.1.2 Causal Complex 2.1.2.1 Unhealthy environment 2.1.2.2 Education defficiency 2.1.2.3 Malnutrition	2.1.2.1 Group discussion and 2.1.2.4 Work group Practice		5 4 5	
		Sub-total	<u>2</u>	15

2.1.2.4 Social and Economic Poverty			1	Hr.
2.1.2.5 Etiological Agent	2.1.2.5 Review of Bibliography		10	
	Conference		6	
	Work group		3	
	Group discussion		<u>12</u>	
	Practice			
		Sub-total		32
2.1.3 Evolution	2.1.3 Review of Bibliography		1	
	Conference		5	
	Work groups		3	
	Group discussion		<u>3</u>	
		Sub-total		12
2.1.4 Clinical and Cabinet Diagnosis	2.1.4 Conference		3	
	Work groups		3	
	Group discussion		2	
	Exercise		<u>20</u>	
		Sub-total		38
2.1.5 Effects upon the Individual and the Community	2.1.5 Work groups		3	
	Group discussion		<u>3</u>	
		Sub-total		6
2.1.6 Treatment	2.1.6 Conference		2	
	Exercise		4	
	Practice		<u>12</u>	
		Sub-total		18
2.1.7 Prevention			2	
2.1.7.1 Personal hygiene				
Washing of hands				
2.1.7.2 Excreta disposal				
2.1.7.2.1 Latrines	2.1.7.1 Conference		3	
	and Work groups		6	
	2.1.7.2 Group discussion		4	
	Exercise		<u>12</u>	
	Practice		<u>18</u>	
		Sub-total		43
2.1.7.2.2 Trash containers and final disposal	2.1.7.2.2 Conference		1	
	Work group		2	
	Group discussion		2	
	Exercise and practice		<u>25</u>	
		Sub-total		30

5.12-116

2.1.7.2.3 Drainage Promotion and Study	2.1.7.2.3 Review of Bibliography Conference Work group Group discussion Exercise Practice	1 1 2 2 12 <u>12</u>	Sub-total	30
2.1.7.2.4 Sewage Treatment	2.1.7.2.4 Review of Bibliography Conference Work group Group disposition Exercise and practice	1 1 2 2 <u>24</u>	Sub-total	30
2.1.7.2.5 Potable water 2.1.7.2.5.1 Investigation and Appraisal of Sources	Review of Bibliography Conference Exercise Practice	1 12 —	Sub-total	13
2.1.7.2.5.2 Samples	Conference Practice	1 <u>2</u>	Sub-total	6
2.1.7.2.5.3 Programming of Mini Aqueducts	Review of Bibliography Conference Exercise Practice	1 5 36 <u>80</u>	Sub-total	92
2.1.7.2.5.4 Simple Treatment to Water Sources	Review of Bibliography Conference Work Group Group discussion	1 1 3 <u>2</u>	Sub-total	7
2.1.7.2.5.5 Promoting Potable Water in Homes	Group discussion Work group	2 <u>6</u>	Sub-total	8
2.1.7.2.5.6 Sources of Contamination	Review of Bibliography Conference Group discussion Group work	1 2 2 <u>6</u>	Sub-total	11

5.12-117

2.1.7.2.6 Food Control	Review of Bibliography					2	
2.1.7.2.6.1 Inspection of Establishments where Food is Handled	Conference					6	
	Work group					6	
	Group discussion					4	
	Practice					<u>12</u>	
	Sub-total						30
2.2 Illnesses Transmitted by Respiratory Tract							
2.2.1 Identification and Definition Respiratory Infections	Review of Bibliography					1	
Measles	Work group					4	
Whooping cough	Group discussion					<u>3</u>	
Tuberculosis							
2.2.2 Conditioning Factors	Review of Bibliography					1	
	Work group					6	
	Group discussion					3	
	Conference					4	
	Practice					<u>12</u>	
	Sub-total						26
2.2.3 Causal Agents	Review of Bibliography					1	
	Conference					5	
	Work group					3	
	Group discussion					3	
	Practice					<u>6</u>	
	Sub-total						18
2.2.4 Evolution and Diagnosis of Clinic and Cabinet	Conference	A	B	C	D	6	2
	Work group	3	3	3	3	3	3
	Group discussion	2	2	2	2	2	2
	Exercise	30	18	18	18	84	116
						<u>12</u>	
2.2.5 Effect on the Individual and the Community	Work group	3	3	3	3	3	3
	Group discussion	2	2	2	2	8	20
2.2.6 Treatment	Conference	2	2	2	2	<u>4</u>	
	Exercise	4	4	4	4	16	
	Practice	12	2	2	2	<u>18</u>	42
2.2.7 Prevention							
2.2.7.1 Immunisation (a) (B) (C)	Conference					1	
	Work group					3	
	Group discussion					<u>2</u>	
	Sub-total						6

