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ANALYSIS OF THE NUTRITION PROBLEM IN THE GUATEMALAN POPULATION HEALTH SECTOR

Secretariat of the National Economic Planning Council

Nutrition Institute for Central America and Panama (INCAP)

September, 1977

LAC/DR/N

INDEX

		Page No.
I.	LIST OF PROFESSIONALS WHO COLLABORATED ON THE ANALYSIS OF THE NUTRITIONAL SITUATION IN GUATEMALA	1
II.	INTRODUCTION	2
III.	SUMMARY	3
IV.	MALNUTRITION IS A VERY IMPORTANT PROBLEM IN GUATEMALA. EVIDENCES OF PROBLEM	5
	1. Retardation of physical growth	5
	2. Low birth weight	8
	3. Morbidity	9
	3.1 Specific morbidity caused by malnutrition	9
	3.2 Morbidity associated with malnutrition and reflected in the demand for ambulatory and hospital care	11
	3.3 Malnutrition and intestinal malabsorption	12
	3.4 Effect of social factors on morbidity caused by malnutrition	13
	3.5 Morbidity in pregnant women: effects on birth weight	13
	3.6 Morbidity caused by deficiency of specific nutrients: anemia, vitamin A deficiency and endemic goiter	14
	3.7 Conclusions	18
	4. Mortality	19
	4.1 Infant mortality	19
	4.2 Mortality in children 1-4 years	20
	4.3 Mortality in the second year of life	21

Page No.

4.4 Conclusions 21

5. Causes of Mortality 23

5.1 Mortality due to malnutrition 23

5.2 Mortality with malnutrition as an associated cause 23

V. CONSUMPTION AND AVAILABILITY OF FOODSTUFFS AND NUTRIENTS 25

1. An important portion of the Guatemalan population is undernourished 25

2. Seriousness of the situation and its tendency to deteriorate 26

3. Small children are those most affected by nutritional deficiency 27

4. Mother's milk as the only food for the infant 28

5. The diet of the pregnant woman as a nutritional problem 30

6. Deficiency in the diet of the farm workers 30

7. Recommendations 31

VI. TRADITIONAL PRACTICES AND BELIEFS REGARDING HEALTH AND NUTRITION 32

1. Findings 32

2. Conclusions 34

VII. RECOMMENDATIONS 35

1. General Recommendations 35

2. Recommendations on data required to plan nutrition policies, prepare objectives, design and evaluate programs 37

Page No.

3. Specific recommendations for the health sector 39

VIII. BIBLIOGRAPHY 43

Tables 48

I. LIST OF PROFESSIONALS WHO COLLABORATED ON THE ANALYSIS OF THE NUTRITIONAL SITUATION IN GUATEMALA

Institution	Name of Professional
General Secretariat of the Economic National Planning Council	Dr. Carlos Estrada Sandoval Dr. Hugo Figueroa
Ministry of Public Health and Social Welfare	Dr. Otto Retana (R.I.P.) Lic. Alma Aída Hernández Lic. Julia Montoya Lic. Hedi de Dardón Dr. Carlos Andrade Lara Dr. Carlos Quijivix Dr. José Víctor Minera Dr. Oswaldo Rodríguez Dr. José Nigrín
Institute of Nutrition of Central America and Panama (INCAP)	Dr. Ivan Beghin (N) Lic. Elena Núñez (N) Lic. Marina Flores (N) Dr. Lenín Sáenz (N) Lic. Ricardo Sibrián (N) Dr. Guillermo Guzmán (N) Dr. Charles Teller (N) Lic. Erwin Díaz (N) Lic. Ana Rosa Campos (N) Ing. Vernon Bent (N) Dr. Juan José Urrutia (B) Dr. Juan Rodolfo Aguilar (B) Dr. Roberto Schneider (B) Dr. Fernando Viteri (B) Lic. Velia de Tuna (B) Dr. Reynaldo Martorell (DDH) Dr. Hernán Delgado (DDH) Lic. Víctor Valverde (DDH) Lic. Isabel Nieves (DDH) Ing. Pedro Arenales (S)
<u>Coordinators</u>	Dr. Carlos Estrada Sandoval Dr. Ivan Beghin

(N) = Division of Applied Nutrition
(B) = Division of Biology and Human Nutrition
(DDH) = Division of Human Resources
(S) = Division of Statistics

II INTRODUCTION

From September 1976 through August 1977, the Ministry of Public Health and Social Assistance of Guatemala, with the assistance of the Secretariat of the National Economic Planning Council and the Central American Institute for Nutrition (INCAP), with financial support from the Agency for International Development of the United States, made an analysis of nutrition problems in Guatemala.

The study was mainly based on an analysis of determiants of malnutrition related to the health sector. Causes of malnutrition outside the health sector were not studied; only problems from a health or biological, viewpoint were included.

The supervision of the work and the editing of the final report were entrusted to Dr. Carlos Estrada Sandoval of the Secretariat and Dr. Ivan Beghin of INCAP.

It would be impossible to express our appreciation to all the persons who directly or indirectly contributed to the study. Nevertheless, we would like to note the substantial contribution made by Dr. Otto Guillermo Retana, Chief of Maternal Child and Family Health Division of the Ministry of Public Health and Social Assistance whose premature death prevented him from seeing the results of the study on which he worked so hard.

The study draws conclusions described in the following summary. In order to insure widespread distribution and provide for intensive debate on this important subject for the future of Guatemala, it was decided to present the essential findings in a synthesized, short and easily available publication which could be reproduced in large quantities. The monographs, the basic data, and in general the more specialized information have been compiled in a second, larger volume which is annexed to the health sector assessment document and which are also available to interested persons at the Planning Council and at INCAP.

Guatemala, September 1977

III SUMMARY

The study confirms the existence, already noted on several occasions, of a serious nutritional problem in the population which is evidenced by substantial growth retardation of a large number of children, abnormally large numbers of children with low birth weights, increased susceptibility to infectious diseases, and infant mortality rates and mortality rates in children from 1 to 4 years of age which are among the highest on the continent.

The average caloric intake is insufficient to meet the physiological needs of the population. It is estimated that the caloric deficit of the poorest half of the population is on the order of 40% of the minimum daily requirement. The real consumption of corn, which is the main source of energy in the diet of Guatemalans, has decreased in the last years at an annual rate of more than 6%.

Poor sanitary conditions, and in part malnutrition itself, are greatly responsible for the very high rate of morbidity in childhood due to enteric diseases. These diseases, when their impact on biological utilization of nutrients is considered, are an important cause of malnutrition.

In addition, the lack of sanitation results in a high prevalence of intestinal parasites. Onchocercosis and trichocephaliasis, combined with a low iron intake, cause anemia. Nutritional anemias, particularly anemia due to iron deficiency, continue to be one of the major health problems and significantly affects the productivity of agricultural laborers.

Endemic goitre, which declined in the 1960-70 decade thanks to salt iodization, seems to have disappeared; at least in its endemic form in spite of a reduction in the salt iodization levels. There is clear evidence that fortification of sugar is substantially reducing vitamin A deficiency.

The size and type of nutritional programs undertaken to date by the health sector do not seem to have had any great impact. This fact suggests the need for the health sector to develop a completely new approach to the problem of malnutrition.

Despite large information gaps, it appears that the situation is deteriorating, or at least it is not getting any better. In

other words, economic development, which characterizes Guatemala during the past 10 years, has not had any significant effect on the nutritional status of the population.

If the present situation continues - and there is no indication that it will change, - and in the face of a high population growth rate, we can assume that the nutritional status of the Guatemalan population, already one of the least satisfactory in America, will continue to deteriorate at a slow but steady pace.

In the authors' opinion, only a strong, long-term government policy involving substantial resources firmly and continuously applied can reverse the present negative trend.

The data on which these pessimistic conclusions are based is presented in this chapter. This study concentrates mainly on the nutritional aspects directly related to the health sector and constitutes the first phase of a more complete multisectoral study.

A functional classification of the affected population by income group and by region and subregion for programming purposes has not been done, as originally planned, because the current data available does not permit a functional classification of malnutrition in Guatemala. The study has identified, however, the data gaps.

At the end of the report there are a number of general recommendations and specific short-term recommendations for the health sector, as well as precise indications of the type, characteristics and nature of additional data required to achieve a complete understanding of the problem and its causes.

IV MALNUTRITION IS A VERY IMPORTANT PROBLEM IN GUATEMALA

The existence of a serious nutritional problem has been fully documented in Guatemala by the first field studies made by INCAP in the 1950's, as well as by other more recent studies. Among these we can mention the monography on protein-caloric malnutrition published in 1957 (1); the national survey made jointly by the Government of Guatemala, INCAP and OIR in 1965-66 (2); the longitudinal studies in Santa María Cauqué in the Guatemalan Highlands (3); the studies made in the four towns of El Progreso (4,5), and on the South Coast near the Pacific (6,7). In the National Nutrition Seminar held in Guatemala City in December, 1976, additional information was submitted confirming the magnitude of the nutritional problem in the country (8,9). From the data it has been determined that Guatemala is among the two or three countries in Central America with serious nutritional problems, and its population is among the most malnourished on the continent (10).

In developing countries, malnutrition is a serious problem which is evidenced by:

1. Severe retardation in physical growth, especially in small children;

2. High proportion of children who are underweight at birth (weight of 2500 g. or less or 5½ lbs. or less);

3. High susceptibility to infectious diseases.

4. Very high rates of mortality, especially in infants and in children 1-4 years old.

1. Physical Growth Retardation:

For a better understanding of the antropometric data it is necessary to explain that "weight for age" and "height for age" are indicators that adequately describe the impact of chronic malnutrition and identify children who are suffering, as well as those who have already suffered, malnutrition. On the other hand, "weight for

height" describes children who at present suffer malnutrition and does not take into consideration those cases in which children have suffered retardation of weight or height previously but, at present, in spite of their stunted size, have an adequate weight for their height. In other words, it is an index that, despite identifying children who are currently malnourished, really underestimates the harm that malnutrition has previously caused many children.

The results of different antropometric studies in Table 1 show that from 29% to 38% of Guatemalan children between 6 and 59 months old suffer from second or third degree malnutrition according to the Gomez scale. In other words, approximately one out of every three Guatemalan children has a deficit in body mass of at least 25% of the weight considered normal for their age. It should be pointed out that this is one of the highest prevalences of malnutrition observed in the world. It must be kept in mind that we are only considering children with second and third degree malnutrition, and that the same studies show that nearly 48% of the children suffer from first degree malnutrition, which means that they have a weight deficiency between 10% and 25% for their age.

The same table also describes:

- There is more malnutrition in the rural areas than in areas with a larger urban population who use health services more frequently. These services, due to their low coverage, are provided mainly in the departmental capital cities, the county seats, and in the larger towns.

- No improvement has been observed in the nutritional status of the country when comparing the antropometric data of 1965 to 1975. On the contrary, that data seem to suggest that the rural areas have apparently become worse off in terms of their nutritional status.

It must be understood that the problem of malnutrition varies in its severity with the economic and social conditions of the community. As already mentioned, urban populations evidence a lesser degree of malnutrition; good examples of this is the population of San Miguel Petapa, located in the peripheral area of Guatemala City, and rural populations that receive health

care services. (Table 2). In contrast, in other communities such as Santa María Cauqué studies show that the percentage of malnourished children, degrees II and III (in the group of children 12-30 months old), ranges from 66.1 to 81.2%, which means that the nutritional problem is much more severe (Table 3). Survey data already mentioned for four eastern towns (4,5) presented in Table 2, and for two towns in the Pacific Coast (6) seem to confirm these urban-rural differences in nutritional status.

Table 4 presents the results of height for age; it is observed that approximately 50% of children under 5 years of age have a 10% or higher deficit of height for age. Similarly, the weight for age indicators demonstrate that the totally rural populations appear to be more affected than urban populations or those populations with access to health services.

In connection with secular changes in height during the period 1965-1975, it is important to note that in 1975 a slightly fewer number of children suffered from height retardation compared with that of 1965. Nevertheless, these changes are not really significant.

The data on weight for height contained in Table 5 indicate that in all these studies, at least 20% of the children have a deficit of 10% or more of the normal weight for their actual height. In addition, a considerable proportion of these children, 3.1% to 4.5%, reach a weight deficit for height of 20% or more.

In the rural areas, the proportion of children with deficient weight for height went from 21.7% in 1965 to 33.2% in 1975. Despite possible objections to the comparability of both national samples, it is difficult to overlook the fact that the weight for height indicator shows an important deterioration in the period 1965 to 1975.

In conclusion, as pointed out by weight for age and height for age indicators in various studies, a high percentage of children suffer or have suffered retarded physical growth. A lower percentage, between 20% and 33%, as shown in the results of weight for height, presently suffer malnutrition.

The available data show a tendency toward deteriorating nutritional status for the country during the last 10 years.

This conclusion, which is supported by the percentage of children found with deficits using antropometric indicators, is more important when we think that these percentages, given the growth of the population, imply an actual increase in the numbers of malnourished children in 1975.

Available data does not permit the identification of regions or population groups which are most affected, although data suggests that dispersed rural populations could be the most affected. For the short-term a national antropometric survey should be undertaken and designed in such a way that the methods for data compilation and total number of individuals surveyed will:

a) identify natural regions and departments most affected by malnutrition.

b) clearly differentiate the nutritional status in:

- urban population of the departments
- rural population of the departments
- urban metropolitan population
- rural population in a metropolitan area
- populations living in slums or marginal zones of a metropolitan area.

2. Low birth weight

The Maternal, Child and Family Health Division of the Ministry of Public Health and Social Welfare made a study of newborn children in the maternity wards of the departments during 1975. From a total of 1,235 cases, 15.9% of the children were born with a weight of 2,500 grams or less (Table 6), which reflects not only the deficient nutritional status of women during pregnancy, but also indicates the high death risk of these children during the first year of their lives. In comparison, in 1972 the number of children of low birth weight in the United States was 6.8% (11).

It is essential to point out that the population which seeks maternity wards is highly selected. Not only are they women from rural populations which are less isolated or who come from urban areas, but in addition they use pre-natal out-patient clinics and health services more regularly. The percentage of underweight children at birth is higher in mothers who deliver at home, which

indicates the seriousness of the problem in certain rural communities. In one area with a large indigenous population, INCAP found for the period 1964-1972 that 41.7% of the children at birth weighed 2,500 grams or less (Table 7). This percentage remained unchanged during the period, which suggests the lack of important nutritional changes at least in that population.

Low birth weight is highly related to the nutritional status, as well as morbidity and height, of the mother. Approximately half of the pregnant women attended in maternity wards of the Ministry of Health and Social Assistance have a height under 148 cms. (12), which is considered the lowest limit; mothers under this height have a larger number of children who weigh less than 2,500 g. at birth (13,14).

Those aspects related to morbidity of the mother shall be considered later.

Better quantification of the problem of low birth weight must be considered a priority. It is recommended that well controlled perspective studies in maternity wards and in births at home be undertaken in order to determine more accurately the magnitude of this problem.

3. Morbidity

Two aspects of morbidity are considered in this chapter. The first aspect refers to morbidity specifically due to malnutrition and for which there is very little information; the second aspect deals with diseases associated with malnutrition.

Various studies, made in Guatemala (15), as well as in other countries (16), have shown the close relationship which exists between malnutrition and infectious diseases, especially diarrhea (17), respiratory infections (18), and measles (19). Malnutrition increases the susceptibility of children to infectious diseases, which also become more frequent and more severe (20). The above is reflected in high morbidity and mortality rates.

3.1 Specific Morbidity Caused by Malnutrition

For 30 years the medical profession has recognized the existence of severe malnutrition in Guatemala. It is evident

that protein-caloric malnutrition (PCM) is one of the main health problems, but, paradoxically, there are not even preliminary data on specific morbidity due to PCM in Guatemala. This information gap must be corrected in the near future if the efficiency of the health services is to be increased, its programs reoriented and progress evaluated.

Kwashiorkor was recognized more than three decades ago, and was carefully studied in all its aspects by Guatemalan pediatricians and by INCAP (21). There is no doubt that its severe forms are less frequent today, but at present some cases are still seen in hospitals. However, the actual decrease of the more spectacular clinical cases does not necessarily imply a decrease in the incidence of PCM.

The only information available at the national level is the prevalence of third degree malnutrition (Gomez' classification - Tables 1 and 2 mentioned above). In 1975 in twelve communities studied by INCAP, 5.1% of 663 children suffered from third degree malnutrition. In Santa María Cauqué the prevalence of third degree malnutrition in a group of children between 2 and 2-1/2 years was 16% (Table 3). If it is true that not all children have the clinical symptoms of acute PCM, it must be remembered that among children with second degree malnutrition some suffer from kwashiorkor and marasmus.

Data on out-patient clinics and hospital admittances are not very useful. The heading "vitamin and other nutritional deficiencies" represents from 3.9 to 19.0% (average of 6.7%) of the causes for visits of children one year old or under in 1975 according to the Ministry of Public Health and Social Assistance. (Table 8). In children 1-4 years of age (Table 9), the corresponding figures are 2.4 to 9.8% (average of 4.9%). In both groups, malnutrition constitutes the fifth cause for visits, but if we take into consideration the inter-relation between malnutrition and infectious diseases responsible for the first four causes, it is evident that there is considerable under-estimation.

The same can be concluded from the statistics on hospital discharges; the heading "vitamin and other nutritional deficiencie

is reported as the third cause of admission of children under one year of age (6.1% of admissions) and second cause in children 1-4 years of age (18.9% of admissions) (Table 10).

Once more it is important to point out that children admitted for any other cause, but who in addition suffer from malnutrition, are included in these figures; as a result, the number is underestimated. On the other hand, these data reflect the demand for service and not the true morbidity in the infant population.

A review of Tables 11 and 12 will show that it is not possible to determine the differences in actual morbidity among departments because there is a great difference in health service coverage within the departments of Guatemala. It is necessary to note that the quality and reliability of the information leaves much to be desired, because of the lack of standardization of reporting in health facilities which constrains analysis of the data. This fact also explains the high variability observed in the figures.

3.2 Morbidity associated with malnutrition and reflected in the demand for ambulatory and hospital care

Tables 8 through 12, despite their imperfections and unreliability of data, permit some general conclusions on the characteristics of the demand for medical care at outpatient clinics and hospitals.

With little variation, the first five causes for consultation as well as hospitalization are: enteritis and other diarrheal diseases, acute respiratory diseases, other infectious and parasitic diseases, skin and subcutaneous diseases, and vitamin and other nutritional deficiencies. For children under one year of age and children 1-4 years diarrhea is the main reason for medical attention. This places Guatemala among the countries whose number one health problem is the malnutrition-gastroenteritis association in children, taking into account that malnutrition is at the same time a causative factor for the high prevalence of diarrhea as well as, in a great measure, a consequence of diarrhea.

The same considerations can be applied in a similar way to acute respiratory diseases and other infectious diseases, as well as to intestinal infections caused by Shigella and other parasites

which are reported frequently by health services. As an example, Chart 1 shows data obtained in four eastern towns of the country (22), and Tables 13, 14, and 15 show studies made in one Indian town in the Altiplano (3), which illustrate the high frequency of infectious diseases and intestinal infections in pre-school age children.

3.3 Malnutrition and intestinal malabsorption

Recent studies made by INCAP (6) have shown the interrelationship among environment, nutritional status, and gastrointestinal disease which is evident in the high incidence of diarrheal episodes. The great prevalence of gastrointestinal diseases is observed particularly in the poor rural and periurban areas, where the population lives in extremely poor conditions, not only from an economical point of view, but also in terms of sanitation, food and water supplies, housing, medical care services (2, 23, 24, 25). It is also in these environments that the problem of children and adults with moderate or severe malnutrition is more serious. This situation needs a very careful evaluation in order to determine to what degree gastrointestinal diseases are the cause or consequence of malnutrition.

The gastrointestinal ecology of the above mentioned population groups is characterized by morphological alterations in the gastrointestinal mucous membrane associated with increased upper intestinal flora and various degrees of disfunction. Recent studies have shown that there is a significant ratio of adults suffering from subclinical malabsorption. The latter condition possible represents a very serious health problem as there is evidence that 50-59% of "healthy" adults in the rural areas lose between 150 to 300 calories per day above the fecal caloric elimination of healthy individuals in Guatemala (6). The economical and biological impact produced by this additional caloric loss is very significant, when it is considered that their diet is already marginal or inadequate.

On the other hand, diarrheal and gastroenteritis episodes constitute the number one cause for consultation in the population of children under five years old and the first cause of death. In most cases, the diarrheal problem is associated with various degrees of malabsorption, resulting from an increased upper gastrointestinal flora (26), high levels of free biliary acids (27) and morphological changes in the duodenal mucous

membrane (28). Many of these changes begin at an early age (29) which may predispose these individuals to a higher incidence of malabsorption and non-specific diarrhea.

It is important to extend our knowledge about the interactions of the environment, nutrition status, and digestive processes of the Guatemalan population in order to improve the effectiveness of public health programs.

3.4 Effects of social factors on morbidity due to malnutrition

There is a possible relationship between migration and malnutrition. A study made in three Guatemalan villages (30) showed that there is a higher percentage of children suffering from severe or moderate malnutrition when the parents migrate. This relationship is found in families with above average incomes, as well as in families with lower incomes (Table No. 16).

In the eastern part of Guatemala, it was observed that there was a significant relationship between the possibility of cultivating land and the prevalence of malnutrition in the family. Malnutrition was lower in families that owned or had access to more than 2 manzanas of land. Access to land was more important than ownership itself. (Table 17) (31).

These observations indicate that there are factors which have not been thoroughly studied which influence morbidity due to malnutrition. Therefore, it is recommended at the end of this report that an epidemiological study of PCM be made in Guatemala

3.5 Morbidity in pregnant women: effects on birth weight of children

Maternal morbidity during pregnancy is closely associated with the child's weight at birth (15). Surveys of mothers who had low morbidity rates showed that only 10.5% of the children were born weighing less than 2,500 g. On the other hand, for another group of mothers whose morbidity rate was high, the percentage was 33.3% (15). INCAP studies in an Indian community in the Guatemalan Altiplano show that the incidence of infectious diseases is high during pregnancy (32). Data compiled for such studies during a period of eight years revealed that infectious respiratory diesases

and diarrhea were present in 71.7 and 20.2%, respectively, during pregnancy. Even more serious illnesses such as bronchial pneumonia and dysentery were regularly present. The infections most frequently found were respiratory, diarrheal and urinary (table 18); there was also a high prevalence of asymptomatic infections. It should also be pointed out that in most of the women surveyed intestinal parasites, entero-viruses, pathogenic enteric bacteria and vaginal parasites were present (15).

On the other hand, the same study showed in regard to the mother's nutritional status and the child's weight at birth, that maternal malnutrition may be one of the factors responsible for retarded fetal growth. It appears that low ingestion of nutrients and high incidence of infections during pregnancy are causes of growth retardation.

This fact emphasizes the necessity for pregnant women to eat at least the minimum daily requirement of nutrients to insure a normal fetal growth.

There is no information at the national level which will permit us to quantify the magnitude of the problem. However, there is evidence to believe that an intervention oriented towards better nutrition for pregnant women could result in a decrease in infectious diseases and improve fetal growth.

3.6 Morbidity due to deficiency of specific nutrients: anemia, vitamin A and goiter

Anemia

The hematological status of the Guatemalan population was evaluated as an integral part of the Nutritional Survey for Central America and Panama in 1965 (2).

Since 1965, INCAP has continued investigating nutritional anemia, evaluating smaller populations on the coast, on the altiplano, and in the capital city.

