III. HEALTH SECTOR PERFORMANCE

III. Health sector performance

1. Resources

According to the central government budget[3], in 1982-83 the Ministry of Health, Housing and Cooperatives is expected to spend 8.425 million Belizean dollars (excluding housing, fisheries and cooperatives but including all of the ministry's central administration). This total does not include expenditure on water and sanitation services provided by the Water and Sewerage Authority, or refuse collection services of the town governments. This would amount to just under nine percent of total domestically-financed government spending, or to 4.6 percent of total GDP. Capital expenditures included in the budget total another 10.3 million dollars, of which nearly 90 percent represents requests for external assistance. However, this figure includes 8.9 million for a new hospital for Belize City, for which funds have not been obtained and even the decisions as to size and services to be offered are not final. Even the recurrent budget should not be regarded as definitive; as the Ministry has itself pointed out in a thorough review of the country's health status and services[4], in recent years it has been common to spend on health 40 to 50 percent more than was budgeted. Assuming such an excess for the current year, and including in capital spending only the domestic contribution, would yield a total of about 13 to 14 million dollars, which is still only about 14 percent of the budget or

[3]Government of Belize, *Estimates of Revenue and Expenditures for the year 1982-83* (Belmopan, March 1982).

[4]Ministry of Health, Belize (in collaboration with PAHO/WHO, Jamaica), *Health and Health Status: Belize* (Belmopan, April 1982, p. 65, processed).

7.5 percent of GDP. These figures are not extraordinarily high, but they clearly suggest the difficulty of any expansion of resources for the health sector at current levels of total revenue.

The Ministry is almost entirely financed out of general revenue. There are not taxes dedicated specifically to pay for health exptenditures, and the only source of revenue which is related to use of facilities if the charge for hospitalization. The fee schedule distinguishes five categories of patients: the poorest pay nothing, while the wealthiest still pay only five dollars per day. There are also reltively low fees for some diagnostic and surgical procedures. All together, these fees are expected to raise 150,000 dollars in 1982-83, which (on a total of 381 hospital beds) implies a revenue of one dollar per bed per day. Assuming half the patients to be treated free of charge, and a 65 percent occupancy rate, the fees would still bring in only 3.32 dollars per bed per day for those patients paying something. (Most of the remainder of the total of 544 beds in the country are in the mental hospital, whose inmates presumably do not pay.)

The 8.425 million dollars are divided by type of expenditure as follows:

personal emoluments	5.041	(60%)
travel expenses	0.122	(1.5%)
supplies and materials	1.329	(16%)
other operating and maintenance	1.369	(16%)
public utility services	0.312	(3.7%)
equipment	0.135	(1.6%)
grants and contributions	0.117	(1.4%)

When the budget is exceeded, of course, it is the categories of supplies and materials and other operating and maintenance costs which are most likely to increase; so the share devoted to wages, salaries and benefits typically runs somewhat below 60 percent. The expected distrubiton of expenses does not show any obvious imbalance. Problems in staffing, in provision of supplies and in maintenance, discussed below might however require that the structure of spending be changed slightly.

2. *Private expenditures on health*

The budget discussed above covers all public health measures in Belize and essentially all the hospital care provided in the country, as well as some care provided out of the country for patients who are transported at public expense to hospitals in neighboring countries (especially Mexico). It does not cover private spending by Belizeans on hospital care in other countries, or doctors' services provided privately in the country, or expenditures at private pharmacies. Doctors (specialists) employed by the Ministry are allowed to practice privately outside their regular hours; outside of Belize City, non-specialists may also take private patients. In addition there are between 20 and 30 full-time private practitioners in the country, of whom about ten are in Belize City. A 16-bed private clinic has just opened there, and there are a few privately-supported clinic beds in other towns. It is clear that most private health care expenditure in the country is for doctors' consultations and drugs; private patients requiring hospitalization are nearly always sent to the public hospitals. Assuming that there are the equivalent of 36 full-time private doctors in the country, that

each one employs a nurse full-time, and that private practice pays one and half times as well as government service, expenditure on these services would be about 1.6 million dollars per year; with allowances for office supplies and equipment and possible other staff, perhaps as much as 2.5 million. These figures are only rough estimates, made in the absence of any data from family budget studies, from insurance firms, or from the practitioners themselves. What they suggest is that private health care spending may be about one-fourth to one-third of what is spent through the public system. Almost all doctor's fees collected privately must come from higher-income patients; all but the very poorest may however frequent pharmacies and buy drugs and supplies.

