

MINISTRY OF PUBLIC HEALTH,
THE REPUBLIC OF HONDURAS

**THE STUDY
ON
THE STRATEGIES AND PLANS
FOR
THE UPGRADING OF HEALTH STATUS
IN
THE REPUBLIC OF HONDURAS**

**FINAL REPORT
VOLUME III
SUPPORTING REPORT**

SEPTEMBER 1996

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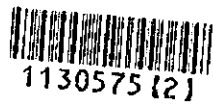
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In this report, project cost is estimated at March 1996 price and at an exchange rate of US \$ 1.00=11.00 Lempira(Lps.).

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**FINAL REPORT
(SUPPORTING REPORT)**

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GENERAL EXPLANATION OF THE SURVEY STUDY

1. INTRODUCTION

The fields surveys were conducted during the second phase of the study in order to collect information missing from existing documents or sources, and to provide additional data for elaboration of the National Master Health Plan. The surveys were designed to grasp the health demand and perception in households and the health care seeking behavior, to gain the information on the health supply in health facilities in Honduras, and to evaluate the financial aspect of the health services.

Three types of survey were conducted: household survey in the whole area of Honduras, exit-patient interview survey and health facility survey in all MSP health facilities, all IHSS hospitals, selected private hospitals and selected CESAMOs and CESARs.

2. THEMATIC CONTENTS IN THE SURVEYS

2.1 Household survey

All characteristics from the household survey can be segregated (with different levels of statistical significance) by department, municipality, health region or area or study zone.

(1) Characteristics of housing:

number of rooms, crowding, water and electricity supply, excreta disposal, availability of TV and radio.

(2) Composition of households and characteristics of household members:

- a) age, sex, ethnicity, religion, education level, civil status, social security coverage, smoking and drinking habits of all household members, identification of household heads;
- b) incidence of health/disease-related events:
 - hospitalization in last two years,
 - ambulatory curative care in the last two weeks,
 - prevention/chronic disease control in the last three months;
- c) traditional believes and sources of information for selected health themes.

(3) Characteristics of households:

- a) recent migration patterns, ownership of home, cultivable land and transport means, processing of drinking water;
- b) deaths from accidents and violence, from chronic degenerative diseases, prevalence of chronic degenerative diseases, incidence of acts of violence;
- c) average monthly household monetary income:

- from regular sources (salaries, pensions, etc...)
 - from irregular/extraordinary sources (sale of agricultural products, lottery, etc...);
- d) average household expenditures on selected items (housing, food, health care, education, clothing, transport);
- e) knowledge of service providers in the surrounding area and general patterns of use of those providers, according to type of ailment.

(4) Experience with health services:

- hospitalization
 - ambulatory curative care
 - prevention/control visit
- a) reasons for contact with provider and reasons for selection of site;
- b) transport costs (money and time); waiting time, visit time; opinions of client on these aspects;
- c) outcome of initial contact, characteristics of referral, coping with failed initial contact;
- d) incapacity generated by disease/problem;
- e) needs for outside services (drugs, lab exams) and obtention strategies;
- f) overall satisfaction with services and willingness to return to the same facility/service;
- g) patterns of payment for services: sources of indirect payment, quantity paid directly by patient;
- h) willingness to pay for services, according to the direct price actually paid and the overall satisfaction with the quality of services.

2.1.2 Institution Survey

Contents described here are for hospitals; contents for health centers are similar but fewer, as needed.

(1) Overall management and organization:

- a) organigram of the institution;
- b) management training of the director; technical support for the direction; existence of action and supervision plans;
- c) technical/administrative committees functioning in the hospital;
- d) community support for the institution; its main achievements;
- e) overall patterns of staffing by shifts and categories of personnel; specific patterns of staffing for emergency department;
- f) service production: outpatients, discharges, patient-days, bed-days, deliveries, C-sections, major and minor surgeries; 10 main causes for outpatient clinic, inpatients, surgery, emergency.

(2) Logistics and pharmacy, physical plant:

- a) programming and actual reception/purchase of a sample of selected drugs for 1994; physical inventory of same drugs;
- b) drug storage conditions; training of responsible staff; actual frequency of drug reception and inventories; drugs most often in excess or stock-out;
- c) electricity and water supply characteristics; emergency supply; garbage and excreta disposal; availability of transport; fire control and prevention.

(3) Financial management:

- a) payroll personnel per category (and department); salary scales;
- b) approved and expended budget for years 1990 to 1994; the latter by category: personnel, non-personnel services (maintenance, per-diems), materials and supplies (including drugs, fuel, medical equipment, food, etc...);
- c) cost recovery and exemption mechanisms; prices charged to user; quantities recovered in 1994 and 1995 and use of these funds.

(4) Department-specific characteristics:

This module is applied to each clinical department (Medicine, Surgery, Pediatrics, etc...) in the hospital and each major group of services: administration (direction, personnel, accounting, statistics), diagnosis (x-rays and labs), general services (hygiene, maintenance, cooking, security).

- a) actual and desired staffing patterns by category;
- b) past training of personnel and training needs;
- c) health education activities;
- d) sanitary installations for patients and personnel;
- e) physical conditions of facility (structure, lighting, ventilation);
- f) inventory of equipment; use status and reasons for non use or incomplete use.

(5) Perceived problems and suggestions for changes

2.1.3 Exit-patient interview survey

Exit-patient interview survey was conducted in same facilities investigated for health institutions surveys. Includes outpatients, emergency ambulatory patients and inpatients to be discharged.

(1) Characteristics of patients:

Age, sex, ethnicity, religion, education level, civil status, social security coverage, smoking and drinking habits of all household members, identification of household heads; department and municipality of residence.

(2) Experience with health services:

- a) reasons for contact with provider and reasons for selection of site; patterns of decision-making for health care seeking behaviors.
- b) transport costs (money and time); waiting time, visit time; opinions of client on these aspects;
- c) outcome of initial contact, characteristics of referral, coping with failed initial contact;
- d) incapacity generated by disease/problem;
- e) needs for outside services (drugs, lab exams) and obtention strategies;
- f) satisfaction with specific aspects of health services (status of facility and equipment, hygiene, food and lodging for inpatients, technical capacity of attending personnel, adequacy of interpersonal relationships); overall satisfaction with services and willingness to return to the same facility/service;
- g) patterns of payment for services: sources of indirect payment, quantity paid directly by patient;
- h) willingness to pay for services, according to the direct price actually paid and the overall satisfaction with the quality of services.

3. SURVEY METHODOLOGY

3.1 Household survey

3.1.1 Sampling design

The sampling design for the household survey reflected the need to obtain intervention-oriented information on specific zones or subgroups rather than to obtain a nation-wide, statistically significant picture of the variables investigated. Thus, it was decided not to use a self-weighted sample, such as the one used in the National Epidemiology and Family Health Surveys. The overall design would still be that of a two-step cluster sample survey.

Given an initial sample size of 2,500 households, it was decided to assign a fixed number of household to each geographical stratum defined in the 1988 Population and Housing General Census, as follows:

Urban, large cities:	700
Urban, small cities:	700
Rural:	1,000

In addition, 50 households was assigned to each of the traditionally discarded departments of Gracias a Dios and Islas de la Bahía, thus leading to a total of 2,500 households.

Within each stratum, the number of households in the sample was assigned proportionally to the total number of households for each of the 6 zones defined through cluster analysis during the first phase of the study.

Zone A: Copán, Intibucá, La Paz, Lempira, Ocotepeque, Santa Bárbara

Zone B: Colón, Comayagua, El Paraiso, Olancho
 Zone C: Atlántida, Cortés, Francisco Morazán, Islas de la Bahía
 Zone D: Valle
 Zone E: Choluteca, Yoro
 Zone F: Gracias a Dios

(see Figure 1, attached)

A segment size of 30 households for urban areas and 20 households for rural areas was then chosen, leading to a total of 101 segments to be included in the sample. The steps corresponding to this process are shown in the following tables.