The hematological status was evaluated based on standards established for Central America and Panama (33) in which the

"percent value risks" were established, relative to a population with below-normal values of hemoglobin for each age, sex and altitude. The results of the analysis showed that the hemoglobin and hematocritic values that are within the average and below-average of 1 SD (Standard deviation) involve a 20% risk of being below normal; the values within the average of 1½ SD involve a 75% risk of being below normal; and that the lesser values are undoubtedly below normal.

This study showed that the prevalence of anemia (individuals with more than 75% risk) for Central America and Panama, including Guatemala, is very high. It was found that for altitudes of 0 to 749 meters above sea level, 750 and 1499 meters above sea level and altitudes between 1500 and 2800 meters above sea level, this prevalence was of 19.7%, - 12.6%, and 11.7% respectively (34). The impact of infections caused by onchocercosis on anemias was also measured (35). The results indicated that the population of Central America and Panama presents a high prevalence of low hemoglobin levels, with "risk" averages of 20% and 75%, respectively, as follows: for altitudes of less than 750 meters above sea level, 19.8% and 10.6% for populations without onchocercosis and 28.8% and 20.6% for populations with onchocercosis. In the case of altitudes between 750 and 1500 meters above sea level, the corresponding prevalences were 15.3% and 10.8% for populations without onchocercosis and 21.8% and 16.4% for populations with onchocercosis. The groups by age and sex which showed the highest prevalences of low hemoglobin levels in the population without onchocercosis were those of children from 1 to 4 years of age and women 13 to 20 years of age. In population with onchocercosis all age groups showed high prevalence of low hemoglobin levels.

On the Guatemalan south coast, women of reproductive age were studied along with adult men. Findings showed a prevalence of anemia of 20% and of iron deficiency measured by transferrous saturation of 53%. When these individuals were treated with ferrous sulphate, 85% of them reached normal values according to the hematological standards for Central America and Panama so that the prevalence of anemia dropped to 6% and iron deficiency to 21%. On the other hand, around 12% of the individuals needed iron and folic acid to reach normal hematologic levels.

Studies made of nursing mothers showed that anemia is higher in this group than in women of reproductive age who are not breast-feeding (13% with a risk above 75% and 21% with a risk above 20%).

Anemia during pregnancy is also a health problem in rural as well as suburban areas, regardless of altitude.

In analyzing the iron intake of 197 families in Guatemala in 1965 (2), it was found that 34% of the families did not meet the requirement, their intake was less than 10 miligrams per day. In addition, most of the iron comes from cereals and vegetables because very little meat is consumed. The iron absorption is, therefore, low.

Studies made on the role of folates in the etiology of nutritional anemias suggest that in cases of severe folate deficiency, there is an under-utilization of iron, since in the populations studied it was proven that there was a reverse correlation between concentration of folates in the red corpuscles and serum iron and transferrine saturation. The opposite occurs when iron is given to correct the hematological status, but it induces below-normal levels of folates in erthrocytes. Nevertheless, these low levels do not appear to affect the hemoglobin levels. Given the importance of folates as coenzymes in the metabolism of nucleic acids and the transfer of carbon units, the depletion of this nutrient with the administration of iron may have other consequences in the population at large.

Thus, the findings permit the conclusion that iron deficiency in Guatemala is a serious nutritional problem, which is the major cause of 90% of all anemias observed in the rural and urban areas and which is exacerbated by the presence of onchocercosis infections.

Anemia has specific undesirable repercussions, among them limitation on work capacity in adults. INCAP is currently developing projects in this area.

Taking into account feeding patterns of the Guatemalan population, the only way to prevent iron deficiency in the population is by fortifying common foods. It is obvious that iron in its heminic form is found only in hemoglobin, and meat is expensive and not easy to synthesize for industrial production

Because of this problen, INCAP has been testing various iron salts since 1973 in order to find one which will meet the necessary requirements for fortification. Among these are: ferrous sulphate, iron orthophosphate, a mixture of iron orthophosphate with sodium acid sulphate and iron and sodium salts, Sr ethelene-diamino-tetracetate (Na Fe EDTA).

Of those the most promising one is NaFeEDTA, which has been under study since 1975. The results to date indicate that: iron in NaFeEDTA is protected from the negative influence of absorption inhibitors in the diet; promotors such as ascorbic acid increase its absorption; and its presence increases iron absorption in the diet itself all of which raises its properties of prevention of iron deficiency. In addition, stability and organoleptic studies have given highly satisfactory results.

Currently a field project is being carried out which will prove the effectiveness of salt in the programs of food fortification with iron for controlling iron deficiency.

Vitamin A

The findings of the nutritional survey made in 1965 show that vitamin A deficiency is a public health problem in Guatemala and that an adequate intake of vitamin A is essential for normal growth and development. (2).

The government, conscious of this problem, approved and implemented a program of sugar fortification with vitamin A in November, 1975. Prior to 1975 an evaluation was conducted. The results of the initial survey showed that vitamin A deficiency was still a problem (Tables 19 and 20). 55.2% of pre-school age children had levels of vitamin A below the desirable limits (Table 19). About 90% of lactating women, during the first 12 months of lactation, had less than 49 micrograms of retinol per 100 ml of milk (Table 21), which is the recommended level by FAO/WHO.

Vitamin A consumption from the regular diet in the surveyed populations was very low and only two population groups consumed satisfactory amounts. It is hoped that vitamin A levels will increase satisfactorily with the fortification of sugar.

Subsequent surveys made in 1976 (April and October) after fortification show a marked improvement of the situation (Table 19) which shows the effectiveness of such an intervention.

Endemic goiter

Studies made in 1955 by INCAP and the Ministry of Health showed that the prevalence of endemic goiter in the country was 38%. In 1959 a salt iodization program was initiated. As a consequence a marked decrease was observed.

Nevertheless, according to subsequent analysis of the product sample, it was found that since 1969 the percentage of iodized salt produced in the country has been diminishing at alarming levels.

In 1965 salt was iodized up to 90.3% of its production but this situation has been deteriorating so that by 1970 the percentage was 69%. In 1976 it was 15%. The sale of salt that enters the country illegally, and which generally is not iodized, should be added to these figures.

It may be concluded that not only is there a problem in the program, but that if the present situation continues it would lead to the possible reappearance of goiter if necessary preventive steps are not taken.

Thus, it is recommended:

a) That surveillance and control of the salt iodization problem be strengthened in orderto obtain as quickly as possible an increase in salt iodization of at least 90%;

b) That a nationwide evaluation, of the prevalence of endemic goiter be undertaken;

c) That the Department of Food Control take over the supervision of the salt iodization program.

3.7 Conclusions

In summary taking into account all of the constraints mentioned above, the morbidity data are characteristic of a very poor population which is undernourished, living in

totally inadequate sanitary conditions, and one which has limited access to health services. Even lacking specific nutritional data, it may be assumed that there is a very high prevalence of malnutrition. If it is considered that the existing information comes from a population which uses preventive and curative health services, it can be assumed that isolated populations, that do not have access to those services, are even worse off.

It is recommended that reporting of malnutrition be improved by reporting malnutrition as an associated cause of morbidity or death in children, regardless of the reason for consultation or admission, and by carrying out a retrospective and perspective study of all discharges by and with malnutrition in all the major hospitals of the country.

4. Mortality

4.1 Infant mortality

In spite of a high degree of under-registration, the infant mortality rate in Guatemala is very high. The preliminary data for 1975 showed a rate of 8.1/1000 live births (Table 22). It is estimated that the rate is closer to 100/1000 when making the necessary readjustments for under-registration. It is a very high rate compared to that of other countries. (Table 23). A slow decrease has been observed in the infant mortality rate since 1960; but the decrease has stabilized during the last 5 years (Table 22, Figure 2). When analyzing the elements of infant mortality, it is observed that post-natal mortality is high: 25.6 in 1975 with a general trend towards improvement. (Table 22). Postneonatal mortality rate is also high (54.3 in 1975, Table 22), a rate which has remained stable with no trend toward improvement during the last 5 years.

If the infant mortality rate for urban and rural areas is compared (Table 24), it is noted that it is consistently higher in the rural area than in the urban sector. Nevertheless, the difference is not great. However it is difficult to make this comparison because under-registration is higher in rural areas. It is also necessary to note that the definition of urban area was made in 1938 and has not been changed. As a result all comparisons of data between urban and rural areas are suspect.

When a comparison is made between indigenous and non-indigenous populations (Table 24), the mortality rate in children from 1 to 4 years of age has been relatively stable in non-indigenous populations from 1965 through 1973, while in the indigenous population it tends to improve. Again we must mention under-registration in rural areas as one possible explanation for the difference found since the indigenous population is concentrated in those areas. As a result of these trends child mortality, which was higher in the indigenous population in 1965, was found to be lower than that of the non-indigenous population in 1973: 70.8 and 89.3, respectively.

In summary, a slight improvement is found in neonatal mortality, while postneonatal mortality does not show any tendency to improve. It must be stressed that postneonatal mortality is the one most influenced by the nutritional status of children. We can conclude that the most probable tendency in child mortality is to remain stable.

4.2 Mortality in children 1-4 years of age

The mortality rate in children 1-4 years of age in 1975 was 28.0 (Table 22). This figure is very high (36) as evidenced by the comparison of mortality rates in children 1-4 years of age in other countries (Table 23). After 1961, there was a slight improvement, but in the last 6 years the trend has stabilized (Table 22, Figure 2). In view of the fact that the quality of the registry is better than in the case of child mortality, certain comparisons can be made among some departments (Table 25). The situation is more critical in Escuintla and in the departments of Totonicapán, Sololá, El Quiché, Suchitepéquez, and Alta Verapaz. In general, with the exception of the department of Escuintla, mortality in children 1-4 years old seems higher in the departments with a high ratio of indigenous population (Figure 3). This impression is confirmed while analyzing the distribution of mortality in the second year of life.

It is difficult to reach any conclusion regarding possible differences between urban and rural areas with respect to mortality in children 1-4 years of age. Between 1968 and 1973, there was a general decreasing trend in mortality of children 1-4 years of age, both in the urban and in the rural areas - (Table 24, Figure 4). Mortality in children 1-4 years old has always been higher in the rural areas, but this difference is

gradually disappearing. On the other hand, it is difficult to draw firm conclusions because of the outdated definition used to define urban and rural areas.

There is a greater difference in the mortality rate of the 1-4 age group between indigenous and non-indigenous populations. Between 1965 and 1973 there was a general trend towards improvement, with a slight improvement in the non-indigenous population (Table 27, Figure 4), and in the indigenous population the mortality rate of children 1-4, which was very high in 1965, has been rapidly declining. The difference between the two groups tends to decrease accordingly, but the mortality rate is always higher in children 1-4 years in the indigenous population.

4.3 Mortality in the second year of life

The specific mortality rate in the second year of a child's life is considered a relatively good indicator of nutritional status in populations where protein deficiency is a problem (36, 37). This rate in Guatemala is very high, concentrating practically all mortality of the 1-4 age group in the second year. In 1973-74, this rate was 33.5/1000 (Table 25). There has been a tendency toward improvement since 1969.

The geographic distribution of this rate is very interesting. When analyzing it a clearly defined pattern is encountered: the mortality rate in the second year of life is higher in the departments of Escuintla and Sololá, Totonicapán, Alta Verapaz and Quiché (Figure 5). The latter are almost totally populated by Indians.

4.4 Conclusions

The data indicate that the infant mortality rate, as well as mortality in children 1-4 is very high when compared to other countries. The general downward trend in mortality rates has stabilized in the last 5 years, with the exception of a slight improvement in rates for neonatal mortality and mortality in the second year.

A study of the geographic distribution of the mortality rates in the second year of life and in the 1-4 age group suggests that the situation is worse in the department of Escuintla and in those departments with a large indigenous

population. In general there are indications that the indigenous population is worse off which is especially reflected in mortality in children 1-4 years. In spite of the improving trend, current rates are still very high with very little difference noted between urban and rural environments.

If theserates are used as indicators of the nutritional status of the population, the following is suggested:

1. The nutritional status of the population in general is very poor;

2. The nutritional status of departments with a high percentage of indigenous populations is even worse despite the fact that the difference between indigenous and non-indigenous populations, on a national level is not very great;

3. The department of Escuintla deserves special attention because all health indicators point to a more serious situation than in the rest of the country and one which is not necessarily linked to the nutritional status of the population.

The most important fact which is apparent from the data on infant mortality and mortality in children 1-4 years is the general trend towards stagnation. The indicators suggest a slight improvement or no improvement at all. If an analysis is made of the country's population growth and its impact on nutritional status especially on child spacing and absolute number of persons within the risk groups, a favorable prediction for improving nutritional status could not be made.

The annual growth rate has been increasing from 2.4% in 1940-1950, 2.7% in 1950-1964, to 3.1% in 1964-1973 (38). In absolute numbers in 1965 there were 200,000 children born, in 1975 about 245,000, and it is expected that about 400,000 children will be born in the year 2,000, taking into consideration a moderate decrease in fertility. This means that the number of children 1-4 years of age will increase from one million in 1975 to 1.8 million in the year 2,000. With respect to the number of pregnant women, the expected increase is an annual average of 400,000 in 1975-1980 to almost 600,000 in 1995-2000.

Undoubtedly, these figures indicate that the absolute number of persons within the groups at risk of malnutrition - children and pregnant women - grows continuously.

5. Causes of Mortality

5.1 Mortality due to malnutrition

There are no specific mortality rates due to malnutrition for each group and for each department. The international classification for causes of death does not allow for this data. Such classification utilizes the basic cause of death as the only criterion, without involving associated causes. But associated causes may represent in total mortality a much more important role than the basic cause, as evidenced by the survey of mortality in infants and children made by the Pan American Health Organization in the American continent. (39). This study showed that malnutrition, defined as II or III degree (Gomez) is found as an associated cause in 32% to 70% of all deaths due to different causes in children under 5, while malnutrition as a basic cause plays a proportionally smaller role.

In other words, the type of statistics we have on hand ignore the important role of malnutrition in mortality of children due to diarrhea, measles, whooping cough, respiratory infections and other diseases, and only mentions malnutrition when it is the basic, immediate and visible cause of death. Therefore, the under estimation of the role of malnutrition in mortality is very substantial. In spite of the above, malnutrition is the fourth basic cause of death in Guatemala among children under one and 1-4 years of age (Tables 28 and 29). The mortality rate due to vitamin and other nutritional deficiencies is high and alarming, particularly when it is compared with the other Central American countries (Figure 6).

5.2 Mortality with malnutrition as an associated cause

There is no quantitative information on the role of malnutrition as an associated cause of death in Guatemalan children. The structure of mortality by causes is very characteristic of an infant population seriously affected by malnutrition. In the group of children under one the main causes of death are acute respiratory diseases, diarrhea, and other infectious and parasitic diseases (Table No. 28). This order is fairly consistent in all departments with some differences.

Most deaths are due to infectious diseases, many of which would not be lethal if the child were not suffering from malnutrition.

In the group 1-4 years diarrhea occupies first place in the causes of death, followed by respiratory diseases (Table 29). In this age group the interaction between malnutrition and infection is emphasized by mortality figures. Measles, which is a disease that does not cause a great number of deaths in well nourished populations, is responsible for 15.9% of deaths (Table 30). In five departments (Totonicapán, Sololá, Petén, Izabal and Quezaltenango) measles is the first basic cause of death (Table 31). In these departments the number of deaths due to measles demonstrated the existence of severe nutrition. All available information in this report suggests that if mortality due to measles is not higher in the other departments, it is because of the residual effects of the immunization campaigns initiated in 1972. The specific mortality rate due to "enteritis and other diarrheic diseases" in children 1-4 is a much less specific indicator of nutritional status than the mortality rate due to measles. But it should be noted that the rate is high when compared to other Central American countries (Fig. 7).

In conclusion this chapter illustrates, without adequate quantification, that malnutrition plays an important role in the mortality of Guatemalan children. The causes of mortality in children under one year and children 1-4 years of age could not be explained without accepting the fact that the child population suffers from protein-caloric malnutrition.

As already stated, the exclusive use of basic causes in the classification of deaths distorts reality and underestimates the role of malnutrition. To this general consideration we note the widespread existence of under-registration in some departments. On the other hand, it is difficult to make valid comparisons among departments and among different geographic regions.

There is an urgent need to improve substantially the system for gathering information on mortality and its causes in order to obtain a true understanding of the situation for planning programs. The health services must double their efforts to improve the quality and reliability of routine compilation of information on deaths, and include malnutrition as an associated cause on death certificates and in health statistics.

V CONSUMPTION AND AVAILABILITY OF FOODSTUFFS AND NUTRIENTS

The analysis of available data shows that:

1. A large part of the Guatemalan population is undernourished;

2. That this serious situation is becoming worse;

3. That small children are most affected by malnutrition;

These conclusions are based on two main sources of information: the food balance sheets and the various dietary surveys made in the country.

1. An important portion of the Guatemalan population is undernourished

a) Based on information provided by the food balance sheets for the years 1960-70, the average caloric consumption in 1970 covered only 93% of the energy requirement and 91% of the protein requirement, according to dietary recommendations estimated for these populations (Table 32) (40, 41).

Upon disaggregating this information by income level, it was found that 50% of the population was classified as low income. In this group, the caloric consumption covered only two-thirds of the energy needs and half of the protein needs. These figures were an average which means that within the group there were individuals whose caloric and protein intake was even more deficient, indicating a very serious level of malnourishment.

Moreover, the quality of proteins was very low, because the protein derived mostly from corn is deficient in essential aminoacids. The percentage of animal protein in the diet of low income persons was not sufficient, reaching a NDpCal% of only 5.1%, while the value considered adequate for these populations is around 6.3%.

b) In the national dietary surveys made in 1965 (2), 40 communities throughout the country were studied, and the results showed 100% adequacy for the national average consumption of calories for the total population surveyed. Nevertheless, on separating the families by socio-economic level, it was found that the lowest income group received less than 86% of its energy requirements.

Regarding protein consumption, although the national average also showed an adequate level, it was found that 27% of the families did not cover their protein needs. It is probable that disperse populations who do not live in villages may have an even more limited intake of calories and proteins.

In other dietary surveys made in 1975 in the rural areas, 12 communities were selected including small villages. The 1965 surveys included only towns or county seats and not small villages. Therefore, the results of both surveys are not totally comparable. However, they show a similar deficit, especially in calories, with a caloric adequacy of 84% in 1975. This again indicates that a considerable number of families is under the average which already shows a deficit of 16%. The figure for protein intake shows, as in 1965, an adequate average level.

Other dietary surveys made by INCAP in the last few years, in populations where nutritional research is being conducted, confirm the deficit of calories and proteins (6).

If the rural areas are compared with urban areas, great differences are observed with a higher level of caloric and protein intake in the urban area. Table 33 points out that 42% of the rural families do not meet their energy needs, while in the urban areas only 30% is under the required level.

2. The seriousness of the situation and its tendency to deteriorate

a) The balance sheets for 1960 and 1970 regarding the availability of calories per capita, as well as other statistical data which are more recent and still unpublished, indicate the decreasing trend in total calorie consumption. This coincides with findings based on survey data of families in 1965 and 1975. In the dietary surveys made in 1965 the distribution of families according to adequate caloric intake showed, as has already been pointed out, that 42% of the families did not adequately cover their energy needs, and if this distribution is compared with that of the families studied during the survey made in 1975, it is found that 70% of them do not meet their energy needs. The comparison points out that during the 10-year period the dietary situation drastically deteriorated, and that the number of families with caloric deficiencies was higher.

b) The balance sheets also show a decrease in the availability of proteins per capita at a national level. The dietary surveys for 1975 compared to those for 1965 do not show a decrease for the rural areas; nevertheless, the consumption of protein is low. If families are analyzed according to levels of protein adequacy, the surveys of 1965 show 73% of the families with an adequate protein intake compared to 70% in 1975. With the deterioration of the diet, the relative consumption of corn increases, which indicates that protein quality of diets in 1975 is even lower because other foods disppear and are substituted by corn.

c) The main source of calories and proteins in rural diets are corn and beans. In the 1965 survey 65% of the calories and 50% of the proteins were derived from corn and approximately 7% of the calories and 10% of the proteins were derived from beans (2). In the 1975 survey these percentages increased in relative terms for corn because diets in rural communities consist mostly of corn. The figures for availability of these two basic grains in the balance sheets from 1960 to 1976 (Table 34) show that in the last 8 years the national daily per capita consumption of corn has decreased from 555 grams in 1968 to 278 grams in 1976, reduction of 6% per year. Regarding beans, the availability per capita for 1960 - 1976 (Table 35) remains more or less the same, with an average of about 28 grams per person per day for the whole country. These data indicate that diets have deteriorated in the last few years and that the caloric intake has decreased, exacerbating the malnutrition problem as the population increases and food availability decreases.

3. Small children are those most affected by nutritional deficiency

The infant population is even more affected by malnourishment in families, not only during the post-natal period but during uterin development.

a) Based on family diet surveys studies have been made of food consumption of pre-school children where intake levels of calories and proteins present higher deficits than the rest of the family. (Figures 8 and 9) (42).

During the 1965 surveys of the rural areas it was found that the average per family consumption of proteins and calories was more adequate than that of the child; children's diets showed higher deficiencies in nutrients, especially calories. In other words, the deficiencies found in the family were more serious in pre-school children, especially 1-2 years old. (Figure 9). Other community surveys made of pre-school children 1-3 years old by INCAP show the same deficits, not only in calories, but also in proteins, vitamins and minerals. After 3 years children accept and follow the adults' diet and thereby increase their consumption of corn and beans. However, any food of animal origin disappears from their diet, leaving it with very low protein value.

Studies of children's diets with respect to calories and proteins show that the low consumption of calories is more severe than that of proteins. However, again the protein quality is so low that for the rural child the protein deficit is as serious as the caloric deficit. The amount of food given to pre-school children is limited in all rural families by income constraints as well as by cultural beliefs. This phenomenon has been verified by comparing the caloric and nutrient intake of families and of pre-school children. It was found that in spite of the availability of food within the family, the food ingested by pre-school children is very little, regardless of the income level of the family.

4. Mother's milk as the only food for the infant

Because of the excellent qualities of mother's milk as the ideal food for the newborn, an analysis of breast-feeding practices in Guatemala was undertaken.

As a general rule among women in the rural areas, and particularly among those in Indian communities, breastfeeding is highly practiced. From a longitudinal study of a community in the Altiplano during an eight year period (Santa María Cauqué) it was found that all women breastfed their babies. (3). The same practice is observed in ladino women living in the rural areas, as evidenced in studies made in other communities. Breastfeeding is continued for 12 months or more (an average of 18 months) and in some cases it extends beyond two years. After three months children begin eating food such as cereal "atole " (drink), bean or vegetable soup or tortilla or bread in small amounts (43).

INCAP studies reported that one of the main reasons for breastfeeding until the child was two years old was either to prevent another pregnancy, or the mother was afraid to give the child foods which would make him sick.

The quality of human milk, a subject studied by INCAP, is similar in its nutritional composition in Indian and Ladino women belonging to different income groups, at least during the first few months. Afterwards, malnutrition of the mother affects milk production and composition. In comparing milk of well-nourished mothers with that of mothers suffering malnutrition, the protein, lactose and fat content is similar, but malnourished women lack vitamins which diminishes the quality of their milk. If women are given vitamin A supplements, the vitamin A level of the milk being produced is increased. (Tables 36 and 44).

Because of the influence of western customs among low income groups in the rural areas, mothers tend to decrease the duration of the lactation period. According to an INCAP study breastfeeding, on an average, lasts only six months in Guatemala City. In higher income groups the lactation period is shorter with weaning taking place at one or two months.