Seen in terms both of social equity and of economic efficiency, this dual system has one definitive advantage and one equally clear disadvantage. The first is that price discrimination is possible for doctors' consultations, with the well-to-do paying more and allowing the poor access to subsidized care. The fact that public employees can practice privately means that medical profession is not dichotomized, and provides an escape from the low public sector salaries. The disadvantage is that this duality does not extend to hospitals (with the exception of relatively few patients), and in consequence, also does not extend to nurses, most of whom are employed in the hospitals or other public health posts. The poor end up subsidizing the rich for nursing and hospital services, and low pay for nurses has more effect on staffing than does relatively low pay for doctors.

3. *Personnel*

The government has vacancies, for which funds are budgeted, for both MDs and nurses (staff for non-medical posts do not appear to present a problem). Low pay is regarded as the chief difficulty in recruiting and retaining people for both jobs: doctors can make only from about 16,000 to 20,000 dollars per year, and nurses from just over 13,000 (for a nurse practitioner) down to as little as 5,220 for a rural health nurse. Members of both professions readily emigrate, especially to the United States; the nursing school routinely lost, in recent years, most of its graduates this way. The problem is more serious for nurses than for MDs, for three reasons. First, no public training is provided for doctors, whereas nurses are trained at public expense. Second, doctors -- but not nurses -- can increase their incomes by private practice. Third, Belize is able to attract some foreign doctors, but few if any foreign nurses, to work in the country. These are likely to come from either neighboring Latin America or Caribbean countries, or from the Indian subcontinent.*

Recently the government has begun to require nurses trained at public expense to work for the Ministry at least a year or two in return, and this appears to raise their retention; but the cost of their training

*One of the reasons offered for the visit to Belize by the authors of this report, was that the country had the opportunity to employ doctors from Costa Rica who had been let go by that country's health ministry or social security system. It was suggested that PAHO would be asked to provide a supplement to Belizean salaries to attract such people. Aside from the fact that a supplement to foregin doctors' pay might possibly be as well or better spent to attract Belizean doctors into public service or keep them from emigrating, it is curious that this issue was not raised in any discussions with Ministry officials in Belize. Only once was it observed, casually, that the current economic crisis in both Costa Rica and Mexico might make some short-term "bargains" available to Belize.

is still largely wasted if many leave as soon as their indenture is over. Raising nurses' pay seems to be a necessary part of any solution to the sector's staffing problems.

If a rise in nurses' salaries were to lead to demand for higher pay by doctors so as to maintain pay differentials (whether absolute or relative), there would a large deadweight loss involved. There are no estimates of how important such an effect might be, but those officials asked about it generally did not expect that doctors would insist on a parallel increase, so the deadwight loss would be small. Changing the relative pay of doctors and nurses might also be easier for the Ministry to bear if somewhat more responsibility were shifted to nurses in the hospitals, reducing the demands on doctors' time.

4. *Administration and management*

From an economic viewpoint, there appear to be three significant problems. All three, it should be said, are recognized within the Ministry, and in two cases it is relatively clear what should be done for a solution. The first and probably the simplest problem is one of inventory control, especially for drugs: hospitals and dispensaries carry small stocks; re-order times are too long; and shortages are frequent. (The problem does not seem to affect vaccines, perhaps because demand for them is more predictable or perhaps because the requirements of the cold chain cause more care to be exercised.) Apart from the need to reduce re-stocking time, the chief need is for a one-time effort to build up inventories and, where necessary, to add to and improve storage space[4, p.46]. The cost of this effort would be small compared to

the costs borne by patients who fail to get the drugs or other supplies they need.