Table Household distribution per zone and stratum

Zone	Large cities	Small cities	Rural areas	Total
A	0	33,025	161,614	194,639
B	0	50,029	135,118	185,147
C	178,984	63,381	115,238	357,603
D	0	6,767	16,863	23,630
E	0	37,074	83,223	120,297
F				
Total	178,984	190,276	512,056	881,316

source: Population and Housing General Census, 1988

note: Data for Zone C do not include number of households for Islas de la Bahía, and for Zone F (Mosquitia region, Department of Gracias a Dios) are not available.

Table Household distribution in the sample

Zone	Large cities	Small cities	Rural areas	Total
A	0	121	316	437
B	0	184	264	448
C	700	233 (+30)	225 (+20)	1158 (+50)
D	0	25	33	58
E	0	136	163	299
F		(30)	(20)	(50)
Total	700	700 (+60)	1000 (+40)	2500

note: One urban segment (30 households) and one rural segment (20 households) was selected in each of the department of Islas de la Bahía and Gracias a Dios, to make a total of 2,500 households.

Table Number of segments in the sample

Zone	Large cities	Small cities	Rural areas	Total
A	0	4	16	20
B	0	6	13	19
C	23	8 (+1)	11 (+1)	44
D	0	1	2	3
E	0	5	8	13
F	0	(1)	(1)	2
Total	23	24 (+2)	50 (+2)	101

note: 1 urban and 1 rural segment was selected in each of Zone C and F, using a special sampling mechanism. The total number of segments thus was 101.

3.1.2 Sample selection

(1) Segment selection

Using the segment list from the 1988 Census, all segments were reordered by zone and by stratum. Within each sub-stratum, a cumulative list of households was added. Dividing the total number of households by the number of segments to be drawn from the sub-stratum, a sampling interval was obtained which, jointly to a randomly chosen starting point, was used for the systematic selection of segments, based upon their size, as assessed by the number of listed households.

Zone	Large cities	Small cities	Rural
A	0	4,638	23,701
B	0	45,776	125,205
C	5,925	32,234	64,594
D	0	5,802	11,387
E	0	21,000	61,499

Zone	Large cities	Small cities	Rural
A	0	0.813421686	0.083018806
B	0	0.131900173	0.042579055
C	0.883516149	0.59025059	0.906833303
D	0	0.446448688	0.917307547
E	0	0.703749808	0.767526167

Maps from the selected segments were obtained from the Mapping Division of the General Directorate for Statistics and Censuses (DGEC). A total of 21 maps (7 urban and 14 rural) were found missing, thus leading to select as a replacement the closest segment for which a map was available. The seemingly random pattern of map loss and replacement procedure should allow to maintain the statistical validity of the sample.

The following departments were affected by the replacement process : Cortés (3 segments), Choluteca (2), El Paraiso (3), F. Morazán (5), Lempira (1), Ocotepeque (1), Olancho (2), Santa Bárbara (2), Valle (2). The number of replaced segments per zone was Zone A (4), Zone B (5), Zone C (8), Zone D (2), and Zone E (2).

The selected segments are shown in Table 1 attached.

(2) Household selection

A random starting point was selected for each segment, based upon the enumeration of households present on the map at the beginning of the survey. The sample would then include this household and the 29 (urban areas) or 19 (rural areas) households following in

the order given by the enumeration. The random starting point would ensure that different portions of the selected segments would be investigated (*central vs. peripheral, northern vs. southern, etc...*). However, since the maps were done for the 1988 Census and the study time-frame did not provide the time needed to actualize the map, it was expected to find, during the actual field work, a different number of households in each segment.

The following procedure was adopted for household selection :

using the household defined on the map as the starting point for the segment, and following the map enumeration system, the supervisor would locate the 30 (urban) or 20 (rural) households that should theoretically be selected for this segment;

if one or several new houses were found on the way between two consecutive houses, they would be included in the sample, and a corresponding number of households would be subtracted at the end of the enumeration ; and

conversely, if a mapped house was found to be actually absent, an additional house would be investigated at the end of the list.

This mechanism corresponds to a *de facto* map updating process. A control sheet indicating for each segment the households actually selected was designed to maintain close supervision of the process and allow for a rough estimation of growth rates for the segments investigated.

(3) Estimation of parameters

The non self-weighting character of the sample design implies that *resulting parameters (frequencies and averages) can be estimated directly only at stratum or sub-stratum level*. The calculation of national estimates will require the application of a weighing system to the combination of partial estimates, where the weight will correspond to the proportion of the population included in each partial stratum or sub-stratum.

3.2 Institution survey

The universe for the institution survey includes all the MSP and IHSS hospitals, a sample of private hospitals and a sample of CESAMOs and CESARs.

3.2.1 Selection of hospitals

Given the hospital-oriented initial focus of the project and the importance of this sector in the improvement of the health status, it was decided to include all government and Social Security hospitals in the sample. The military hospital was not included in the original sample.

The health sector focus of the study implied the need for selection of a sample of private institution, especially as the exit-patient interview survey also conducted at these facility would provide precious information about client choices for health care.

A total of 11 private facilities were selected in a non-random manner, as the selection attempted to include various types of private practices : large and small clinics, religious or business affiliation, etc.

The selected hospitals for the survey is shown in Table 2 attached.

3.2.2 Selection of health centers

The selection process for the health centers was definitively not a random process, considering several characteristics :

- representation of the previously defined study zones ;
- closeness of the binomial CESAMO-CESAR, to be able to analyze referral patterns from a local system point of view ;
- minimization of logistical difficulties.

Thus the estimates obtained for each kind of health facility should not be construed as statistically representative of all CESAMOs and CESARes in Honduras. A total of 20 CESAMOs and 16 CESARes has been selected.

The selected health centers for the survey is shown in Table 3 attached.

3.3 Exit-patient interview survey

The exit interviews was conducted at the same facilities covered by the institution survey. However, in order to increase the sample size in larger hospitals, it was decided to omit the exit interviews in a small sub-sample of area-level MSP hospitals, assuming a certain level of homogeneity in the patterns of hospital use at this level.

Averagely the exit interview survey in hospitals implies the interview of

- 20 clients from the outpatient clinic,
- 10 clients from the emergency clinic,
- 10 hospitalized patients about to be discharged.

In a number of large hospitals (such as Hospital Escuela, Mario Catarino Rivas, IHSS), this number has been doubled.

For the health centers, 30 patients are to be interviewed in each CESAMO and 20 in each CESAR.

The selection of patient uses different systems according to the facility's internal organization. These systems are documented for each facility and taken into account the following principles:

- The selection will be systematic, so that the investigator will not use his/her own decision in the process;

- It will cover the complete range of time during which the clinic is open, in order to avoid a selection bias linked to client's time of arrival or departure; however, logistical constraints will prevent the full implementation of this principle for emergency patients (i.e., there won't be night time investigation);
- It will cover an acceptable sample of the range of services offered during the clinic time (i.e., all patients won't be drawn from a single clinic).

The number of the selected samples are 360 for hospitalized patient and 1,880 for ambulatory patient. The numbers of selected samples for each facility are also shown in the Table 7 and Table 8.

4. DATA COLLECTION AND PROCESSING

Data collection was conducted by interviews using prepared interview questionnaire for the household survey and the exit-patient survey. For the facility survey, data collection was conducted by interviews and collection of existing records at facilities using prepared questionnaire and forms for the facility survey (see Annex 1: Questionnaires for the household survey, for the facility survey, and for the exit-patient interview survey).

ESA Consultores, a Honduran consultant company, was contracted for collecting the data and for the initial phases of data processing as well as for training interviewers and field supervisors.

Training of interviewers and field supervisors, and pre-test were carried out between July 16 and 29. Field data collection took place between July 31 and September 1 in 1995. Coding and inputting data on diskettes was done simultaneously.

5. SUMMARY TABLES

Summary tables (tables of simple frequency for each parameter) of the three surveys are attached.

5.1 Household survey

In the summary tables, data from Zone F (Gracias a Dios) are not included because the segments and households were not randomly sampled, and the number of the household was not assigned proportionally to the actual number of the household in Zone F.

The national parameters were calculated by weighing system for some questions, and are shown in the columns of "Honduras". Figures in the columns of "total" were simple sum of all samples..

