THE
CEBU LONGITUDINAL
HEALTH AND NUTRITION SURVEY

Survey Procedures

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This document consists of two sections. The first, covering a few pages only, provides a quick overview of the **CEBU LONGITUDINAL HEALTH AND NUTRITION SURVEY (CLHNS)** in terms of its basic goals, its design and its analytical plans. The latter have evolved slowly in the course of the study and, because of the richness of the assembled data set, will undoubtedly continue to do so in the future. Section II describes the CLHNS data in detail: the procedures by which they were collected, their completeness and reliability, and the computerized data files into which they are organized.

Worthwhile data sets and their documentation are the result of painstaking work. In the case of the CLHNS data, this work involved numerous people, each one of them a specialist in her or his own field, and spanned years as well as continents. And yet, once everything has been said and done, the 'fame' usually rests with those whose names appear on articles and books based on the data. All the indispensable others involved in the development of the survey instruments, their testing, the set-up and supervision of the data-collection process, the gathering of the data, their editing and computerization, and the preparation of the 'final' data files usually receive an honorable collective mention in some footnote, if that much. These pages, because they directly refer to the work of the OPS staff, offer a small opportunity of giving express recognition to some of the people behind the final CLHNS output without forgetting that their work was--and still is--an integral part of a not only enjoyable but necessary cooperation with colleagues from the Carolina Population Center and the Nutrition Center of the Philippines who initially made the project possible and kept it going ever since.

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SECTION I

THE CEBU LONGITUDINAL HEALTH AND NUTRITION STUDY

A SCHEMATIC OVERVIEW

1. STUDY GOALS

The initial goal was to study infant feeding patterns, determinants and consequences using a prospective design.

During the 1981-83 design phase of the study, the focus was expanded to address a set of pregnancy outcomes, maternal and child health, and birth spacing issues which could be studied effectively with the prospective design.

2. STUDY DESIGN

a. SAMPLING

Random sample, 3,327 pregnant women and single live births.

33 randomly selected communities in Metro Cebu: 17 urban and 16 rural.

Include all low birth weight (LBW) infants: pre-term and small for date.

Exclude all twin births.

b. SURVEY SCHEDULE

Study a 12-month birth cohort: May 1983 through April 1984.

Periodically collect data on all infants born in the sample barangays and their mothers until the infants are 24 months old.

Collect concurrently relevant household and community data.

3. SURVEY INSTRUMENTS

a. CENSUS OF HOUSEHOLDS

Identification of all pregnant women in sample barangays.

b. BASELINE SURVEY

During sixth month of pregnancy (starting March/April 1983). Topics: maternal health behavior, diet, health status, socioeconomic characteristics of household, KAP measures.

c. DELIVRY SURVEY

Ideally on third day of infant's life (starting 1 May 1983). Topics: weight of infant at day 3, delivery practices, gestational age assessment, infant feeding during first two days of infant's life.

d. LONGITUDINAL SURVEYS (bimonthly)

Topics: detailed infant and maternal diet, mother and infant anthropometry and morbidity, socioeconomic household changes, health practices, industry behavior, coital behavior, family planning, otherchild spacing factors.

Water quality and diarrhea etiology for a subsample.

e. COMMUNITY-LEVEL SURVEYS

Health professionals' KAP (biannually)- not included on CD
Health facilities' practices (biannually)- not included on CD
Family planning facilities and personnel- not included on CD
Food markets (bimonthly)
Community characteristics (start and end of survey period)
Water quality (quarterly)

4. ANALYSIS GOALS

a. PREGNANCY OUTCOME

Social, biomedical, health service factors affecting gestational age and birth weight.

b. INFANT FEEDING

Dynamics of breast feeding and other feding behaviors.

Key factors affecting feeding choices at birth and ages 2 to 24 months.

C. CHILD HEALTH AND SURVIVAL

Patterns, determinants and consequences of infant growth, morbidity (diarrhea, URI), and survival.

Health services (ORT, immunization, other preventive and curative factors): patterns, determinants, and impact.

Water use and quality, food processing, personal and environmental hygiene.

Effects on infant growth, morbidity and mortality of the following factors:

Birth weight and gestational age,
Infant feeding patterns,
Nutritional status
Food processing practices,
Immunization patterns,
ORT use,
Quality of water at source and in house,
Excreta disposal,
Personal hygiene.

d. CHILD SPACING

Timing of return of menstruation and conception and key determinants: infant feeding, maternal nutrition, NFP, contraception, coital behavior.

Patterns, continuation, discontinuation of natural and modern family planning practices, determinants, consequences.

e. **WOMAN'S HEALTH**

Diet, anthropometry, morbidity and health service use.

Lactation patterns, diet, physical activity and nutritional status.

SECTION II

THE CEBU LONGITUDINAL HEALTH AND NUTRITION STUDY

DATA COLLECTION AND DATA ENCODING ACTIVITIES

THE CEBU LONGITUDINAL HEALTH AND NUTRITION STUDY

INTRODUCTION[1]

The Cebu Longitudinal Health and Nutrition Project, a joint endeavor of the Carolina Population Center, University of North Carolina at Chapel Hill, the Nutrition Center of the Philippines, Manila, and the Office of Population Studies, University of San Carlos, Cebu City, was originally conceptualized as a study of prevailing patterns of infant feeding in the Metro Cebu Area. In particular, the study wanted to investigate (a) the sequencing of feeding events, looking not only at milk but also non-milk items, (b) the various factors affecting feeding decisions at each point in time during the first two years of a baby's life, and (3) the effects that different feeding patterns have on infants, their mothers and the households in which mothers and children reside. The idea was to study these topics within as natural a setting as possible and to analyze how infant feeding decisions made in and by the household interact with various social, economic and environmental factors and affect health, nutritional, demographic and economic outcomes.

During the period of project design (1981-83), the focus of the study was expanded to include other issues related to such factors as birth weight and gestational age, infant growth, morbidity and survival, maternal diet and nutritional status, child spacing and mother's work, and child care. To obtain the needed information, a detailed multipurpose longitudinal survey of women, their infants and households was designed by an interdisciplinary group of social and biomedical researchers. The information obtained through the survey was to enable the analyst later on to examine causal relationships in a longitudinal manner.

In more specific terms, the longitudinal survey was to collect data on feeding patterns, health and nutrition of mothers and infants, demographic and socioeconomic background characteristics of the woman-infant pairs and their

[1] Cf. Executive Summary, Chapel Hill, January 1986.

households as well as activity profiles of household members, beginning with women in their 6th month of pregnancy and periodically thereafter when the infants were born and 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, and 24 months old. Appendix A (p. 62) outlines, in a schematic manner, the various subject areas covered by the longitudinal surveys.

In addition to information on mother-infant pairs and their households, it was decided to collect, through special surveys, data on community background characteristics, health and family planning facilities available, modern as well as traditional health practitioners serving the study population, and commercial establishments in the study area selling infant food. Also to be included in the survey efforts were repeated (a) collections of food prices prevailing in the major stores of the sample barangays, and (b) water quality tests of household water sources used for the feeding of the sample infants which make it possible to study the etiology of diarrhea. The basic motivation behind all of these efforts was the desire of integrating biomedical and socioeconomic variables into a coherent causal model that distinguishes between 'underlying' socioeconomic (individual, household and community), 'intermediate' behavioral and biomedic, and 'outcome' variables such as, e.g., infant growth and morbidity and permits to trace the processes that determine the outcome variables (cf. MODEL p. 3).

In the design, particular care was taken to obtain data that will allow to answer questions concerning the formulation and impact of programs and policies affecting infant feeding, mother-infant health and other relevant outcomes. Likewise carefully considered in the study design were crucial confounding factors and methodological complexities such as unobserved heterogeneity and endogeneity of determinants.

A. LONGITUDINAL SURVEY OF MOTHER-INFANT PAIRS

1. Preparatory Survey Activities

a. Sampling Design. The initial target set by the project was to collect longitudinal information over a three-year time span from 2,000 mothers who deliver a baby in the course of a specified one-year period. This period was eventually defined as the time between 1 May 1983 and 30 April 1984. Each sample respondent was to be visited 14 times: at the time of the mother's pregnancy, preferably during her sixth month (Baseline Survey), two days after the birth of the infant (Birth Information Survey), and every two months thereafter until the infant had reached his or her second birthday (Longitudinal Surveys 1 through 12). To make provisions for refusals and other drop-outs, the desired sample size was increased to 2,500. To locate this number of pregnant women who would give birth

between 1 May 1983 and 30 April 1984, it was estimated that some 20,000 households had to be canvassed. This estimate was based on the results of a pilot survey undertaken by OPS in 1982. To obtain the required number of households, a random sample of 33 barangays (neighborhoods in the city and villages in the rural areas) situated in Metro Cebu and containing approximately 20,000 households was selected. Prospective respondents were all pregnant women residing in these barangays who would deliver a live birth at any time between 1 May 1983 and 30 April 1984. The main reasons for employing cluster instead of simple random sampling were the need to keep the travelling of the survey personnel in financially feasible limits and to centralize the survey operations for maximum supervision. For a more detailed description of the sampling design, see Appendix B (p. 63).