In Indian as well as Ladino cultures in the rural areas beliefs and customs are oriented around a higher production of milk, which demonstrates the importance given to mother's milk. In Guatemala it has been found that milk production by low income women in rural, as well as urban, areas fluctuates between 400 and 700 cubic centimeters per 24 hours.

Without a doubt, breastfeeding is one of the most important factors influencing children's survival in rural areas especially children who are under weight at birth. If there were better environmental sanitation and health education programs, the nutritional status of children would undoubtedly improve because the high incidence of infectious diseases and diarrhea would decrease, resulting in improved child health. The advantages of prolonged breastfeeding must be stressed, especially among low-income urban groups which tend to stop breastfeeding after a few months.

Studies made in four villages in the Department of El Progreso, a rural area, and in the central part of the Municipio of San Miguel Petapa, an urban area, showed that there is a

trend to reduce breastfeeding (Table 37). Before 1960 only 19.6% of the women in San Miguel Petapa stopped breastfeeding at 9 months. During the period 1969 - 1974 this percentage rose to 42.4%. There was also a decline in breastfeeding in rural areas during the same period.

It is important to support supplemental feeding programs directed at pregnant and lactating women in order to insure the production of high quality and sufficient milk which will be the only nourishment a child will have during the first few months of life.

5. The diet of the pregnant woman as a nutritional problem

The diet of pregnant women is also a nutritional problem in Guatemala. Studies made in the rural areas show that women do not increase their food intake during pregnancy, or perhaps increase it only a little during the last trimester. Thus, the caloric intake of women does not meet their minimum energy requirements. Studies made by INCAP's Division of Human Development have demonstrated that because of this deficiency, the addition of calories to the diet improves the nutritional status of both mother and child. The same applies to nursing mothers who have a deficiency in calorie consumption despite the fact they are capable of a long breastfeeding period, the amount of milk produced after six months is very low compared to the milk production of women in other areas.

Studies made (45) of the influence of the mother's nutrition on fetal growth in Guatemala show that 78% of the women whose consumption was greater than 2200 calories, gave birth to children of satisfactory weight. In comparison only 38% of mothers who had a calorie intake of less than 1800 gave birth to children with satisfactory weights. Obviously an increase in the caloric consumption results in higher birth weights, ensuring a higher survival rate. Children with low birth weights have a greater risk of becoming malnourished in the first year of life.

6. Deficiency in the diet of the farmworker

The caloric intake of rural adult males is deficient despite the fact that the energy requirements used for these populations refer to individuals with a lower level of activity than that of agricultural workers. Therefore, calorie deficiencies found

in these farmworkers are even worse. Studies made by Viteri and others at INCAP regarding productivity (46) find that increasing the calorie consumption of men who work in the rural area translates into more productivity per unit of work or per cultivated area.

7. Recommendations

Dietary surveys should provide more precise quantitative information, not only at the family level, disaggregated by agricultural regions and income level, but also at the individual level, identifying the groups most at risk, such as nursing mothers, pregnant women, and pre-school children. Reliable information is available for previous years but should be updated. For example the nutritional values of food consumed at the present time should be updated in order to obtain more information on actual requirements of the Guatemalan rural population.

Moreover, it is necessary to have information on economic indicators which impact dramatically on the nutritional situation of the country. 1975 data from the National Economic Planning Council (8) show that when comparing the cost of the recommended minimum diet with the per capita income for that year, the per capita income of the top quartile for the rural areas (Q268) does not cover the costs of the recommended minimum diet (Q273.75). Naturally, the situation is even more serious for the lowest quartile where the average per capita income is only Q67.00 per year. In general income of 70% of the population is lower than the cost of the recommended minimum diet.

Economic data should be disaggregated by region and updated for use in program planning and the design of a nutrition surveillance system.

VI. TRADITIONAL PRACTICES AND BELIEFS REGARDING HEALTH AND NUTRITION

This summary of the socio-scientific literature search on health and nutrition contains some of the main conclusions of the nutrition assessment. The detailed report which includes a description of the objectives, scope, and methodology is divided into geo-economic regions, and is annexed to the health sector assessment.

The socio-cultural data on knowledge, attitudes and practices towards health in general, and nutrition in particular, cannot be generalized by regions or for the nation as a whole. Guatemala is a bi-ethnic, multi-lingual country, with several local variations in the social and cultural patterns. Thus, the generalizations made here are tentative, and must be corroborated by the field studies.

1. Findings

Following are the most important findings. Needless to say this summary does not do justice to the quantity and abundance of the material gathered.

a) The complex hot-cold concept governs a great portion of the ladino and Indian cultures. This concept is more widespread among the Indian population, residents of rural areas and low income groups in general than among the members of the privileged class. The hot-cold difference is a principle that rules the food taxonomy as well as the emotional and physical state of man. It explains to a degree the etiology of disease and indicates the procedures to follow in the prevention, treatment and cure of sickness. Thus, it is a critical component of the practices and care of pregnant women and nursing mothers, as well as the diets of children, babies, and sick people.

It is important to remember that, because it is both a symbolic and cultural complex, the hot-cold system is flexible and has the ability to modify innovations. Thus, it serves to soften, filter, and redefine cultural elements and procedures which cultural contact and modernization expose it to.

b) The balance between health and sickness is a ubiquitous problem in all human societies. In Guatemala most of the

population, without making ethnic distinctions and with the exception of the cosmopolitan classes, is more oriented towards sickness than health. That is to say, according to common perception, medicine, whether traditional or modern, has as its main purpose the curing and not the prevention of illnesses. This orientation towards sickness and not towards health is explained in part by the fact that much of the etiology of sickness in the traditional thinking is supernatural, and thus, uncontrollable. There is very little that man can do to prevent illnesses caused by forces stronger than he.

The microbe theory of sickness - a concept natural to western medicine - is unknown by the population in general. The system of folk medicine prevails in which the Indian is a major participant and to a lesser degree, the rural ladino and certain urban sectors. This system attributes the causes of illness to sudden changes in the hot-cold equilibrium, to the actions of supernatural beings, or to negative emotional experiences. Germ theory, even though it is recognized, has little credibility.

c) The reluctance to adopt modern medical concepts and to modify the system of traditional beliefs does not find parallels in the acceptance of modern medical practices. On the contrary, generally, the population that participates in folk medicine - specialists as well as patients - tend to accept and demand modern medical treatment after recognizing its rapid and positive effects. What changes visibly is the health conduct and not the associated beliefs. The change in beliefs is slower, more complex and difficult.

d) The demand of the population in general for medical services can be derived from the above. The initial reaction of a sick person is to ignore the symptoms and to wait for them to disappear. If this does not happen, the next step is self-diagnosis and self-prescription and treatment.

Up to this point the process is similar for both Indians and ladinos. If they do not get better, they will seek specialized attention: the Indian goes to a practitioner of traditional medicine first, while the ladino tries to seek modern medical care. Nevertheless, the medical conduct of the Indian tends to be more heterogeneous. The Indian may participate in two or more medical systems, serially or simultaneously.

The Ladino usually seeks professional attention in the earlier stages of the illness than the Indian, even though the more common pattern is to seek medical attention when the illness is at an advanced or serious stage. This behavior agrees with the orientation towards sickness discussed earlier.

e) Even when the demand for modern medical services is late, the services offered in the rural areas and marginal zones of the urban centers are used. This is mostly true of public health services, particularly mother-child care.

f) The data suggests the conclusion that the major obstacle for accepting modern medicine in the rural areas, and especially in the indigenous areas, is not treatment or medical practices per se. The barrier that constrains utilization of modern medicine is the way in which these services are organized and delivered. There are language and cultural barriers which result in different expectations, on the part of the patient and health personnel, for service and anticipated benefits. The attitudes and values of the personnel that represent official modern medicine also prevent the utilization of these services by the indigenous population, and to a lesser degree, by the Ladino population.

Finally, the delivery of modern medical services is exclusive and prevents the patient from participating in other medical traditions simultaneously. This implies that the person seeking modern medical attention has to totally reject traditional medicine. This represents an obstacle because, as mentioned earlier, in the public perception the coexisting medical systems are not competitive, but rather complimentary.

2. Conclusions

There are great gaps in our knowledge of the anthropological and sociological aspects of health and nutrition in Guatemala. In particular, our greatest ignorance is in the area of practices and beliefs of pre, peri and post-natal care, care and diet of pregnant and nursing women, in breastfeeding and weaning practices, and in the care of childhood diseases. More specifically, we need to understand the change process in these areas and the felt needs of the populations involved. The specific recommendations regarding these aspects are presented in the section on recommendations.

VII RECOMMENDATIONS

As stated in the introduction, this work did not intend to study the nutritional problem in Guatemala as a whole, but to describe it from a biological standpoint and to consider its implications within the Health Sector. The causes for malnutrition, as has been said many times, are multiple and are found in various sectors; since these were not covered by the study, specific recommendations could not be made for each one. Nevertheless, so that the Health Sector may fulfill its role regarding nutrition, there are some important steps at the governmental level, outside the Health Sector, or of a multisectoral type for which recommendations are made in this chapter. A good portion of these recommendations are directed mainly at the Health Sector and in no way constitute a proposal for a global solution to the nutrition problem in Guatemala. For this purpose it is necessary to make a more complete study which would cover all sectors related to the nutritional problem; such a study would help us to understand better all causes and factors which influence the problem, such as was made during the National Nutrition Seminar held in December, 1976.

On the other hand, this study describes important data gaps which are the reasons why many aspects are not fully known or understood. In particular, there is not enough information for adequate planning for nutrition in Guatemala. Therefore, a third group of recommendations is included concerning data required for planning and programming.

1. General recommendations

This study indicates a tendency to a slow but progressive deterioration of the nutritional and dietary status of the Guatemalan population. If the causes of this situation remain unchanged and demographic growth follows its current trend, a progressive exacerbation of the present situation is unavoidable.

The nutrition problem in Guatemala will not be solved without taking determined and sustained action at the political level. In order to guide the authorities in this regard, the following general recommendations are proposed:

1.1 Strengthen the institutional infrastructure created as a result of the 1976 Seminar which will be responsible for analyzing the problem, proposing solutions to the political

powers, and based on its decisions, formulating a national food and nutritional policy and designing corresponding action plan. This strengthening may be done through the following:

- Provide the Intersectoral Nutrition Commission with professional full-time personnel, support personnel and a budget.

- Invite other sectors that may contribute to the solution of the nutritional problem, such as agriculture, education, and finance to send high level personnel to collaborate with the Commission, freeing them, whenever possible, of other obligations.

- Provide the Commission with control over international foreign aid agreements related to nutrition, i.e. grants, loans, technical assistance, etc.

1.2 The Nutrition National Commission would draft a National Food and Nutrition Policy and generate a national debate from which guidelines can be prepared for a National Food and Nutrition Action Plan. This plan, of course, shall be prepared in close collaboration with the interested sectors/ The National Food and Nutrition Plan shall serve as a Master Plan for existing or future sector plans which should incorporate the nutrition component.

Another task of the Commission shall be to periodically inform all sectors of the progress in increasing the general knowledge of the situation, on the consequences of malnutrition, and on the forseeable effects of present policies of each sector on nutrition.

It should also collaborate with the sectors in the establishment of a National System for Epidemiological and Nutritional Surveillance, and to complete the task of a national diagnosis of malnutrition with the other sectors.

1.3 The Government should include in the nation's budget sufficient funds to be utilized by the sectors in the implementation of nutrition programs or programs with nutrition

components, within the context of a global plan, i.e. the Master Plan or the National Food and Nutrition Plan.

2. Recommendations on data required to plan nutrition policies, prepare objectives, design and evaluate programs

2.1 In general there is a lack of historic data; only in a few cases is there longitudinal data which covers a long enough period to be able to identify trends. For this reason a great effort is required to identify trends in the variables used in the national nutritional diagnosis. On one hand, available information should be updated and completed using retrospective data; on the other hand, all future data compilation should be based on annual data, in order to make comparisons in time and projections.

2.2 Since most available data is aggregated nationally and disaggregated data is found, it is generally by department, it is recommended that information be disaggregated whenever possible and reaggregated by regions because regional diversity raises the probability of finding great regional differences not only in the prevalence of malnutrition, but in its causes and prevention.

2.3 One of the major obstacles in the making of a valid, useful diagnosis for the planner, is the poor quality of vital statistics, particularly in the rural areas. On one hand, there is an important under-registration of data on mortality of infants, and on the other, registries of the causes for death and consultations in health facilities are incomplete and not standardized.

Therefore, it is recommended to make a complete restructuring of the current data compilation and dissemination system including standardization of information. It is necessary to incorporate malnutrition as an associated cause of death in diagnoses and on death certificates, establish standards, motivate and train personnel including physicians; and provide adequate supervision.

2.4 In addition to the last two recommendations, a Nutritional Surveillance System must be created. This study could contribute to the selection of indicators to be used by that

system. The Nutrition Commission of the Planning Council has an explicit responsibility for surveillance written into the government decree which created it.

2.5 It is recommended that a tripartite working group be created, composed of the National Economic Planning Council, Ministry of Public Health and Social Assistance, and General Bureau of Statistics, in order to implement the above recommendations. INCAP, through its Food and Nutritional Surveillance program will cooperate with the work of this team upon request.

2.6 It is important to update the national food balance sheets, which were developed by the National Bureau of Statistics; for this purpose the Bureau should receive additional professional resources.

2.7 Considerable work has been done during the preparation of this study on the main demographic variables of the Guatemalan population. Part of this information was used in this report, but there is a great amount of unused and unprocessed data. Therefore, it is recommended to ask the General Bureau of Statistics to complete compilation, processing and analysis of this data and distribute it as soon as possible as a monograph.

2.8 Four specific nutritional problems should be studied in depth from an epidemiologic viewpoint: protein-caloric malnutrition in children under 5 years of age; nutritional anemia, low birth weight, and endemic goiter.

- A study is recommended on the prevalence of the different types of protein-caloric malnutrition according to WHO international classification, a study of hospital deaths, and a study of the association or relationship between malnutrition and infectious diseases and other relevant epidemiologic factors. For this purpose, the following should be done:

a) a retrospective and perspective study at health facilities (hospitals and out-patient clinics).

b) a national antropometric survey.

Both studies should provide data by region in addition to information by health area and enable comparisons to be made

among populations of urban, rural, periurban, and "slum" areas.

- The study of anemias should include a review of relevant articles, PhD theses, and other studies recently conducted in Guatemala; the preparation of an interim report; and the execution of a national survey. The survey design should allow for the collection of data disaggregated by sex and age; physical status; altitude; departmental and geographic regions; and income levels.

The study of low birth weights should be a perspective study conducted in maternity wards and in homes where deliveries are made in order to supplement studies already carried out by INCAP.

- The study on endemic goiter, should include a clinical survey, perhaps limited to the school age population. The design of the survey would be similar to those mentioned above.

2.9 The Nutrition Assessment should be expanded to include sectors such as agriculture and education in order to achieve a global diagnosis of the country's nutritional problem (the so called Phase II of the nutrition assessment). The National Food and Nutrition Commission of the National Economic Planning Council has already undertaken various related studies which should be supported by the interested sectors. Phase II of the nutrition assessment should begin during the last of 1977. Data from the agricultural, economic and educational sectors should be analysed. Phase II should at least cover such aspects as agricultural production, food exports and imports, purchasing power, employment, etc.

3. Specific Recommendations for the Health Sector

The recommendations proposed for the Health Sector are based on findings and conclusions of this study, general conclusions from an overall examination of the Health Sector, and on the WHO Resolution 30-51 of the XXX World Health Organization Meeting which, "requested governments .... to give highest priority to the problems related to food and nutrition in their health programs ....." (47).

It is recommended that:

3.1 The Ministry of Public Health and Social Assistance, by means of an official declaration, recognize that the relationship between child malnutrition and gastroenteritis is the major health problem in Guatemala.

3.2 The Ministry of Public Health and Social Assistance create a working group to design a plan of action for nutrition with the Health Sector over the short and medium term which will support the work of the Nutrition and Food Commission of the National Economic Planning Council.

This group should consist of high level officials, department heads, nutrition specialists and pediatricians. The officials and specialists on the team should meet periodically, at least weekly, to prepare a national conference for the health sector personnel, at which the plan of action would be presented and discussed.

The format and procedures used to prepare the National Nutrition Seminar held in December, 1976, might be adopted for this conference.

The plan of action should include not only the Ministry of Public Health and Social Assistance, but also other agencies in the sector, especially the Social Security Institute, which should participate from the beginning.

The Ministerial resolution which will create the working group should be very specific in stating the terms of reference and give a firm date, which cannot be extended, for presenting conclusions.

In addition to preparing an action plan for the short and medium term, the working group should define the role of the health sector in nutrition, especially the role of the Ministry's nutrition department. Discussions could be based on documents prepared for the XXX Meeting of the World Health Organization.

A third task would be to prepare concrete and realistic nutrition interventions for the health sector.

3.3 The action plan should take into account the following considerations:

General Guidelines

- Place substantial emphasis on motivation and orientation of health personnel, especially physicians, nurses, and EPSs1/, to make them aware of their role in alleviating malnutrition.

- Emphasize the integration and coordination of nutrition programs at all levels. By means of a carefully studied plan, coordinate existing and future nutrition programs including education and recuperation services, placing them under the responsibility of the area health chiefs along with budgetary resources and necessary decision-making authority. At the same time, positions for nutritionists or physicians with training in nutrition should be created in the regional health areas with sufficient salary and professional incentives.

- Provide or expand integrated basic health services including nutrition to poor people.

Short-term actions

- Collaborate with the Food and Nutrition Commission of the National Economic Planning Council in the establishment of a Nutritional Surveillance System; at the same time, improve the registry of vital statistics according to the recommendations made above.

- Establish in all health posts and centers and other health facilities the early detection, treatment, referral and counter-referral of all persons suffering from acute malnutrition, including the preparation of standards, training of personnel, and systems for supervision. This activity should have priority over other health programs.

- Improve treatment for malnourished people in hospitals by establishing norms and intensive training of all medical and paramedical personnel.

1/ The Ministry's program for last year medical school students to spend one year practicing in the rural areas.

Define the role of paramedical personnel, TSRs and EPSs in nutrition programs, especially in the two activities mentioned above.

- Accelerate existing programs for construction of water systems using maximum community participation, accompanying such activities with intense educational campaigns on the use of potable water.

- Expand oral rehydration services for child gastroenteritis.

- Reconsider the norms for the care of pregnant women in order to prevent low birth weights.

- Make a concerted effort to train health personnel at all levels in nutrition in such a way that everyone receives training within the next few years. At the same time, the supervisory system should be restructured to include nutrition. The emphasis of the training effort is on incorporating nutrition into the routine activities of the health service.

3.4 In light of the interrelationship between malnutrition and diarrhea in children, the Ministry's program for expanding environmental sanitation should be strengthened immediately, especially the construction of rural water systems.

3.5 From the information gathered on traditional beliefs and practices regarding health and nutrition, it is evident that additional in-depth studies by region should be undertaken in order to improve health service delivery by incorporating some elements of traditional medicine.

Finally, it is important to point out that many of these recommendations resemble conclusions made at the Seminar on Malnutrition in Guatemala in December, 1976, held under the auspices of the National Economic Planning Council and INCAP. The Seminar recommended that a Presidential Decree name a commission that would be in charge of nutritional planning for Guatemala.

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TABLE 1

GOMEZ CLASSIFICATION IN CHILDREN FROM 6 TO 59 MONTHS - GUATEMALA 1965-75

Years	Description of the Population	Cases	Nutritional condition			
			Normal	Degree I	Degree II	Degree III
			%	%	%	%
1965	Rural *	776	18.7	48.6	27.2	5.5
1965	Urban-Rural *	859	22.0	47.7	25.2	5.1
1975	Rural *	663	15.0	46.9	33.0	5.1
1975	Health services**	1026	23.0	48.2	26.1	2.7

Source: * INCAP
** DIMIF (Maternal/Child Health Division, Ministry of Health)

TABLE 2

GOMEZ CLASSIFICATION IN CHILDREN OF 6 TO 59 MONTHS - GUATEMALA 1966-76

Year	Description of the Population	cases	Nutritional condition			
			Normal	Degree I	Degree II	Degree III
			%	%	%	%
1966-76	Santa María Cauqué (highly indigenous)	4749	3.9	31.2	56.1	8.8
1971-75	Four eastern rural towns (highly non-indigenous)	7878	11.9	52.6	32.6	2.9
1974-1975	San Miguel Petapa (peripheral urban, highly non-indigenous)	827	22.4	53.3	22.0	2.3
1972	San Jose Poaquil (principal city)	215	15.3	54.9	27.0	2.8
1972	San Jose Poaquil (villages)	454	7.5	39.9	42.7	9.9

SOURCE: INCAP

TABLE 3

PERCENTAGE DISTRIBUTION OF CHILDREN 60 MONTHS OR LESS IN INDIGENOUS POPULATION OF SANTA MARIA CAUQUE ACCORDING TO NUTRITIONAL STATUS (GOMEZ CLASSIFICATION) BY AGES. GUATEMALA. INCAP - 1966/1976

Age (months)	Number of cases	Classification of nutritional condition			
		Degree III	Degree II	Degree I	Normal
6	640	4.1	23.3	52.8	19.8
12	599	10.7	55.4	31.2	2.7
18	578	14.2	65.1	19.6	1.1
24	507	16.0	65.2	17.6	1.2
30	487	11.9	66.0	21.1	1.0
36	457	8.3	63.0	27.6	1.1
42	429	6.3	61.3	30.8	1.6
48	379	5.3	55.7	37.2	1.8
54	355	3.1	58.6	36.9	1.4
60	318	3.5	57.5	37.7	1.3

Source: INCAP

Table 4

HEIGHT FOR CHILDREN FROM 6 TO 59 MONTHS - GUATEMALA
1965 - 1975

Year	Description of the population	Cases	% of Adequacy of height for age		
			90 & up	85-89	less than 85
1965	rural *	756	48.4	32.0	19.6
1965	urban *	839	51.9	30.3	17.8
1975	rural *	666	50.9	30.8	18.3
1975	health services **	814	62.4	25.3	12.3

SOURCE: * INCAP
** DIMIF

TABLE 5

WEIGHT FOR HEIGHT IN CHILDREN FROM 6 TO 59 MONTHS - GUATEMALA
1965-1975

Year	Description of the population	Cases	% of Adequacy of weight for height		
			90 & up	80-89	less than 80
1965	rural *	750	78.3	18.4	3.3
1965	urban-rural *	833	79.4	17.5	3.1
1975	rural *	666	66.8	28.7	4.5
1975	health services **	804	73.0	23.0	4.0

SOURCE: * INCAP
** DIMIF

Table 6

PERCENT DISTRIBUTION, ACCORDING TO WEIGHT AT BIRTH, OF A SAMPLE OF NEWLY BORN CHILDREN OF BOTH SEXES WHO WERE TAKEN CARE OF AT THE MATERNITY OUT PATIENT CLINICS OF THE MINISTRY OF PUBLIC HEALTH AND SOCIAL WELFARE OF GUATEMALA - DIMF, DGSS/INCAP

1975

Weight in grams	Per Cent
2300 or less	9.2
2301 - 2500	6.7
2501 - 2750	14.1
2751 - 3000	16.2
3001 - 3250	26.0
3251 - 3500	11.3
3501 - and more	16.5
Cases	1235

Table 7

PERCENT DISTRIBUTION OF NEWLY BORN CHILDREN BY WEIGHT - SANTA MARIA CAUQUE (1964-1972)

Weight in grams	Per cent
< 1001	0
1001-1500	1.2
1501-2000	6.5
2001-2500	34.0
2501-3000	48.1
3001-3500	10.0
3501-4000	0.2
4001-4500	0
> 4500	0
Cases	430

Table 8

PERCENTAGE DISTRIBUTION OF MORTALITY BY THE FIRST FIVE CAUSES IN CHILDREN UNDER ONE - ATTENDED IN HEALTH CENTERS AND HEALTH POSTS OF THE MINISTRY OF PUBLIC HEALTH BY DEPARTMENT, GUATEMALA 1975

Department	Total Consultancies All Causes	Enteritis and Other Diarrheas	Infectious and Parasatic Diseases	Acute Respiratory Diseases	Skin and Sub-cutaneous Diseases	Vitamin and Other Deficiencies	Other Causes
Total	74,874	22.4	15.8	9.8	9.7	6.7	35.7
Guatemala	25,762	18.5	15.0	7.9	19.2	5.6	33.8
El Progreso	1,037	21.4	17.0	8.1	4.5	5.7	43.3
Sacatepéquez	1,435	19.9	-	18.5	5.9	16.2	39.4
Chimaltenango	2,681	20.5	25.9	9.1	3.8	4.6	36.0
Escuintla	4,525	25.1	19.5	11.0	5.8	4.7	33.9
Santa Rosa	3,445	29.7	19.5	11.8	4.4	6.7	27.9
Sololá	927	32.9	26.8	7.9	6.0	5.8	20.5
Totonicapán	536	19.0	-	14.3	5.2	15.7	45.7
Quezaltenango	3,327	17.6	20.2	8.1	2.1	3.9	48.0
Suchitepéquez	2,041	20.2	-	21.5	6.5	19.0	32.8
Retalhuleu	868	23.5	26.3	12.1	5.4	10.3	22.4
San Marcos	2,677	32.0	2.0	11.8	4.8	8.7	40.6
Huehuetenango	1,603	23.8	17.0	13.4	4.2	5.9	35.7
El Quiché	1,913	16.9	16.8	10.4	3.7	10.6	41.6
Baja Verapaz	1,190	21.6	16.2	11.5	8.4	5.7	36.6
Alta Verapaz	1,419	34.2	13.5	10.8	4.2	4.9	32.4
El Petén	2,813	28.3	21.6	8.4	3.9	6.2	31.5
Izabal	3,375	17.1	14.6	13.4	5.7	7.3	41.9
Zacapa	4,638	23.4	18.6	8.5	4.2	5.3	39.9
Chiquimula	3,648	21.4	19.0	6.5	4.1	8.7	40.4
Jalapa	1,399	34.9	3.9	8.6	4.8	7.1	40.7
Jutiapa	3,615	29.4	18.1	11.0	4.4	5.9	31.1

SOURCE: DIMIF, 1977 projections based on census figures 1964-1973.