TOTAL

5.12-118



2.3.5 Effects on the Individual and the Community	Work group									4	
	Group discussion									<u>2</u>	
										Sub-total	6
2.3.6 Treatment	Conference									2	
	Exercise									<u>4</u>	
	Practice									<u>30</u>	
										Sub-total	36
		1	2	3	4	5	6	7	8	TOTAL	
2.3.7 Prevention											
2.3.7.1 Sanitation											
2.3.7.2 Personal Hygiene	Rsv. Bibliography	1	1	1	1	1				5	
2.3.7.3 Housing	Conference	1	1	1	1	1				5	
2.3.7.4 Community Hygiene	Group work	2	2	2	2	2				10	
	Group discussion	1	1	1	1	1				5	
	Practice									<u>12</u>	
										37	
2.4 Accidents											
2.4.1 Classification	Review of Bibliography									1	
	Conferences									2	
	Work group									3	
	Group discussion									<u>2</u>	
										Sub-total	8
2.4.2 Conditioning Factors											
2.4.2.1 Alcoholism	Work group									3	
2.4.2.2 Defficient Security Measures in Work	Group discussion									<u>3</u>	
										Sub-total	6
2.4.2.3 Irresponsibility											
2.4.2.4 Enviromental											
2.4.3 Causal Agent											
2.4.3.1 Physical	Conference									2	
2.4.3.2 Chemical	Work group									3	
2.4.3.3 Mechanical	Group discussion									<u>2</u>	
										Sub-Total	7
2.4.4 Evolution and Diagnosis	Conference									6	
	Review of Bibliography									1	
	Work group									5	
	Group discussion									<u>4</u>	
	Practice									6	
										Sub-total	22

2.4.6 Treatment

1. Dressing of wounds
2. Bondages
3. Tourniquets
4. Drainage of Abscesses
5. Suture of wounds
6. Removal of stitches
7. Extraction of foreign bodies
8. Washing of ears
9. Immobilization of fractures
10. Applying compresses
11. Artificial respiration
12. Heart massage
13. Gastric flushing
14. Mobilization
15. Vesical catheterisation

Conference  
Exercise and practice

	18	
	<u>30</u>	
Sub-total		48

2.4.7 Prevention

- 2.4.7.1 Work Security and Hygiene

Conference  
Work group  
Group discussion

	2		
	2		
	<u>2</u>		
Sub-total		6	5.12-121
TOTAL		996	
GRAND-TOTAL		<u>2,678</u>	Hr

### MAYAN CONCEPTS OF DISEASE

The ancient Maya concept of disease was permeated by religious ideology, its multitudinous gods and their incurable wrath, its sorcerers and its diviners. Some information derives from the modern Maya, whose beliefs may have survived from classic times. The Maya made a clear distinction among the following causes of disease:<sup>1</sup> 1) possession by semi-personified "winds", 2) the "evil eye" and kindred influences, 3) punishment by a god or spirit, 4) witchcraft, 5) certain mythical birds that carry disease or death, and 6) extremes of hot and cold properties of food.

The idea of evil winds was fundamental to their conception of disease. The winds were thought to have entered the body of an afflicted person, and treatment consisted of removing them. The gales of sickness were identified with actual winds that blew, and it was those that people tried to avoid. The young were particularly susceptible because they had no experience of avoiding them; as a result, children suffered sickness more frequently than their elders. Evening winds in a yellow sky and whirling winds were particularly dangerous. The former brought colds and fevers to children, who were therefore usually required to remain inside at dusk.