Of the 33 sample barangays, 17 are located in urban, and 16 in rural areas. Contrary to the commonly held idea that a metro area is urban by definition, Metro Cebu, as officially defined by the Philippine government, encompasses vast tracts of agricultural or uninhabited lands reaching far into the central mountain ranges of Cebu Island or out into the sea to small offshore islands. In terms of administrative units, Metro Cebu consists of three distinct cities, among them Cebu City, the second largest city of the Philippines, (the other cities are Mandawe City and Lapu Lapu City) and six municipalities (Consolacion, Liloan, Cordova, Talisay, Minglanilla and Naga).

At the time of the 1980 Census, the Metro Cebu Area included 243 barangays of which the Census Bureau, on the basis of population size and density, physical characteristics and administrative functions, had classified 155 as urban, and 88 as rural. In view of the entirely rural character of many of the Metro Cebu barangays classified as urban in terms of predominant livelihood activities and availability of, and distance to, physical, social and administrative facilities, the Census classification of urban and rural was modified. In the context of the Child Health and Survival project, only those barangays forming a contiguously built-up area with the core of Cebu City, the central portion of Metro Cebu, are designated as urban, while barangays separated from this urban core by considerable stretches of open lands are defined as rural. According to this reclassification, 95 barangays of Metro Cebu are considered urban, and 148 rural (see Appendixes C & D, pp. 64-67).[2]

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[2] While the criteria used to distinguish between *urban* and *rural* locations are arbitrary ones and no attempts were made in the context of this study to specify what exactly they measure, it was hypothesized that variations in these criteria reflect variations in life styles of people residing in urban or rural places. Such variations were assumed to arise from urban-rural discrepancies with respect to availability of, and access to, physical, social and administrative facilities as well as differences in livelihood activities, occupational structure and, consequently, income levels.

On the assumption that patterns of household child care, infant feeding and health care are of a greater variety in urban locations compared to rural ones, the urban population was oversampled. While it had been decided at the outset of the survey that three fourth of the sample was to be allocated to urban and only one fourth to rural respondents, the urban respondents in the actually obtained sample account for 78 percent of all respondents.

b. Public Relations Activities. Beginning in August 1982, initial contacts were made with provincial, city, municipal and barangay officials to inform them of the planned project, to obtain their agreement to conducting the survey in their areas of jurisdiction and to elicit their active support for the project. Many barangay officials urged, or agreed to, the holding of barangay meetings in which the populace was to be informed of the purpose of the survey and the activities it would involve. These barangay meetings were held during the months of August and September. Toward the end of this period, official permits for conducting the survey were obtained from the administrative officials of the province, the three cities of Metro Cebu and all the municipalities in which sample barangays are located. Additional visits were made to the provincial, city and municipal health offices to inform them about the planned survey. Finally, permits for the survey were secured from the local military authorities.

c. Establishment of a Barangay Reporting Network. One important activity was the establishment of a Barangay Reporting System in all of the 33 sample barangays. The ideal procedure for obtaining speedy and reliable information about births and infant deaths that occur in the sample barangays would have been the permanent positioning of OPS staff members in the barangays. Because of financial and related constraints, such a system was not feasible. The second best and actually adopted solution was the creation of a reporting network using barangay residents as reporters. Shortly before the start of the survey operations, attempts were made to hire one or, in larger barangays, two official reporters who would, on a permanent basis and either personally or with the help of casual reporters, give daily reports about births and infant deaths in their localities directly to the office or to the survey teams operating in their areas. OPS promised to pay the official reporters a monthly honorarium of Pesos 100 plus transportation and/or communication expenses of Pesos 50.

The field staff easily found persons in all sample barangays willing to serve as reporter, but the initial enthusiasm of a number of them either

waned fast or turned into a game to make a fast buck without much effort. Upon the recommendation of the field staff, informants found to be ineffective were replaced by others (a sometimes delicate operation since some of the persons involved were barangay officials), or the position of barangay reporter was abolished altogether. By June 1983, a total of 30 reporters were officially employed by the project.

In addition to hiring official barangay reporters, also midwives and hilots (traditional birth helpers) residing and/or working in the survey area were requested to report to OPS or the interviewers in the field all births that they had attended to. Most of the traditional birth helpers who were approached responded very positively to this request. OPS paid them Pesos 5.00 for every birth that they reported within three days of its occurrence, and an additional five Pesos if they had weighed the infant immediately after birth with an infant weighing scale issued them by OPS.

After the start of the survey operations, the barangay reporters were also requested to report to the office or the field staff the names of all women who had become pregnant since the household listing in March 1983 or who had been missed during that operation. Reports made were verified immediately by the field personnel. Three months into the field operations, this reporting procedure had yielded the names of 430 newly or previously missed pregnant women.

d. Hiring and Training of Field Personnel. For the survey operations, OPS could rely partly on its own experienced field staff numbering 10, some of whom had been in the 'business' for more than eight years. They were to form the core of the field staff and trained to assume the supervisory functions in the field. Their number was augmented through the hiring of 12 new interviewers in December 1982, among them five registered nurses. The latter were needed primarily for the performance of gestational age tests on infants who either were born prematurely, whose mothers had suffered from diabetis during pregnancy or whose gestational age could not be obtained from indicators normally supplied by the mothers.

Aside from instructions in interviewing techniques, the training focused on problems related to (1) the obtaining of reliable information on infant morbidity, especially diarrhea, measles and respiratory infections, (2) anthropometric measurements, (3) gestational age tests, and (4) food-intake recall. All training sessions related to these special topics, conducted between January and March 1983, were supervised by the project consultants: Dr. Tomas Fernandez of the Cebu Institute of Medicine (CIM), and Dr.

Cora Barba, Nutrition Department, University of the Philippines at Los Baños.

In the course of the morbidity training, the pertinent sections of the survey questionnaire were reviewed and repeatedly field tested and, wherever necessary, revised. The anthropometric training, which covered the weighing of infants and mothers, the use of Harpenden calipers for skinfold measuring and the measuring of height of infants (by means of infantometers) and mothers (by means of ordinay meter sticks) included practice sessions in Paknaan, CIM's field station. With respect to skinfold measurements of mothers, practice sessions involving five volunteer women were held in the course of which each of these women was measured five times by every trainee. Variations in measurements of the same woman by different trainees were, as expected, considerable. To minimize such variations, the trainees were instructed to take, during the actual survey, three measurements each time and to record an average.

The training for administering gestational age tests (those devised by Dubowitz and Ballard) was arranged by Dr. Cerna, head of the Pediatrics Department of CIM. The training included lectures, film showings and tests on newly born infants, including premature ones. Dr. Mariano of Southwestern University, one of Cebu's better known neonatologists, provided additional lectures and practical advice. The training concluded with interobserver reliability tests assessing the accuracy of the gestational age tests administered by the trainees.

Dr. Barba, the project's dietary consultant, reviewed all questionnaire sections dealing with food intake, revised the Food Item Code Book developed by the OPS staff and held two-day training sessions with all interviewers. Afterwards, with the help of Mrs. Reyes of the University of San Carlos' Home Econopmics Department, the Food Item Code Book, used by the interviewers during the field work, was completed.

In May of 1983, in anticipation of the increasing interview load, 11 additional field workers were hired and trained, with the training following a schedule similar to the one just described for the first batch of interviewers.

e. Acquisition of Survey Equipment. During the second half of 1982, OPS acquired, either directly or through the Carolina Population Center, the following survey equipment:

TRANSPORTATION:	1	Suzuky Beaver (4-wheel-drive vehicle)
	1	Ford Fiera (jeepney-type) transporter
ANTHROPOMETRY:	40	Holtain Tanner Whitehouse skinfold calipers (Harpenden)
	100	HIW Infant Weighing Packs (scales), 25 kg
	50	HIW Infant Weighing Packs (scales), 10 kg
	75	Adult Bathroom scales
		(All of the above anthropometric equipment was purchased from CIM WEIGHING EQUIPMENT, London)
	30	Height Measuring Tapes for adults
	24	Stanley Folding Rulers (for height measuring)
	400	TEL-A-FEVER tapes (Celestial Mercantile Corp., Mamaroneck, NY)
	400	Arm-Circumference Measuring Tapes (ROSS-INSER)
	30	Infantometers (manufactured by NCP)
FOOD RECALL:	24	sets of Pyrex Measuring Cups
	17	sets of Measuring Spoons
	1	unit NUTEX table scale.

f. Preparatory Data Collection Activities. The first data collection in the context of the Metro Cebu Child Health and Survival Study was undertaken in April 1982 during a pilot survey of all households (5,250) located in four randomly selected barangays in the Metro Cebu area. The survey was designed (1) to obtain an estimate of the average number of pregnant women per household, and (2) to gain an impression of the reliability of pregnancy and childbirth related information that the study wished to obtain from the prospective respondents.