Table 9

PERCENTAGE DISTRIBUTION OF MORTALITY BY THE FIRST FIVE CAUSES IN CHILDREN 1-4 YEARS ATTENDED IN HEALTH CENTERS AND HEALTH POSTS OF THE MINISTRY OF PUBLIC HEALTH BY DEPARTMENT, GUATEMALA 1975

Department	Total Consultancies All Causes	Enteritis and Other Diarrheas	Infectious and Parasatic Diseases	Acute Respiratory Diseases	Skin and Sub-Cutaneous Diseases	Vitamin and Other Deficiencies	Other Causes
Total	160,895	18.5	15.3	12.9	9.8	4.9	38.5
Guatemala	59,789	14.8	14.4	11.9	6.2	4.1	48.6
El Progreso	4,131	17.1	16.9	7.8	14.5	5.5	62.4
Sacatepéquez	2,380	16.3	-	30.1	19.3	7.4	26.8
Chimaltenango	5,173	21.2	27.5	9.5	7.7	5.1	29.0
Escuintla	8,063	21.3	14.7	18.8	16.4	6.4	22.4
Santa Rosa	7,098	26.0	15.1	13.3	14.0	4.8	26.7
Sololá	2,511	24.0	34.0	8.4	7.6	7.2	18.8
Totonicapán	1,231	16.4	-	16.4	14.9	5.3	47.0
Quezaltenango	5,755	16.0	22.2	9.0	6.5	2.4	43.9
Suchitepéquez	3,881	4.9	-	30.5	18.6	9.2	36.7
Retalhuleu	2,397	14.9	22.8	13.3	11.7	5.3	31.9
San Marcos	6,650	34.8	2.0	9.7	10.3	4.6	38.5
Huehuetenango	3,340	20.2	13.7	15.8	12.1	5.0	33.2
El Quiché	4,240	18.9	18.5	9.6	13.9	3.8	35.2
Baja Verapaz	3,592	17.0	14.6	13.3	10.9	5.8	38.3
Alta Verapaz	3,499	29.1	23.0	10.5	7.6	4.5	25.3
El Petén	6,098	22.4	28.5	9.7	9.8	4.3	25.4
Izabal	7,388	16.4	13.4	18.6	15.5	9.8	26.3
Zacapa	8,290	17.2	16.3	11.9	8.4	4.3	41.9
Chiquimula	6,392	20.3	17.0	10.9	10.9	3.9	36.9
Jalapa	2,742	28.9	8.1	10.4	13.1	6.6	32.9
Jutiapa	6,255	22.3	14.3	15.1	10.6	4.6	33.1

SOURCE: DIMIF, 1977 projections based on census figures 1964-1973.

Table 10

DISTRIBUTION BY PERCENTAGE OF HOSPITAL DISCHARGES ACCORDING TO FIRST CAUSES IN CHILDREN UNDER 1 AND 1 TO 4 YEARS, GUATEMALA, - 1975.-

Causes	AGES	
	Less than 1 year	1-4 years
Total	100.0 (8,529)	100.0 (13,382)
Enteritis & other Diarrheas	34.9	21.5
Acute respiratory diseases	21.8	17.0
Lack of vitamins and other nutritional deficiencies	6.1	18.9
Other Infectious & Parasitic diseases *	5.6	12.5
Rest of 10 first causes	11.1	6.0
All the 10 first causes	79.5	75.9
Rest of the causes	20.5	24.1
Measles	3.1	7.0

* Includes Measles

SOURCE: DIMIF 1977

Table No. 11

HOSPITAL DISCHARGES OF CHILDREN OF LESS THAN ONE YEAR OF AGE ACCORDING TO THE FIRST FIVE CAUSES, BY DEPARTMENT, PER 1000 CHILDREN BORN ALIVE
(Hospitals of the Ministry of Public Health and Social Welfare)

Department	All Causes	Enteritis and Other Diarrheas	Acute Respiratory Diseases	Infectious and Parasatic Diseases	Vitamin and Other Deficiencies	Congenital Disease	Other Causes
Total	297.36	130.49	83.45	28.12	22.68	14.96	17.63
Guatemala	381.68	151.12	124.30	71.43	24.75	10.05	-
El Progreso	274.85	133.89	66.95	7.05	31.71	17.60	17.60
Sacatepéquez	464.88	229.94	129.96	37.49	47.48	-	19.99
Chimaltenango	48.86	15.91	10.22	4.54	9.09	6.81	2.27
Escuintla	436.34	212.85	95.78	9.00	57.30	17.19	44.20
Santa Rosa	42.65	14.02	9.04	2.58	7.75	3.87	5.17
Sololá	37.99	3.16	11.08	11.08	4.74	3.16	4.74
Totonicapán	135.91	36.49	54.11	11.32	5.03	22.65	6.29
Quezaltenango	296.12	88.31	87.57	16.32	21.52	35.62	46.75
Suchitepéquez	227.64	100.25	69.59	5.89	16.51	8.25	27.12
Retalhuleu	659.87	268.24	225.32	59.01	51.85	-	55.43
San Marcos	79.22	23.33	19.53	4.34	5.96	20.62	5.42
Huehuetenango	206.52	59.53	58.47	10.01	10.01	56.89	11.59
El Quiché	51.01	16.34	13.73	1.30	7.84	6.53	5.23
Baja Verapaz	124.53	59.30	35.58	11.86	13.83	3.95	-
Alta Verapaz	242.35	100.36	34.27	4.89	73.43	14.68	14.68
El Petén	763.38	450.42	178.41	84.82	49.72	-	-
Izabal	1,101.56	507.23	328.35	150.64	61.19	-	54.13
Zacapa	1,439.39	868.84	357.48	42.61	144.41	-	97.06
Chiquimula	358.28	205.52	84.71	27.77	18.05	11.10	11.10
Jalapa	384.54	174.79	115.36	19.22	29.71	10.48	34.95
Jutiapa	249.35	125.60	41.55	10.15	19.39	12.92	39.71

Source: Programming Division Min. of Public Health, 1975
Projections based on census figures 1964-1973

1975.

Table No. 12

HOSPITAL DISCHARGES OF CHILDREN FROM 1 TO 4 YEARS OF AGE ACCORDING TO FIRST FIVE CAUSES AND BY DEPARTMENT, BY 1000 INHABITANTS OF THIS AGE GROUP 1975

Department	All Causes	Enteritis and Other Diarrheas	Vitamin and Other Deficiencies	Acute Respiratory Diseases	Infectious & Parasatic Diseases	Congenital Disease (Intestinal Occlusion and Hernia)	Other Causes
Total	151.74	42.80	37.72	33.20	29.60	5.86	2.54
Guatemala	172.24	34.04	28.69	46.83	53.55	9.11	-
El Progreso	126.04	41.66	46.87	16.66	8:33	6.25	6.25
Sacatepéquez	187.24	61.57	48.92	48.92	19.39	4.21	4.21
Chimaltenango	63.85	7.30	30.39	10.38	7.30	5.38	3.07
Escuintla	231.58	83.06	94.53	25.73	8.11	11.46	8.67
Santa Rosa	48.82	9.85	26.98	3.85	6.85	1.28	-
Sololá	59.81	12.90	12.90	12.90	9.96	9.38	1.75
Totonicapán	85.20	21.07	8.52	35.42	9.86	10.31	-
Quezaltenango	95.69	23.48	25.98	20.48	13.24	9.49	2.99
Suchitepéquez	101.81	40.65	29.42	14.71	12.38	4.64	-
Retalhuleu	226.38	87.30	42.14	44.55	42.74	-	9.63
San Marcos	65.02	14.21	20.85	10.04	9.47	10.42	-
Huehuetenango	92.28	25.22	25.78	23.53	17.74	-	-
El Quiché	35.41	8.19	11.32	8.43	3.37	2.40	16.86
Baja Verapaz	97.73	30.67	29.24	18.54	2.14	4.28	12.84
Alta Verapaz	68.62	18.47	26.65	9.50	10.55	1.05	2.37
El Petén	557.73	213.92	129.88	111.73	89.77	-	12.41
Izabal	495.36	121.30	83.38	1.0.88	179.79	-	-
Zacapa	400.52	170.22	80.10	110.91	25.41	9.24	4.62
Chiquimula	172.53	62.19	55.17	30.59	16.04	5.01	3.51
Jalapa	155.09	58.84	34.32	47.81	7.35	4.29	2.45
Jutiapa	139.15	41.71	50.43	25.21	8.71	5.29	7.78

SOURCE: Programming division Ministry of Public Health & Soc. Wel. 1975
Projections based on census figures 1964-1973

Table N° 13

INFECTIOUS DISEASES, RATE PER 100 PERSONS/MONTH BY INTERVALS OF 6 MONTHS IN 45 CHILDREN OBSERVED SINCE THEIR BIRTH TO 3 YEARS OF AGE

Santa María Cauqué, 1964-1969

Disease	Age, Months					
	0-5	6-11	12-17	18-23	24-29	30-35
	270*	270	270	270	255	250
Upper Respiratory	25.6	34.1	33.3	31.1	30.1	35.7
Lower Respiratory	15.9	23.0	23.7	27.4	24.3	14.0
Intestinal	33.3	63.0	77.8	87.4	78.0	55.0
Eyes	21.9	18.5	13.7	14.4	8.9	5.0
Ears	0.7	0.4	1.5	0.4	1.9	0.8
Mouth	9.3	6.3	8.2	4.1	7.0	3.9
Skin	1.9	3.3	2.2	6.3	2.7	4.7
Infectious Diseases**	1.9	10.0	8.2	9.6	7.7	7.4
Other ***	0.7	1.1	2.2	4.1	1.2	1.9
Total	111.1	159.6	170.7	184.8	161.8	128.3

* Number of persons/month.

** Measles, chicken pox, German measles, whooping cough.

*** Genital-urinary, unknown fevers, tendonitis.

Table 14

PREVALENCE OF INFECTIOUS BY SHIGELLA BY 6 MONTH INTERVALS IN 45 CHILDREN OBSERVED SINCE THEIR BIRTH TO 3 YEARS OF AGE

Santa. María Cauqué, 1964-1970

Sub groups of Shigella	Intervals of age, Months					
	0-5	6-11	12-17	18-23	24-29	30-35
	N=1105*	N=1131	N=1105	N=1131	N=1090	N=1071
Dysenteriae	1(0.09)**	3(0.27)	24(2.17)	37(3.27)	50(4.59)	41(3.83)
Flexneri	13(1.18)	0	39(3.53)	132(11.67)	140(12.84)	165(15.41)
Boydii	0	1(0.09)	9(0.81)	9(0.80)	6(0.55)	17(1.59)
Sonnei	1(0.09)	0	3(0.27)	1(0.09)	12(1.10)	14(1.31)
All	15(1.36)	4(0.35)	75(6.79)	179(15.83)	208(19.08)	237(22.13)

* N = Number of cultures.

** Number of Shigella strains isolated (percentage of prevalence).

Table 15

PREVALENCE OF 4 INTESTINAL PARASITES IN 45 CHILDREN OBSERVEL SINCE BIRTH TO 3 YEARS OF AGE

Santa María Cauqué, 1964-1970

Months	Number of Samples*	Entamoeba histolytica	Giardia lamblia	Ascaris lumbricoides	Trichuris trichiura
0	471	0.21**	0.21	0.21	0
3	556	1.26	2.16	0.36	0.18
6	569	0.18	3.69	0.53	0.18
9	578	0	8.13	1.21	0.17
12	549	0.73	12.57	9.29	0
15	554	0.90	15.52	27.26	1.62
18	573	1.57	15.53	34.55	3.49
21	566	2.47	17.14	33.04	4.77
24	559	4.47	17.53	54.74	5.19
27	545	7.52	19.82	69.54	6.24
30	538	9.11	18.77	69.70	4.28
33	525	6.86	22.10	69.71	3.81
36	298	10.40	19.13	77.85	3.02
	6881	3.24	13.11	32.81	2.53

* Samples were obtained weekly from one week old to three years of age.

** Percentage of positive samples in each quarter.

Table 16-

PERCENTAGE OF PRESCHOOL CHILDREN WITH MODERATE OR SEVERE MALNUTRITION BY TYPE OF MIGRATION OF THE FATHER, CONTROLLING PER CAPITA FAMILY INCOME, THREE VILLAGES, Guatemala, 1974.-

Duration of Migration	% of Malnutrition Income higher than moderate		Income less than moderate	
7-12 months	31.6	(19)	---	(0)
1-6 months	41.2	(17)	57.1	(21)
did not migrate	33.1	(39)	35.6	(59)
TOTAL	29.3	(75)	41.3	(80)

a less than 80% of normal weight per age

b,c $_p$ < .05 (difference between percentages)

d_p < .10 (difference between percentages)

Table No. 17

CLASSIFICATION OF FAMILIES
ACCORDING TO PREVALENCE OF MODERATE
MALNUTRITION IN CHILDREN FROM 2 TO 3 YEARS OF AGE

Classification Rank	Group	Prevalence of Moderate Malnutrition in Children from 2 to 3 years of age	
		n	%
1	Farmers with less than 2 manzanas of land	37	37.8
2	Farmers with 2.0 to 2.9 manzanas of land	74	31.1
3	Salaried agricultural workers	43	27.9
4	Artisans and merchants	39	17.9
5	Farmers with more than 5 manzanas of land	36	16.7

Source: Valverde, V., R. Martorell, V. Mejía-Pivaral, H. Delgado, A. Lechtig, Ch. Teller & R. Klein. Relationship between family land availability and nutritional status. Ecology of Food and Nutrition, Vol. 6, pp. 1-7, 1977.

Table N° 18

INCIDENCE TO INFECTIOUS DISEASES[1] DURING PREGNANCY
SANTA MARIA CAUQUE, GUATEMALA, 1964-1971

Trimester of Pregnancy	Number of Women Observed	Infections of Urinary Tract	Diarrhea and Dysentery	Respiratory Infections		Infectious Hepatitis
				Upper	Lower	
I	360	5(1)[2]	22(6)	65(18)	7(2)	0
II	358	7(2)	20(6)	85(24)	14(4)	1
III	364	5(1)	31(9)	109(30)	13(4)	1
Total	1082	17(2)	73(7)	259(24)	34(3)	2
Incidence/100 pregnancies	361	4.9	20.2	71.7	9.4	0.5

1 Diagnosis on clinical basis.

2 Number of cases (percentages in parenthesis).

Source: Mata, L.J., J.J. Urrutia & B. García. Malnutrition and infection in a rural village of Guatemala. En: Proceedings 9th Congr. Nutrition, México, 2:175-192, 1975.

Table No. 19

SERUM LEVELS OF VITAMIN A IN PRE-SCHOOL CHILDREN OF THE RURAL AREA OF GUATEMALA
CHANGES ASSOCIATED WITH SUGAR FORTIFICATION

Rural Populations of 1000 to 2000 Inhabitants

(1975 - 1976)

Survey	Date	Percentages of serum levels by risk category			
		"High Risk"	"Moderate Risk"	"Inadequate Reserves"	"Adequate"
		<10 µg/100 ml	10-19.9 µg/100 ml	20-29.9 µg/100 ml	30 ó > µg/100 ml
1*	Oct-Nov 75	2.5	17.5	35.2	44.9
2**	Abr-May 76	0.9	13.0	35.5	50.7
3***	Oct-Nov 76	0.2	5.0	25.5	69.2

* Survey No. 1 was made before starting the sugar forticiation project at the national level. Only a pilot type fortification project that included about 8% of the sugar cane crop had been made.

** Survey No. 2 was made 5 months after starting the fortification project but before the 1975-76 sugar cane crop that ended in June 1976.

*** Survey No. 3 was made after the population had been consuming sugar from the 1975-76 fortified crop with a 75% efficiency (3,137,317 quintals fortified from a total production of 4,197,867 quintals for local consumption).

Source: Evaluation of the project of sugar fortification with vitamin A, INCAP.

Table No. 20

CLINICAL SIGNS ATTRIBUTABLE TO DEFICIENCY OF VITAMIN A

GUATEMALA, OCTOBER-NOVEMBER 1975

Signs	Samples of Positive Cases	Prevalence (for 10,000)	Prevalence (%)
Leucomas (XS)	7/677	103.39	1.03*
Xeroxis (X1A)	1/677	14.77	0.14

* Critical level of 0.1% prevalence, unpublished data.

SOURCE: Evaluation of the project of sugar fortification with vitamin A, INCAP.

Table No. 21

EVALUATION OF SUGAR FORTIFICATION WITH VITAMIN A

RETINOL CONCENTRATION IN MOTHER'S MILK

(270 Samples)

Basal Survey Guatemala*

µg/100 ml

	49 or less	50 or more
N	240	30
%	88.9	11.1

* Oct-Nov./75.

WHO Tech. Rep. No. 302. Vitamin A in "Mother's Milk": 49 µg/100 ml.

Source: Evaluation of the project of sugar fortification with vitamin A, INCAP.

Table 22

INFANT MORTALITY RATES AT BIRTH AND AFTER BIRTH
(BY 1000 BORN ALIVE) AND MORTALITY OF 1-4 YEARS
1960 - 1975

Years	Infant mortality	Mortality at birth	Mortality after birth	1-4 years 2*
1960	91.8	36.9	54.9	---
1961	84.8	35.6	49.2	29.8
1962	91.3	36.3	55.0	31.4
1963	92.8	37.2	55.6	32.2
1964	87.8	34.7	53.1	27.3
1965	92.6	35.2	57.4	33.5
1966	89.0	34.8	54.2	31.0
1967	86.7	32.2	54.5	28.3
1968	92.0	34.0	58.0	31.6
1969	91.3	30.8	60.5	33.9
1970	87.1	30.8	56.3	27.0
1971	81.6	29.2	52.4	29.2
1972	80.0	27.6	52.4	22.6
1973	79.9	27.3	52.3	22.3
1974 1	74.0(75.4)**	26.4	47.5	21.7
1975 1	79.9(81.1)**	25.6	54.3	28.0

* per thousand children of 1 to 4 years
** preliminary figures

SOURCE: Statistics Bureau. Statistical year book 1975, Guatemala

1. Planning and statistics Office. Bureau of Health Services of Guatemala, data in parenthesis of child mortality are preliminary figures from the Statistics office.