The second problem is one of maintenance, especially of vehicles. The Belizean health sector is not short of physical capital, in relation to the country's income level, but it is short of the services of much of the capital because of breakdowns and inadequate maintenance. This is most true of vehicles; a summary[4, p.43] shows seven vechicles out of 30 out of service at once. The resulting shortages lead to ambulances being used as trucks, which is wasteful as well as dangerous. The exact size and composition of the fleet the Ministry should maintain depends on the use to be made of the district hospitals, and thus on the referral system, which is still under discussion. What is clear, however, is the need for better maintenance of the existing stock; part of the solution, as with drugs and supplies, may be a one-time stocking of spare parts.

The third problem is the most complex; it concerns the balance of use of doctors, nurses and physical plant, and so is involved with staffing and pay questions. District hospitals are underutilized, because of the relative ease of reaching Belize City, the lack of an incentive system to promote their use, and -- sometimes -- the fact that the absence of a single MD practically closes down the hospital. If the district hospitals were more fully used, a new or repaired Belize City hospital might be smaller than the current 174 beds, allowing for some capital saving. To achieve that will require fuller coverage by doctors in the districts, and possibly a fee system which penalizes people for bypassing their local hospital unnecessarily. The other part

of this resource-balance problem is the shortage of nurses, which precludes letting nurses take more responsibilities in the hospitals. Even with some reduction in the physical plant of the health sector, an increase in staff may be necessary.

5. *The General Environment*

The environmental health conditions in the country are not developed. An while environmental diseases (except malaria) do not abound, they are a permanent threat in all communities, especially where infrastructural works and services are under undeveloped.

(a) Water

The main towns of Belize, Belmopan, and Orange Walk enjoy communal water supply systems (from surface sources) with chlorination facilities that guarantee potability on a relatively constant basis to over 90% of urban dwellers (EH Table 1). But in rural areas only 40% of the people have house connections or easy access to a water supply (usually wells). Others must rely on raw river water, hence the location of many villages, especially in the north-west, on river and other water bodies. As discussed later, water quality control is incomplete.

(b) Liquid wastes

In urban areas only 6% of the people live in houses connected to communal sewage systems. Belmopan is fully served. However, in Belize City a sewer system is still being completed and 132 connections have already been made for treatment by sewage lagoons in the south which outlet to a coastal waterway. A large percentage of all urban dwellers still rely on septic tanks and latrines; and in some cases in Belize City the use of buckets and the dumping of faecal matter into city drains are reported. In rural areas there are few connections to communal sewerage systems and 89% (see EH Table 1) of the people rely on septic tanks or latrines. Failure of coverage (or latrine usage) is related

to the high prevalence of intestinal parasites in children.

c) Solid waste

The dumping of soild wastes along city streets and in public places is common, and is linked to weaknesses in public attitude and the lack of adequate municipal collection vehicles. Additionally, disposal is by open dumping in most communities and the sanitary landfill for the largest urban community (Belize City) is generally without soil cover.

d) Disease vectors

It is not surprising that with such a large area of low swampy land and numerous waterbodies, Belize experiences a high prevalence of mosquitoes. Malaria is on the increase (discussed elsewhere) and Aedes aegypti control operations are constantly undertaken. Other important vectors or pests are: rodents, roaches and cockroaches. In 1981 the first human rabies case in a decade occured in Benque Viejo Town, and dog immunization (or extermination) has been necessary. Twenty cases of human rabies were treated in 1981 and the Veterinary Laboratory confirmed 18 rabid animals in 1980 in dogs, cats and cattle.

e) Food

Although there have been no major food-borne diseases in recent years, food sanitation is deficient. Eating habits are casual; food establishments are under-inspected and un-hygienic; and food handlers are mostly untrained and uncertified. Animal slaughtering is generally carried out in municipal slaughterhouses in district capitals and in the official commercial slaughterhouse in Belize City. Outdated food sanitation legislation is reportedly not supported by

local courts.

f) Environmental pollution

Air pollution is generaly not a problem with few exceptions, e.g. the area downwind of the Tower Hill Sugar Factory outside Orange Walk where bagasse particles and soot prevail during factory operations in January to June. In some communities land pollution exists, and water pollution from industrial effluents is growing, as follows:

Haulover Creek (Belize City)	- Metal plant and other industries
New River	- Sugar factory
Stann Creek River	- Citrus fruit processing

Noise pollution is not a community problem.

g) Housing environment

Except for Belmopan which is a new city, many urban houses are old and some are dilapidated and structurally unsound, especially the timber houses. In the low income group in Belize City, overcrowding is frequent and housing conditions unhealthful. In rural areas many houses are thatch-roofed and environmentally sub-standard. The increase in unplanned refugee settlements, by refugees from nearby countries mean a continuing increase in sub-standard homes without such minimum infrastructural facilities as water supply, sewerage, drainage and roads systems.

h) Working environment

A 1980 study of the conditions of work for the estimated workforce of 33,000 (65% in agricultural activities) showed occupational

hygiene and safety problems to be:

- Work injuries in sugar cane and banana cutting, and in sawmills.
- Pesticide poisoning from insecticides (e.g. malathion), herbicides (e.g. 2-4-D and paracquat) and rodenticides.
- Organic dust from handling or wind-blown dry bagasse.
- Heat exposure in farming operations.

i) Other environmental health problems

Other environmental health problems which may arise at major public fairs and entertainment occasions or in recreational areas (e.g. beaches or natural parks), are not considered of such a scale or regularity to merit identification.

6. *Specific Activities*

A. *Health Data*

1. *General Demographic Characteristics*

Belize, with a population of 145,353 in 1980, is the 5th largest country of the 12 Caricom member nations. With a population density of 6 per km^2 (or 15 per km^2 of arable land) it is one of the least densely populated countries in the world.

Table 1 presents a summary of basic demographic indicators for the 12 year period 1970-1981. With the exception of infant mortality, the demographic indicators have not altered significantly during this period: the crude birth rate (per 1000 population) has ranged from 37.1 in 1970 to 41.8 in 1977, with a mean of 39.8 (S.D. = 1.39); the fertility rate per 1000 females 15-44 years old has ranged from 191.6 in 1970 to 218.0 in 1980 with a mean of 207.4 (S.D. = 7.94); the crude death rate per 1000 population has ranged from 4.7 in 1981 to 6.8 in 1970 with a mean of 5.9 (S.D. = 0.66). In contrast, the infant mortality has shown a steady decline from a high of 60 per 1000 live births in 1971, to the present low of 27 per 1000 live births in 1981. During the period 1970-1980 the annual rate of growth was 1.9. Life expectancy at birth in 1977 was estimated at 67.7 years. In 1981, 1 out of 29 children born will die before reaching school age.

Within Belize, demographic characteristics vary. Appreciably among the 6 districts (Figure 1, Map of Belize by districts). Table 2 presents an analysis of district demographic estimates for 1980. Cayo District has the lowest birth rate (27.5), infant mortality (27.1) and

crude death rate (3.1) in contrast with Toledo district having the highest birth rate (51.0), infant mortality (58.3) and crude death rate (9.4).

According to the 1980 census, the population of Belize is a relatively young population, with 46.3% of the population less than 15 years of age (Figure 2).

2. *Major Health Problems*

This section will deal with data available at the national level on major health problems seen in the 7 hospitals of Belize and reviews of death certificates. The hospital data represent collation of information from hospital record diagnoses, analyzed by the Department of Statistics, Ministry of Health, Housing and Cooperatives. Limitations in interpretation of these data must be kept in mind as the diagnostic capabilities outside of the Belize City Hospital are limited with antiquated X-ray facilities available in Belmopan, Stann Creek, Orange Walk and Punta Gorda Hospitals, and basic laboratory services available for hemograms, blood glucose and gram stains at Belmopan, Stann Creek, and Punta Gorda Hospitals.

Mortality data are collected from reviews of death registrations. Of the 691 deaths reported in 1981, 159 (23%) had autopsies performed by the physicians at Belize City, Belmopan and Stann Creek Hospitals. There is presently no trained pathologist in the country. Deaths that occur outside of the hospitals are reported to the municipal council authority in urban areas and to village alcaldes or leaders in rural areas. Their interpretation of mortality data must be limited.