In November 1982, after the 33 sample barangays had been selected and the start of the main survey had been set for January 1983, a household Census was performed in all sample barangays. In the course of this activity, all households were visited and complete household rosters were obtained together with information on the number of currently pregnant women in the households and the expected dates of delivery. After a delay in the completion of the contractual arrangements had forced a postponement of the starting date of the main survey by three months, a second canvass of households was undertaken in February and March of 1983. The results of this canvass and a comparison of the enumerated households and persons with those counted in the 1 May 1980 Census of Population are presented in Appendix E (p. 68). The figures for 1980 and 1983 imply an average annual population growth of 5.4 percent of which, according to official birth and death estimates, almost one half is the result of net migration. The time table of the longitudinal survey operations which was set up in March 1983 is shown in Appendix F (p. 69).

2. Survey Outcomes

a. Number of Eligible Sample Women. The number of pregnant women in the 33 sample barangays who reported a pregnancy termination during the specified one year period largely exceeds the targeted number. The field staff, in cooperation with local reporters whom the project employed in every sample barangay, identified some 3,702 of them, not counting 27 women who erroneously reported themselves as being pregnant and excluding 9 eligible women whom the survey did miss entirely, as was discovered later. Likewise excluded from this number are 755 pregnant women who delivered their babies or terminated their pregnancies otherwise either shortly before 1 May 1983 (511) or after 30 April 1984 (244). Since the exact delivery dates of these women were not known beforehand, Baseline interviews had been administered to 318 of them before it became definite that they were not eligible for inclusion in the sample. In all, the survey personnel contacted, at one time or another, a total of 4,493 women, of whom 3,711 were eligible for inclusion in the survey and 3,702 were actually included.

The criteria used jointly to determine the eligibility of a woman for inclusion into the sample are:

(1) Residency in one of the 33 sample barangays;
(2) Pregnancy termination between 1 May 1983 and 30 April 1984;
(3) Delivery of the sample child in a sample barangay or any health facility located in the Metro Cebu Area.

Criterion (1) limits eligibility to women and infants with permanent residence in the sample barangays. A "resident" is defined as a person who, at the time of the survey, is living in the household and has no permanent residence elsewhere. This somewhat broad definition was chosen in lieu of commonly used others that require a person to have lived in the household for a predetermined period of time before he/she is considered a household resident. Such more restrictive definitions are not always understood by the respondents and easily lead to confusing replies. Any permanent change in residence during the survey period, i.e. permanent outmigration into non-sample localities, terminated the eligibility for the sample. Outmigrants are operationally defined as sample women who, either alone (when migrating before delivery) or together with the sample child (when migrating after the delivery) left the sample area while survey operations were going on and could not be contacted any more at any time during the longitudinal survey period or at the time of a "Follow-up Survey" (see pp. 22-24) in June/ July 1986. Sample children of

outmigrating mothers who were left behind in the sample areas remained part of the sample population.

Criterion (3) specifies that the delivery of the sample infants must take place in Metro Cebu, either at home in the sample barangay or any medical facility located in Metro Cebu, the larger ones of which are serving the entire Metro Area. Children delivered outside of the sample area are not considered part of the sample population even if their mothers keep their permanent residences in the sample barangays. For example, 106 women who had resided in the sample area during their pregnancies and who again were living there during the Follow-up Survey (cf. pp. 23-25) in June/July 1986 confirmed that they had delivered their children outside of Metro Cebu. These women were eligible respondents for the Baseline Interview but not thereafter.

b. Final Survey Status of Eligible Sample Women. Table 1 presents, by Sample Barangay and Final Survey Status Code, a breakdown of all women contacted by the survey personnel during the field operations. The Final Survey Status Code, which is explained in more detail on p.11, indicates:

(a) whether a woman was eligible for the survey;
(b) the type of pregnancy termination a woman experienced;
(c) the extent of a woman's participation in the survey (completion of all interviews, missing of intermittent interviews, outmigration, refusal, being missed).

The status codes of all women eligible for the survey range from 12 to 24. Women with codes 00 through 03 were eligible for the Baseline Survey but not thereafter since they gave births outside of the specified period 1 May 1983 through 30 April 1984. Baseline interviews collected for them are not included among the computerized survey records.

A breakdown of Table 1 by longitudinal survey (Baseline, Birth Information, L1- L12) can be found in Appendix K (pp. 79-92).

Table 1. NUMBER OF ALL WOMEN CONTACTED DURING THE 1983-1986 CEBU LONGITUDINAL HEALTH AND NUTRITION SURVEY, BY BARANGAY AND FINAL SURVEY STATUS

BRGY NO.	FINAL SURVEY STATUS CODE* 00	01	02	03	12	13	14	15	16	17	18	19	20	23	24	29	ALL CODES
1	16	1	5	5	94	25	19	7	7	1	3	4	2	0	0	1	190
2	13	1	4	4	56	38	15	5	4	0	0	1	0	0	0	0	141
3	36	0	5	13	132	73	35	8	7	3	3	4	2	1	0	1	323
4	14	0	0	16	94	18	17	3	5	2	4	2	3	0	0	0	178
5	3	0	2	2	12	3	2	0	1	1	0	0	0	0	0	0	26
6	14	0	1	5	78	12	12	8	3	2	1	1	3	0	0	1	141
7	28	1	6	7	106	30	18	7	9	1	12	1	2	3	0	0	231
8	12	0	3	6	66	21	18	8	10	5	4	0	5	0	0	0	158
9	20	0	9	12	141	16	15	4	8	0	1	2	2	4	0	2	236
10	26	0	8	14	99	56	32	16	6	1	3	1	2	1	1	1	267
11	11	2	6	12	105	25	13	6	11	0	8	1	2	3	1	1	207
12	16	0	11	2	59	21	12	7	8	0	3	0	2	0	0	2	143
13	68	22	12	19	222	92	49	9	12	5	1	1	7	6	2	5	532
14	13	0	3	4	55	18	11	2	11	3	2	0	3	0	2	1	128
15	8	0	4	2	65	11	7	3	2	0	1	0	2	2	1	1	109
16	13	0	3	8	68	38	12	10	4	1	4	0	1	1	0	1	164
17	33	0	8	7	160	42	33	17	16	4	6	3	4	0	0	1	334
18	4	0	1	5	35	0	0	1	1	0	1	0	0	0	0	0	48
19	0	0	1	2	21	1	1	1	2	0	1	0	0	0	0	0	30
20	2	10	5	4	56	12	3	1	0	2	1	0	0	0	0	0	96
21	4	0	0	0	14	0	0	1	2	0	0	0	0	0	0	1	22
22	1	0	2	2	9	4	6	2	1	2	0	0	0	0	0	1	30
23	1	3	3	4	18	5	2	0	3	0	0	0	0	0	0	0	39
24	0	0	0	0	11	2	0	0	1	0	0	1	0	0	0	0	15
25	3	0	1	1	25	2	2	1	0	0	0	0	0	0	1	0	36
26	2	0	3	0	48	7	5	3	0	0	2	2	0	0	0	1	73
27	5	4	4	6	52	8	6	3	6	2	4	0	0	1	0	1	102
28	13	2	7	19	116	34	11	4	17	2	1	0	2	0	0	4	232
29	3	0	0	4	40	3	8	2	8	2	0	1	2	0	0	0	73
30	4	0	2	2	40	2	1	2	1	1	0	1	0	0	0	1	57
31	5	0	0	8	42	2	10	0	1	0	1	1	2	0	1	0	73
32	0	0	1	3	30	2	4	0	0	0	1	0	1	0	0	0	42
33	0	0	0	0	10	2	3	2	0	0	0	0	0	0	0	0	17
ALL	391	46	120	198	**2179**	**625**	**382**	**143**	**167**	**40**	**68**	**27**	**49**	**22**	9	27	4493
Urban	344	27	90	138	**1612**	**539**	**320**	**120**	**124**	**29**	**56**	**21**	**42**	**21**	7	18	3508
Rural	47	19	30	60	**567**	**86**	**62**	**23**	**43**	**11**	**12**	**6**	**7**	**1**	2	9	985

Barangays 1 through 17 are *urban*, and 18 through 33 *rural* sample barangays.
For a breakdown of this table by longitudinal interview, see Appendix K, pp. xx-xx).

EXPLANATION OF SURVEY STATUS CODES
Appearing in the Masterlist of Sample Women and on the Data Records

00 - Woman delivered before 1 May 1983. No interview was conducted.

01 - Woman delivered after 30 April 1984. No interview was conducted.

02 - Woman delivered before 1 May 1983. Baseline interview was conducted but excluded from the data files.

03 - Woman delivered after 30 April 1984. Baseline interview was conducted but excluded from the data files.

12 - Sample woman with child surviving past age 2 and complete survey records (14 longitudinal interviews).

13 - Sample woman outmigrated permanently from the survey area during the survey period.

14 - Sample woman with one or more missing longitudinal interviews. Woman either completed the last (12th) longitudinal interview or confirmed, upon return to the sample area after her survey period, that the sample child was alive. Reasons for "missed" interviews:

OM - woman temporarily outmigrated;
RF - woman temporarily refused to be interviewed;
NC - woman could not be found or contacted;
JL - woman was jailed;
MS - woman was missed by the interviewers;
LS - interview schedule was lost;
MF - interviewer manufactured interview data.