2. Vital statistics, non published tabulations. Bureau of Statistics, Guatemala.-

Table 23

NUMBER AND PERCENT DISTRIBUTION AND MORTALITY RATES IN CHILDREN OF LESS THAN 1 YEAR OF AGE AND FROM 1-4 YEARS FOR CENTRAL AMERICAN AND OTHER AMERICAN COUNTRIES.-

Country	Year	Less than 1 yr.		From 1 to 4 yrs.	
		%*	Rate**	%*	Rate**
Guatemala	1972	27.7	79.0	21.5	22.6
El Salvador	1972	27.6	58.5	15.4	0.7
Honduras	1972	24.4	43.0	16.8	10.0
Nicaragua	1969	27.7	54.4	14.3	9.5
Costa Rica	1972	28.9	59.0	7.7	4.0
Panama	1972	20.3	33.0	12.0	5.1
Colombia	1969	27.4	62.7	15.8	6.1
Argentina	1970	14.4	65.2	2.8	3.3
Canada	1972	3.7	17.1	0.8	0.1
United States	1972	3.1	18.5	0.6	0.1

* % of deaths in this age group regarding total deaths

** rate per 1000 born alive

*** rate per thousand children of 1-4 years.

SOURCE: Health conditions in the Americas 1969-1972 Scientific publication 287, World Health Organization. Panamerican Health organization. Regional office of WHO, Washington D. C. 1974

Table 24

GUATEMALA INFANT MORTALITY RATES IN URBAN-RURAL AREAS AND ETHNIC GROUP 1965- 1973

YEARS	TOTAL	INDIGENOUS	NON-INDIGENOUS	URBAN	RURAL
1965	92.6	94.4	90.8	*	-
1966	89.0	90.2	87.7	-	-
1967	86.7	92.3	85.0	-	-
1968	92.0	101.5	83.6	97.6	88.7
1969	91.3	91.0	91.6	98.0	87.4
1970	87.1	80.7	94.0	90.3	85.3
1971	81.6	76.7	86.7	87.9	76.8
1972	79.0	70.8	88.0	86.5	74.4
1973	79.6	70.8	89.3	90.7	72.8

* no information available

SOURCE: Vital statistics, non published data
Bureau of Statistics Guatemala

Table 25

GUATEMALA: INFANT MORTALITY RATES; MORTALITY 1-2 YEARS; and MORTALITY 1-4 YEARS. BY DEPARTMENT - YEARS 1969-1970, 1971-1973, 1974-1975

Department	Infant Mortality			Mortality 1-2 years			Mortality 1-4 years		
	1969-1970	1971-1973	1974-1975	1969-1970	1971-1972	1973-1974[a]	1969-1970	1971-1973	1974-1975
Total	89.2	80.0	78.3	45.2	39.1	33.5	30.5	24.7	24.7
Guatemala	86.0	83.6	82.6	27.4	22.2	20.8	17.6	13.2	13.5
El Progreso	110.4	95.7	83.4	32.2	22.7	22.7	19.5	13,6	12.4
Sacatepéquez	88.6	82.3	80.8	41.3	35.2	26.7	26.4	21.8	21.0
Chimaltenango	99.6	91.0	88.3	50.9	48.0	35.2	34.2	28.5	25.6
Escuintla	128.2	119.7	122.7	61.8	46.9	51.9	38.1	29.4	30.4
Santa Rosa	95.0	83.5	80.8	41.8	32.9	33.0	27.1	20.3	19.7
Sololá	111.1	102.3	101.8	69.9	77.7	51.1	47.3	46.1	35.0
Totonicapán	120.1	102.1	122.4	71.8	65.5	48.3	47.7	38.4	66.3
Quezaltenango	110.8	94.0	96.0	50.1	40.4	38.5	32.7	25.0	31.5
Suchitepéquez	103.8	84.1	81.4	56.5	37.8	38.9	39.3	26.1	23.9
Retalhuleu	100.1	83.5	75.2	42.5	37.0	34.6	27.6	23.0	20.9
San Marcos	81.7	72.3	64.5	44.5	39.2	34.7	29.9	23.8	24.9
Huehuetenango	83.0	66.4	59.9	42.9	40.3	35.0	28.5	25.6	23.5
El Quiché	78.6	66.7	66.4	60.8	57.0	39.4	35.1	36.4	32.5
Baja Verapaz	93.3	73.0	69.6	49.8	43.1	36.7	34.0	27.3	25.5
Alta Verapaz	59.6	59.8	54.1	52.9	58.7	49.3	38.7	40.0	32.8
Petén	82.8	80.5	83.3	33.8	35.5	30.6	23.0	21.5	29.6
Izabal	117.1	72.5	66.0	35.1	32.8	21.5	25.4	20.6	22.0
Zacapa	83.0	67.4	70.0	36.3	23.3	20.0	25.5	15.4	14.9
Chiquimula	72.3	56.7	47.9	41.3	25.4	22.9	31.1	18.7	19.1
Jalapa	73.5	64.2	66.0	42.1	38.2	30.5	28.8	26.1	22.6
Jutiapa	78.4	69.4	66.6	44.4	33.3	27.6	28.6	21.8	20.6

Source: Vital statistics, non published data. Bureau of Statistics, Guatemala - Years 1974/75 - Planning and Statistics Unit - Bureau of Health Services

Table No. 26

GUATEMALA. MORTALITY RATES BETWEEN BIRTH AND 2 YEARS OF AGE BY DEPARTMENT AND AREA - 1968-1969

(Data from 1973 Population Census)

Department and Area	Mortality per thousand		
Republic	149		
Zones			
Urban		84	
Capital			76
Outside Capital			142
Rural		161	
Departments:			
Guatemala	92		
Zacapa	134		
Sacatepéquez	135		
Retalhuleu	142		
Izabal	146		
Jalapa	147		
Baja Verapaz	148		
Alta Verapaz	148		
El Petén	151		
El Progreso	153		
Santa Rosa	153		
El Quiché	157		
Quezaltenango	158		
Suchitepéquez	159		
San Marcos	162		
Jutiapa	163		
Chimaltenango	164		
Huehuetenango	165		
Totonicapán	167		
Chiquimula	184		
Escuintla	190		
Sololá	207		

Source: Mortality in the first years of life in the Latin American countries; Guatemala. (Preliminary data given by Dr. Hugo Behm). CELADE. San José, Costa Rica 1977.

NOTE: Basic data comes from the 1973 Population Census, the information originated with two questions made to women of 15 years old: How many living sons do you have? Of the ones born alive, how many are living now? For this last question information is needed from women between 15 and 25 years of age.

W. Brass and J. M. Sullivan methodology was used for obtaining this information.

Table 27

GUATEMALA: MORTALITY RATES IN CHILDREN OF 1-4 YEARS PER URBAN AND RURAL AREAS AND ETHNIC GROUP 1965-1973

Years	Total	Indigenous	Non-indigenous	Urban	Rural
1965	33.5	51.7	19.9	*	-
1966	31.0	47.7	18.3	-	-
1967	28.3	42.5	20.3	-	-
1968	31.6	46.6	19.9	27.7	33.4
1969	33.9	46.6	23.8	30.9	35.3
1970	27.0	36.3	19.5	24.7	28.1
1971	29.2	41.5	19.0	26.8	29.7
1972	22.6	30.6	15.9	20.9	23.3
1973	22.3	28.9	16.8	21.7	22.6

*no information available

SOURCE: Vital Statistics - unpublished tabulations

Bureau of Statistics - Guatemala

Table 28

MORTALIBY RATE (PER 1,000 CHILDREN BORN ALIVE) in CHILDREN OF LESS THAN 1 YEAR DUE TO THE FIRST CAUSES OF DEATH BY DEPARTMENT 1975.

Department	All 10 first diseases	Acute Respiratory diseases	Enteritis & other diarrheas	Infectious & parasitic diseases	Lack of vitamins & other nutr. defic.	The othe 10 main disease
Total	59.30	23.65	17.65	6.90	3.58	7.52
Guatemala	63.69	12.71	26.36	3.97	6.74	13.91
El Progreso	75.87	31.26	29.76	5.65	3.27	8.93
Sacatepéquez	74.68	35.67	13.34	9.50	7.70	8.47
Chimaltenango	71.33	44.63	14.57	10.02	2.11	-
Escuintla	89.35	29.23	36.62	20.09	3.41	-
Santa Rosa	71.08	29.56	26.22	8.36	3.08	3.86
Sololá	60.85	37.01	9.79	6.75	2.85	4.45
Totonicapán	107.46	44.57	10.63	18.32	6.22	27.72
Quezaltenango	72.81	30.91	13.17	15.70	3.07	9.96
Suchitepéquez	40.54	24.39	2.17	6.83	1.73	5.42
Retalhuleu	99.20	65.06	12.70	4.29	2.97	14.18
San Marcos	34.65	20.53	8.90	3.68	1.17	0.37
Huehuetenango	32.01	19.75	8.64	2.28	0.67	0.67
El Quiché	50.86	23.79	11.49	4.71	1.76	9.11
Baja Verapaz	46.61	27.88	7.21	3.44	2.02	6.06
Alta Verapaz	38.55	16.63	10.90	2.24	4.98	3.80
El Petén	89.82	12.18	50.04	23.20	1.80	2.60
Izabal	43.59	8.48	14.13	7.28	4.35	9.35
Zacapa	65.04	20.47	26.23	3.41	5.12	9.81
Chiquimula	25.42	8.57	8.97	2.99	1.49	3.40
Jalapa	51.16	28.58	22.35	1.56	4.51	4.16
Jutiapa	68.58.	21.60	28.17	2.50	3.43	12.88

Source:, DIMIF 1977

Table 29

MORTALITY RATES (PER 1,000 INHABITANTS) OF CHILDREN FROM 1-4 YEARS, ACCORDING TO THE FIRST CAUSES OF DEATH - BY DEPARTMENTS

1975.

Department	All first 10 causes	Infectious & parasitic diseases	Enteritis & other diarrheas	Acute respiratory diseases	Vitamin and other nutr. deficiencies	Others
Total	16.92	6.26	4.80	4.29	1.30	0.27
Guatemala	7.10	3.75	1.14	1.35	0.86	-
El Progreso	8.10	4.29	0.40	2.06	0.95	0.40
Sacatepéquez	22.24	8.54	7.56	4.79	1.25	-
Chimaltenango	24.94	8.44	5.37	7.29	3.77	0.07
Escuintla	14.17	6.99	5.10	1.10	0.98	-
Santa Rosa	7.38	3.96	1.19	1.56	0.35	0.32
Sololá	23.99	6.16	6.68	10.26	0.89	-
Totonicapán	78.78	9.89	46.52	19.00	3.29	0.08
Quezaltenango	25.64	6.39	13.84	4.29	1.12	-
Suchitepéquez	17.14	12.00	3.65	0.42	0.90	0.17
Retalhuleu	10.86	5.05	2.51	2.35	0.95	-
San Marcos	14.60	6.72	2.37	4.94	0.57	-
Huehuetenango	23.38	7.61	4.23	10.39	1.15	-
El Quiché	27.67	9.16	5.99	11.36	1.16	-
Baja Verapaz	18.72	5.20	3.94	7.45	2.13	-
Alta Verapaz	20.17	7.12	1.89	7.70	3.31	0.15
El Petén	38.77	18.65	10.57	3.23	5.44	0.88
Izabal	17.42	5.20	6.91	2.97	1.35	0.99
Zacapa	9.55	4.46	1.26	-	1.13	2.70
Chiquimula	8.50	3.80	2.06	1.10	1.40	0.20
Jalapa	10.80	1.10	1.10	5.30	1.70	1.60
Jutiapa	17.10	10.30	1.40	1.20	1.60	2.60

Source: DIMIF, 1977

Table 30

PERCENT DISTRIBUTION OF MORTALITY, ACCORDING TO THE FIRST CAUSES IN CHILDREN OF LESS THAN 1 YEAR AND CHILDREN OF 1-4 YEARS. Guatemala 1975

CAUSES	A G ES Less than 1 year	1-4 years
Total	100.0 (19,385)	100.0 (18,725)
Acute respiratory diseases	29.6	23.5
Enteritis and other diarrheic diseases	22.1	30.6
Other infectious and parasitic diseases *	8.6	21.0
Lack of vitamins and other nutritional deficiencies	4.5	6.4
Rest of the 10 first causes	9.5	1.3
All first 10 causes	74.2	82.8
Rest of the causes	25.8	17.2
Measles	4.6	15.9

* includes measles

SOURCE: DIMIF 1977

Table No. 31

GUATEMALA: MORTALITY RATES 1-4 YEARS (THOUSAND OF INHABITANTES OF 1-4 YEARS) BY CAUSES AND DEPARTMENTS, 1975

Department	Enteritis and Other Diarrheas	Measles	Flu	Vitamin and Other Deficiencies	Pneu-monia	Intes-tinal Worms	Whooping Cough	Bronchitis Emphysema & Asthma	Anemia	Malaria
Total	8.4	4.5	2.4	1.4	1.9	1.5	0.9	0.5	0.4	0.2
Guatemala	6.3	0.9	0.5	1.4	1.4	0.5	0.2	0.2	-	-
El Progreso	5.6	0.4	-	1.3	2.0	-	-	0.7	-	-
Sacatepéquez	5.8	4.0	0.4	1.4	3.2	4.0	1.6	0.3	-	-
Chimaltenango	9.3	4.2	1.5	4.2	5.3	1.8	0.7	0.5	-	-
Escuintla	13.1	1.9	-	1.6	1.2	6.9	0.3	0.6	0.2	-
Santa Rosa	10.2	0.4	0.2	0.9	2.0	3.1	-	1.3	-	-
Sololá	6.9	6.7	3.8	1.0	4.2	0.5	2.5	0.4	-	-
Totonicapán	11.4	19.1	9.8	3.8	1.9	4.7	8.6	0.9	-	-
Quezaltenango	8.1	15.5	1.6	1.2	2.3	2.1	0.7	0.6	0.2	-
Suchitepéquez	16.4	1.2	0.3	0.9	-	3.7	-	0.2	0.4	0.2
Retalhuleu	7.6	1.0	-	1.4	2.5	-	0.4	0.4	-	0.2
San Marcos	8.4	1.1	4.4	0.3	0.6	1.5	0.8	0.4	0.4	-
Huehuetenango	8.1	2.4	7.6	0.7	1.5	0.5	-	1.4	0.5	0.3
El Quiché	10.4	6.0	6.3	0.8	3.5	-	2.5	0.5	0.5	0.9
Baja Verapaz	6.8	2.6	3.4	1.4	3.9	1.2	1.1	1.4	1.4	1.3
Alta Verapaz	9.0	1.5	4.1	1.7	3.9	0.8	1.4	0.3	2.5	-
El Petén	12.1	3.9	-	2.8	1.6	1.7	-	0.5	0.8	-
Izabal	6.4	5.9	-	1.7	2.4	0.9	0.7	0.7	-	-
Zacapa	6.0	0.9	-	0.8	-	0.2	-	-	0.4	-
Chiquimula	5.0	0.8	0.2	1.7	0.7	-	0.7	-	0.2	1.5
Jalapa	1.1	-	2.1	1.0	1.6	1.1	0.8	0.8	0.7	-
Jutiapa	11.5	0.1	-	1.6	0.7	0.9	-	0.6	0.1	-

SOURCE: Bureau of Health Services.
The population data was obtained from the 1964-1973 Census.

Table No. 32

EVALUATION OF CALORIC AND PROTEIN NEEDS

GUATEMALA, 1970

	Strata according to income				
	low 50%	medium 30%	high 15%	very high 5%	average 100%
Total calories	1326.1	2,362.1	2918.8	4234.0	2021.3
% of adequacy	61	109	134	195	93
total proteins (g)	30.7	56.9	75.5	129.7	50.3
% of adequacy	51	95	160	314	01
% calories from fat	13.2	14.5	17.6	25.8	15.9
% calories from proteins	9.3	9.6	10.3	12.3	10.0
NDpCAl%	5.1	5.3	7.2	9.8	6.0

* Adequate NDpCal% value 6.3

Source: GAFICA-INCAP figures

Table No. 33

PERCENTAGE DISTRIBUTION OF FAMILIES BY ADEQUACY OF CALORIC AND PROTEIN CONSUMPTION

GUATEMALA 1965-1967

Adequacy	RURAL AREA Calories	RURAL AREA Protein	URBAN AREA Calories	URBAN AREA Protein
< 25%	0	0	0	0
25 to 49%	2	1	0	0
50 to 74%	12	7	5	4
75 to 99%	28	19	25	14
> 100%	58	73	70	82

Source: Nutritional Evaluation of the Population of Central America and Panama. Regional Summary. Institute of Nutrition of Central America and Panama. Nutrition Program Center for Disease Contro. U.S. Department of Health, Education and Welfare, 1971, p. 135-141.

Table No. 34

PER CAPITA CORN CONSUMPTION IN GUATEMALA FROM FOOD BALANCE SHEETS

YEAR	CONSUMPTION PER YEAR Kg	PER DAY gr
* 1960	180.6	494.8
1961	179.0	490.4
1962	197.8	541.9
1963	197.4	540.8
1964	209.3	573.4
1965	204.0	558.9
1966	177.1	485.2
1967	179.9	492.9
1968	202.6	555.0
1969	197.6	541.3
1970	195.3	534.9
**1971	118.2	323.8
1972	118.6	324.9
1973	116.4	318.9
1974	105.2	288.1
1975	101.5	278.2
1976	101.5	278.0

SOURCE: * SIECA - Statistics on Food and Agriculture in Central America, 1972

** Bureau of Statistics. Ministry of Economy, Republic of Guatemala.
Data on Availability/Utilization, analysis of supply for human consumption and balance of 1970-76. Basic grains (preliminary figures) Guatemala, March 1976.

Table No. 35

PER CAPITA BEAN CONSUMPTION IN GUATEMALA FROM SHEETS OF FOOD BALANCE

YEAR	CONSUMPTION ANNUAL Kg	CONSUMPTION DAILY gr.
* 1960	7.7	2.1
1961	8.1	22.2
1962	8.7	23.8
1963	8.8	24.1
1964	10.1	27.7
1965	10.7	29.3
1966	10.6	29.0
1967	10.3	28.2
1968	10.1	27.7
1969	10.7	29.3
1970	10.2	27.9
** 1971	10.2	28.0
1972	9.9	27.2
1973	10.2	28.0
1974	9.8	26.9
1975	10.3	29.1
1976	10.2	28.1

SOURCE: * SIECA: Statistisc on food and agriculture in Central America 1972

** Bureau of Statistics. Ministry of Economy Republic of Guatemala
Data on availability/utilization, analysis of supply for human consumption and sheet of food balance 1970-76. Basic grains (preliminary figures) Guatemala, March 1976

Table No. 36

LEVEL OF VITAMIN A IN MOTHER'S MILK IN THE RURAL AREA OF GUATEMALA

CHANGES ASSOCIATED WITH SUGAR FORTIFICATION

Rural Populations from 1000 to 2000 inhabitants (1975-1976)

Survey	Percentage of vitamin A level in mother's milk with more than 30 µg/100 ml* or less	
	< 30 µg/100 ml	30 o > µg/100 ml
1**	60.7	30.3
2***	53.8	46.2
3****	41.3	58.7

* Level of vitamin A in milk considered as the initial goal of the program.

** Survey No. 1 was made before starting the sugar fortification project at the national level. Only a pilot type fortification project that included about 8% of the sugar cane crop had been made.

*** Survey No. 2 was made 5 months after starting the fortification project but before the 1975-76 sugar cane crop that ended in June 1976.

**** Survey No. 3 was made after the population had been consuming sugar from the 1975-76 fortified crop with a 75% efficiency (3,137,317 quintals fortified from a total production of 4,197,867 quintals for local consumption).

Source: Evaluation of the project of sugar fortification with vitamin A, INCAP.

Table N° 37

DURATION OF LACTATION PERIOD IN THE RURAL AREA[1] AND MARGINAL URBAN AREA[2]

GUATEMALA

	Area	% of mothers by duration of lactation period				Total 100%	(N)
		0-3 Months*	4-9 Months	10-15 Months	16+ Months		
Before 1960	Rural	4.9	7.0	38.9	49.2	100.0	(486)
	Urban	5.2	14.4	43.1	37.3	100.0	(459)
1960-68	Rural	3.5	6.2	35.2	55.1	100.0	(805)
	Urban	12.9	19.4	35.2	32.5	100.0	(901)
1969-74	Rural	3.6	8.6	41.8	46.0	100.0	(582)
	Urban	19.9	22.5	29.1	29.5	101.0	(693)
Total	Rural	3.9(73)	7.2(134)	38.2(715)	50.7(951)	100.0	(1873)
	Urban	13.5(278)	19.3(397)	34.9(717)	32.3(661)	100.0	(2053)

* Does not include children that died during the first 12 months of the lactation period nor children lactating at the present.

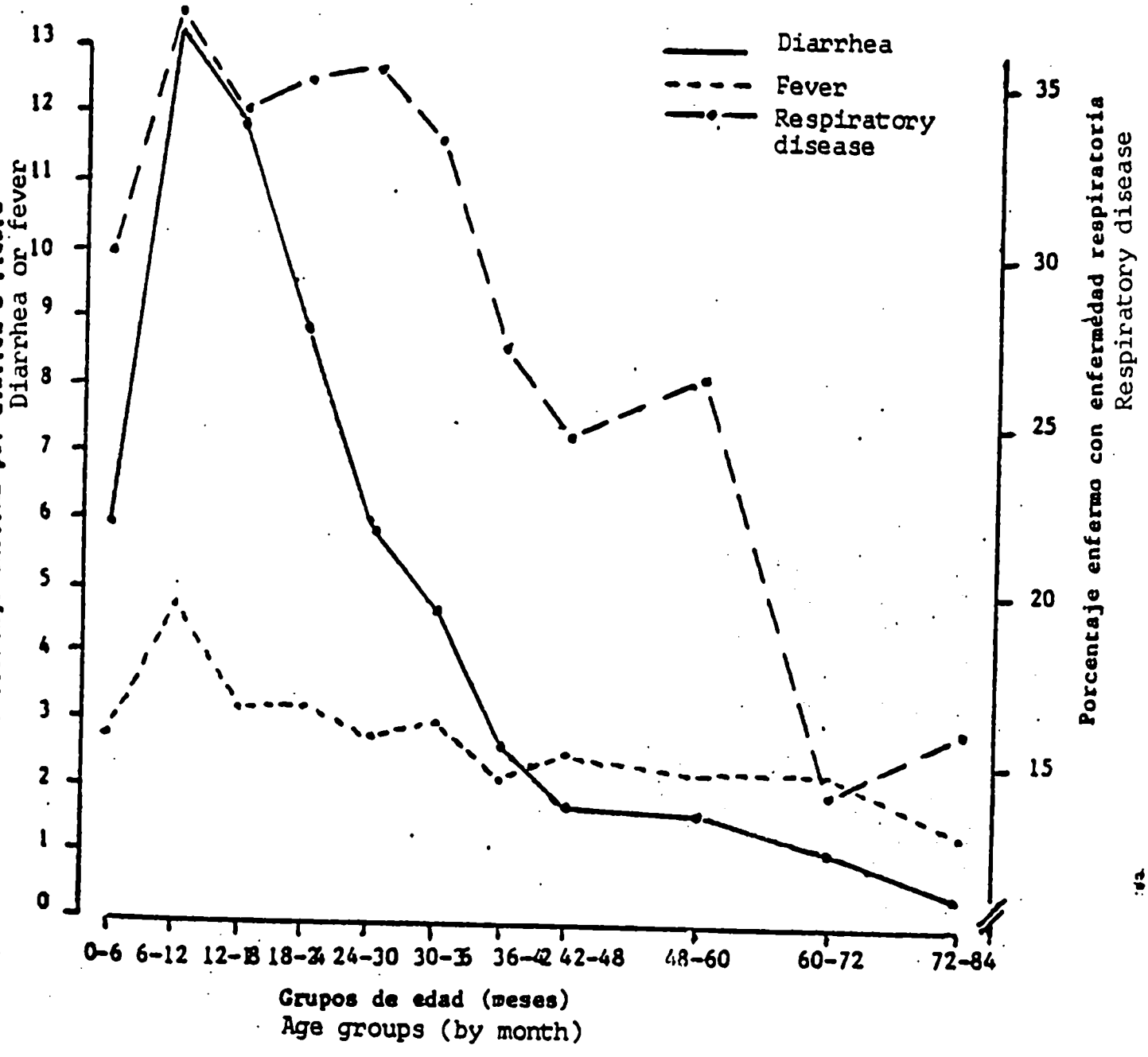
1 Four towns of the Department of El Progreso.

2 Urban area of the Municipium of San Miguel Petapa, Department of Guatemala.

Source: Teller, Ch., et al. Urbanización, Lactancia Materna e Intervalo entre Nacimientos: Implicaciones para la Planificación Nutricional. INCAP, 1977.