5.1.1 The number of household for the analysis

As shown in Table 6, 101 segments were assigned for household surveys, and 99 segments were completed. Segment No.76 (San Andres, Limpira) was not reached by the field survey teams due to rivers swollen by rain. Segment No.101 (Victoria, Yoro) was not reached because of bad road conditions caused by the rain. Other two segments, segment No. 42 and No.13 could not be reached because of high water in the revise, and nearby rural communities were sampled in their stead. The location of these segments are shown in Figure 2 attached.

The number of the household surveyed was 2,332, which is 92.9 % of the number of the selected households for the survey (see also Table 6 attached for detail information).

Table Household distribution in the data

Zone	Large cities	Small cities	Rural areas	Total
A	0	118	314	432
B	0	178	249	427
C	628	254	213	1,095
D	0	29	38	67
E	0	139	132	271
F	0	24	16	40
Total	628	742	962	2,332

note: data from the zone F (Gracias a Dios) was not included in the summary tables attached

Distribution of the population in the sample is shown in Table A. The number of cases who has sought hospital care in the two years prior to the date of survey is shown in Table B, the number of cases who has sought curative ambulatory care during two weeks prior to the date of survey is shown in Table C, and the number of cases who has sought ambulatory prevention services or the control of chronic diseases in the three months prior to the date of survey is shown in Table D. Among these cases, only those who were available at home during the field work, were interviewed for Module G, H and I.

Table A Population distribution in the data

Sex	Large cities	Small cities	Rural areas	Total
Male	1,501 (47.3%)	1,836 (48.3%)	2,691 (50.7%)	6,028 (49.1%)
Female	1,670 (52.7%)	1,967 (51.7%)	2,619 (49.3%)	6,256 (50.9%)
Total	3,171 (100.0%)	3,803 (100.0%)	5,311 (100.0%)	12,284 (100.0%)

note: Zone F is not included..

Table B The number of cases who has sought hospital care in two years before the date of the survey

Sex	Large cities	Small cities	Rural areas
Male	81 5.4%	75 4.1%	76 2.8%
Female	160 9.6%	186 9.5%	137 5.2%
Total	241 7.6%	261 6.9%	213 4.0%

Note: % indicate the percentage of total population surveyed.
Zone F is not included.

Table C Ambulatory care

Sex	Large cities		Small cities		Rural areas	
Male	210	14.0%	320	17.4%	375	13.9%
Female	279	16.7%	384	19.5%	428	16.4%
Total	489	15.4%	704	18.5%	803	15.1%

Note: % indicate the percentage of total population surveyed.
Zone F is not included.

Table D Preventive care and control of diseases

Sex	Large cities		Small cities		Rural areas	
Male	61	4.1%	70	3.8%	110	4.1%
Female	138	8.3%	122	6.2%	152	5.8%
Total	199	6.3%	192	5.1%	262	4.9%

Note: % indicate the percentage of total population surveyed.
Zone F is not included.

5.1.2 Calculation of weighed proportions and averages for national estimates for the household survey

Given that the sample for the household survey is not self-weighted (that is, an increased weight was given to the urban strata relatively to the rural one), the estimates of national parameters cannot be obtained directly from the simple sum of all sample elements.

Table 4 attached provides the bases for the weighting system. Looking at the "Table %" section of the table, one can see that stratum 1 (large cities or "TG & SPS in Summary Tables) comprises roughly 20% of the total number of households in the country, stratum 2 (small cities) counts for 21.7% and stratum 3 (rural) for 58.3%. However, in the final sample, these strata represent respectively 27.6, 31.6 and 40.8% of the total sample, thus overrepresenting the urban areas and underrepresenting the rural zone. For instance, if one was to assume a prevalence of 20% for a given variable in the urban strata and 10% for the same variable in the rural strata, the unweighed proportion at national level would be: $(0.20 \times 0.276) + (0.20 \times 0.316) + (0.10 \times 0.408) = 15.9\%$. However, the weighed proportion would actually be: $(0.20 \times 0.20) + (0.20 \times 0.217) + (0.10 \times 0.583) = 14.2\%$.

Thus, in order to calculate national estimates, each sample stratum estimates needs to be weighed by a factor proportional to its importance in the original population, according to the formula:

$$pA = (pA_1 \times N_1/N) + (pA_2 \times N_2/N) + (pA_3 \times N_3/N)$$

where pA_1 , pA_2 and pA_3 are the sample proportions for variable A in strata 1, 2 and 3 respectively, pA is the national estimate of this proportion, N_1 , N_2 and N_3 the number of households of each stratum in the population and N is the total number of household in the population.

When dealing with proportions or averages referring to sub-groups in the initial samples, the corresponding estimate at national level is given by the following formula:

$$pB = \frac{pB_1 (pA_1 \times N_1/N) + pB_2 (pA_2 \times N_2/N) + pB_3 (pA_3 \times N_3/N)}{(pA_1 \times N_1/N) + (pA_2 \times N_2/N) + (pA_3 \times N_3/N)}$$

where pB_1 , pB_2 , and pB_3 are the sample proportion estimates for national level and for each stratum for variable B in the sub-group defined by a given value of variable A.

Estimating a national estimate pC for variable C in one of the sub-group defined by a value of variable B would imply a similar process, replacing the denominator in the previous equation by the numerator, and multiplying each factor of the numerator by pC_1 , pC_2 , and pC_3 respectively:

$$pB = \frac{pC_1 A pB_1 (pA_1 \times N_1/N) + pC_2 A pB_2 (pA_2 \times N_2/N) + pC_3 A pB_3 (pA_3 \times N_3/N)}{pB_1 (pA_1 \times N_1/N) + pB_2 (pA_2 \times N_2/N) + pB_3 (pA_3 \times N_3/N)}$$

The formula for calculating national estimates of averages is similar to that for proportion, as shown in the following equation:

$$A = \frac{(A_1 \times N_1/N) + (A_2 \times N_2/N) + (A_3 \times N_3/N)}{(pA_1 \times N_1/N) + (pA_2 \times N_2/N) + (pA_3 \times N_3/N)}$$

where as the estimate of a national average B for the same sub-group defined by the value of variable A described above would be:

$$pB = \frac{B_1 (pA_1 \times N_1/N) + B_2 (pA_2 \times N_2/N) + B_3 (pA_3 \times N_3/N)}{(pA_1 \times N_1/N) + (pA_2 \times N_2/N) + (pA_3 \times N_3/N)}$$

These calculations assume that the sample is self-weighted within each stratum, which Table 10 shows it could be a valid assumption.

5.2 Institution survey

As shown in Table 7, all MSP hospitals (6 national hospitals, 6 regional hospitals and 16 area hospitals) and IHSS hospitals could be completed the survey. Among the selected private hospitals, three hospitals (Medical Center of San Pedro Sula, Hospital Viera in Tegucigalpa, and the Berioz Clinic of Comayagua) could not be surveyed effectively because of low patient numbers. Substituted for them, respectively, were the Military Hospital, the Medical Center and the Adventist Hospital, all in or near Tegucigalpa.