> Codes appear in the Masterlist of sample women only, not on the data records.

15 - Sample woman refused to be interviewed before Baseline or after last interview shown in Masterlist.

16 - Sample baby died.

17 - Stillbirth.

18 - Miscarriage.

> At the beginning of the survey, women who had experienced an abnormal pregnancy termination were dropped from the survey. At a later stage of the operations, it was decided to take these women back into the sample. 56 women whose babies died have complete survey records (14 interviews).

19 - Twin birth. Woman was dropped from the sample. Baseline interview obtained is included in the data files.

20 - Woman was discovered by survey personnel only after her delivery. No Baseline interview was obtained and the woman dropped from the sample. All interviews obtained are included in the data files.

23 - Woman was dropped from the sample because of giving erroneous information to the interviewer or because delivery was reported too late to the survey personnel. In some instances, the Baseline interview was obtained after the Birth Information interview. All interviews obtained are included in the data files.

24 - Missed pregnancy. No interview was conducted.

29 - Erroneous pregnancy report. No interview was conducted.

Of the 3,711 eventually identified eligible women in the 33 sample barangays, 2,233 (60.2 percent) responded to all 14 longitudinal interviews. The sample infants of 2,179 of these women survived their second birthday, while those of 54 mothers had died in the sample areas before reaching this age. From the vast majority of the remaining mother-infant pairs, at least partial information was obtained. No information is available for nine 'missed' women and their infants and 179 pregnant women who 'disappeared' from the sample areas during the time between the February/March 1983 Household Census and their scheduled Baseline interviews. Table 2 provides a detailed breakdown of all longitudinal interviews obtained by type of interview and final survey status of sample respondents.

Table 2. NUMBER OF LONGITUDINAL INTERVIEWS, BY FINAL SURVEY STATUS OF SAMPLE WOMAN

FINAL SURVEY STATUS OF SAMPLE WOMAN*	TYPE OF INTERVIEW														ALL INTER VIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12		
12 Complete Rec.	2179	2179	2179	2179	2179	2179	2179	2179	2179	2179	2179	2179	2179	2179	30506	2179
13 Outmigrant	446	311	239	201	159	144	127	112	90	74	59	41	21		2024	625
14 Temp. Migrant	382	382	317	300	278	259	216	254	246	239	264	290	284	300	4046	382
15 Refusal	66	50	36	21	13	8	7	5	4	4	3	2			219	143
16 Infant Died	155	156	111	108	103	98	105	114	126	128	116	117	114	117	1668	167
17 Stillbirth	38	38		1	6	12	21	26	28	27	29	27	28	29	310	40
18 Miscarriage	13	8			1	2	5	5	6	7	7	6	6	6	72	68
19 Twin Birth	26														26	27
20 Discovered Late		49													49	49
23 Dropped	22	6	2												30	22
24 Missed															--	9
ALL STATUSES	**3327**	**3179**	**2884**	**2810**	**2739**	**2702**	**2695**	**2695**	**2679**	**2658**	**2657**	**2662**	**2632**	**2631**	**38950**	**3711**

* For an explanation of 'Survey Status Codes', see p.11.

c. Temporary Migrants. The sample population was an extremely mobile one. About one fourth of all sample women were, at one time or another, reported to have "outmigrated" from the sample areas. At the beginning of the survey operations, such reports were taken at face value. However, after a number of months of careful checking by the field staff, many of those who reportedly had outmigrated were back in their original residences. After this had been discovered, checks as to the whereabouts of the reported outmigrants were made by the field workers every time alongitudinal interview was scheduled. In all, 382 "Temporary Outmigrants" were identified and taken back into the sample. To qualify as a returnee, the one-time or repeated "outmigrant" had to have completed at least a Baseline and Birth Information interview. As Table 3 shows, almost 40 percent of the temporary migrants completed 13 out of 14 interviews, and three fourths of them 10 interviews or more.

Table 3. NUMBER OF LONGITUDINAL INTERVIEWS OF SAMPLE WOMEN WHOSE INFANTS SURVIVED THEIR SECOND BIRTHDAY BUT WHO MISSED ONE OR MORE LONGITUDINAL INTERVIEWS [STATUS CODE 14]

NUMBER OF COMPLETED INTERVIEWS	TYPE OF INTERVIEW														ALL INTERVIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12		
13	144	144	123	132	130	126	133	132	135	131	134	139	134	135	1872	144
12	67	67	61	57	59	57	57	58	52	45	54	61	52	57	804	67
11	46	46	41	35	31	32	31	33	29	30	32	39	38	43	506	46
10	27	27	24	19	17	17	15	14	13	15	19	19	21	23	270	27
9	21	21	16	13	10	8	6	13	14	9	14	14	14	16	189	21
8	13	13	10	11	9	3	4	3	2	4	3	8	11	10	104	13
7	16	16	13	13	8	7	4	1	1	4	5	8	8	8	112	16
6	12	12	12	11	10	7	1	0	0	0	1	1	2	3	72	12
5	7	7	6	4	4	2	0	0	0	1	1	0	1	2	35	7
4	9	9	5	5	0	0	0	0	0	0	1	1	3	3	36	9
3	6	6	6	0	0	0	0	0	0	0	0	0	0	0	18	6
2	14	14	0	0	0	0	0	0	0	0	0	0	0	0	28	14
INTERVIEWS MADE	**382**	**382**	**317**	**300**	**278**	**259**	**251**	**254**	**246**	**239**	**264**	**290**	**284**	**300**	**4046**	**382**

The temporary outmigrants, particularly those with many missing interviews, will be used among others to assess the behavioral contamination of the sample women with respect to the treatment of their (sample) infants caused by the survey operations themselves. The assumption is that behavioral contamination, an unavoidable byproduct of any longitudinal survey dealing with behavioral matters, will be more in evidence among women who have been in contact with the survey personnel and survey operations for an uninterrupted period of more than two years than among those who have had only intermittent contact with the project.

d. Permanent Outmigrants. Distinct from the "temporary" outmigrants are those respondents who reportedly left the sample areas for good. Since the experience with the temporary outmigrants had proven that reports of terminal outmigration cannot be taken at face value, a final check on all reported outmigrants was made in June/July 1986 (cf. Follow-up Survey) in the course of visits by the field staff to the last known residences of all those sample women reported to have outmigrated, 82 were found to have returned together with their families. Since all of these 82 had completed at least Baseline and Birth Information interviews and 65 of them a good number more, they were reclassified as temporary migrants. Only those reported outmigrants who could not be found in their orginal sample barangays during the Follow-up Survey were ultimately classified as "outmigrants."

Table 4. NUMBER OF LONGITUDINAL INTERVIEWS OF SAMPLE WOMEN WHO OUTMIGRATED WITH THEIR SAMPLE INFANTS BEFORE COMPLETION OF THE SURVEY [STATUS CODE 13]

LAST INTERVIEW BEFORE OUTMIGRATION	TYPE OF INTERVIEW													ALL INTERVIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	
L11	21	21	19	20	20	19	17	20	18	18	20	21	21		255	21
L10	20	20	17	18	16	16	18	18	17	19	19	20			218	20
L9	20	20	19	16	15	16	16	17	16	18	20				193	20
L8	19	19	18	18	19	18	18	18	19	19					185	19
L7	20	20	19	16	14	16	18	19	20						162	20
L6	20	20	20	18	17	18	19	20							152	20
L5	21	21	19	19	19	20	21								140	21
L4	21	21	18	19	20	21									120	21
L3	19	19	19	19	19										95	19
L2	38	38	37	38											151	38
L1	34	34	34												102	34
BI	58	58													116	58
BS	135														135	135
None															---	179*
INTERVIEWS MADE	**446**	**311**	**239**	**201**	**159**	**144**	**127**	**112**	**90**	**74**	**59**	**41**	**21**		**2024**	**625**

* All of these women had disappeared from the sample area by the time their Baseline interview was scheduled, but in June/July 1986, 33 of them were back in their original residences. Of the latter, 28 confirmed that they had given birth outside of the sample area.

Table 4 shows the number of interviews given by the 625 outmigrant sample women and indicates the time of their outmigration in terms of the last interview they completed. Beginning with Longitudinal Survey Nr.3, the number number of outmigrants between successive surveys is relatively constant, hovering around 20. During earlier survey phases, however, the numbers were substantially larger, particularly the number of those who disappeared between household canvass and Baseline interview (179) and between Baseline and Birth Information interview (135). At first glance, two explanations for this phenomenon offer themselves. The first is that women seek the help of their parents or other close relatives when the time of delivery approaches and move in with them for some time. When the interviewer came around for a scheduled interview, she was informed that the respondent "had moved away." Since during the early stage of the project messages of this type were not questioned, the respondent was dropped from the sample. A second suggestion is that prospective respondents, when first approached, were unwilling to participate in the survey but reluctant to say so openly. Instead, they instructed other members of their households or neighbors to tell the interviewers, whenever these came around, that they had moved away. This latter hypothesis helps to make plausible the rather low refusal rate of less than four percent. On the basis of experiences made during other longitudinal surveys in the Cebu area, a refusal rate of ten percent or even higher had been expected.