Chart N° 1

PERCENTAGE TIME OF SICKNESS DUE TO DIARRHEA, FEVER AND RESPIRATORY DISEASES IN GUATEMALAN CHILDREN SINCE THEIR BIRTH TO 7 YEARS OF AGE

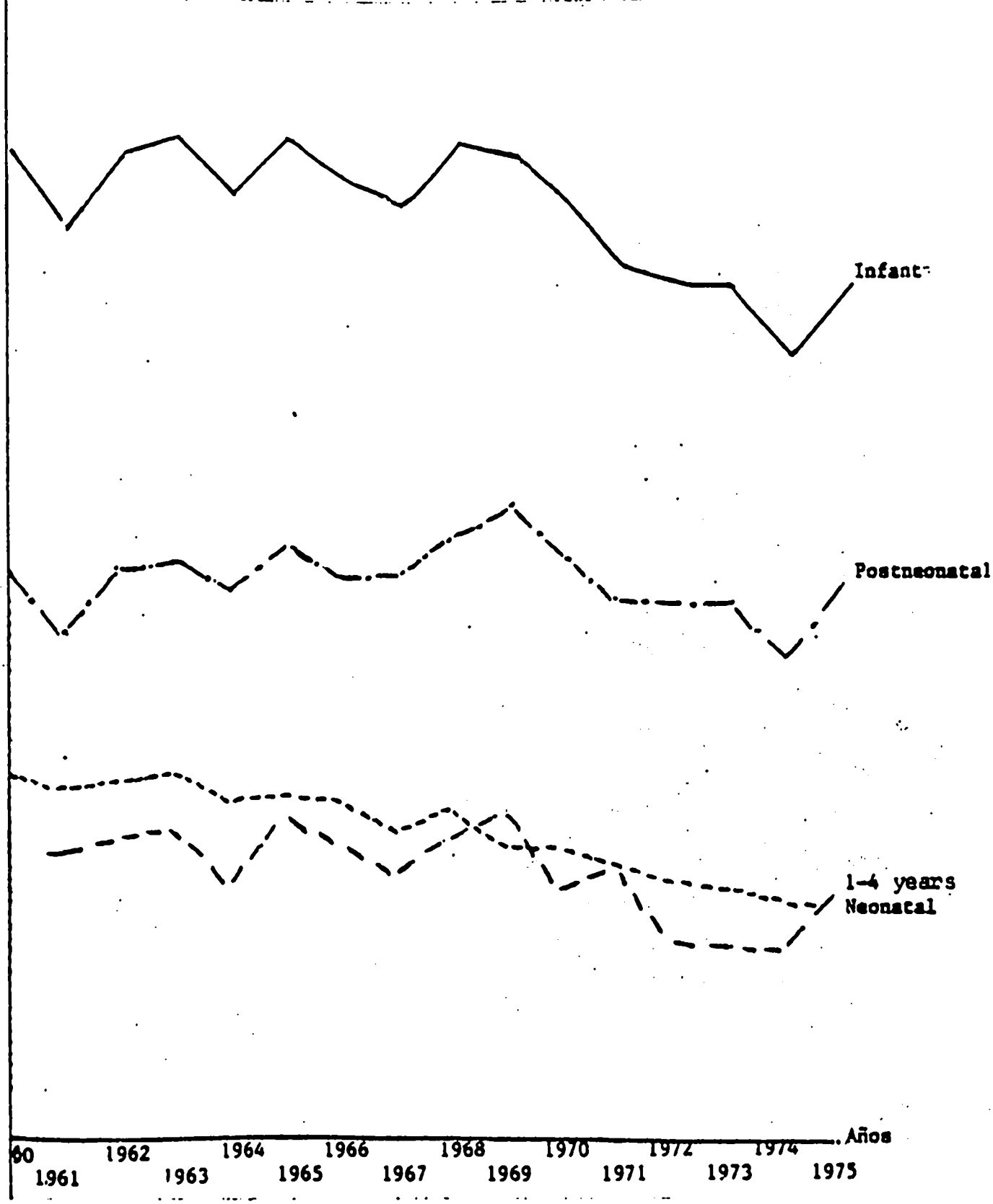


Fuente: División de Desarrollo Humano, INCAP, 1975

Source: Division of Human Development, INCAP, 1975

Chart N° 2

GUATEMALA: INFANT MORTALITY RATES, NEONATAL, POSTNEONATAL (PER THOUSAND BORN ALIVE) AND MORTALITY OF 1-4 YEARS (PER THOUSAND INHABITANTS OF 1-4 YEARS) 1960-1975



Source: For years 1960-1973, Statistical Yearbook, 1974. Bureau of Statistics. For years 1974-1975 unpublished data, Planification and Statistics Office, Bureau of Public Health Services, Guatemala.

Chart NO. 3

TASA DE MORTALIDAD DE 1-4 AÑOS POR DEPARTAMENTO
1974 -1975

Mortality rate in children of 1-4 years by Department 1974-1975

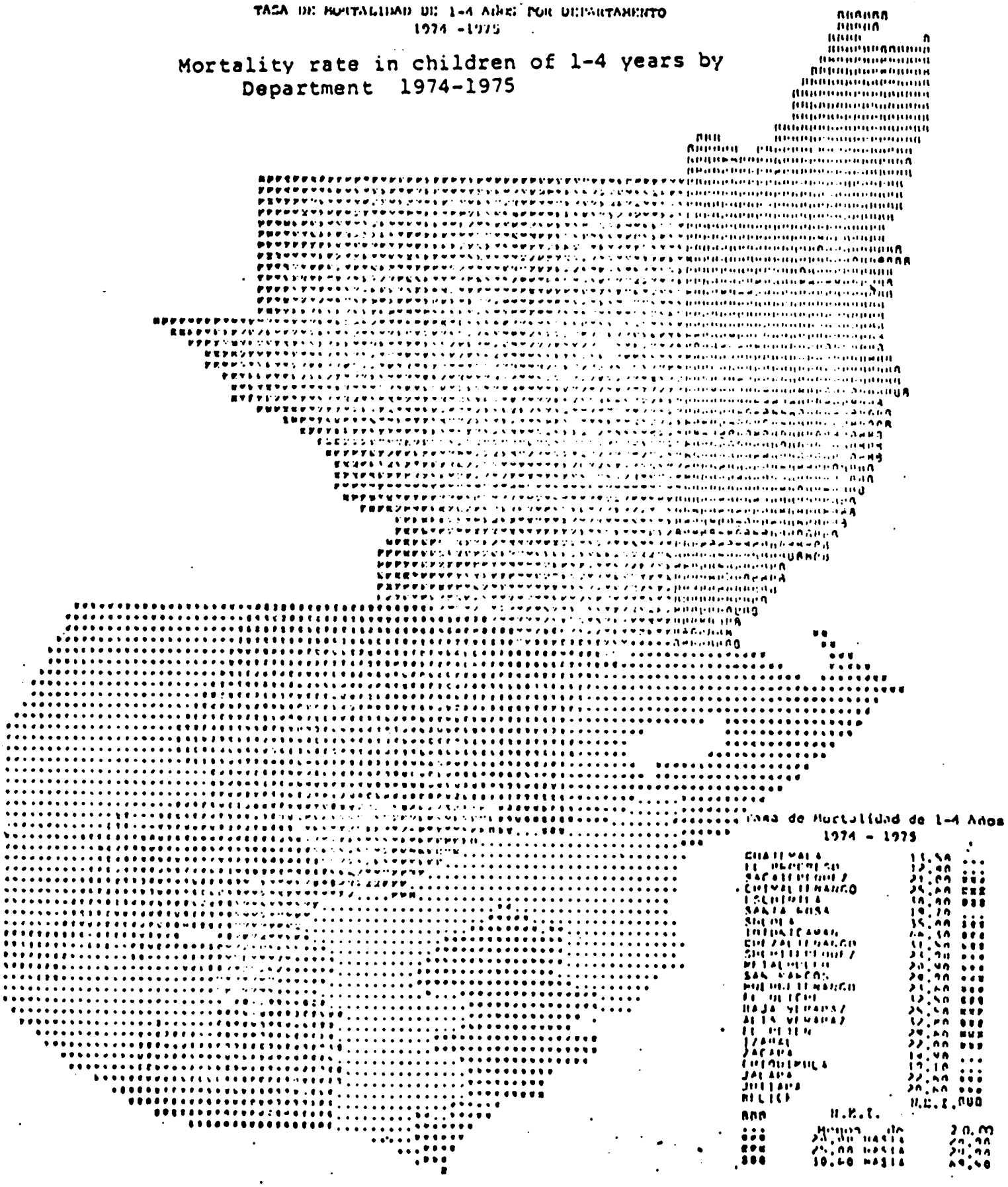
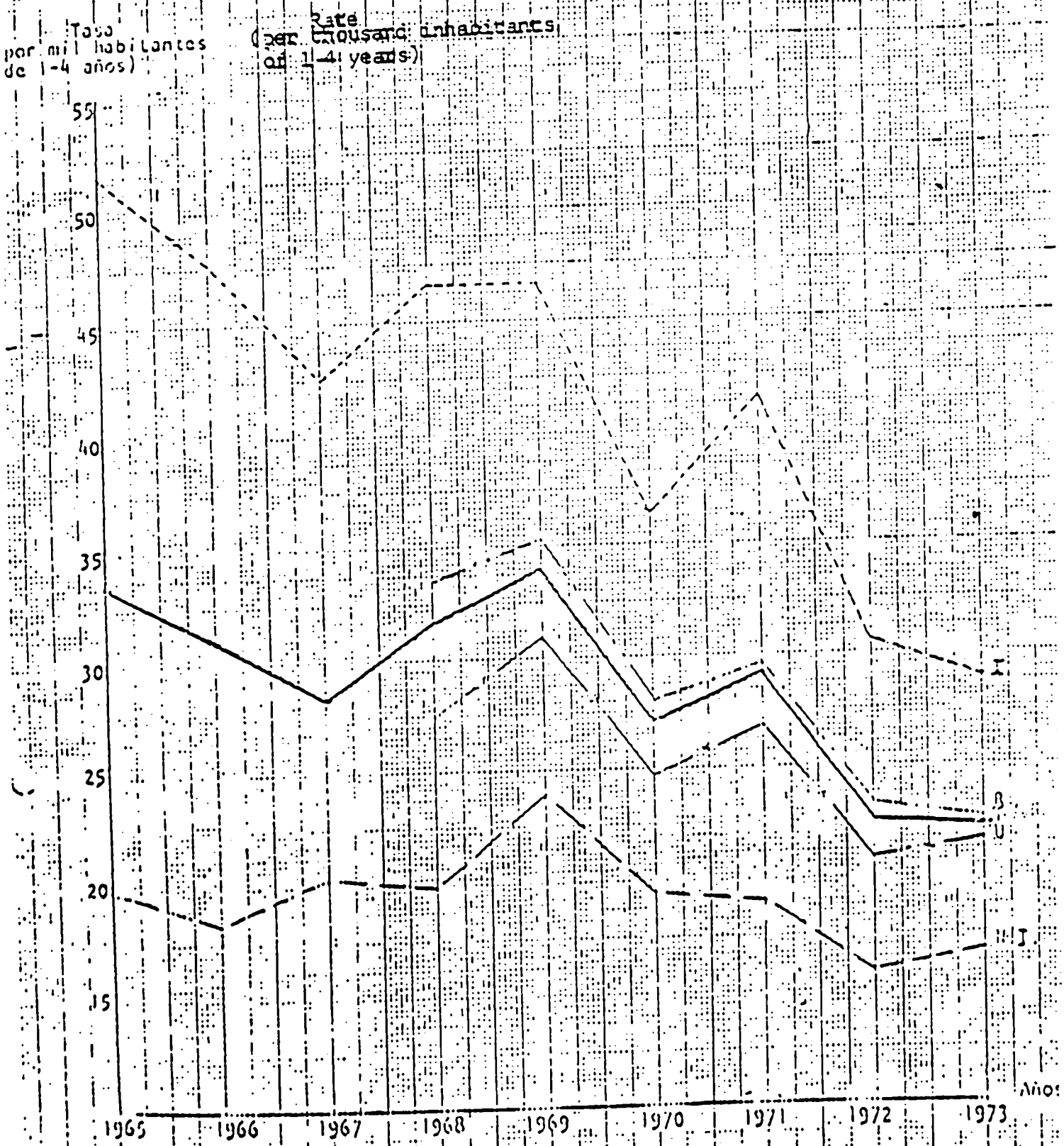


Chart No. 4

GUATEMALA MORTALITY RATES IN 1-4 YEARS OF AGE PER URBAN-RURAL AREA AND INDIGENOUS GROUP 1965-1973



Source: Vital Statistics, unpublished tabulations - Bureau of Statistics, Guatemala

Chart No. 5

Mortality rate in children of 1-2 years
By department 1973-1974

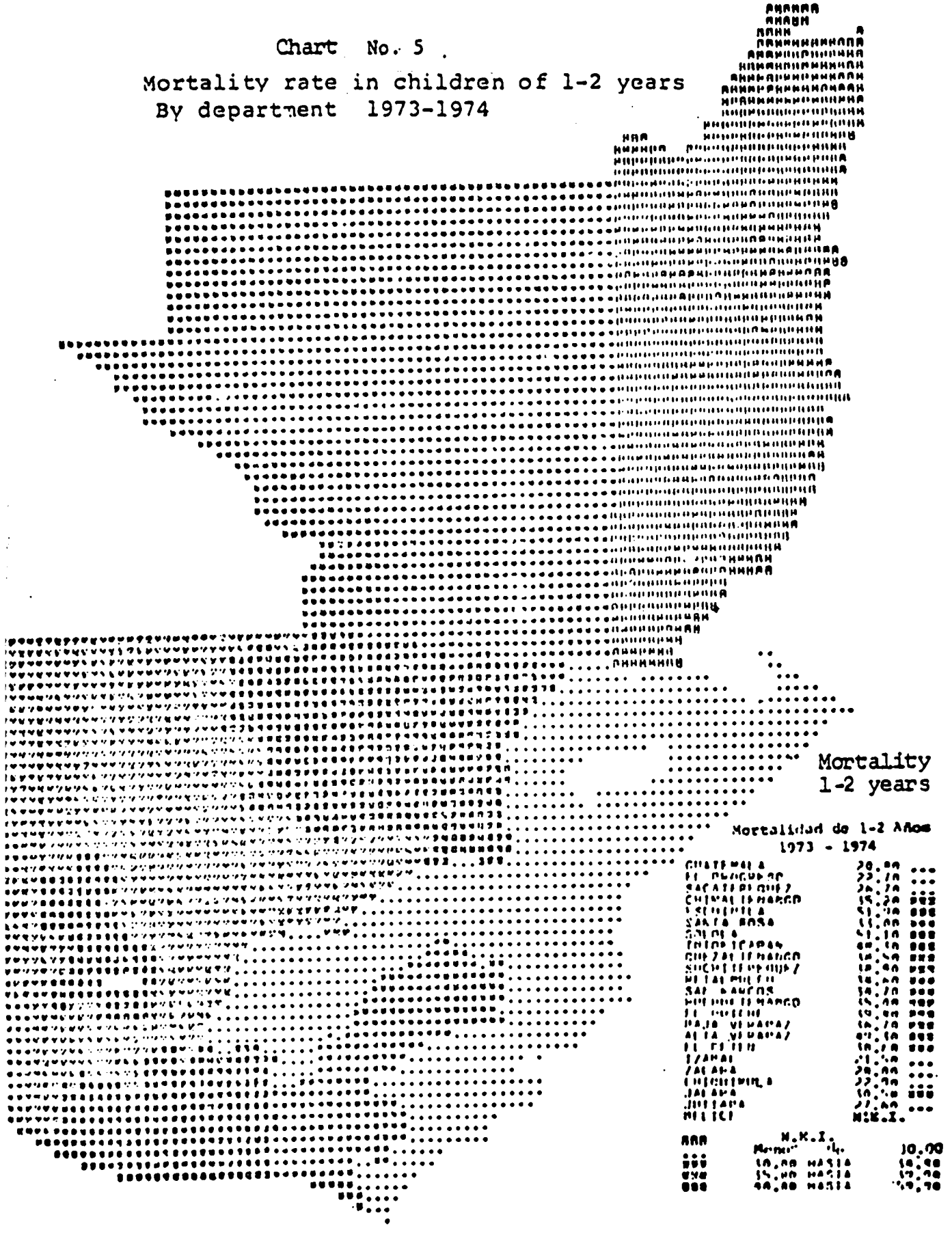
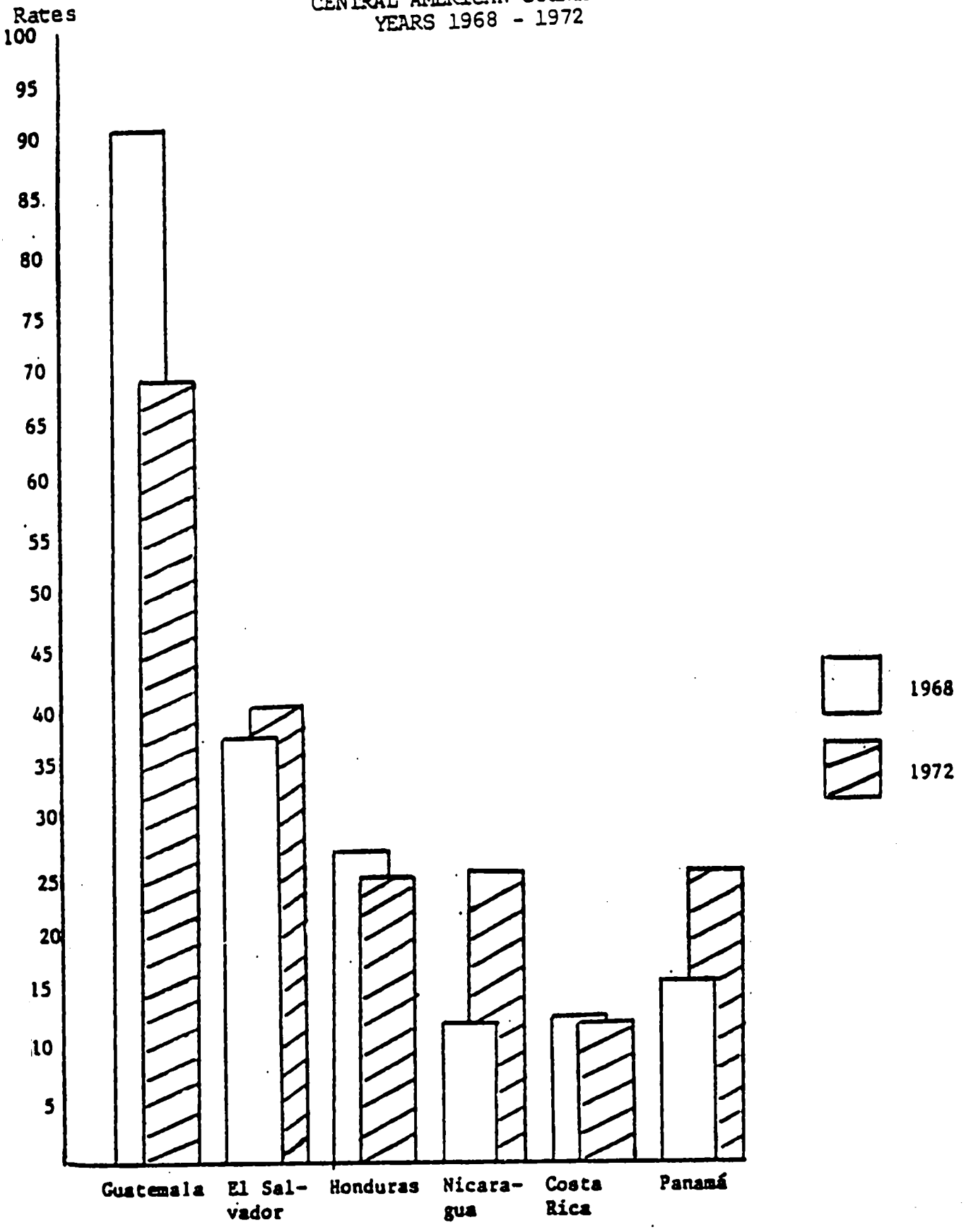


Chart N° 6

MORTALITY RATES, VITAMINS AND OTHER NUTRITIONAL DEFICIENCIES IN CHILDREN 1-4 YEARS* FOR GUATEMALA COMPARED WITH THE OTHER CENTRAL AMERICAN COUNTRIES
YEARS 1968 - 1972

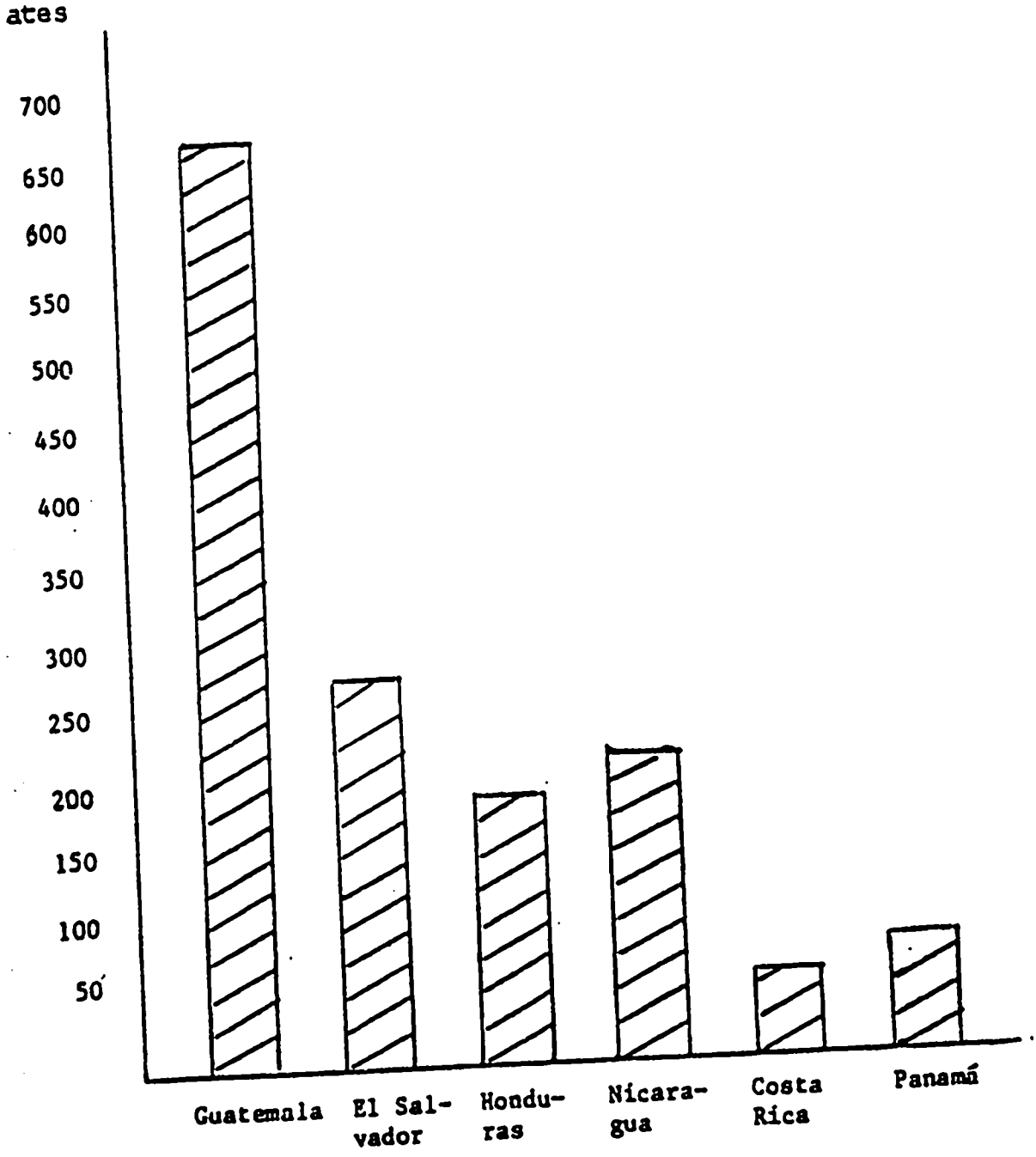


* Per 100,000 inhabitants.
Source: Las Condiciones de la Salud en las Américas 1968 - 1972, PAHO/WHO.