Regarding health centers survey, the survey team failed to do facility survey in Mosquitia, thus only 19 CESAMOs and 15 CESARs were completed. The nurse assigned to the CESAR at San Jeronimo in Intibuca was on vacation for the entire month of August, the CESAR located in Masaguara was substituted for it. The location of all institutions surveyed is shown in Figure 3 attached. (see Table 3 attached)

5.3 Exit-patient interview survey

As mentioned in the previous section 5.2 *Institution survey* and shown in Table 2 and Table 8, some of the selected institutions did not provide sufficient number of the patients. Three of the selected private hospitals were substituted by other hospitals in Tegucigalpa. The CESARs at Rio Blanco, Olancho and at Miralda, Francisco Morazan were closed due to field work or nurse's vacation. The compliance of the goals of the exit-patients survey was as follows:

Table Compliance of the goals of the exit patients survey

Type of Patients	Planned	Completed	% Completed
Ambulatory	1,760	1,621	92.1%
Emergency	410	271	66.1%
Hospitalized	430	368	85.6%

Tables and Figures

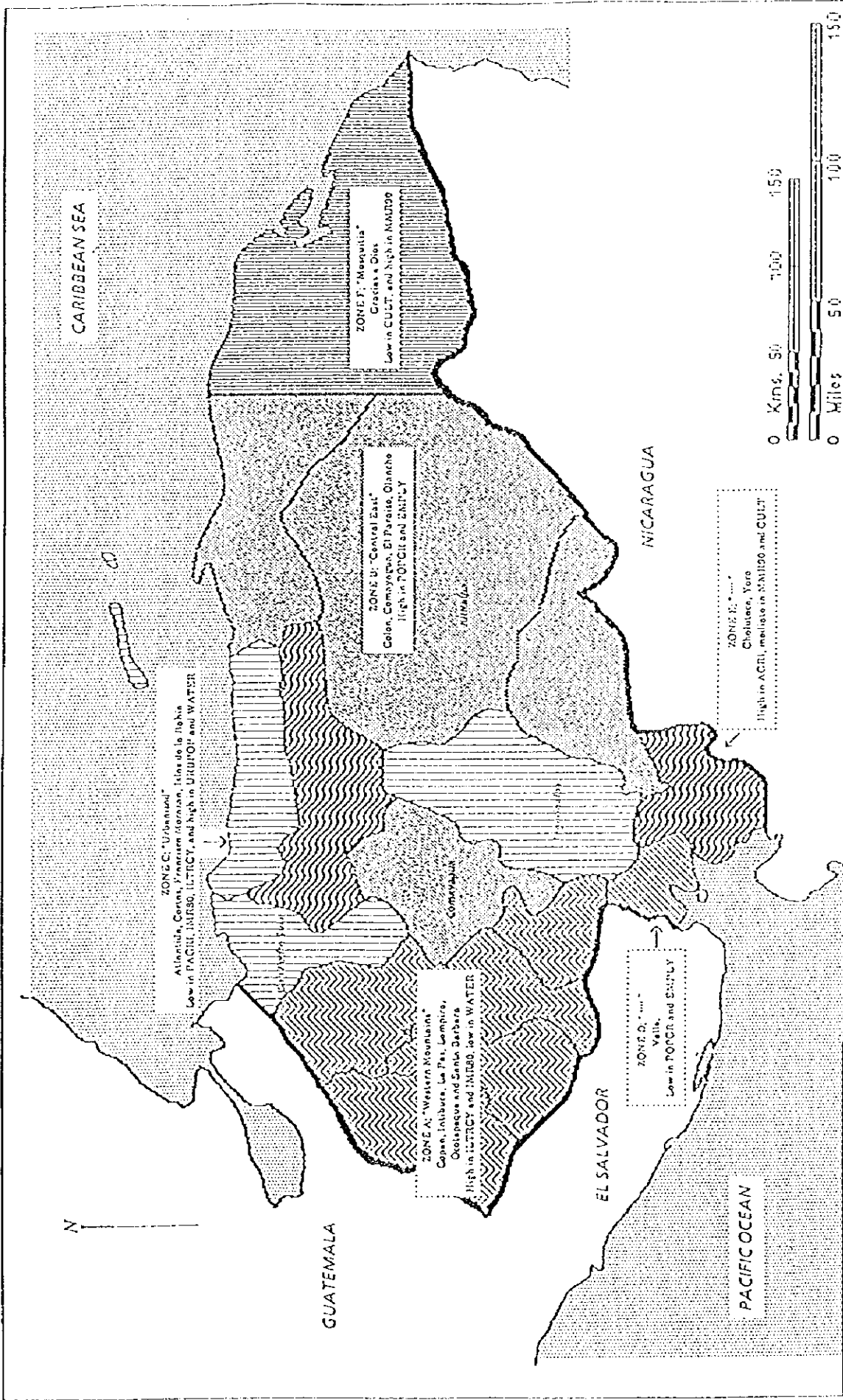


Figure 1 Zoning for the sampling of household survey, institution survey and exit-patient interview survey

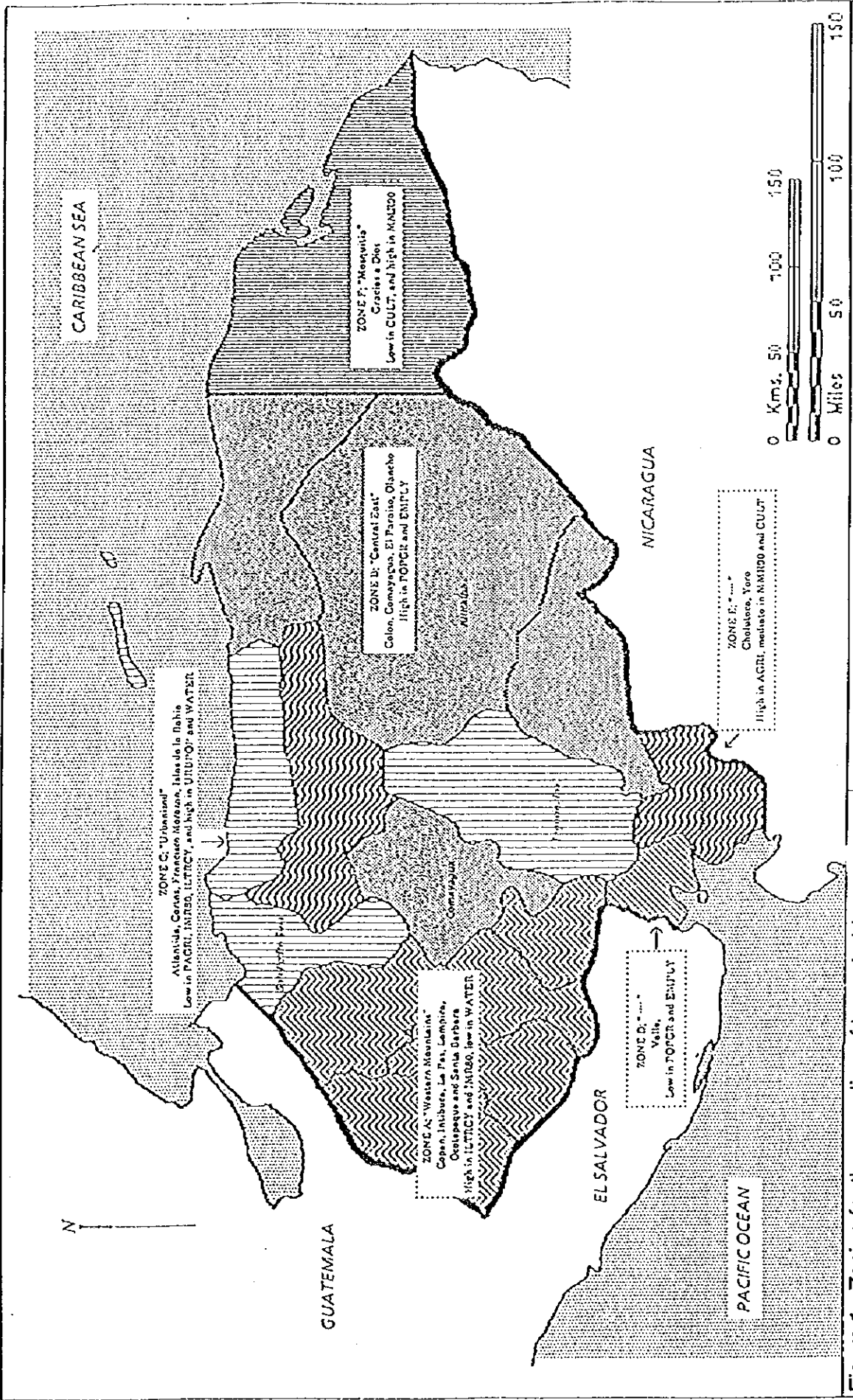
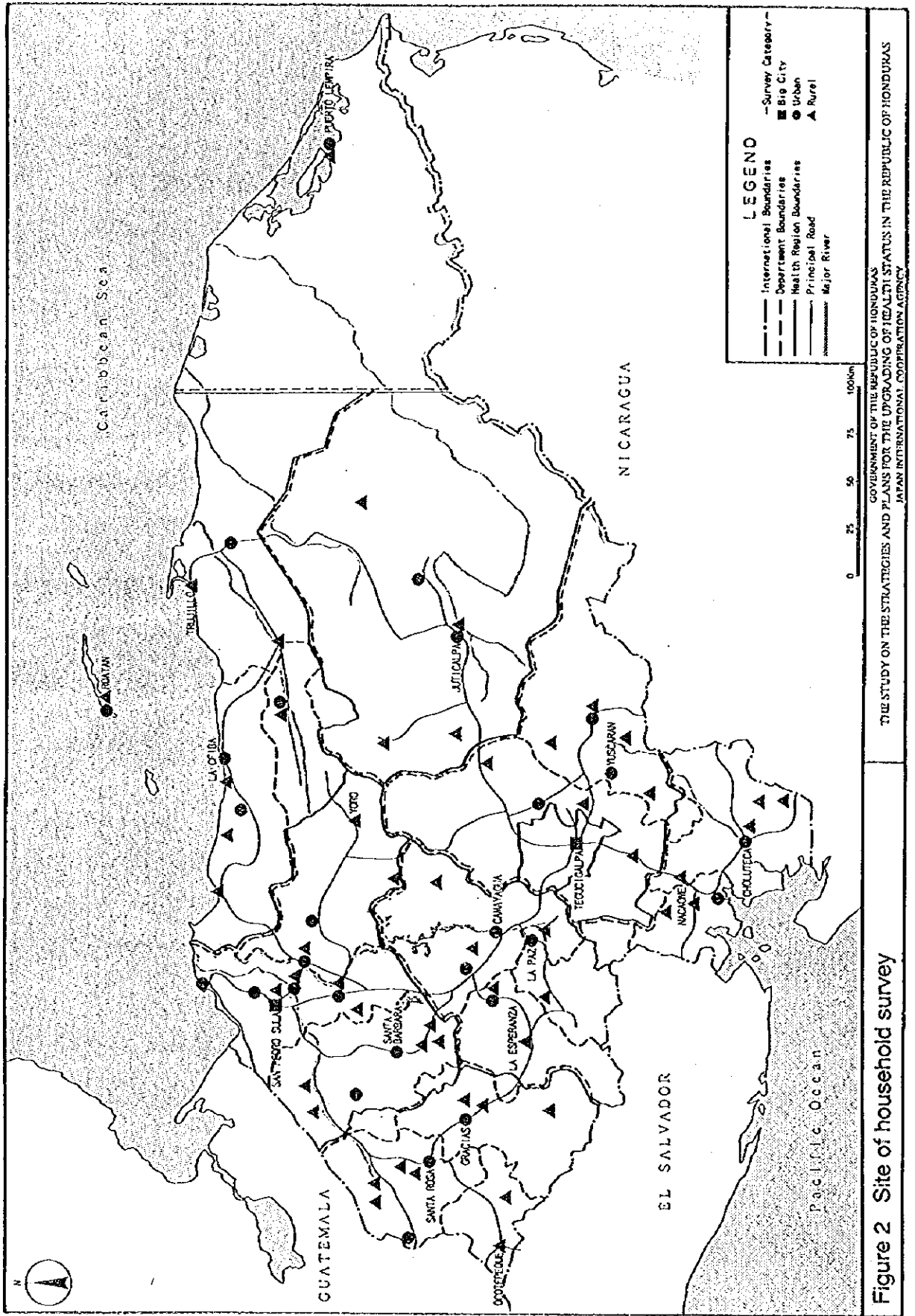