Tables 3, 4 and 5 present the leading diagnoses of hospital admissions in 1980 and 1981. Comparison of Tables 3 and 4 further illustrate problems in interpretation of data available from different documents as the data do not match, though they present the same information.

As can be seen in Tables 3, 4 and 5, intestinal infectious diseases are a leading cause of hospitalization in the country if one excludes direct obstetrical causes. In addition, respiratory conditions are a major cause of hospitalization in Belize City Hospital. The limitations in diagnostic capabilities are further illustrated by the fact that a leading cause of admission to hospitals in the country is "signs, symptoms and ill defined conditions".

Diagnostic data on outpatient visits were only available for the outpatient facilities in Belize City, and are presented in Table 6. Again, intestinal infectious diseases, ill defined conditions and respiratory disease are leading diagnoses, accounting for 41% of the total outpatient visits.

Table 7 presents the 10 leading causes of death for all age groups during 1981. As can be seen, diseases of the circulatory system account for 31.7% of all deaths. Infectious diseases were responsible for 19.2% of reported deaths and thus rank number two in causes of death.

Table 8 presents an analysis of reported causes of death in early childhood further divided into the neonatal period, 1-11 months of age and 1-4 year olds. The leading cause of death in the neonatal

period are conditions arising in the perinatal period, accounting for 70.6% of all deaths. The 2nd leading cause in this age group is pneumonia (8.2%) followed closely by intestinal infectious diseases (7.1%). Infectious diseases account for 16.5% of all deaths in this age group.

In the 1-11 month old age group, the leading cause of death is intestinal infectious diseases (22.8%), followed by bronchitis, emphysema and asthma (16.5%) and conditions arising in the perinatal period (12.7%). Infectious diseases account for 45.6% of all deaths in this age group.

In the 1-4 year old age group, the leading cause of death is pneumonia (20.8%) followed by infectious intestinal diseases (18.6%). Infectious diseases accounted for 51.2% of all deaths in this age group.

A breakdown of etiologies of infectious disease deaths in Belize during the 3 year period 1978-1980 is shown in Table 9. Gastroenteritis and pneumonia accounted for 67.8% of all infectious disease deaths.

3. National Surveillance Capacity and Reported Disease Morbidity

Surveillance of communicable diseases in under the responsibility of one of the two medical officers of health at the national level. The list of reportable diseases concurs with the recommended list by CAREC (Caribbean Epidemiologic Center) in Trinidad and Tobago.

The health care delivery network in Belize presently consists of 29 rural health centers, 7 district hospitals and mobile clinics. The designated chain of reporting of the surveillance system is health centers

report to their respective district hospitals and the district hospitals report to the Department of Statistics based in Belize City Hospital. A "coupon" book of forms to be filled in triplicate is used, with information solicited on name, address, age and diagnosis. All forms must be signed by the Distric Medical Officer and are required to be submitted to Belize City weekly.

Field visits revealed that reporting was incomplete, as the District Medical Officers were often too busy to fill out individual forms on all cases seen, and many of the health centers were not reporting since the cases had not been confirmed by the district medical officers.

In addition to the coupon books of surveillance forms, there are individual case investigation forms for cases of diphtheria, poliomyelitis, typhoid fever, veneral disease, dengue fever, malaria and gastroenteritis/ foodborne illnesses (Appendix 1 pp 1-7).

At present there is no full time epidemiologist to conduct investigations but there is a Belizian studying for an MPH at Tulane University who is due back in September to take over the responsibility of country epidemiologist. There is also a medical officer in Costa Rica on a 6-month fellowship studying tuberculosis who is due to return in November, 1982.

Thus, the individual case investigations are the responsibility of the part-time MOH; typhoid fever, gastroenteritis/foodborne and veneral diseases are investigated with the help of the public health inspectors; and dengue fever and malaria cases are investigated by the vector control staff.

Table 10 shows the annual incidences of the 5 leading communicable diseases in Belize in 1980 and 1981 as contained in the annual statistical report. Malaria is the leading cause of morbidity, followed by gastroenteritis. Table 11 shows the annual report of diseases to CAREC for 1980, 1981 and 1982 (thru the week ending 31 August 1982). Again, problems in data collection are reflected by comparing reports of gastroenteritis, gonococcal infections and influenza in Tables 10 and 11.