Information collected during the longitudinal surveys as well as two follow-up surveys held in mid 1984 and mid 1986 permits to gain some idea as to the initial migration destinations of the outmigrants. This information, which is available for 70 percent of the 625 respondents who were reported to have left the sample areas for good, is summarized in Appendix G. Some 12 percent of all outmigrants were not really migrants but "local movers" since they stayed in the Metro Cebu area. The largest proportion, about 40 percent, migrated relatively short distances either within the the Province of Cebu or to islands in the immediate vicinity of Cebu. Long distance moves to Luzon or Mindanao were relatively rare.

e. Refusers. The total number of women who openly refused to participate in the survey or to continue their participation is surprisingly small: 147. Some doubts as to the correctness of this small proportion have been registered before, and it probably can be assumed that a number of refusers had themselves reported as migrants in order not to have to reveal their negative attitudes toward the project to the project workers.

Table 5 illustrates that sample attrition as result of open refusal declined with increasing survey duration, exactly the opposite of what one normally would expect. This undoubtedly can be attributed at least in part to (a) the good rapport of the field staff with the survey population, and (b) the small gifts that periodically were handed out to the sample mothers. The attraction of these gifts is highlighted by field reports according to which some non-sample women expressed the desire to get pregnant so that they too could become recipients of such gifts. The apparent eagerness of many respondents to get something out of the survey and, for that reason, stay with it is a reflection of the economic situation at the time of the survey. It is probably safe to argue that existing economic hardships in combination with the gifts handed out by the survey personnel have helped considerably in keeping the number of refusals to a minimum.

Table 5. NUMBER OF LONGITUDINAL INTERVIEWS OF SAMPLE WOMEN WHO REFUSED TO PARTICIPATE OR TO CONTINUE PARTICIPATION IN THE SURVEY [SATUS CODE 15]

LAST INTERVIEW BEFORE REFUSAL	TYPE OF INTERVIEW														ALL INTER VIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12		
L10	2	2	2	2	2	2	2	2	2	2	2	2			24	2
L9	1	1	1	1	1	1	1	1	1	1	1				11	1
L8	1	1	1	1	1	1	1	1	1	1					10	1
L6	1	1	1	1	1	1	1	1							8	1
L5	2	2	2	2	2	2	2								14	2
L4	1	1	1	1	1	1									6	1
L3	5	5	5	5	5										25	5
L2	8	8	8	8											32	8
L1	15	15	15												45	15
BI	13	14													27	14
BS	17														17	17
None															--	76
INTERVIEWS MADE	**66**	**50**	**36**	**21**	**13**	**8**	**7**	**5**	**4**	**4**	**3**	**2**			**219**	**143**

f. Infant and Child Deaths. The final number of infant (under 1 year of age) and child (1 year old) deaths found by the survey is 167. Some 93 percent (156) of these deaths were recorded during the longitudinal survey itself, and the remainder in June/July 1986 during a follow-up survey of "lost cases". For 151 of the 156 infant and child deaths found in the course of the longitudinal survey, special Mortality Interviews were completed; in the five remaining cases, the mothers declined to supply any further information after their children had died. Four mothers of the 11 children whose deaths were discovered only in June/July 1986 had refused any cooperation with the survey when initially asked, and the seven others either had disappeared from the sample barangays for a while and been classified as outmigrants or made themselves unavailable to the field staff in other ways.

The 167 infant and child deaths mentioned do not include:

(a) 4 confirmed deaths among 311 infants who had permanently outmigrated with their mothers and died outside of the sample area;

(b) 10 confirmed deaths outside of the sample area among 106 infants born to mothers who had left the sample area while pregnant and delivered their babies elsewhere;

(c) 6 confirmed deaths in the sample area among 26 twins and one triplet born in the sample area.

Table 6. NUMBER OF LONGITUDINAL INTERVIEWS OF SAMPLE WOMEN WHOSE INFANTS DIED BEFORE THEIR SECOND BIRTHDAY [STATUS CODE 16]

NUMBER OF COMPLETED INTERVIEWS	TYPE OF INTERVIEW														ALL INTER VIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12		
14	54	54	54	54	54	54	54	54	54	54	54	54	54	54	756	54
13	16	16	14	15	16	12	16	16	14	16	13	16	14	14	208	16
12	11	11	8	7	9	9	7	9	11	11	11	10	9	9	132	11
11	18	18	13	13	9	11	12	10	18	18	15	14	13	16	198	18
10	14	14	9	9	7	6	10	11	13	13	8	8	9	9	140	14
9	9	9	3	2	1	1	1	7	8	8	8	8	8	8	81	9
8	7	7	2	2	2	2	1	1	5	5	5	5	6	6	56	7
7	3	3	2	2	2	2	3	1	0	0	0	1	1	1	21	3
6	4	4	1	1	1	1	1	2	3	3	2	1	0	0	24	4
5	2	2	2	2	2	0	0	0	0	0	0	0	0	0	10	2
4	1	1	1	1	0	0	0	0	0	0	0	0	0	0	4	1
3	5	5	2	0	0	0	0	3	0	0	0	0	0	0	15	5
2	9	9	0	0	0	0	0	0	0	0	0	0	0	0	18	9
1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	5	5
None															--	9
INTERVIEWS MADE	**155**	**156**	**111**	**108**	**103**	**98**	**105**	**114**	**126**	**128**	**116**	**117**	**114**	**117**	**1668**	**167**

Not indicated in Table 6 is the time at which the sample children had died. What Table 6 does show is that, frequently, one or more interviews were missed immediately after a child's death. The main reason for this is the initial instruction to the field staff to drop mothers who had lossed either their pregnancy or child (see "Stillbirths" below).

How complete are the death reports obtained during the survey operations? An examination of available survey records documenting the survival status of the sample children at age 2 indicates that the number of missed deaths cannot be large. Existing survey documents include:

2,479 longitudinal questionnaires (L12) completed in the presence of the sample children after these had completed their second birthday (cf. Table 2);

82 reports from temporary outmigrant mothers obtained during the June/July 1986 Follow-up Survey that their sample child was still alive (cf. pp. 23-25);

198 reports obtained during the June/July 1986 Follow-up Survey who had refused participation in the survey, were discovered late and/or dropped or who had been missed by the survey that their sample children had been alive at age 2 (cf. Table 12 and 12);

156 longitudinal questionnaires from mothers whose sample child had died before the age of 2;

11 reports obtained during the June/July 1986 Follow-up Survey from sample women who had been lost during the survey for various reasons that their sample children had died before the age of 2 in Metro Cebu.

Taken together, these documents cover 2,926 sample mothers and as many sample children. Of the remaining 785 sample mothers,

625 are outmigrants (cf. Table 4);

135 had abnormal pregnancy terminations (miscarriage, stillbirth, multiple births, cf. Table 2).

This leaves the children of only 25 sample women about whose fate nothing is known; Of these mothers, 14 had refused to participate in the survey, nine had been discovered late, and 2 had been dropped.

The likelihood of more infant and child deaths being hidden among the children of mothers officially classified as "permanent outmigrants" who in reality were refusers is substantially reduced through evidence to the contrary obtained during the June/July 1986 Follow-up Survey. Table 12, which details the results of this survey (see p.24 below), shows that reliable survival status reports from close relatives were obtained for the children of 210 out of 311 sample women who outmigrated after their children had been born in Metro Cebu, and from 138 out of 314 sample women who had outmigrated from the sample area before they had given birth to their sample child. The birth place outside of Metro Cebu of 106 children of the latter 314 sample women is likewise known. Included in the 348 survival reports are 14 deaths that had occurred outside of the sample area.

g. Stillbirths. The number of interviews from sample women whose pregnancies terminated in a stillbirth is relatively small. The main reason behind the "missing" of interviews from these women (as well as those who had experienced a miscarriage or lost their sample child through death) was not necessarily their unwillingness to give information or the tardiness of the interviewers but a change in the survey strategy implemented in midstream. Initially, the survey personnel had been instructed to drop all

operations for women who had lost pregnancy or child. At a later stage of the survey, when the examination of birth spacing became part of the project's analysis plans, attempts were made to persuade these dropped women to reenter the sample. These attempts were not too successful because mothers either had outmigrated or simply refused to get involved in the survey once more. As Table 7 shows, all but two of the sample women who experienced a stillbirth had completed Baseline and Birth Information interviews, but it then took about 10 months before some 21 of them had reentered the sample.