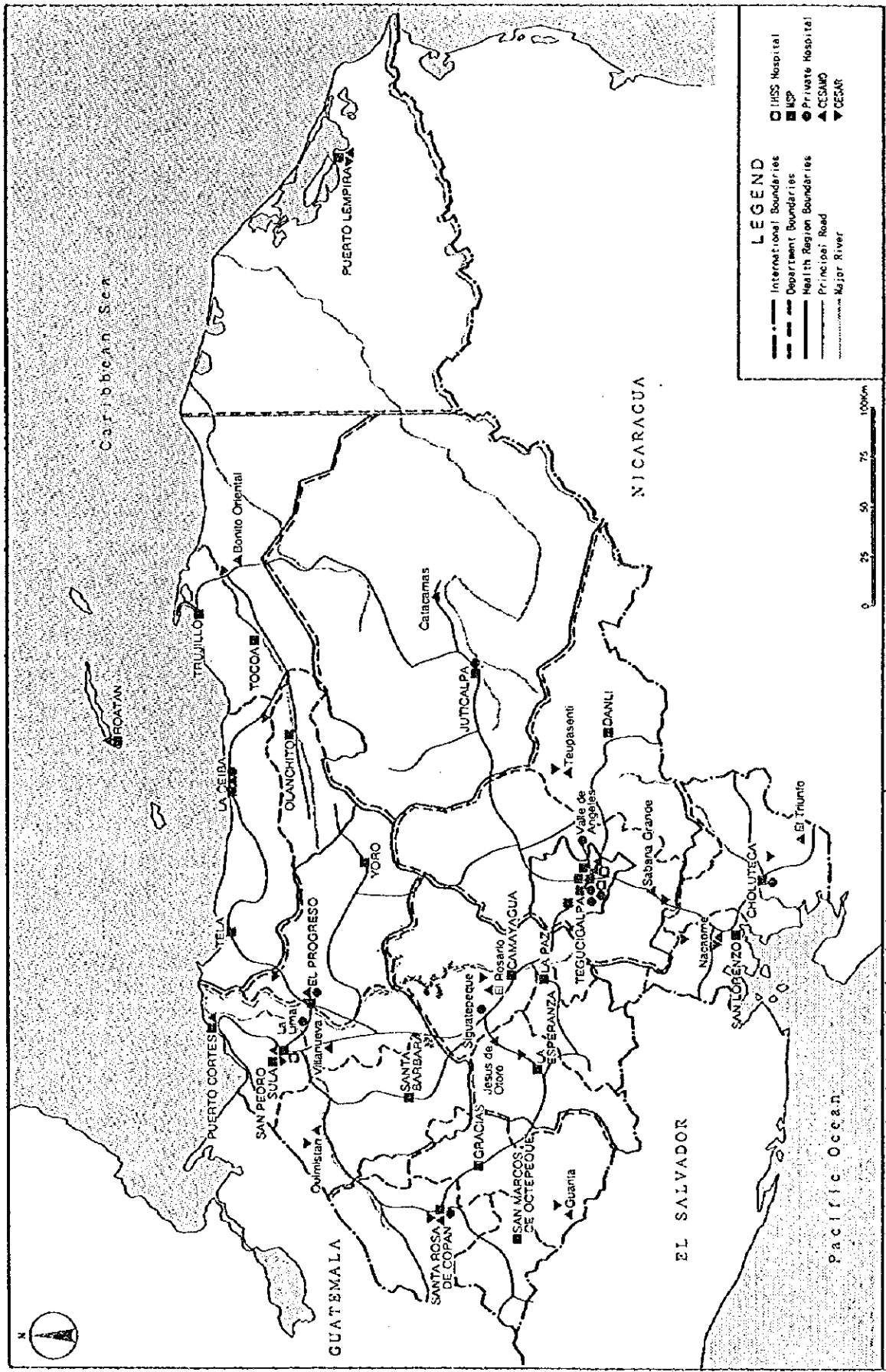
Figure 1 Zoning for the sampling of household survey, institution survey and exit-patient interview survey

GOVERNMENT OF THE REPUBLIC OF HONDURAS
THE STUDY ON THE STRATEGIES AND PLANS FOR THE UPGRADING OF HEALTH STATUS IN THE REPUBLIC OF HONDURAS
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GOVERNMENT OF THE REPUBLIC OF HONDURAS
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 JAPAN INTERNATIONAL COOPERATION AGENCY

Figure 2 Site of household survey



LEGEND

- International Boundaries
- - - Department Boundaries
- Health Region Boundaries
- Principal Road
- Major River
- IHSS Hospital
- MSP
- Private Hospital
- ▲ CESMAP
- ▼ CESAR