Morbidity Trends

a Malaria

Table 12 shows the number of reported cases of malaria during the period 1970-1981. During the years 1970 and 1971 malaria was the sixth leading reportable disease; this increased to fourth during the years 1972-1975; and since 1977 it has been the leading reportable disease with an incidence of 141 cases per 10,000 population reported in 1981. As of 31 August 1982 there have been more cases reported for 1982 than for all of 1980. Only the Cays and Belize City proper are considered to be malaria free, with cases reported in all 6 health districts. Of note, all reported cases are based on positive thick blood film (TBF) slides from suspect fever cases, thus clinically compatable cases that do not have positive TBF's either due to poor quality of the slides or improper timing of slide preparation, are not reported, thus resulting in a probable under reporting of cases. Of interest is that there have been no deaths reported due to malaria since 1976 in spite of the increased incidence.

Of additional concern is the corresponding increase in

falciparum infections. Prior to 1978, only vivax infections were reported. In 1978 there were 2 falciparum; in 1979 - 13 falciparum; 1980 - 34 falciparum; 1981 - 41 falciparum; and, as of July 1982 - 48 falciparum.

b. Gastroenteritis

Annual data for gastroenteritis were only available for 1980-1982 (Tables 10 and 11) with rates of 61 and 60 per 10,000 population respectively. The rate of gastroenteritis for children less than 5-years old in 1981 was 201 cases per 10,000 children less than 5; and as of August 1982, 208 cases per 10,000 children less than 5.

c. Vaccine Preventable Diseases

Table 12 shows the number of reported cases of the 6 vaccine preventable diseases during the 1970-1981 interval.

1) Measles

During the period 1970-1981 measles was endemic with rates ranging from a low of 0.63 per 10,000 population in 1974 to a high of 102.4 per 10,000 population in 1976. There were epidemic increases at 4 year intervals, the most recent being 1980. Age specific data were not available, but in 1981 there were 2 measles deaths reported - both were in 1-year olds, suggesting that measles is still a disease of early childhood.

2) Pertussis

During the period 1970-1981 pertussis was endemic with rates per 10,000 population ranging from a low of 0.14 in 1979 to a high of 17.24 in 1971. Intervals between peak incidences ranged from 2-4 years. There were no reported deaths due to pertussis in 1981.

3) Tetanus

Tetanus cases were reported to occur every year except 1976 and

1977 for which there is no information available (Table 12).

In 1981 there were 2 cases of neonatal tetanus reported. It is felt that neonatal tetanus is greatly underreported especially from remote rural areas where there is an underreporting of births and early deaths, and the majority of deliveries are attended by untrained family members, often the husbands, in the Mayan villages.

4) Tuberculosis

Tuberculosis is not felt to be a major health problem with rates per 10,000 population ranging between 1.18 in 1978 to 3.59 in 1970 (Table 12).

5) Polio

During the 12 year period 1970-1981, poliomyelitis has appeared as a sporatic problem with cases reported only in 1972-1974, and 1978-1979. There were no cases reported in 7 of the 12 years (Table 12).

6) Diphtheria

During the 12 year period only 3 cases of diphtheria were reported, one case a year in 1972, 1975 and 1990 (Table 12).
In addition, there has been 4 cases reported in 1982.

d. Typhoid Fever

The reported incidence per 10,000 population of typhoid fever during the period 1970-1981 has been fairly steady ranging from a low of .07 in 1981 to a high of 0.72 in 1979 (Table 12). As of 31 August 1982, there have been no cases reported. Of note, criteria for case reporting requires laboratory confirmation.

e. Sexually Transmitted Diseases

During the period 1970-1980, after an initial increase in

incidence of gonorrhea in 1971, there has been a steady decrease from the high of 31.25 per 10,000 population (1971) to a low of 8.32 per 10,000 population in 1980. A similar but more dramatic pattern is seen for syphilis during this period (Table 12). In 1982 as of 31 August, both diseases are showing increases (Table 11) with a 2.5-fold increase in gonorrhea and a 3-fold increase in syphilis. As with typhoid fever, both gonorrhea and syphilis require laboratory confirmation.