Table 7. NUMBER OF LONGITUDINAL INTERVIEWS OF SAMPLE WOMEN WHOSE PREGNANCIES TERMINATED IN A STILLBIRTH [STATUS CODE 17]

NUMBER OF COMPLETED INTERVIEWS	TYPE OF INTERVIEW														ALL INTER VIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12		
13	1	1		1	1	1	1	1	1	1	1	1	1	1	13	1
12	4	4			4	4	4	4	4	4	4	4	4	4	48	4
11	6	6				6	6	6	6	6	6	6	6	6	66	6
10	6	6			1		6	6	6	5	6	6	6	6	60	6
9	5	5				1	1	5	5	4	4	5	5	5	45	5
8	5	5					1	1	4	4	5	5	5	5	40	5
7	1	1							1	1	1		1	1	7	1
6	2	2						2	1	2	2			1	12	2
4	1	1					1	1							4	1
3	1	1					1								3	1
2	5	5													10	5
1	1	1													2	2
None															--	1
INTERVIEWS MADE	**38**	**38**	**0**	**1**	**6**	**12**	**21**	**26**	**28**	**27**	**29**	**27**	**28**	**29**	**310**	**40***

* Of the 40 women, 7 outmigrated before the completion of the survey, 2 refused, and 1 died.

h. Miscarriages. While stillbirths are relatively easy to trace, miscarriages are not because of their timing and, if they occur in the early months of pregnancy, the eventual unawareness of the mother. Since the sample women were enrolled in the survey after their pregnancy status had been discovered by the local reporters and confirmed by the field staff, i.e., at a time when the mothers were relatively sure of their status, fetal losses that had occurred in an earlier stage of pregnancy were not covered by the survey, a fact which probably explains the relatively small number of reported miscarriages. Some 52 women informed the interviewers of their miscarriages when these came for the Baseline interview, which was scheduled for the sixth month of pregnancy or later. Because of the "dropping instructions" then in force, none of these women was interviewed. One of the reasons that so few women who had suffered a miscarriage were willing to reenter the sample later on (a fact indicated in Table 8 by the small number of those who did) is undoubtedly the embarrassment felt by mothers when having to talk to strangers about such a personal and unfortunate event. In one case classified as "miscarriage," it has been reported that the fetus was intentionally aborted by the birth attendant.

Table 8. NUMBER OF LONGITUDINAL INTERVIEWS OF SAMPLE WOMEN WHOSE PREGNANCIES TERMINATED IN A MISCARRIAGE [STATUS CODE 18]

NUMBER OF COMPLETED INTERVIEWS	TYPE OF INTERVIEW														ALL INTERVIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12		
12	1	1			1	1	1	1	1	1	1	1	1	1	12	1
10	1	1					1	1	1	1	1	1	1	1	10	1
9	1						1	1	1	1	1	1	1	1	9	1
8	1	1							1	1	1	1	1	1	8	1
7	1								1	1	1	1	1	1	7	1
6	2						1	1	1	2	2	1	1	1	12	2
4	1					1	1	1							4	1
2	2	2													4	2
1	3	3													6	6
None															--	52
INTERVIEWS MADE	**13**	**8**	**0**	**0**	**1**	**2**	**5**	**5**	**6**	**7**	**7**	**6**	**6**	**6**	**72**	**68***

* Of the 68 sample women, 4 outmigrated before the completion of the survey and one was dropped because of leprosy.

i. Multiple Births. According to a decision made during the planning stage of the project, all twin births were to be disregarded because of their relatively low birth weight and other characteristics distinguishing them from single births. Between 1 May 1983 and 30 April 1984, the project registered 26 twin births and one triple birth in the 33 sample barangays. Prior to their deliveries, 26 of the 27 mothers involved had completed the Baseline interview. Two years after their deliveries, 49 of the children were still alive. Of the six who had not survived, among them a member of the triplet, one child had died shortly after birth, and five between month 2 and 9 of their lives (see Table 9).

j. Missed Women. In the survey documents, 49 mothers and their infants are classified as "discovered late." Of these mothers, the project learned through the local reporters only after they had delivered their sample babies. Since the mothers' pregnancies were not known to the field staff, no Baseline interviews were conducted. Even though Birth Information interviews have been obtained from all 49 of these mothers, the latter were dropped from the survey because of the missing Baseline information.

Another 22 mother-infant pairs were dropped from the sample despite the availability of Baseline information for them. In 17 instances, the sample birth was reported only weeks after it had occurred so that the collection of reliable birth information was no longer possible. The situation was similar with one mother who, together with her infant, spent the first four weeks after delivery in the hospital and, therefore, could not be contacted for the Birth Information interview. In the case of two mothers, who came to the attention of the survey staff after they had given birth, Baseline interviews were obtained only after the Birth Information visit. Among the "dropped", finally, are two mothers who told the interviewers that their pregnancies had terminated in a stillbirth or miscarriage, respectively, while in reality, as confirmed later, their pregnancy terminations had been normal and their infants had survived (see Table 9).

Nine additional eligible women were found by the project only after their infants were already a couple of months old. From these nine women, no interviews whatsoever were obtained (see Table 9).

Table 9. NUMBER OF LONGITUDINAL INTERVIEWS OF SAMPLE WOMEN WHO WERE EXCLUDED FROM THE SAMPLE, BY REASON FOR EXCLUSION [STATUS CODES 19,20,23,24]

REASON FOR EXCLUSION	TYPE OF INTERVIEW													ALL INTER VIEWS	NO. OF SAMPLE WOMEN
	BS	BI	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	
Multiple Birth	26														26	27
Discovered Late		49													49	49
Dropped	22	6	2												30	22
Missed															--	9
INTERVIEWS MADE	**48**	**55**	**2**												**105**	**107**

k. Spurious Pregnancy Reports. Some 27 women in the 33 sample barangays who, during the household canvasses in 1982 or 1983, were reported as pregnant had, in reality, not been pregnant at all. From 20 of these women, explicit confirmation of not having been pregnant shortly before or during the survey was obtained during the Follow-up Survey of lost respondents in June/July 1986.

Table 10. IDEAL NUMBER OF INTERVIEWS, INTERVIEWS ACTUALLY OBTAINED, LOST, AND MISSED

FINAL SURVEY STATUS OF SAMPLE WOMAN	No. OF ELIGIBLE WOMEN	IDEAL NUMBER OF INTERVIEWS*	ACTUALLY OBTAINED INTERVIEWS	NUMBER OF LEGITIMATE LOSSES	LOST BECAUSE OF ORIGINAL SURVEY POLICY	TEMPORARY OUTMI-GRATION	DISCOVERED/ REPORTED LATE OR MISSED
12 Compl. Rec.	2,179	30,506	30,506	--	--	--	--
13 Outmigrant	625	8,750	2,024	5,789	--	937	--
14 Temp. Migr.	382	5,348	4,046	--	--	1,302	--
15 Refusal	143	2,002	219	1,782	--	1	--
16 Infant Died	167	2,338	1,668	167	200	303	--
17 Stillbirth	40	560	310	84	123	43	--
18 Miscarriage	68	952	72	37	766	77	--
19 Twin Birth	27	27	26	--	--	--	1
20 Disc. Late	49	686	49	--	--	--	637
23 Dropped	22	308	30	--	--	--	278
24 Missed	9	126	--	--	--	--	126
ALL STATUSES	**3,711**	**51,603**	**38,950**	**7,859**	**1,089**	**2,663**	**1,042**
(Percent)		(100.0)	(75.5)	(15.2)	(2.1)	(5.2)	(2.0)

* Number of eligible women times 14.

l. "Missed Interviews". If all eligible women had been included in the survey and remained in the sample area throughout the survey period and been interviewed 14 times, the number of interviews would total 51,603; the number of longitudinal interviews actually obtained is 38,950, or 75 percent of the "ideal" total. A breakdown of the number of "missed interviews" by reason for missing shows that most of them were lost legitimately. "Legitimate" reasons are: terminal outmigration of the respondent or her refusal to participate in the survey. As Table 10 illustrates, outmigration of the respondent or her refusal account for 62 percent of all "missed" interviews. This proportion includes 288 potential interviews from respondents who outmigrated or refused after they had experienced an abnormal pregnancy termination or after their sample

infants had died. The number of remaining "missed" interviews is reduced further by those that were not collected on account of the original project policy to drop women from the survey after it became known that they had experienced an abnormal pregnancy termination or that their sample child had died. Since also temporary outmigration is an event that the field personnel could not control (2,663 interviews were lost because of this), the actual number of interviews that the project really did miss because of late reporting or real oversight amounts to 1,042, which is two percent of the ideal number of interviews.

3. Follow-up Survey of "Lost" Respondents.

Because of the not always reliable migration information obtained during the survey and in order to establish a firmer base for the calculation of infant and child mortality rates, a Follow-up Survey of all sample women or mother-infant pairs who had been "lost" at any time during the longitudinal survey operations was undertaken in June and July of 1986, shortly after the official longitudinal survey operations had terminated. During this survey, the last known residences of all lost mothers were visited and inquiries made as to their whereabouts and the survival status of their sample infants two years after birth. The specific questions to which answers were sought are the following:

(1) Had those reported to have outmigrated really outmigrated?

(2) Were children born to eligible women who had refused, were missed or had been dropped from the sample still in the survey area and alive and, if they were not, when had they outmigrated or died?

(3) How many infant and child deaths are hidden behind refusals or outmi gration reports?

(4) What about the whereabouts and the survival of multiple births?