Figure 3 Sites of health institutions for institution survey and exit-patient interview survey

GOVERNMENT OF THE REPUBLIC OF HONDURAS
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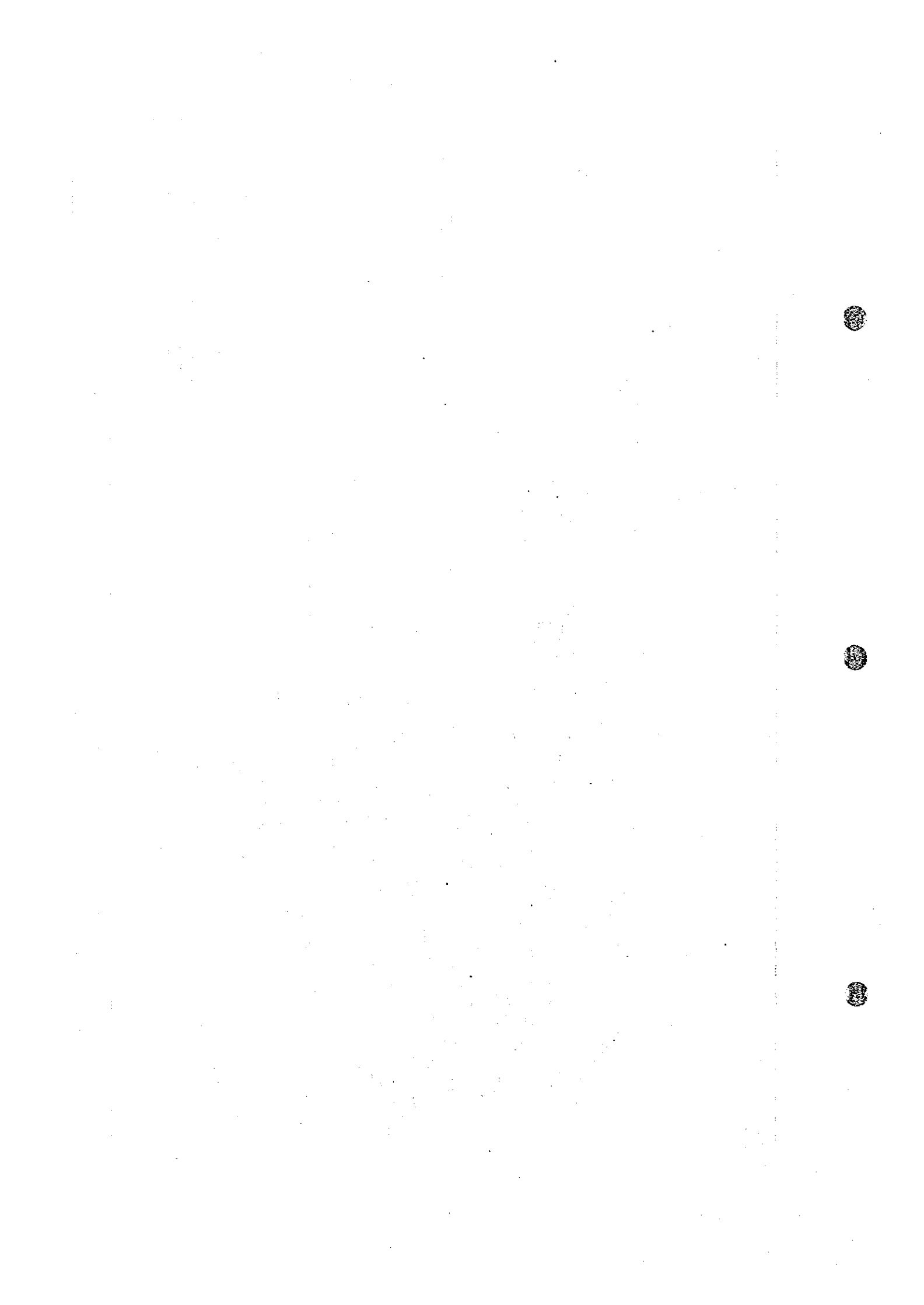


Table 1 List of Segment for Household Survey

Seg. No.	Department		Municipality		Stratum Code*	Zone	Number of Households		Number of Interviews		
	Name	Code	Name	Code			Targeted	Completed	Mod. G	Mod. H	Mod. I
001	Atlántida	1	La Ceiba	1	2	C	30	28	8	34	7
002		1	La Ceiba	1	2	C	30	30	16	50	6
003		1	El Porvenir	2	3	C	20	20		25	
004		1	Esparta	3	3	C	20	19		9	
005		1	San Francisco	6	2	C	30	29	5	27	4
006		1	Tela	7	3	C	20	17	2	14	5
007	Colón	2	Trujillo	1	3	B	20	18	5	11	1
008		2	Sabá	5	3	B	20	18	4	27	6
009		2	Bonito Oriental	10	2	B	30	30		61	
010	Comayagua	3	Comayagua	1	2	B	30	30	18	34	11
011		3	El Rosario	3	3	B	20	20	4	40	17
012		3	Humuya	5	3	B	20	20	3	22	9
013		3	San Luis	16	3	B	20	20	1	22	
014		3	Siguatepeque	18	2	B	30	29		29	
015	Copán	4	Concepción	3	3	A	20	20	4	13	1
016		4	Copán Ruinas	4	2	A	30	30	4	10	3
017		4	Florida	10	3	A	20	20		3	
018		4	San Antonio	15	3	A	20	20		5	
019		4	Veracruz	23	3	A	20	20	1	10	1
020	Cortés	5	San Pedro Sula	1	1	C	30	30		35	
021		5	San Pedro Sula	1	1	C	30	29	9	24	6
022		5	San Pedro Sula	1	1	C	30	27	12	18	11
023		5	San Pedro Sula	1	1	C	30	29	8	24	3
024		5	San Pedro Sula	1	1	C	30	30	11	29	4
025		5	San Pedro Sula	1	1	C	30	29	9	20	6
026		5	San Pedro Sula	1	1	C	30	29	7	22	7
027		5	San Pedro Sula	1	3	C	20	20	3	13	3
028		5	San Pedro Sula	1	1	C	30	28		14	
029		5	Choloma	2	2	C	30	28		39	
030		5	Potrerrillos	5	2	C	30	30	9	34	8
031		5	Potrerrillos	5	3	C	20	19	7	22	3
032		5	Puerto Cortés	6	2	C	30	30		16	
033		5	San Antonio de Cortés	7	3	C	20	20	2	12	3
034		5	La Lima	12	2	C	30	22		12	
035		5	La Lima	12	3	C	20	20		24	
036	Choluteca	6	Choluteca	1	2	E	30	29		32	
037		6	Choluteca	1	2	E	30	28		34	
038		6	Concepción de María	3	3	E	20	18		26	
039		6	El Triunfo	6	3	E	20	20	3	29	5
040		6	Pespire	11	3	E	20	18	4	19	5
041		6	Santa Ana de Yusguare	16	3	E	20	20		17	
042	El Paraíso	7	Alauca	2	3	B	20	20		27	
043		7	Danlí	3	3	B	20	18		6	
044		7	Danlí	3	2	B	30	30		13	
045		7	San Lucas	12	3	B	20	18	3	8	7
046		7	Teupasenti	15	3	B	20	18	4	17	4
047	Francisco	8	Distrito Central	1	1	C	30	29	7	20	9
048	Morazán	8	Distrito Central	1	1	C	30	28	14	22	4
049		8	Distrito Central	1	1	C	30	27	13	23	11
050		8	Distrito Central	1	1	C	30	28	11	21	6
051		8	Distrito Central	1	1	C	30	29	5	14	11
052		8	Distrito Central	1	1	C	30	20	8	22	12
053		8	Distrito Central	1	1	C	30	29	10	31	11
054		8	Distrito Central	1	1	C	30	29	17	29	13
055		8	Distrito Central	1	1	C	30	26	8	23	17
056		8	Distrito Central	1	1	C	30	18	5	20	5
057		8	Distrito Central	1	1	C	30	27	13	16	17
058		8	Distrito Central	1	1	C	30	22	13	12	11
059		8	Distrito Central	1	1	C	30	28	19	9	10
060		8	Distrito Central	1	1	C	30	29	9	28	5
061		8	Distrito Central	1	1	C	30	28	10	14	6
062		8	Guaimaca	6	3	C	20	20	8	33	7
063		8	Sabanagrande	16	3	C	20	20	8	11	2
064		8	San Antonio de Oriente	17	3	C	20	19	3	9	7
065		8	San Juan de Flores	20	2	C	30	29	7	22	7
066	Gracias a Dios	9	Puerto Lempira	1	2	F	30	24	10	26	1
067		9	Tuntunlara	1	3	F	20	16		12	
068	Intibucá	10	Jesús de Otoro	7	3	A	20	19		22	2
069		10	Jesús de Otoro	7	2	A	30	30		23	
070		10	Yamaranguila	16	3	A	20	20	6	16	8