f. Hepatitis

During the period 1970-1981 hepatitis has been endemic with reported incidences ranging between a high of 6.70 per 10,000 population in 1973 to a low of 1.22 per 10,000 population in 1980 (Table 12). As of 31 August 1982, there have been 36 cases reported, representing an increase from the reported cases during the entire year 1981.

g. Dengue Fever

In 1978, Belize experienced its first outbreak of dengue fever in over 21 years. The exact number of cases reported was not available. Cases continued to be reported in 1980 (4) and 1981 (9) and, in 1982, second major epidemic occurred with 447 cases reported as of the 31 August.

h. Other Communicable Diseases

Morbidity data are not available, but it is the feeling on the part of the health authorities that additional diseases of concern in Belize are: leptospirosis, Chagas, and schistosomiasis. Of anecdotal importance is that during field visits, the team encountered a 2-year old child in the Carozal District Hospital with a classic Romanis sign

of acute Chagas' disease.

At present, leprosy has not been reported as a health problem in Belize, but with the recent influx of refugees from Guatemala, Honduras, and El Salvador where leprosy has been reported, there is concern on the part of the health authorities that leprosy may appear.

4. *Nutritional Status*

An assessment of the nutritional status in Belize was begun in 1977 with the assistance of the Caribbean Food and Nutrition Institute (CFNI). Data available for a sampling of 24% of the population less than 3 years of age between 1975 and 1978 showed 30% of this population to be in the Gomez I-III categories.

A review of clinic records of children less than 3 years of age seen in the Toledo District in 1976 revelaed that 46% of these children were in Gomez I-III categories (Table 13).

Follow up assessment of the nutritional status of the less than 3 year old population through a review of clinic records from 8 clinics in 1981 revealed 22% to be in the Gomez I-III categories (Table 14 and Table 15). This review represented information on 30% of this age group.

Caution should be taken in interpretation of these results as they pertain to the population of children 0-3 years of age who came to the attention of the health services.

A nutritional survey was conducted in 1978 with the assistance

approximately
of the CFNI which revealed: / 33% of children < 3 years old in the Gomez I-III categories, a prevalence of 40% anemia in the < 5 year old population and 50% parasitic infestation in children < 5 years old.

5. *Dental Health*

Surveys of the dental health picture in Belize have revealed that among school children, the proportion having dental caries in permanent teeth ranged from 22% in 6-year olds to 91% in 15-year olds. It is estimated that 90% of the adult population have peridontal disease.

B. *Existing Government Health Programs*

1. *Maternal and Child Health (MCH)*

Maternal and child health care program activities were begun in Belize in 1974. In 1976, The Tripartite Plan of Operations for Maternal and Child Health Services in Belize, was signed. This plan is a formal agreement between the Government of Belize, the United Nations Children's Fund (UNICEF) and the Pan American Health Organization/World Health Organization (PAHO/WHO). The plan was aimed at improving MCH services in the country setting specific targets for December 1977. (See inclosed Document - Report on Evaluation of MCH Project - Tripartite Plan of operations for MCH services in Belize, 1974-1977 - January 1979).

The objectives of the MCH program, as stated in the 1982 Belize Health Profile document are:

1. To reduce maternal and child mortality and morbidity.
2. To improve the coverage and efficiency of the MCH services.
3. To provide regular comprehensive care for children under

5 years of age, with the emphasis on supervision of their physical, mental and nutritional development.

4. Promote family life education for the adolescent and adult population.

The stated strategies and criteria for achieving the objectives are:

1. The extension of prenatal care and the registration and attendance of all expectant mothers throughout the country.

2. To increase hospital deliveries to 60% of all pregnant mothers and home assistance by trained personnel to 70% of the remainder.

3. To increase the level of immunization of pregnant women against tetanus.

4. To provide health education with speical emphasis on family life education to women and men of childbearing age.

5. To conduct a program of immunization of preschool children aiming at a target of 100%.

Responsibility for the stated activities related to the MCH program is within the scope of work of the public and rural health nurses based in the district hospitals, health clinics and operating the mobile clinics. Prenatal clinics are scheduled once a week in all health centers; child health clinics are scheduled once a week in all clinics; there are breast feeding clinics, and post-natal clinics, the latter aimed at the high risk infant population; in addition there are follow up clinics, home visits and school visits.