The Follow-up Survey attempted to trace a total of 968 "lost" cases:

Permanent Outmigrants	709
Refusers	151
Multiple Live Births	27
Women Discovered Late	49
Dropped Women	23
Missed Women	9

In the process, 82 mother-infant pairs previously classified as outmigrants (Status Code 13) were found living once again in their original residences in the sample barangays. Since all of the mothers had completed Baseline and Birth Information interviews and the sample infants of all of them either were alive or had been alive at their second birthday, they were reclassified as "temporary outmigrants" (Status Code 14. The reclassified women are incorporated in Table 3, p.13). For 106 of all sample mothers who had

outmigrated before their delivery, their children's place of birth outside of Metro Cebu could also be identified (see Table 11 below).

During the Follow-up Survey, 11 "hidden" deaths of sample infants were discovered, a fact substantiating the hypothesis that some mothers do try to conceal the death of their baby. In six cases, the mothers had intentionally hidden the fact of their infants' death by having themselves reported as outmigrants (2 women), by refusing to give information to the interviewer immediately after the child had died (3 women), or by never being around at interview time (1 woman, officially classified as "refuser"). In four of the remaining five cases, the mothers had refused cooperation with the survey from the very beginning, and one infant death was reported by a mother who had been dropped from the sample. All of these respondents were assigned a final survey status code of 16 (infant died).

Table 11. NUMBER OF LOST SAMPLE INFANTS, BY INFORMATION ABOUT THEIR PLACE AND DATE OF BIRTH AND SURVIVAL STATUS AT AGE 2, AND REASON FOR LOSS

REASON FOR LOSS	PLACE & DATE OF BIRTH		SURVIVAL STATUS AT AGE 2			ALL LOST INFANTS
	Known	Unknown	Alive	Dead	Unknown	
Mother and/or child outmigrated						
after Birth Information Interview	311*	-	206	4	101	311
after Baseline Interview	62	73	76	5	54	135
before Baseline Interview	44	135	52	5	122	179
Mother refused to give information	135	8	129	-	14	143
Mother was discovered too late	45	4	40	-	9	49
Infant was dropped from the sample	21	1	20	-	2	22
Infant was missed by the survey	9	-	9	-	-	9
Multiple birth	27*	-	21	6**	-	27
ALL LOST CASES	**654**	**221**	**553**	**20**	**302**	**875**

* All of these infants were born in the sample area.
** In this table, multiple births are counted as 1.

The reclassification of the 93 respondents just mentioned reduces the number of "lossed cases" to 875. For the sample children of about two third of these women, the Follow-up Survey was able to obtain information as to place of birth, whereabout in mid 1986 or survival status at age 2. This information is summarized in Table 11 (see also Appendix G, p. 70).

During the Follow-up Survey, efforts were made to obtain information from reliable sources. Changes in Final Survey Status Code were made only when the information on which such changes were to based came from the "lost" respondents themselves or members of their nuclear families. Reports made by aunts, neighbors or friends were not accepted as reliable for this purpose. Mother-infant pairs classified during the survey as outmigrants were assumed to really have outmigrated for good when they were not residing in their last known residences in the sample barangays, i.e., could not be contacted in person during the June/July 1986 Follow-up Survey and their leaving was confirmed by close relatives or previous neighbors. All information sources used during the Follow-up Survey are listed in Table 12.

Table 12. NUMBER OF TIMES INFORMATION ABOUT LOST RESPONDENTS WAS OBTAINED FROM SPECIFIED SOURCES DURING THE 1986 JUNE/JULY FOLLOW-UP SURVEY, BY TYPE OF LOST RESPONDENT

TYPE OF LOST RESPONDENT	Mother	Father	Sibling	Grandmother	Grandfather	Aunt	Uncle	Cousin	Neighbor	Other Persons	None	All Sources
Outmigrant												
after BI	-	-	-	44	5	84	16	8	38	15	101	311
after BS	31	6	1	9	2	14	2	3	6	7	54	135
before BS	27	6	-	7	1	8	-	1	3	4	122	179
Refused	63	16	6	10	2	17	1	1	5	8	14	143
Late*	22	2	1	4	-	3	2	1	2	3	9	49
Dropped	17	1	-	2	-	-	-	-	-	-	2	22
Missed	6	-	-	-	1	2	-	-	-	-	-	9
Twins**	15	2	2	2	1	3	-	-	2	-	-	27
ALL TYPES	**181**	**33**	**10**	**78**	**12**	**131**	**21**	**14**	**56**	**37**	**302**	**875**
(percent)	(20.7)	(3.8)	(1.1)	(8.9)	(1.4)	(15.0)	(2.4)	(1.6)	(6.4)	(4.2)	(34.5)	(100.0)

* Mother was discovered by the survey personnel after the birth of the sample child.
** Include one triplet.

4. Completeness and Reliability of Survey Information

a. Timing of Birth Interviews. The reliability of the Birth Information data collected depends largely on the time after birth at which the Birth Information Interview took place. The 'ideal' time set for this interview at the outset of the survey operations was the third day of an infant's life, i.e., the first day at which information about the dietary intake during the first two days of life could be obtained. As the following listing shows, this 'ideal' was attained for only 31 percent of the infants to whose mothers a birth information was administered. However, the third day was also the day on which the largest proportion of all Birth Information Interviews was conducted. Some three fourth of all interviews were completed on or before the fifth day of life, and 84.6 percent during the first week of life.

Most of the deviations from the ideal interview date are the result of various factors, foremost among them the dependence of the interviewers with respect to knowing when a birth had occurred on the local barangay reporters (a number of whom had been replaced in the course of the first survey year because of unsatisfactory performance), the lack of adequate communication facilities between the sample barangays and Cebu City, and the frequent breakdown of the telephone system in the Cebu area, an occurrence that hurt the survey operations especially during the Christmas Season of 1983.

DAY OF BABY'S LIFE*	NUMBER OF BIRTH INTERVIEWS N	%	Cum. %
3	991	31.2	31.2
4	927	29.2	60.4
5	399	12.6	73.0
6	231	7.3	80.3
7	137	4.3	84.6
8	75	2.3	86.9
9	74	2.3	89.2
10	59	1.9	91.1
11	40	1.2	92.3
12	39	1.2	93.5
13	31	1.0	94.5
14	29	0.9	95.4
15+	147	4.6	100.0
	3,179	**100.0**	

* Day of infant's life on which Birth Information Interview was conducted.

On the average, Birth Information Interviews were conducted on the 5.7th day of the infants' life. This average, however, is somewhat misleading because of the 147 interviews made more than two weeks after birth which push the average upward. A clearer impression emerges from the following listing of sample barangays by percent completion of all Birth Information Interviews on or before the fifth day after the infants' birth.

COMPLETION RATE	# OF URBAN BRGYs	# of RURAL BRGYs
Over 90 %	-	1
80 - 89 %	3	8
70 - 79 %	9	4
60 - 69 %	3	2
50 - 59 %	2	1

The sample barangay with the best performance is Pulpogan, with a completion rate on or before the fifth day of 94.1 percent. The barangays with the worst completion records are two large and congested urban areas (Labangon in Cebu City and Mantuyong in Mandawe City) and one barangay located on an offshore island of Cebu (Cao-oy), which has no direct communications link with Cebu City. Two reasons for the below-average performance of Labangon and Mantuyong is the high mobility of the sample women in these areas and the difficulty experienced by the barangay reporters to keep track of the large number of mobile pregnant women found there at all times.

According to a ruling made before the Birth Information Survey, Birth Information Interviews made more than two weeks after a baby's birth to be considered as unreliable. If this criterion is applied then, as indicated above, information obtained through some 4.6 percent of all Birth Information Interviews is to be thus classified.

b. Infants' Birth Weight. The primary purpose of hiring midwives and Mananabangs as project reporters was to obtain information on the birth weight of the infants they had helped deliver. For babies born in hospitals, this information was taken from the hospital records (provided the hospitals were willing to release this information). Of the 3,133 sample women with live births from whom Birth Information Interviews were obtained, 2,689 (85.8 percent) reported that their infants had been weighed immediately after birth. The birth weights reported by the birth helpers, most of them of the traditional type (Mananabang), ranged from 900 to 4,800 grams, not counting three extreme cases of

5,000, 5,216 and 6,722 grams, respectively. The reported mean birth weight exclusive of the three extreme cases is 3,020 grams.

Following a commonly accepted standard, low birth weight (LBW) in the context of the survey was defined as 2,500 grams or less. According to this definition, 379 (14.1 percent) of all sample infants for whom birthweight information is available were LBW babies.