Table 1 List of Segment for Household Survey

Seg. No.	Department		Municipality		Stratum Code*	Zone	Number of Households		Number of Interviews		
	Name	Code	Name	Code			Targeted	Completed	Mod. G	Mod. H	Mod. I
071	Islas de la Bahía	11	Roatan	1	2	C	30	28	8	43	5
072		11	Roatan	1	3	C	20	19		20	
073	La Paz	12	San José	12	3	A	20	20	3	39	12
074	Lempira	13	Belen	2	3	A	20	20		20	
075		13	La Iguala	9	3	A	20	20	2	19	3
076		13	San Andrés	16	3	A	20	0			
077	Ocotepeque	14	Ocotepeque	1	3	A	20	19	1	10	
078		14	San Marcos	13	3	A	20	16	6	10	8
079	Olancho	15	Juticalpa	1	2	B	30	30	11	17	9
080		15	Juticalpa	1	3	B	20	20		13	
081		15	Catacamas	3	2	B	30	29	9	46	11
082		15	Concordia	4	3	B	20	20		8	
083		15	Dulce Nombre de Culmí	5	3	B	20	19		10	
084		15	Yocón	22	3	B	20	20	5	22	2
085	Santa Bárbara	16	Santa Bárbara	1	2	A	30	29		13	
086		16	Ceguaca	5	3	A	20	20		2	
087		16	Macuehizo	12	3	A	20	20		4	
088		16	Quimistán	17	3	A	20	20		9	
089		16	San Francisco de Ojuera	18	3	A	20	20		5	
090		16	San Luis	20	2	A	30	29	7	7	3
091		16	San Pedro Zacapa	23	3	A	20	20		6	
092	Valle	17	Nacaome	1	3	D	20	18	7	12	11
093		17	San Lorenzo	9	3	D	20	20	9	25	6
094		17	San Lorenzo	9	2	D	30	29		19	
095	Yoro	18	Yoro	1	3	E	20	19		16	
096		18	El Progreso	4	2	E	30	28	9	42	3
097		18	El Progreso	4	3	E	20	18		23	
098		18	Morazán	6	2	E	30	28		42	
099		18	Olanchito	7	3	E	20	19		19	
100		18	Olanchito	7	2	E	30	26		5	
101		18	Victoria	10	3	E	20	0			
Total							2510	2332	447	2036	401

* Stratum 1: Big cities (Tegucigalpa & San Pedro Sula), 2: Other small cities, 3: Rural area (shaded rows)

Note: Shaded rows indicate stratum 3 (rural segments).

Table 2 List of Hospitals for Institution Survey and Exit-patient Interview Survey

Hospitals Code	Name of Institution	Place	Sector*	Dpto	Munic. Code	Region Code	Area No.	Zone No.	Number of Patients**					
									Sample			Actual		
									Ambul.	Emerg.	Hosp.	Ambul.	Emerg.	Hosp.
1101	Hospital Mario Catarino Rivas	SPS	MSP	05	01	3	0	C	40	20	20	40	19	20
1102	Hospital San Felipe	TGU	MSP	08	01	M	3	C	40	-	20	40	-	20
1103	Hospital Santa Rosita	TGU	MSP	08	01	M	3	C	-	-	-	-	-	-
1104	Hospital Mario Mendoza	TGU	MSP	08	01	M	3	C	-	-	-	-	-	-
1105	Instituto del Torax	TGU	MSP	08	01	M	3	C	20	10	10	20	10	10
1106	Hospital Escuela (BMI)	TGU	MSP	08	01	M	3	C	40	20	20	40	20	20
1107	Hospital Escuela (BMQ)	TGU	MSP	08	01	M	3	C	40	20	20	40	20	20
1201	Hospital Atlántida	La Ceiba	MSP	01	01	6	1	C	20	10	10	20	10	10
1202	Hospital Santa Teresa	Comayagua	MSP	03	01	2	1	B	20	10	10	30	0	10
1203	Hospital del Occidente	Sta Rosa de Copán	MSP	04	01	5	1	A	-	10	10	-	10	10
1204	Hospital Leonardo Martínez	SPS	MSP	05	01	3	0	C	20	10	10	20	0	10
1205	Hospital del Sur	Choluteca	MSP	06	01	4	3	E	20	10	10	20	10	10
1206	Hospital San Francisco	Juticalpa	MSP	15	01	7	1	B	20	10	10	20	10	10
1301	Hospital Tela Integrado	Tela	MSP	01	07	6	2	C	-	-	-	-	-	-
1302	CHA	Tocoa	MSP	02	09	6	4	B	-	-	-	-	-	-
1303	Hospital Salvador Paredes	Trujillo	MSP	02	01	6	5	B	20	10	10	20	10	5
1304	CHA	Puerto Cortes	MSP	05	06	3	3	C	20	10	10	20	9	10
1305	Hospital Gabriela Alvarado	Danlí	MSP	07	03	1	1	B	20	10	10	20	10	10
1306	Hospital de Roatan	Roatán	MSP	09	01	6	1	C	20	10	10	20	10	10
1307	Hospital E. Aguilar Cerrato	La Esperanza	MSP	10	01	2	2	A	-	-	-	-	1	-
1308	Hospital R. Suazo Córdova	La Paz	MSP	12	01	2	4	A	20	10	10	29	1	10
1309	Hospital Dr. J.M. Galvez	Gracias	MSP	13	01	5	2	A	-	-	-	-	-	-
1310	CHA	San Marcos O.	MSP	14	13	5	3	A	20	10	10	20	10	9
1311	CHA	Santa Bárbara	MSP	16	01	3	4	A	20	10	10	30	0	20
1312	CHA	San Lorenzo	MSP	17	09	4	2	D	20	10	10	20	10	10
1313	CHA	El Progreso	MSP	18	04	3	2	E	20	10	10	20	10	10
1314	CHA	Olancho	MSP	18	07	6	3	E	20	10	10	20	10	10
1315	Hospital M. de J. Subirana	Yoro	MSP	18	01	3	5	E	-	-	-	-	-	-
1316	CHA	Puerto Lempira	MSP	09	01	8	1	F	-	-	-	-	-	-
2201	Hospital Noroccidental	SPS	HISS	05	01	3	0	C	40	20	20	40	20	20
2202	Hospital IHSS (MO)	TGU	HISS	08	01	M	3	C	40	20	20	40	20	15
2203	Hospital IHSS (MI)	TGU	HISS	08	01	M	3	C	40	20	20	60	0	20
3001	Hospital V. d'Antoni	La Ceiba	PRIV	01	01	6	1	C	20	10	10	20	10	6
(3002)	Policlínica Berlios	Comayagua	PRIV	03	01	2	1	B	20	10	10	-	-	-
3012	Hospital Adventist	Valle de Angeles	PRIV	08		M		C	-	-	-	8	2	1
3003	Hospital Evangélico	Siguatepeque	PRIV	03	18	2	3	B	20	10	10	20	0	7
3004	Centro Médico Quirúrgico	Sta Rosa Copán	PRIV	04	01	5	1	A	20	10	10	19	4	1
3005	Hospital Tela Railroad Cy	La Lima	PRIV	05	12	3	1	C	20	10	10	20	10	10
(3006)	Centro Médico Sanpedrano	SPS	PRIV	05	01	3	0	C	20	10	10	-	-	-
3006	Hospital Militar	TGU	PRIV	8	1	M		C	-	-	-	20	5	6
3007	Policlínica San Rafael	Choluteca	PRIV	06	01	4	3	E	20	10	10	30	0	4
(3008)	Hospital & Clínicas Viera	TGU	PRIV	08	01	M	3	C	40	20	20	-	-	-
3008	Hospital Centro Médico	TGU	PRIV	08	01	M		C	-	-	-	35	0	0
3009	Hospital MEDICASA	TGU	PRIV	08	01	M	3	C	20	10	10	30	0	10
3010	Clínica Santa Lucía	Juticalpa	PRIV	15	01	7	1	B	20	10	10	21	9	7
3011	Clínica Médica Cristiana	El Progreso	PRIV	18	04	3	2	E	20	10	10	20	1	6
									840	410	430	892	271	368