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<sup>1</sup>

References 1 and 2, this section.

They never put their eyes to cracks in walls or to holes in doors for fear of drafts. In particular, winds blowing from water were likely to lead to sickness. Usually the winds were personified rather vaguely, but often very evil winds were given explicit names. Ritual medicine was employed to trick and cajole the winds into leaving the affected person. In some cases the winds were completely anthropomorphized and conceived to be little people wearing hats and other garments. These individuals were quite mischievous, and three especially traveled together: "Evil Wind", "Asthma Wind" and "Asthma-seizure Wind." Children's illnesses, especially intestinal disorders, were attributed to them. Whooping cough was brought to the house by three similar small personages called "Lords of the Whooping Cough". Dogs were tied up so as not to bite these visitors and annoy them into perpetrating more mischief.

Another concept held that any aperture in the body was a possible entrance for evil, or a form of "ojo". The waves of malevolence were likely to enter a newborn through the umbilicus and winds carrying sickness might pass from one person to another. The nature of the affliction from evil winds depended upon the immediate circumstances of the recipient; in childbirth, the danger from the winds was much

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<sup>1</sup>References 3 and 4, this section.

greater. This notion of communicability merged with another complex of ideas generally known as "ojo", or the "evil-eye". As noted above "ojo" was used also in the names of winds and thus signified any form of communicable malignance. Beside the winds, "ojo" could be created merely by looking at someone, certain men and animals causing disease by gazing upon or touching a child. Persons with these harmful abilities were considered dangerous and were not to be crossed.

The evil winds were considered paramount, and witchcraft was not a leading cause of sickness and death among the classic Maya. Sickness was either an unfortunate accident or the result of a lapse from piety, and confession, especially by a sick person, was customary. It is believed that the Maya clearly attributed subsequent outbreaks of sickness and general disaster to the displeasure of the gods invoked by the erotic practices that the invading Toltecs imposed on them<sup>1</sup>. The fear of sickness was a constraint to right conduct and conformity to ritual. Even failure to observe the prayers in commemoration of the death of a relative brought illness. Sorcerers were recognized for their ability to cast illness upon a person by one of several ways<sup>2</sup>; by their control over the evil winds using magical incantations; by creating

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<sup>1</sup> Reference 5, this section.

<sup>2</sup> Reference 6, this section.

images (usually of beeswax) and burying, cutting or piercing them, and, most commonly, by one of a multitude of small living things that the sorcerers supposedly controlled. These creatures came from the underworld.

Another important concept in the etiology of disease did not involve from the supernatural, but was founded upon a sort of physiological principle, a distinction between "cold" and "hot" things. All foods were recognized as being one or the other. Very "hot" foods were honey, coffee and beef. Very "cold" foods were turkey, rice, papaya and pork. Intermediates were oranges, cassava, pineapple, sugar cane and chocolate. "Cold" articles were moderated by adding "hot" and vice versa. By similar logic if two articles of the same type were taken, the effect was cumulative. The notion of "hot" and "cold" in connection with classes of foods had meaning related to the appropriateness of a diet of one class for a person whose supposed temperature was attributable to the opposite class. For example, a feverish person should eat no foods in the "hot" category, only those that were "cold" or "half-cold", in order not to aggravate his situation, while for a person with a chill it worked in the opposite manner. Fever was attributed to eating too much "hot" food; eating too much "cold" food led to debility and especially sterility. To a person in normal condition and good health, all foods were

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References 7 and 8, this section.

considered suitable provided they were eaten in moderation.

Among the causes of death, the supernatural again appeared in the form of two mythical birds of the night: "parrot-seizure" and "purple parrot-seizure"<sup>1</sup>. They were thought to be dark blue and purple in color and to attack children. By night they cried like babies when they flew over the huts, vomiting as they passed; their disgorgement dropped into the mouth of a sleeping child, and caused death with a blue appearance. Perhaps babies dying from a congenital cyanotic heart disease were considered to be their victims.