Table 16 presents an analysis of the prenatal clinic attendance

by gestastional date of visit and district in Belize 1981. Using the reported number of live births in 1981 (6030) and the reported number of stillbirths in hospital in 1981 (107) and comparing the number of women seen for first visits in prenatal clinics in 1981, the estimated coverage of pregnant women with at least one visit during the first 5 months of pregnancy during 1981 was 30.6%; the estimated coverage of pregnant women with at least one visit during pregnancy was 89.1%. Caution must be taken in interpretation of these figures as the actual number of pregnancies is unknown, espcially those resulting in late spontaneous abortions and stillbirths not attended in the hospitals.

Table 16 also shows the number of pregnant females receiving the complete recommended schedule of tetanus toxoid thru prenatal clinics both primary series and recommended boosters; using the same estimated target population, during 1981, 34.3% of the target population was adequated covered by tetanus toxoid.

In 1981, 3382 of the 6137 reported births, or 56.9% were attended in hospital. Data were not available on the proportion of total births attended by trained personnel vs. untrained personnel. To achieve the goal of attendence of 60% of all non-hospital deliveries by trained personnel, a traditional birth attendent (TBA) training program was instituted in 1974. By 1978, 55 of 92 known TBA's (60%) had been trained thru this program. This program has the stated target to train 8 TBA's annually - thus if 100% of this goal was achieved during the years 1979-1981, an additional 24 TBA's would have been trained resulting in 86% of known TBA's trained. Caution must be exercised in interpretation

of these figures as the true number of TBA's in the country is not known. Of importance is the knowledge that among the Mayan population, TBA's are not used regularly, but rather family members often the husband or his brother attend to deliveries, suggesting cultural obstacles to achievements of the stated goal.

As stated earlier, post natal and early childhood health care are delivered through several clinics run by the health services. The aim is to register all children before 6 weeks of age, with appointments arranged at discharge time from hospital.

Table 17 presents the attendance of child health clinics in 1981. If one takes the target population to be all children less than 5 years of age, then in 1981, each child had an average of 2.1 visits to the child health clinics. Again, caution should be exerted in interpretation of these data when one keeps in mind actual access to services: In 1980, of the 69,817 rural inhabitants, 6,181 (8.9%) had direct access to a health center; 23,277 (33.3%) had access to health services through consistent mobile visits (1 x /month); 23,781 (34.1%) had access to health services to sporadic mobile clinics; and 16,758 (23.7%) had no direct access to health services.

2. *Food and Nutrition Program*

The government has identified through a Food and Nutrition Policy, objectives for a food and nutrition program, which is still in the early stages of implementation. The four objectives of the program are based on the findings of the nutritional survey conducted in the Toledo District

and are:

1. The reduction of severe and moderate energy-protein malnutrition in children less than 3 years of age.
2. The reduction of anemia in pregnant and lactating women.
3. The elimination of vitamin A deficiency.
4. The increase in food size sufficiency.

The current program activities are coordinated by the intersectorial Food and Nutrition Council with representation from the Ministries of Health, Agriculture Education and Social Development. These activities include: nutritional education programs conducted through the Rural Education Agricultural Program (REAP), home economics studies in the schools, and MCH educational programs through the MOH. There is an established National Food and Nutrition Week during which time there is an emphasis on education and sensitization of the public to various areas of health and nutrition.

Through the MCH program of the MOH, emphasis is placed on monitoring the growth and development of children seen in the child health centers. There are breast feeding clinics and local Breast is Best (BIB) groups to encourage breast feeding, and education of mothers to encourage proper weaning practices. In addition, education on child spacing has been included.

A survey of mothers attending child health clinics in July and August 1980 revealed that in 33% of their infants were exclusively breast fed during the first four months of age; when evaluated rural vs. urban, 55% of rural infants and 16-17% of urban infants were exclusively breast fed during the first four months of age,