Chart N° 7

MORTALITY RATES DUE TO ENTERITIS AND OTHER DIARRHEAS IN CHILDREN 1-4 YEARS* FOR GUATEMALA COMPARED WITH THE OTHER CENTRAL AMERICAN COUNTRIES

1972

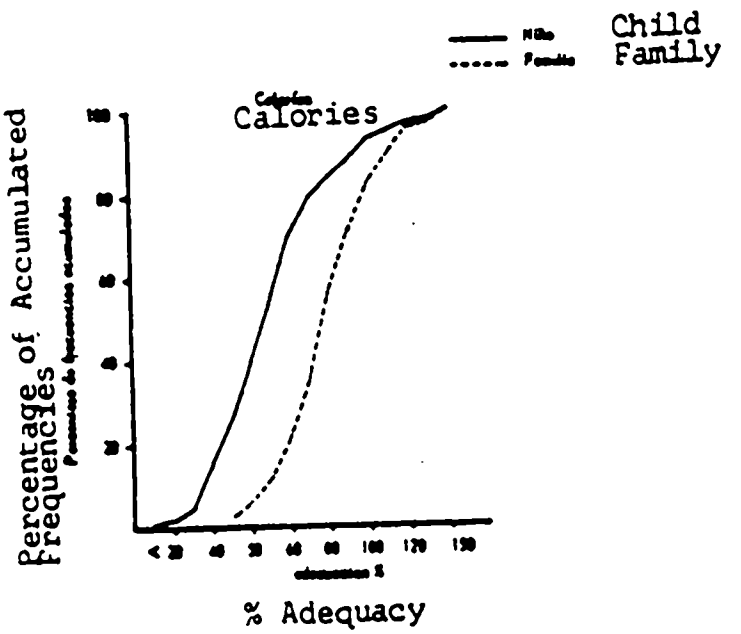


* Per 100,000 inhabitants.
Source: Las Condiciones de la Salud en las Américas, 1972, PAHO/WHO.

Chart N° 8

DISTRIBUCION DE FRECUENCIA ACUMULADA DE LOS PORCENTAJES DE ADECUACION PARA CALORIAS EN LAS DIETAS DE LAS FAMILIAS Y DE LOS PREESCOLARES DE GUATEMALA

DISTRIBUTION OF THE ACCUMULATED FREQUENCY OF THE PERCENTAGE OF CALORIC ADEQUACY IN THE DIETS OF GUATEMALAN FAMILIES AND PRE-SCHOOL AGED CHILDREN

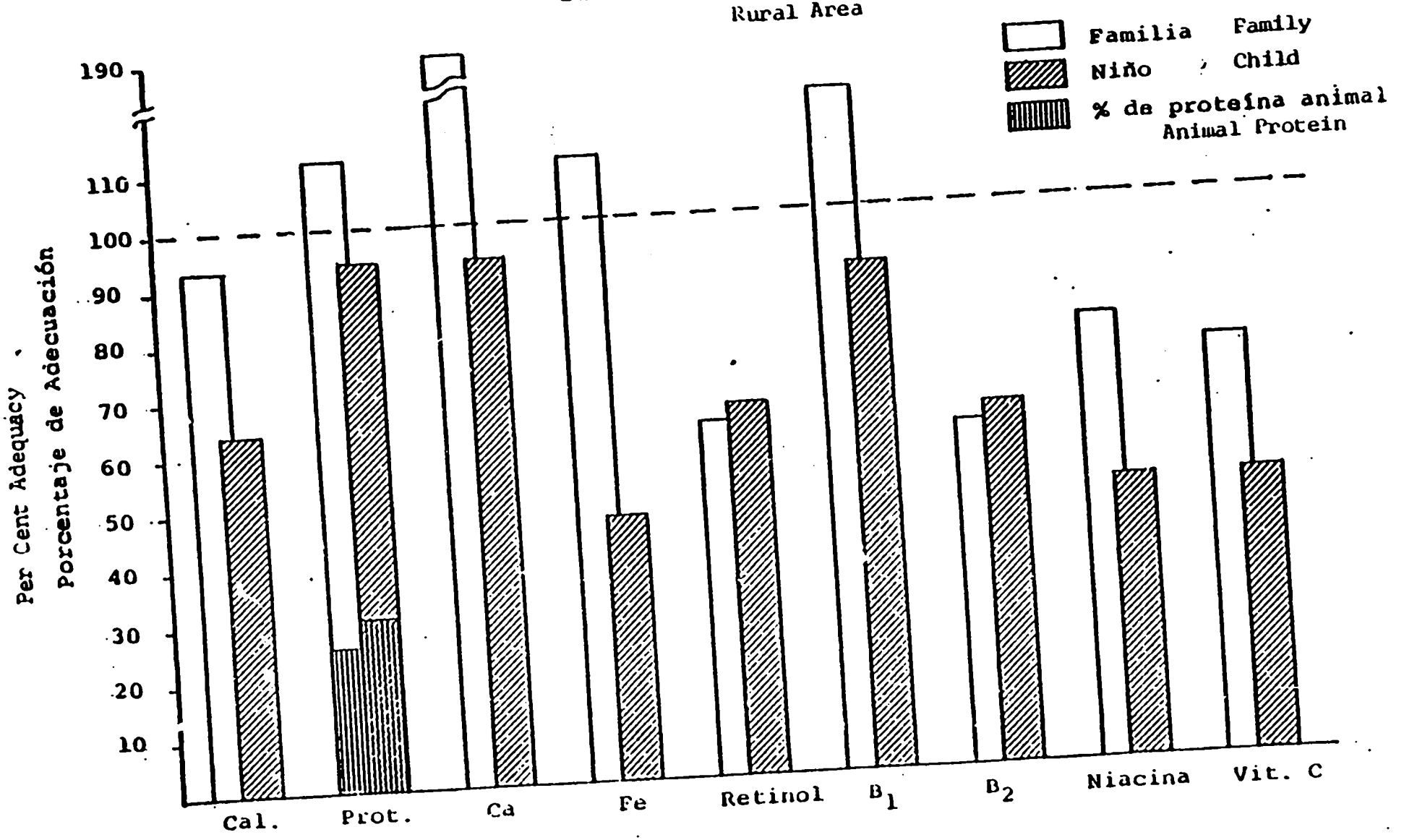


Source: Flores, M., M.T. Menchú, M.Y. Lara & M.A. Guzmán. Relación entre la ingesta de calorías y nutrientes en preescolares y la disponibilidad de alimentos en la familia. Arch. Latinoamer. Nutr., 20:41-58, 1970.

ADEQUACY OF FAMILY AND PRE-SCHOOL CONSUMPTION LEVELS
ADECUACION DE NIVELES DE INGESTA

FAMILIA Y PREESCOLAR

Guatemala - Area Rural
Rural Area



Fuente: Flores, M. Datos no publicados.

Source: Flores, M. Unpublished data.

REVIEW OF A SOCIAL SCIENCE LITERATURE ON KNOWLEDGE:

ATTITUDES AND PRACTICES RELATED TO HEALTH

NUTRITION IN GUATEMALA

Isabel Nieves
Timothy Farrell
December, 1977

INTRODUCTION

The social science literature review for the Nutrition Sector Assessment for Guatemala consists of an evaluative summary of available material on knowledge, attitudes and practices related to health and nutrition published since 1930. The review covers all geographic sections of the country. The study was limited to material available from public (and some private) resources in Guatemala City since it was not possible to travel to other libraries where more complete coverage is available. Thus, it should be noted that while every attempt was made to obtain the broadest possible temporal and spatial coverage, the report falls short in this regard. This is particularly true for the most recent academic literature in medical anthropology and sociology.

SCOPE

The definition of "knowledge, attitudes and practices" is taken in its widest sense and includes habits, patterns of behavior, cultural values and norms, beliefs, and other socio-cultural aspects of health and nutrition. Six specific health/nutrition categories have been identified. These are not conceptually homogeneous for they include not only categories of behavior, but also categories of people defined as being at greatest risk. The categories and their components are presented below.

1. Environmental Sanitation

Water supply, waste and excreta disposal, food sanitation.

2. Health and Illness

Disease classification, preventive medicine, disease etiology, disease treatment, morbidity, mortality and death, personal hygiene of mothers and children, malnutrition and dietetic deficiencies, ethnoanatomy and ethnophysiology.

3. Delivery of Medical Services

a) Traditional medical services: specialists and personnel, diseases treated, delivery process, demand and utilization.

b) Modern empirical systems: specialists and personnel, diseases treated, delivery process, demand and utilization.

c) Modern medical systems: specialists and personnel, diseases treated, delivery process, demand and utilization.

d) Health activities: Public health services, health education, community participation.

4. Foods

Food acquisition, food storage, food processing, food consumption.

5. Infants and Children

Infants' diets, infant care, children's diets, child care, hygiene and health education, nutritional status.

6. Pregnant and Lactating Women

Conceptions of pregnancy, birth, family composition and birth control, diets for pregnant and lactating women, care of pregnant and lactating women. Nutritional status.

The available literature in these categories was reviewed and classified according to a regionalization of the country based on geographic, administrative and economic criteria. The ultimate objective for each region was to construct a general and representative picture of the sociological and anthropological aspects of health and nutrition in each region.

In the following sections we present the conclusions of this exercise by region.

REGION I: (Altiplano)

Of the nine regions classified, the Guatemalan highlands has received the most anthropological attention. Consequently, it is also the region where we found the richest data on health and nutrition.

ENVIRONMENTAL SANITATION

The available data is extremely fragmentary and, therefore, of little generalizability. Details exist on water sources, water supplies and availability of drainage systems and latrines in various communities at given times. For example, in 1963 the National Indian Institute reports that in the Department of

Totonicapán only the central parts of the township had sewage systems. In 1971 San Antonio Ilotenango, Quiché had no potable water, no drainage system and no waste disposal services.

Where there is no potable water system the water is usually supplied by natural sources and wells. Where potable water is available it is generally distributed through public "pilas" and faucets (llena cánteros) located in the towns. The people usually store water in clay or plastic jars or in barrels or other objects designed primarily for other purposes. These containers are frequently left uncovered. The water that comes from these natural sources is not usually boiled.

We conclude that the data on environmental sanitation for the Western highlands is totally inadequate. There is no information on concepts of sanitation, local and regional sanitation practices, ideas of cleanliness or hygiene: nor on the attitudes, values and beliefs related to these concepts. The information that is available is too old to be contemporaneously useful.

HEALTH AND ILLNESS

The Altiplano is the region with the richest data on traditional medicine. We know that the traditional medical system recognizes a series of diseases - "sudor" or transpiration; "sangre fresca" or fresh or cold blood: and "bola" for example that do not exist in the context of modern medicine. In the same way several diseases and/or set of sets of symptoms recognized by western medicine - diarrhea and intestinal parasites, to mention two - are not classified and are not treated as such by traditional medicine. Diarrhea is so prevalent that it is not considered a pathological or abnormal state. Thus, it does not enter in the category of diseases and does not receive the treatment that is reserved for these.

In addition to having a different classification of health and illness to the western system, traditional medicine as practiced in the Altiplano does not recognize the germ theory of disease. Disease etiology is found in the actions of supernatural beings like God and the angels, in the effects of celestial bodies in their different phases, and in the ruptured balance of the hot and cold qualities of the body caused by overexposure to a hot or cold agent. This belief in body equilibrium derives from the humoral medicine practiced in classical Greece and has an historical

continuity with the medical beliefs and practices introduced by the Spaniards. At present, the hot-cold complex has manifestations that vary from region to region, but in all regions it encompasses the classification of foods, corporal states and diseases, including diseases of the mouth and teeth. The cause of illness is also found in internal body states, such as weakness, that make the individual more susceptible to external agents, such as the strong or "hot" look of a pregnant woman. The state of the blood of the person can also determine if his body is weak or strong. The relative strength of the blood is determined, in turn, by the quality of the food eaten and by the physiological states of the body, such as menstruation and pregnancy. Further, lack of food may debilitate the general body state. Another etiological category is that of physical disturbances. These are mechanical failures in bodily functioning or in body components that result in illness. Typical illustrations of this process are the fallen fontanell and stretching of the veins. The former is exclusively an illness of childhood. When the fontanell falls the child dies of asphyxia. The latter, as well as spontaneous abortion, is caused by carrying heavy loads in such a way that puts unnecessary strain on the body.

Illnesses can also originate in negative psychological or emotional experiences. Sadness or "tristeza", jealousy or "los celos" and repressed anger or "enojo reprimido"; fights and "susto" or fright, all result in physical states that are recognized as illnesses and called by the same names as their causes. In addition, feelings such as these are responsible for ailments such as heart pain, scattered bile, or "bola", a hard sensation in the stomach. Strong emotional experiences also contribute to bodily disequilibrium and they have the effect of debilitating an individual or causing him to fall sick.

Finally, disease can originate in witchcraft and evil spells. As is to be expected, illnesses can be prevented by avoiding their causes: chills and cold foods, over-exposure to heat, listening to loud thunderclaps that may rupture the sack in which parasites live and cause them to become disturbed, exposure without protective amulets to the agents of evil eye: and, situations in which children could be easily frightened. Illnesses of natural or super-natural origin can be prevented by carrying out the necessary rituals and/or keeping the blood in a strong state. The latter can be accomplished by eating foods with high contents of "substance" or nourishment.

In general, traditional preventive medicine tries to control either the internal condition that predisposes an individual to a

disease, or the external cause, immediate or intermediate, of the disease or both. The treatment of diseases follows the same logic that is found with regard to the causes of diseases. If a disease is due to a disruption of the balance of the body, due to too much heat for example, the prescribed treatment is a cooling of the body through the ingestion of herbal infusion or teas with cold properties, or by taking walks on cool dewy mornings. If the illness is caused by a sudden chilling of the body, the indicated treatment could be a thermal bath or a rubbing of the affected part of the body to let out the air or to warm up. It is also customary to prepare household remedies composed of herbs, vegetables and pharmaceutical products which are known locally. Treatment of illnesses caused by physical accidents like the fallen fountanell regularly include the manipulation of the affected members. The upper part of the child's head is suctioned or a finger is introduced into its mouth and the pallate pressed upwards to return the fontanell to its normal position. A disturbance of parasites can be cured by mechanical methods. The worms can be tamed by putting a piece of bread soaked in alcohol, "aguardiente" on the stomach and another piece on the back of the patient. "Alboroto de lombrices", or disturbed parasites, may also be cured with medicinal herbs that have the property of being bitter, so that the worms will be forced to take refuge in their sack. If the illness has origins or complications in magical relation the treatment is usually ritual or divinatory. Such treatments may include prayers to God so that he may protect the patient from evil spirits; diagnosis and extraction of the evil by rubbing an egg over the body; and the restitution of the soul to the body by means of magical actions and offers. Various kinds of treatment are often combined for the healing of specific ailments. For example, by using simultaneously ritual expression and empirical cures, or by making the sign of the cross with a twig with some medicinal herb while at the same time treating the patient with an infusion of the same herb. In general, traditional treatment seeks to remedy the internal anomalies that lead to illness, and to eliminate the external causes. Foods that contain high concentrations of "alimento" or nourishment, therefore, are prescribed when it is necessary to re-establish the strength of the body and the blood to hasten the recovery of the patient. The external cause is neutralized when it is removed by one of the methods mentioned above. The internal cause is usually alleviated by means of topical applications of medicine if the illness is limited to a certain part of the body. When the ailment is generalized, treatment is usually taken orally.

Modern medicine, mostly through the pharmaceutical companies that produce commercial medicines and their advertising, has had a

great influence in the practice of traditional medicine in the Guatemalan highlands. Traditional curing and treatment is making more and more frequent use of commercial medicines which are widely known: analgesics, laxatives and antibiotics. People incorporate new medicines to the hot-cold classifications in a fairly automatic manner. The process of incorporation is as follows: the medicine is considered hot or cold, depending on the bodily reaction that it causes (if it lowers the body temperature or condition, the medicine is cold); or according to the illness it is supposed to cure (if the illness is cold, then the medicine is hot). In this manner the Indians of Santa Lucia Utatlán have incorporated close to 20 commercially patented drugs to their traditional classification and they use these according to the dictates of said classification. In Huehuetenango it is believed that malaria is caused by sudden chilling while one works in the heat of the coast. The recognized cure is quinine, not because it helps fight virus but because it is an element with hot properties. In the same way, headache, caused by overheating is soothed by the cold properties of "Mejoral", the local name of a mild analgesic.

Recent information on morbidity, mortality and popular beliefs regarding the most frequent causes of morbidity and mortality is not available. We have sketchy knowledge that the most common illnesses, from the point of view of the people as well as from the point of view of medical doctors and researchers, are infections of the upper respiratory track, bronchitis, and gastrointestinal illnesses, parasites and diarrhea. (Parasites are known by the name of "lombrices". The disease is a disturbance of these parasites, not their presence). Throughout the Altiplano it is recognized that diarrhea is the most frequent illness among children during weaning and the first years after weaning, that is, between 6 months and 2 years of age. It is also a widespread belief that parasite disturbance is very rare among adults, and is found only in cases in which the individual was not properly cured as a child or does not take laxatives with a necessary frequency.

The information we have regarding ethnoanatomy and ethnophysiology in the highlands is relatively old (1950), and does not lend itself to generalization. We have data on organ position and function and their inter-relationships according to the beliefs of specific groups. Nevertheless, there are certain concepts about blood that are common to the region and that, according to recent reports, are still held. The amount of blood in the body is finite and non-regenerative. Each individual is born with strong or weak blood, and although this attribute is not reflected in the body or corporal capacity, the blood quality does pre-dispose the person either to contract or to be immune to certain illnesses. The date

of the birth of a person and the phases of the moon influence the quality of his or her blood. The state of the blood may change during the course of a lifetime, and tends to be weaker during infancy and old age. Menstruation and childbirth also tend to weaken the blood. Ordinarily blood is hot, although in some persons it tends to be hotter than in others. To be healthy it is necessary to maintain a certain degree of heat in the body, which means that the hot-cold equilibrium of the body is not an equal and perfect balance. Carelessness, such as working too hard or over-exposure to the sun, may also cause a disbalance in blood temperature and may debilitate the blood, making an individual more vulnerable to sickness. On the other hand, when the blood overheats, as in the case during pregnancy, and when the person is in a drunken state, people can acquire special powers and unconsciously may give children the evil eye. The blood usually, but not exclusively, runs thorough the veins. In the Altiplano the veins are all those bodily organs that have the form of a channel or conduit. Thus, tendons and intestines are also considered veins or blood conduits. The veins are connected to the walls of the stomach, and through them strength runs to all parts of the body. It is also believed that the veins are connected to the kidneys, in the lower part of the back. That is why when one suffers from stretching of the veins one also experiences pain in the lower back.

Delivery of Medical Services

The knowledge derived from the literature about traditional medical practitioners, known locally by such names as "Sajorines", "Chimanes", "Characoteles", "brujos", "curanderos" and "parteras", is very limited and old. In the Altiplano the medical specialist may be a full-time specialist, but in most cases he practices shamanism and agriculture as dual specialities. Each population group recognizes different types of shamans: the empirical or practical shamans; the professionals that have a stable clientele and who charge for their services and have an esoteric knowledge; and predestined mid-wives.

Modern empirical specialists and the doctors and paramedical personnel of western medicine, although recognized as specialists, constitute a different group. Each village also has its own hierarchy of traditional medical specialists based on prestige and the recognition that each practicing specialist obtains.

The shaman charges for his services and the amounts charged are determined by the type of shamanism that he practices and by his position in the prestige scale. It is very common that the shaman,

using this term in the generic sense, charges only for the cost of the products he uses during treatment, and for him to receive, in cash or in kind, amounts dictacted by custom as gifts and not as payment.

More is known about the recruitment of very specialized healers, such as mid-wives, than about the recruitment of shamans in general. Any process of identification of an individual as a shaman has elements of pre-destination and revelation of his destiny. Shamans, as well as mid-wives, are identified as such at the moment of their birth by markings in their umbilical cords, the placenta, or by uncommon circumstances surrounding the event of birth. Many times the discovery of predestination is made through dreams, revelations from supernatural beings who made the selection, and other signs such as illnesses, finding strange objects in one's path, and through omens. If a woman does not follow her destiny or mandate to be a mid-wife she will be punished by supernatural forces and she will fall ill, almost always fatally ill. Once the destiny of the mid-wife has been discovered her training begins. Regularly the mid-wife learns her trade by observing, imitating and assisting other mid-wives. Nevertheless, mid-wives insist that their knowledge was also the product of supernatural revelations in dreams or visions.

Different kinds of medical specialists treat different illnesses according to their etiology. The empirical shaman treats illnesses that derived from physical causes, like a stretching of the veins. The professional curer does a "costumbre", that is, he practices magico-religious rites to treat illnesses that also have supernatural origins or components. The empirical shaman treats epidemic illnesses, such as whooping cough and measles, illnesses that are sent by God, and uses medicinal herbs and plants almost exclusively. There is a third type of shaman which is a combination of the two categories mentioned above. The midwife can be a curer as well, but only treats abnormalities or pathologies that surround pregnancies, births and newborns. All traditional medical specialists treat, of course, only those diseases that their assumptive system recognizes as such: "susto" or fright, "mal de ojo" or the evil eye, "caida de la mollera" o fallen fontanell, and the disturbance of parasites, for example. In addition, they treat illnesses that belong simultaneously to their assumptive system and to that western medicine -- typhoid and malaria for example -- although the causes of the illnesses may be different for each tradition. The spiritist deals with the spirits who are responsible for the illnesses that humans suffer. They are said to know the best methods for handling these

beings. Finally, witches practice cures for illnesses that are caused by evil or black magic. It should be noted that this typology has local variations and permutations throughout the highlands.

In the available literature there is no specific information on the delivery process, and the demand and utilization of tradition medical services. What we do know is that the delivery of traditional and modern medical services, as well as the utilization, are determined, to a certain degree, by the fact that the majority of the population is oriented towards disease and not towards health. The typical attitude is one that expresses preference for the utiliz tion of curative medicine and not preventive medicine. People seek medical services as a last recourse when the illness has acquired critical or severe proportions.

In regard to modern empirical systems, the sphere of medicine where knowledge, attitudes and practices belonging to traditional and western medicine overlap, the information is extremely inadequate. There is a study that refers specifically to this overlap but it is of very little use for generalization. The area of widest overlap is the incorporation of western medicines of commercial production to the concepts and practices of traditional treatment. Pharmacists, who are the widest distributors of these products, are the medical personnel that most often exhibit the influence of both systems, followed by empirical mid-wives who have received training courses in modern medical practices. The overlap of native and modern systems has meant the amplification of the conceptual frames that are the bases for the traditional beliefs. For example, the concepts of "alimento" or nourishment, and "fresco" or fresh -- a label that identifies an intermediate category between hot and cold -- are used to accommodate and reinterpret new concepts that are derived from modern medicine. There is reason to believe that the use of these concepts also marks a change in the traditiona ideas relating to the connection between food and health.

Although much has been said and speculated on the acceptance and utilization of the services of western medicine by the population in the rural areas of Guatemala, very little exists in the social science literature of the highlands about this problem. There is a clear preference for the services and the personnel of traditional medicine, a preference that is explained by noting that the clientele participate in the same assumptive system of

traditional medicine. It is believed that they feel more afinity with a faith in the medical personnel of this system; that there are no cultural barriers that must be overcome when one seeks these symptoms and complaints of the population in question as bein real and valid, while modern medicine rejects them or relegates them to the category of psychological aberations, fantasies or neuroses. Finally, it should be noted that for these same reasons traditional and modern medical systems do not constitute for the rural populations, contrary, opposing or competitive systems. There is a well-established hierarchy of utilization of services that allows us to identify the order of sequence in which they are sought. Furthermore, the simultaneous use of two or more medical systems is documented, although not for the full geographic region. We expect that further investigation will reveal that the same is happening in the western highlands of Guatemala. We do know wit some degree of certainty that the most common obstacle for the demand of utilization of modern medical services is the form of delivery of these services and the personnel that represent modern medicine in the rural areas of the highlands.