It seems impossible for the Mayan practitioner working within this hopeless etiologic hierarchy to have achieved any sort of creditable cures, especially because the beliefs were more than likely those of the patient rather than those of the physician himself.

#### Practice of Medicine

When the sick man called the practitioner to his hut, permission of the household god having been requested, the first task was to diagnose the illness and to determine its cause. It was necessary for the physician to drink (usually a locally-brewed alcoholic beverage) throughout the period of diagnosis and treatment. In this way he was better equipped to combat the evil spirits.<sup>2</sup> It is possible that while under

<sup>1</sup>

Reference 9, this section.

<sup>2</sup>

Reference 10, this section.

the intoxicating influence, his diagnostic acumen was thought to be sharpened. The most frequent method was divination using the "am". The practitioner would evoke Ix-Chel, the goddess of medicine, placing her image before his patient, while copal incense was burned and tobacco smoke blown across the patient.<sup>1</sup> The practitioner carried a "black bag" containing his equipment, which included any items having magical abilities. The holy stones were rolled before the patient and the divining began to determine the cause and prognosis of the illness.<sup>2</sup> Discovery was essential because the treatment would correspond with the cause. The practitioner would interrogate the patient, particularly concerning his religious observances. Only afterwards, when he believed he had found out the cause and nature of the affliction would a cure be attempted.

If it were learned that the patient's illness was retribution of the gods, propitiatory ceremonies were held immediately. If evil winds were involved, they must be driven out or enticed to leave. If the ailment had been brought about by the neglected soul of a dead relative, another ceremony was indicated, and if witchcraft were involved, a prescribed course of action had to be taken.

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Ibid.

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References 11 and 12, this section.

To decide whether a disease was curable or not, the patient sniffed a sternutatory. If he sneezed, it was considered a favorable sign because it proved irritability<sup>1</sup>. The disease was also judged by its time or origin according to the calendar.

The next step was therapy, and the practitioner would perform the particular ceremony that was indicated. One ceremony, the ritual for the treatment of a person affected with the winds, is called "santiguar" (to heal by blessing) by the modern Maya<sup>2</sup>. It depends on the effectiveness of certain plants to cleanse the body of evil winds. The plant was used to brush the invalid and with the aid of prayers, the winds were expelled. It was believed to be the best cure for the evil winds, accidentally encountered.

In the therapy of diseases caused by excesses of "hot" or "cold" substances, the diagnosis could not always be determined by the apparent state of the patient, and the practitioner occasionally had to test the blood<sup>3</sup> by mixing a portion with a substance in each of the categories. A little wood ash, mixed with water is "hot" and therefore, if the blood turns red, "hot" things are indicated; if black, "cold" things. The treatment prescribed then would be in accordance with the diagnosis. Baths and medicines were also advised to

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<sup>1</sup> Reference 13, this section.

<sup>2</sup> Reference 14, this section.

<sup>3</sup> Reference 15, this section.

counteract the patient's condition.

In the therapy of the "evil eye" diseases, the cure<sup>1</sup> tended to take the form of counter inoculation . The remedy probably varied among doctors but always fell into the pattern of coercing the individual who caused the disease to be brought into indirect contact with the patient; for example, by giving the patient water from which the disease-causer had been drinking.

Maya medicine comprised a great body of remedies and therapeutic measures in which purely ritualistic elements must have formed an indispensable part. The herbal lore alone is enormous. A large number of Maya medical texts treat based upon the alleviation of symptoms and are founded upon an objective pharmacognosy. Some of their cures were obtained by bleeding the parts which gave pain to the sick man, for instance, the gums were bled for a toothache. Landa<sup>2</sup> mentions these remedies of the Maya doctor:

"Iguana dung is an admirable medicine for curing films in the eyes, if placed fresh on them...there is a red worm from which a good yellow ointment is made for swellings and sores by only crushing them or kneading them together."

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<sup>1</sup> Reference 16, this section.

<sup>2</sup> Reference 2, this section.