* MSP: Hospital of Ministry of Public Health, IHSS: Social Security Hospital, PRIV: Private Hospital

** Ambul.: Ambulatory patients, Emerg.: Emergency patients, Hosp.: Hospitalized patients

Table 3 List of CESAMOs and CESARs for Institution Survey and Exit-patient Interview Survey

CESAMOs										
Code	Name of CESAMOs	Place	Sector	Dpto	Munic.	Region	Area	Zone	No. of Patient	
									Sample	Actual
1401	La Pizzaty	La Ceiba	MSP	01	01	6	1	C	30	30
1402	Bonito Oriental	Bonito Oriental	MSP	02	10	6	5	B	30	30
1403	El Rosario	El Rosario	MSP	03	03	3	1	B	30	29
1404	Santa Rosa de Copán	Santa Rosa de Copán	MSP	04	01	5	1	A	30	30
1405	Miguel Paz Barahona	SPS	MSP	05	01	3	0	C	30	29
1406	Puerto Cortés	Puerto Cortés	MSP	05	06	3	3	C	30	30
1407	Villanueva	Villanueva	MSP	05	11	3	1	C	30	30
1408	El Triunfo	El Triunfo	MSP	06	06	4	5	E	30	30
1409	Teupasenti	Teupasenti	MSP	07	15	1	1	B	30	30
1410	El Pedregal	Tegucigalpa	MSP	08	01	M	1	C	30	30
1411	El Chile	Tegucigalpa	MSP	08	01	M	2	C	30	30
1412	Sabanagrande	Sabanagrande	MSP	08	16	1	3	C	30	30
1413	Oak Ridge	Oak Ridge	MSP	11	01	6	1	C	30	6
1414	Jesus de Otoro	Jesus de Otoro	MSP	10	07	2	3	B	30	30
1415	Guarita	Guarita	MSP	13	07	5	3	A	30	23
1416	Catacamas	Catacamas	MSP	15	03	7	2	B	30	30
1417	Quimistán	Quimistán	MSP	16	18	3	7	A	30	30
1418	Nacaome	Nacaome	MSP	17	01	4	1	D	30	30
1419	El Progreso	El Progreso	MSP	18	04	3	2	E	30	30
(1420)	.....	.....	MSP	09		8	1	F	30	0
									600	537
CESARs										
Code	Name of CESARs	Place	Sector	Dpto	Munic.	Region	Area	Zone	No. of Patient	
									Sample	Actual
1501	Descombro	Jutiapa	MSP	01	04	6	1	C	20	20
1502	Corocito	Bonito Oriental	MSP	02	10	6	5	B	20	9
1503	Guacastagua	El Rosario	MSP	03	03	2	1	B	20	17
1504	Concepción	Concepción	MSP	04	03	5	1	A	20	3
1505	Naco	SPS	MSP	05	01	3	0	C	20	20
1506	Santa Ana de Yusguare	Sta Ana Yusguare	MSP	06	16	4	3	E	20	17
1507	San Isidro	Teupasenti	MSP	07	15	1	1	B	20	20
1508	La Venta del Sur	La Venta del Sur	MSP	08	08	1	3	C	20	20
1509	Miralda	Orica	MSP	08	14	1	4	C	20	0
1510	San Jerónimo	Jesus de Otoro	MSP	10	07	2	3	B	20	0
1516	Masaguara			10		2		B		15
1511	Tomala	Tomala	MSP	13	25	5	3	A	20	20
1512	Rio Blanco	Catacamas	MSP	15	03	7	2	B	20	0
1513	Corredores	Quimistán	MSP	16	18	3	7	A	20	11
1514	Moropocay	Nacaome	MSP	17	01	4	1	D	20	0
1515	Toyos	El Negrito	MSP	18	03	3	2	E	20	20
(1516)	.....	.....	MSP	09		8	1	F	20	0
									320	192

Nota: Zona se refiere a la zonificación realizada durante la primera fase del estudio.

Table 4 Bases for weighing the sample for household survey

<i>Household distribution per region and stratum</i>					<i>Table %</i>				<i>Column %</i>		
Zone	1. Large cities	2. Small cities	3. Rural	Total	1	2	3	Total	1	2	3
A		33,025	161,614	194,639	0.0	3.7	18.1	21.8	0.0	17.0	31.1
B		50,029	135,118	185,147	0.0	5.6	15.1	20.7	0.0	25.8	26.0
C	178,984	65,383	119,910	364,278	20.0	7.3	13.4	40.8	100.0	33.7	23.0
D		6,767	16,863	23,630	0.0	0.8	1.9	2.6	0.0	3.5	3.2
E		37,074	83,223	120,297	0.0	4.2	9.3	13.5	0.0	19.1	16.0
F		1,504	3,665	5,168	0.0	0.2	0.4	0.6	0.0	0.8	0.7
Total	178,984	193,782	520,393	893,159	20.0	21.7	58.3	100.0			

Estimates for Gracias a Dios and Islas de la Bahía
 Population 1995 (pop. projections from 1988 census)
 Proporción U/R 1988 (census)
 Proporción U/R 1995 (estimated)
 # people/house (from field survey)
 Additional houses (urban)
 Additional houses (rural)

	Gr. a Dios	I. de la Bahía
Population 1995 (pop. projections from 1988 census)	45,493	27,713
Proporción U/R 1988 (census)	0/100	17/83
Proporción U/R 1995 (estimated)	20/80	30/70
# people/house (from field survey)	6,050	4,152
Additional houses (urban)	1,504	2,002
Additional houses (rural)	6,016	4,672

<i>Household distribution in sample (planned)</i>					<i>Table %</i>				<i>Column %</i>		
Zone	1. Large cities	2. Small cities	3. Rural	Total	1	2	3	Total	1	2	3
A		121	316	437	0.0	4.8	12.6	17.5	0.0	15.9	30.4
B		184	264	448	0.0	7.4	10.6	17.9	0.0	24.2	25.6
C	700	263	245	1,208	28.0	10.5	9.8	48.3	100.0	34.7	23.8
D		25	33	58	0.0	1.0	1.3	2.3	0.0	3.3	3.2
E		136	163	299	0.0	5.4	6.5	12.0	0.0	17.9	15.8
F		30	20	50	0.0	1.2	0.8	2.0	0.0	4.0	1.9
Total	700	759	1,041	2,500	28.0	30.4	41.6	100.0			

<i>Household distribution in sample (actual)</i>					<i>Table %</i>				<i>Column %</i>		
Zone	1. Large cities	2. Small cities	3. Rural	Total	1	2	3	Total	1	2	3
A		118	314	432	0.0	5.1	13.5	18.5	0.0	16.7	32.6
B		178	249	427	0.0	7.6	10.7	18.3	0.0	24.0	25.9
C	628	254	213	1,095	26.9	10.9	9.1	47.0	100.0	34.2	22.1
D		29	38	67	0.0	1.2	1.6	2.9	0.0	3.9	4.0
E		139	132	271	0.0	6.0	5.7	11.6	0.0	18.7	13.7
F		24	16	40	0.0	1.0	0.7	1.7	0.0	3.2	1.7
Total	628	742	962	2,332	26.9	31.8	41.3	100.0			