Little is known regarding the acceptance and the use of public health services. At the present time there are no systematic evalu tions of the socio-cultural aspects that intervene in the decision of the population to seek public health services through health pos and health centers, public hospitals, vaccination and public sanita tion campaigns, etc. Many of the critiques and obstacles mentioned before with respect to the modern systems in general can be applied with more frequency to the public systems of delivery than to the private ones. Health education and environmental sanitation campaigns have also received little attention and systematic evalua tion. The collected information is not sufficient to propose causes of the relative failure of the education programs. It could be proposed, as an hypothesis to be tested through field work, that the public health services as well as the health education programs are designed and implemented in such a way that to partici pate in them one must totally reject other existing medical systems The exclusive character of the delivery of modern medicine is one of the principal barriers impeding the success of said programs.

Food

Food production systems in the Altiplano are well known. Land is held in small plots; it is exploited to the maximum. Agricultural strategies are mixed for cash and subsistence purposes. The

Indian populations of the Altiplano in Guatemala have practiced since colonial times, and perhaps since pre-columbian times, agriculture specialization of one or more products by town or township (municipio), thus creating an exchange network of commercial interdependence that manifests itself in the marketing networks.

Patterns of food consumption for these populations have been described in detail by dietetic and nutritional studies. Here we touch only on those points that relate to the significance and value that people give to food and its consumption. There is very little information in the literature on this specific matter. In their majority the descriptive works in the social sciences have been ethnographic and are very general. They contain little substantive information on food, its acquisition, storage, preparation and consumption, and on associated values, beliefs and attitudes.

Local varieties of squash, corn, beans, and hot peppers are the fundamental basis of the common diet in the Altiplano. These foods have been traditional since pre-columbian times. Subsistence agriculture, with its unending cycle of uncontrollable surplus and scarcity, makes food and its acquisition a real focus of interest and preoccupation for the populations. This is reinforced by the incorporation of overall magico-religious rituals of the population. The Indians of the Altiplano supplement these foods with others: vegetables, bread, sugar and coffee, that are purchased with the profits obtained from the sale of products cultivated for commercial purposes. The agricultural cycle does not end until the product is sold, when sellers become buyers of products needed for consumption. Thus, the regional marketing centers serve important roles in both commercial and social exchange. As was mentioned above, the concept "alimento" or nourishment is in the process of popularization and/or redefinition in the Guatemalan highlans. All food considered "alimento" -- meat, poultry, eggs, and milk, among others -- is highly desirable and simultaneously difficult to obtain. Often these products are simply in scarce supply. Mostly, however, they are simply outside the economic possibilities of the population.

The traditional diet components, hot pepper most of all, also have some kind of nutritive value for the population, but it is of another nature. For the Indian, hot pepper or "chile" is

indispensable in the diet, because it is the only
and strength for hard work. Hot chile sauce or "chirmol" or green chile, constitute an integral part of most meals. Chile and alcohol or "aguardiente" are foods that have particularly hot qualities, according to the conceptual scheme presented above, and, therefore, are taken to give warmth to the body. The classification of foods as hot or cold varies from region to region. Further, it is not strange to encounter local variations, and even different opinions with respect to the classification of one or another food in a given population. What is constant, however, is the existence of such binary classification, the attributes that each category has, and the relation between the categories. A particular food item has the permanent (in any single conceptual classification) attribute of being hot or cold. It cannot be classified as hot in one instance and cold in another. Cold foods, although they are prescribed to treat certain ailments, are potentially more harmful than hot foods. The hot or cold quality of a food item may be determined in two ways. It can be an inherent quality of the food item, or by exposure to hot or cold elements, as for example, the sun and the water. Beliefs regarding the inherent qualities of foods and ideas about their relative values in the treatment of illnesses, find a mutual accommodation in the concept of "alimento" or nourishment that we presented above. The little we know about the process of creation and incorporation of this idea to the conceptual framework established in the culture, makes us think tentatively that the category "alimento" occupies an intermediate position, and therefore an ambiguous position, between that classified as food and that classified as medicine. The concept is of a different etiology from food and medicine, and may serve as a bridge of transition between these. That is, it contains foods that are healthy and that, as well as medicines, restore health and strengthen the body. It is interesting to note that under the label "alimento" fall many elements that recently have been introduced into the diet of the Altiplano. These include Incaparina, Tónico Vigorón (a high energy syrup used as a food supplement), tea and spaghetti, as well as food objects that are relatively more expensive, hard to obtain. In addition, these are considered prestigious, like milk, eggs, liver and bread. The category food (comida), on the other hand, encompasses all the edible products that are common and form part of the basic diet.

It is even more interesting that many of the products considered as "alimento" or nourishment are, at the same time, classified as

fresh, the category that corresponds to the intermediate position between hot and cold. In this way the expansion of the binary opposition between medicine and food by the introduction of the category "alimento" has a direct correspondence in the expansion of the hot-cold classification to incorporate the new category "fresco" or fresh. Further, fresh foods have the advantage of being good foods for the person who eats them because they can be eaten when the body is either in a hot or a cold state. There also appears to be a close relationship between the tendency to classify new elements as fresh and to reclassify old elements as cold or fresh, and the level of acculturation or modernization of the person who is classifying. Young Indians use the classification or label "fresh" more than old Indians, men more than women, and those who are in the process of ladinization more than those who are not. We conclude, tentatively, that the concept "fresh" allows not only the accommodation of the new concept "alimento" into traditional cognitive patterns, but also permits the incorporation of new elements and new nutritional information to the conceptual framework that orders and gives meaning to food and its consumption.

Infants and Children

Of all the categories of information researched, this one, which includes diets and care of infants and children, hygiene and health education, is poorest in terms of the quantity and quality of data obtained. Beliefs and practices regarding breastfeeding and weaning, treatment of sick children, and the supervision of children while eating, for example, are documented for one or two population groups exclusively. These are so old that it is doubtful whether they can be generalized. We find considerable variation in breastfeeding practices, in the beliefs regarding the colostrum, in the length of the weaning period, in the methods used for weaning, and in the introduction of supplementary feeding. In some places the colostrum is not considered food or milk and it is not given to the new borns. In others the baby is put to the breast as soon as he is born. We do not have sufficient information to determine what percentage of the mothers wean in an abrupt manner and how many do it in a gradual manner. In some cases the mother continues to breastfeed even after she has discovered that she is pregnant with another child. In other cases she weans the child abruptly as soon as she finds out about the new pregnancy. There are certain beliefs that are very generalized.

The food that the mother eats while she is breastfeeding can influence the quality of the milk and, consequently, the physical state of the child. If one eats too many cold foods this may cause the maternal milk to become cold and harm the child. When the lactating mother becomes angry her milk can also cause the child to become sick.

We have no information regarding the care and diets of older children, if they are supervised while they eat, and bathe, or if they are under the care of older siblings or other maternal surrogates.

Pregnant and Lactating Women

The Indian women of the Altiplano tell either their mother or mother-in-law about their first pregnancy. Embarrassment usually prevents them from telling directly their husbands. We have no information regarding the methods that are used to determine pregnancy. The husband or mother of the pregnant woman makes a ritual visit to the mid-wife and requests her assistance sometime between the third, fifth or seventh month of pregnancy. Prenatal care in traditional medicine consists of periodic visits that the midwife makes to the pregnant woman during which she tries to determine the sex of the fetus by means of divination. She estimates the date of birth by palpating the abdomen of the mother, and corrects the position of the fetus by means of massages and prayers. We have no quantitative or qualitative information about the utilization of, and the attitudes towards, modern services of prenatal care. There is no available information on the degree to which hospitals, clinics, health posts and health centers are used during childbirth. The midwife burns incense in front of the sweat bath or "temascal" and prays to the saints, to the world God and the spirits, invokes the help of widows, orphans and other midwives, so that childbirth will be easy and free of complications. It is believed that the pregnant woman, as well as the fetus, are in a stage of debility or weakness, and are susceptible to all classes of diseases, most of all to "susto" and to the evil forces. A pregnant woman is in a hot state but after she gives birth her body becomes cold.

We know very little about the childbirth process itself and the beliefs surrounding the event. The Indian woman usually gives birth kneeling or squatting, almost never in a horizontal position. Usually she gives birth with the help of the midwife, her husband, her mother, and her mother-in-law. After childbirth the baby is ritually purified and physically cleansed. The placenta and the umbilical cord have symbolic value and are handled as powerful objects. Regularly they are buried near the "temascal" or hot bath, near the house site, at the foot of a tree, or in another place that also has symbolic significance. The mother also

receives special treatment after childbirth. There is a ritual purification and she receives special foods that are symbolic of her new social status, and intended to improve her physical state. The mother and the child take baths in the "temascal", to get warm, because now they have entered the cold phase. The mother alone continues these ablutions for fifteen to twenty days after childbirth The mother and child are given drinks or infusions called "tomaditas" "atolitos" or "aguitas" that strengthen them and supposedly prevent the mother from having post-partum complications.

Complications of childbirth and post-partum, when they occur, are punishments sent by God for some sin that the mother or her husband have committed and have not confessed. The number of children that a couple will have is "God's will". Nevertheless it is possible to determine the number of children that a woman will have or is destined to have, and the sex of each one, by examining carefully the umbilical cord of the firstborn. Each protuberance designates a birth, and the interval between births. There is no solid information about preferences for the sex of children; spontaneous or induced abortions; treatments of and attitudes toward sterility; ethnoanatomy and ethnophysiology of reproduction; ideas about fetal development and child development; or, on the relationship between the sexes. There is no data available on attitudes towards reproduction, number of children wanted, ideal family in size and composition, use of contraceptives and the beliefs associated with these practices, nor on the concept of family planning.

In addition to the ablutions and ritual meals, post-partum care includes periods of seclusion and reduced activity, ritual proscriptions on diet and sexual relations, and abdominal massages. If the norms on sexual abstinence are broken the newborn could die. It is also very common to find the use of sashes in the adbominal region after childbirth to maintain internal organs in their place and prevent any complications that the woman might have in subsequen births. All these precautions are accompanied by rites and prayers that are conducted by the midwife, a shaman, or both. The information available on the diets of pregnant and lactating women is unrepresentative and superficial. We know of food taboos, the content of which is based on beliefs and magico-religious practices tha vary from place to place. Diet restrictions for women who have just given birth and for women who are lactating are generally related to the hot-cold balance and to the effects of certain foods on maternal milk. Unfortunately there is no other information.

Region II Ixcanchichoy

There is no available information.

REGION III Coffee Belt

This region does not constitute, from an anthropological point of view, an area distinct and separate from the Western Highlands. The ethnic categories are essentially the same: the linguistic groups are the same or belong to similar linguistic families; and, the two regions participate of the same history and tradition. For these reasons they are considered to be one and the same cultural unit. Much research has been done on populations found in the Coffee Belt, but they have been considered as populations belonging geographically and culturally to the Highlands. In the literature review we found that the socio-cultural data on health and nutrition in this region are, in the majority, local variations of the knowledge, attitudes and practices recorded for the Western Highlands. In this way the cultural unity of the two regions is corroborated.

The data on environmental sanitation are as scarce for this region as they are for the highlands. We know, nevertheless, that for the communities that border Lake Atitlán, the lake has a very important position in water provision for consumption, in personal hygiene and in domestic labor. The "chuj", as the thermal bath is known in this region, may have a secondary position in personal hygiene and even in the practice of ritual ablutions and curing. One reason suggested for this is that the representatives of modern medicine have strongly discouraged the practice as being anti-hygienic and without much therapeutic value. The majority of the population now bathes in the lake. In communities where potable water systems have been introduced, the lake is no longer always the principal source of water. Little by little, the socio-cultural aspects of courtship, and other forms of intersexual relations that were once related or associated with the trips to the lake to collect water have been modified.

Illnesses

The Indian populations of the Coffee Belt share the same world view and the same medical-religious assumptive system as the Indians of the Altiplano. The generalizations regarding disease etiology, classification, symptomatology, prevention, and treatment that were made for the Altiplano can be extended to this region as well. In

this region much more data has been collected and reported on the supernatural causes of illness. The belief that there is an undeniable correspondence between the misfortunes of illness and death, on the one hand, and violations of the moral code on the other, is very popular. When a person does not meet his obligations towards the living and the dead, to God, the angels and other spirits, when he sins against the corn and the rain, or when he is adulterous, he will receive an illness as punishment. Further, it is believed that each person is born with a luck or destiny that is pre-established and that it determines his propensity to illnesses and to the possibility of curing and recovery. Prevention, in this case, will not serve any good purpose. This can explain in part the emphasis that the majority of the population has towards curative, as opposed to preventive, medicine in general, and the orientation towards illness and not health. This attitude is also reflected in the behavior of the demand for medical services, be these traditional or modern. The first and most frequent behavioral alternative in the face of an illness among ladinos, as well as Indians, in this region is to ignore symptoms and not seek treatment. The second alternative, in order of frequency and sequence, is self-diagnosis and treatment with household remedies. Finally, one resorts to specialized treatment by traditional and/or modern medical professionals. Ladinos tend to seek professional medical help earlier in the curative process than do Indians. The behavior of the Indians with respect to utilization of medical services is more heterogeneous than that of ladinos. The Indians tend to utilize more than one source of services and from different traditions: the shaman, and the druggist, the shaman and the doctor, and in most cases, the nurse/doctor and the druggist. The patient may alternate among services or utilize them simultaneously, depending on his socio-economic status, his clinical history and the type of illness. It is common to find that the curative therapist utilizes therapies from different traditions. In the region of Lake Atitlán, for example, the shaman usually treats illnesses with potions whose ingredients are not only medicinal herbs and ritual paraphernalia, but also tablets, syrups and other medicines that he himself buys in the drugstore. A complementary belief is that the efficacy of the medicine is not always the function of the professional who prepares and/or prescribes it, nor of the medical system to which it belongs. The efficacy of the medicine depends on the "life" that it may have. If the medicine no longer has "life" it will not have the desired effect. It should be noted that these beliefs are not homogeneous. Competing, and even contradictory beliefs may coexist in the same system. The effects of the publicity of the pharmaceutical companies,

of the processes of social mobility and migration, are the increasing prestige and credibility of modern medicine, and especially of commercial patent medicines.

Available Medical Services

Of all the traditional medical specialists, the one that has the most regional and local variation, is the midwife. In the Altiplano as well as in the Coffee Belt, we find that midwives can be predestined and are highly specialized, or barely constitute a special role in the culture. She may have the recognition and prestige of the town or she may be feared and avoided. She may have sacred status or she may be a lay-curer or shaman. She can admit that she received her training and knowledge by means of observation and training, or she may claim that all her knowledge is esoteric and obtained through mystical revelations. Any midwife, however, is considered different from other women, and she enjoys certain social privileges. Midwives also sometimes have the power to cure feminine sterility. This depends on the definition of the specific role-content of the midwife and of the cause of sterility. When a midwife has the necessary knowledge to cure sterility in women, this knowledge usually involves the manipulation of secret objects and other ritual paraphernalia. It is believed that masculine sterility is caused by feminine magical powers, especially by the powers that women acquire from the genital organs and from menstrual blood. Female reproductive organs have a certain secret power that causes men to turn lame if they are exposed to them. A women, therefore, should not walk over her husband or his agricultural tools. A man should avoid touching the work tools that are exclusively feminine, like the grinding stone, so that he will not turn sterile. Menstrual blood has magical powers, and women that use their menstrual blood to perform black magic or to cast spells are considered witches. There is no information on how masculine sterility is cured.

The same type or types of traditional specialists exist in the Coffee Belt as they do in the Altiplano. The illnesses they treat, the types of treatment and the forms of delivery of the medical services in traditional medicine continues to be high, despite the campaigns of official public medicine. Some reasons for this were given in the previous section. Another, for the Indian, the supernatural component is ubiquitous in disease, and they would rather consult a specialist who takes this into account during treatment. The traditional specialist is sympathetic to the patient's problem,

to the family's misfortune, and treats the patient holistically, and not simply the physical illness. In this manner he fulfills some of the psychological requirements of his clientele. The modern medical practitioner often assumes an impersonal attitude and simply treats the specific illness episode. Further, the fees of the modern doctor generally continue to be higher than those of the shaman.

There are conflicting reports that indicate or imply that shamanistic practice is on the decline and that there are less and less contemporaneous traditional specialists. This is reported more for the area of Lake Atitlán than for the mountainous region of the northern portion of the Western highlands. At the same time, empirical modern medicine is undergoing a vast expansion. Practitioners of this system include empirical therapists, druggists, store owners who sell and prescribe commercial medicines, people who give injections, empirical midwives, as well as representatives of official medicine. Spiritists, usually ladinos, also enter in this classification. The demand for services of these empirical practitioners also is on the rise in this region. The population is said to be somewhat predisposed to incorporate new treatments and practices, accommodating them in most cases to the traditional ones. In very few of the cases do modern practices come to replace traditional ones completely. What does not occur, nevertheless, is a change of medical beliefs corresponding to changes in medical practices. People are capable of incorporating new treatments if they see that these give the desired results. It appears unnecessary to accept the assumptive system or the basic knowledge of a new type of medicine. Changes in ideas and beliefs regularly are slower and more complex than changes in practices in the field of medicine. It must be noted that these conclusions have been inferred from various ethnographic studies that report findings of limited scope. It is also important to note that the conclusions are infrequently based on information collected through quantitative methods using representative samples. Often they are based on the impressions of the ethnographer, on the reports of some key informants, and on the direct observations of medical behavior in a small population. What one can conclude with some degree of certainty is that the demand of modern medical services almost always exceeds the supply.

Foods

There is very little we can add here with respect to the beliefs, attitudes and practices towards food. The hot-cold classification, and the distinction between food and nourishment, or "co-

mida" and "alimento", are as common here as they are in the rest of the highlands. There are no substantive data on the preparation of food, its distribution within the family, consumption patterns, nor on attitudes towards left-overs and waste of foods. The Indians of these communities recognize the nutritional value of meat, eggs and milk and know that the ladinos enjoy better health because they eat these foods with regularity. The Indian does not eat them, not because he does not want to, or because he does not consider them necessary. He does not consume them simply because he does not have the necessary means to buy them.

Infants and Children

There is little additional information on the care and the diets of children. As in the rest of the Indian communities of the Altiplano, the infant is given the breast when he asks for it and not according to an established schedule. The breast is used as a tranquilizer, to calm, entertain or distract the child. It is used as a sort of pacifier. The infant becomes used to soliciting the breast at more or less regular intervals; or, he will suckle during most of his waking hours.

Lactating and Pregnant Women

The beliefs and attitudes on conception, pregnancy and birth that are available have been described earlier. Here too, we lack the most vital data: those that have to do with pre- and post-natal practices and beliefs, as well as diets for pregnant and lactating women. In many places it is believed that pregnant women have uncontrollable desires to eat a certain food. If these urges are not satisfied the infant will be born with physical deformities. What the father eats as well as what the older brothers and sisters eat contribute to the formation of the fetus to the same degree as that which the mother eats. In many Indian tongues the word "pregnant" is the same as the work "sick". The use of the sweat bath after parturition tends to decline in the present time, according to several reports. The switch or decline is attributed to the influence of education programs of official medicine and to the influence of fundamentalist protestant groups and Catholic groups who proselytize, all of which are of the opinion that the use of the sweat bath is a pagan and primitive rite.

Region IV Pacific Coast

There is no information available.

Region V Central Valleys and Highlands

The information for this region is totally inadequate. There are no systematic studies on popular beliefs among the ladinos with respect to the topics that are included in this literature review. There are no systematic data on folkloric ladino medicine.

Region VI The Orient

The information available on all indigenous groups in this area refers to Chiquimula and Jalapa. The data are scarce in extreme. The information available is on the supernatural etiology of diseases and repeats the information obtained in the Altiplano. Furthermore, the sources of this information are very old, antedating 1945.

Region VII The Atlantic Coast

The little information available is not representative of the area. It refers to a group of Black Caribs in the southern part of Belize and the majority describes the preparation of different herbs medicines.

Region VIII Coban

Among the indigenas of Alta Verapaz the use of the thermal bath is unknown; therefore, the use of regular baths for personal hygiene. This bath is not a separate structure. Adults bathe themselves in the back part of the house in an area that is covered with improvised screens and with water that they have collected in natural or public fountains. Bathing means considerable preparation and work, and this is only done once a week. (In the Altiplano, on the other hand, the use of the "temascal" makes bathing more frequent and convenient.) Women bathe standing up, nude or semi-nude. Men bathe, sitting or squatting down and without clothes. Bathing is done with the minimum amount of water possible, many times only washing hair and legs. Wasting water is a sin because water is sacred. There is no information on waste disposal or excreta disposal, nor on attitudes and values related to the above.

Illnesses

Among the Indians of this area diseases are understood and are treated in the same manner as they are in the Altiplano, especially childhood illnesses. There is no additional information on the delivery and utilization of medical services in this area, nor attitudes and characteristics of medical personnel. We know, nevertheless, that the demand for modern medical services, especially in the departmental capital, exceeds supply. This is true also for obstetrical services.

Foods

The only available information is a detailed description of the preparation of "boj," an alcoholic drink made from fermented cane sugar juice.

Infants and Children

Here, as in the rest of the Indian communities in Guatemala, and with less frequency among the ladinos of the lower classes, the baby is given the breast when he wants it and when he asks for it or cries. It is believed that the child cries because he is hungry. Therefore the only form of tranquilizing him is giving him the breast. Supplementary feeding practices for lactating children and weaning practices are very diverse and, therefore, do not lend themselves to generalization.

Lactating and Pregnant Women

This is the most deficient section in terms of the information available. We know that pregnant women, ladino or Indian, urban or rural, try not to eat cold foods because they are harmful. Prenatal care varies with the location of the household (rural or urban) and with the socio-economic level of the family, as well as the ethnic affiliation. An Indian woman of the rural areas cannot observe many of the physical restrictions that her urban and ladino counterparts observe during pregnancy. In the same way, a poor ladino has to continue to do domestic chores well into her pregnancy, while the privileged ladino can depend on other people to do it for her. Finally, we have no further data on post-natal care and diets among the ladinos. For Indians we know more because the knowledge, attitudes and practices are similar to those of the Indians of the Altiplano.

Region IX Petén

There is no available information.

Conclusion

It is undeniable that, in spite of the great number of publications in the field of the social sciences in Guatemala and of the long history of anthropological interest in the area, there are great gaps in our knowledge of medical anthropology and medical sociology. It is also undeniable that the published information is totally inadequate as a basis for evaluation and programming. Regions I and III have been studied most intensively and, as a consequence, more information is available. It is only in these two regions that the initial objectives of composing a general image on knowledge, attitudes, and practices on health and nutrition were attained. Nevertheless, the general overview of the Altiplano and the Coffee Belt are incomplete because we are lacking information in two of the critical areas: infants and children, and pregnant and lactating women. Of the seven remaining regions the picture is even more discouraging. The published information is superficial, unsystematized, non-representative, and many times anachronistic. Theoretically it would be possible to make a functional classification of nutritional problems and health problems in Guatemala, given the design, the coverage and the methods utilized in the first phase of the nutritional assessment. The sociological and anthropological data would be used to form a portrait of lifeways and patterns of behavior that would give perspective and meaning to the quantitative data on anthropometry, morbidity, mortality and census materials. Practically, however, the extant data make this exercise an impossibility. The findings registered in the literature do not allow us to draw even sketchily a descriptive picture of each region. Further, there is very little data available on possibilities of change, attitudes and predisposition towards change, felt needs of the population, community organization and community participation, and those that are available refer to a specific region, the Lake Atitlán area. The lack of generalizable data on these themes does not allow us to give the study an applied or action-oriented focus.

Recommendations

One single recommendation emerges from the literature review: to do anthropological field research in the seven

regions that are lacking data in order to collect information on all the topics presented at the beginning of this report, plus data on propensity to change, felt needs, and possible intervention programs. A secondary recommendation would be to up-date and complete the data for the Altiplano and the Coffee Belt.