A Maya doctrine of numbers existed in relation to the correct number of days or times a remedy was to be applied, thirteen for males and nine for females. The Maya methods can be grouped in a more materialistic application of the therapeutic art. They subscribed to the homeopathic principle, so a disease was treated with objects which would produce changes similar to those present in the disease; the application of crushed wasps nests or other stinging insects for skin eruptions, a concoction of yellow plants for jaundice.

Apparently, the Maya recognized and diagnosed cancer. They describe a remedy for it using powdered claws of a crab. Cures, were often worse than the diseases they were intended to cure. Von Hagen observes:

Pleurisy, "extreme pain that attacks the ribs", could be relieved by drinking turkey broth, or balche mead(5) containing the ashes of dog excrement that had been burned. Dysentery was called rightly a "blood flux". For its cure an extended pharmacopeia was offered: the sap of the rubber tree, a fungus, a euphorbia (which was perhaps better than anything else prescribed.) Dysentery was also cured by "taking the tender tips of the guava-plant mixed with the excrement of dog, adding a little tapir dung as you boil it, and after resting until dawn, adding a bit of honey". The herbal states that the dysentery "will cease by these means." There is little doubt that the patient would cease also.

<sup>1</sup>  
Reference 17, this section.

<sup>2</sup>  
Reference 18, this section.

<sup>3</sup>  
Reference 19, this section.

<sup>4</sup>  
Reference 20, this section.

<sup>5</sup>  
Reference 21, this section.

Therapeutic measures of manipulation, massage, bleeding, and bone-setting were relegated to surgeons, who were acquainted with preparations of narcotics, sedatives, purgatives, emetics and stimulants. They used hemostatic substances to control bleeding and applied healing and cleansing solutions to wounds. They were also acquainted with the physical methods of therapy such as massage, scarification, venesection, counter irritation, bandaging, poulticing, tooth pulling, cupping and sucking.<sup>1</sup> They were able to set fractures and apply splints, and they also applied manipulation by pressure and controlled hemorrhage with a tourniquet. Caustery was also used, while a few ancient skulls indicate that trephining was occasionally practiced.

In the truly physiologic and anatomic concepts of disease and therapy, Maya doctors were as advanced as their European contemporaries. On Maya and Aztec medicine, Behan writes

"The Spaniards noted that Indian medicine was far advanced and they marveled at its sufficiency. Such a high proficiency is quite conceivable, because it is understandable how an intelligent but primitive people can marshal observations and formulate them into conclusions from which concepts of outstanding accuracy may be deducted. These crude concepts are startling in their similarity to those which were later formulated by trained observers who had at hand a wealth of scientific data. It is therefore not surprising that the medical and therapeutic methods of the Maya were rich in innovation and qualified achievement, though they were entirely different and at times were at variance, yet in some respects were far in advance of the practice of the civilization of the Old World." (2)

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1. Reference 22, this section.

2. Reference 23, this section.

Behan states "their method of treatment of wounds was an example of their advanced technique in that they coapted the edges of an incised wound with hair sutures. After closure, the wound was bathed with the juice of the agave plant. However, if the wound healed badly and had left an ugly mark, it was re-opened and cauterized. It was again sewed with hair and covered with melted ulii which is the juice of the India rubber plant."<sup>1</sup>

Von Hagen adds these concluding remarks in his brief chapter on Maya curers: "However, when the patient recovered from these diseases through the various specifics proffered by the doctor (which speaks more for the rugged Maya's constitution than for these un-Homeric simples stuffed down him) and his thoughts turned to love, the doctor could offer him one of several aphrodisiacs, such as the heart of a hummingbird or the testis of a crocodile. As the average Maya was as libidinous as a two-toed sloth, he had need of it. They lacked sexual imagination, which is the only true aphrodisiac; and Aldous Huxley gave them up completely."

Finally, if a patient survived the illness and the cure, and escaped the witchcrafts which caused the illness, the successful doctor could change his role and become a sorcerer, and bring disease to the one suspected of causing the malady. He could return the disease and so parlay malevolence into death".<sup>2</sup>

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<sup>1</sup> Reference 23, this section.

<sup>2</sup> Reference 24, This section.

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