The accuracy of the birth weight information transmitted by the birth helpers can, at least in an approximate manner, be assessed through a comparison with the weights obtained by the field staff at the time of the Birth Information interview. Some 85 percent of these interviews, as pointed out earlier, took place within the first week of the infants' life. Such a comparison is possible for 2,654 of the 2,689 infants for whom the birth weight is reported. The total number of infants weighed by the field staff is 3,104, with the weights ranging from 1,150 to 5,000 grams and a mean weight of 2,993 grams. The latter is slightly below the mean birth weight (3,020 grams), a fact which, aside from inaccurate measurements, may 'also' be explained by the weight loss normally experienced by infants during their first couple of days of life.
To directly compare both kinds of weight on a case-to-case basis does not make sense because of the time difference between birth weight and Birth Information interview weight. However, a comparison of broad weight categories does: children born with an extremely low birth weight should still weigh relatively little a few days later, and vice versa. Table 13 shows that this is indeed so for the sample infants. A little less than three fourth of all children who had been weighed twice fall into the same category on both weights: 2,000 grams and below, 2,001-2,500 grams, 2,501-3,000 grams, more than 3,000 grams. When we look at the extreme ends of this weight scale, we find that 27 of the 67 infants with a reported birth weight of 2,000 grams or less were also weighing less than 2,000 grams at the time of the birth interview, and 998 of the 1,278 children (78 percent) with a birth weight of more than three kg were confirmed in that category during the Birth Information interview. The seemingly low agreement in the category category of 2,000 grams or less hides the fact that one half these children had to gain less than 100 grams to move into the next higher weight group.

Table 13. A COMPARISON BETWEEN REPORTED BIRTH WEIGHTS AND WEIGHTS OBTAINED DURING BIRTH INFORMATION INTERVIEWS*

REPORTED BIRTH WEIGHT	BIRTH INFORMATION INTERVIEW WEIGHT				
	Less than 2,000 grams	2,001-2,500 grams	2,501-3,000 grams	More than 3,000 grams	ALL WEIGHTS
Less than 2,000 grams	27	19	7	4	57
2,001 - 2,500 grams	21	170	98	17	306
2,501 - 3,000 grams	1	98	727	197	1,023
More than 3,000 grams		7	263	998	1,268
ALL WEIGHTS	**49**	**294**	**1,095**	**1,216**	**2,654**

* Figures refer only to 2,654 infants for whom both weights are available.

c. Administration of Ballard Tests. One of the more important variables hypothesized to have a bearing on an infant's nutritional requirements and physical development is prematurity. In normal situations, an infant's gestational age can be estimated, with some accuracy, from information on the mother's last menstrual period. To provide for cases in which this kind of information cannot be obtained, the project's medical consultant recommended the administration of gestational age tests to all infants who meet one or more of the following criteria:

(1) INFANT-RELATED CRITERIA

(a) The infant is born with a (reported) birth weight of less than 2,500 grams;
(b) The infant's delivery was (reportedly) premature.

(2) MOTHER-RELATED CRITERIA:

(c) The mother had experienced bleeding during her first trimester of pregnancy;
(d) The mother cannot remember the date of her last menstrual period;
(e) The mother has not menstruated between her previous pregnancy termination and the onset of her last pregnancy;
(f) The mother had suffered from diabetes while pregnant with the sample child.

During the first survey year (1 May 1983 to 30 April 1984), when infants and mothers were enrolled in the sample, the decision as to whether criteria (a) and (b) applied to a baby was made by the interviewers at the time they administered the Birth Information questionnaire. In case the interviewer was a registered nurse, the gestational age test was administered immediately; in other instances, a nurse was called to the baby as soon as this was possible. The decision as to whether criteria (c) through (f) applied was made by the editing staff in the home office on the basis of the Baseline interviews. To keep the field staff informed about the office decisions, all interviewers received a weekly updated list containing the addresses of the infants concerned, who then were visited on a priority basis.

Among all sample infants, only four were reported to have been born prematurely. To go beyond such spontaneous reports, the interviewers asked the mothers whether their babies were born on the 'expected' date or 'earlier' or 'later'. Almost two thirds of them (1,979) answered that their babies had arrived at the expected time, 16 percent (498) claimed that the birth was too late, and in the opinion of 18 percent (579), the child had come too early. Some 55 of the mothers could not answer this question at all, and to another 68, among them 46 whose pregnancies had terminated in a miscarriage or stillbirth, the question did not apply.

Of all babies (579) supposedly born 'too early', 270 were reported to have arrived 1-7 days before the expected time, another 153 between one and two weeks, and the

remainder between 3 and 11 weeks. One mother even claimed that her baby had been born 20 weeks too early. With respect to birth weight, only 22 percent of all babies who, in the opinion of their mothers, had arrived 'early' and for whom birth weight information is available, had reportedly weighed less than 2,500 grams. What the just quoted figures clearly show is that it is difficult to obtain reliable indicators of prematurity from the mothers themselves. To avoid the issue as to whether reports about premature births were complete, the interviewers relied exclusively on birth weight in their determination as to whether a gestational age test was required or not.

The decision whether or not a gestational age test was to be administered was an easy one to make in all instances in which mother related criteria were involved (50 percent of all actual cases). Whenever the decision rested solely on birth weight, a number of problems emerged either because no birth weight was available or the weight taken by the interviewer at the time of the Birth Information interview differed considerably from the reported birth weight. The latter was especially aggravating when the Birth Information interview was made shortly after a birth.

On the basis of available weight information, infant weights can be classified as follows:

	TYPE	CASES
1.	No BW - Low Interviewer Weight	46
2.	Low BW - No Interviewer Weight	2
3.	Low BW - Low Interviewer Weight	183
4.	Low BW - High Interviewer Weight	65
5.	High BW - Low Interviewer Weight	62
6.	High BW - High Interviewer Weight	6
	ALL TYPES	**364**

BW = Birth Weight
IW = Birth Inform. Interv. Weight
Low = 2,500 g and below
High = More than 2,500 g.

The problematic cases are those classified as Types 4 and 5. To resolve type 4 cases, the field staff accepted the reported LBW of the birth helpers and administered a gestational age test; in type 5 cases, tests where given whenever the interviewer weight fell by 10 or more percent below the reported birth weight.

On the basis of the survey criteria established for the administration of a Ballard Test, 728 sample babies qualified: 426 on account of low birth weight alone or low birth weight in combination with one or more mother related characteristics, and 302 on account of mother related characteristics alone. In 72 of all cases, as Table 14 shows, more than one criterion applied. The most frequently occurring combination was low birth weight and bleeding of the mother during her first trimester of pregnancy (28).

Table 14. NUMBER OF SAMPLE INFANTS, BY CRITERION FOR THE NEED OF A GESTATIONAL AGE TEST

Number of Cases	Low Birth Weight	Bleeding During 1st Trimester	No Menstru-ation	Cannot Remember LMP	Mother Had Diabetes	Unknown	Tests Made	Tests Missed
364	364						291	73
28	28	28					23	5
15	15		15				14	1
15	15			15			14	1
1	1				1		1	
2	2	2	2				2	
1	1	1		1			1	
123		123					115	8
4		4	4				4	
2		2		2			2	
111			111				105	6
1			1	1			1	
1			1		1		1	
49				49			47	2
2				2	2		2	
8					8		7	1
1						1	1	
728	**426**	**160**	**134**	**70**	**12**	**1**	**631**	**97**

The last two columns in Table 14 indicate the number of gestational age tests actually performed (631) and the number of tests 'missed' (97). Two of these missing cases were actually refusals on the part of the mothers to have a Ballard test administered to their babies. In 46 instances, the birth had been reported so late that a gestational age test no longer made sense. According to survey rules, a Ballard test became useless when a baby was more than 10 days old. Included among the 631 Ballard tests on record are 24 that actually were made later than 10 days after birth. All of them had been administered during the early phase of the project when the office staff was still unaware of such 'late' tests.

Half of all 'missed' interviews (48) are to blame on members of the field staff who were not registered nurses. They either overlooked the need for a Ballard test or forgot to report cases to their field supervisors or the office so that a nurse could be dispatched. According to survey rules, only registered nurses were authorized to administer gestational age tests.

With respect to timing, the Ballard tests were to be administered at the time of the Birth Information interview or as soon as possible thereafter. This means that the tests, like the Birth Information interviews, were heavily dependent upon the birth reporters in the sample barangays. The timing pattern of the tests very much resembles the timing pattern of the Birth Information interviews (see p.25).

DAY OF BABY's LIFE*	NUMBER OF BALLARD TESTS N	%	Cum. %
1	1	0.2	0.2
2	9	1.3	1.5
3	177	28.1	29.6
4	193	30.6	60.2
5	95	15.1	75.3
6	57	9.0	84.3
7	32	5.1	89.4
8	15	2.4	91.8
9	17	2.7	94.5
10	11	1.7	96.2
11+	24	3.8	100.0
	631	**100.0**	

* Day of infant's life on which test was performed.

On or before the 'ideal' date, i.e., the third day of a baby's life, only 30 percent of all tests were preformed; 60 percent were completed by the 4th day, and 96 percent before day 11, the cut-off date for obtaining reliable gestational age tests.

d. Anthropometric Measurements. In the second half of 1984, a panel of experts, originally convened by the University of North Carolina at Chapel Hill for the purpose of advising the project staff in Chapel Hill and Cebu, recommended that reliability checks be made on the anthropometric measurements of infants and their mothers taken by the field staff in Cebu. The procedure to be used for this purpose was one developed by Habicht.[3]

According to the Habicht procedure, 'subjects' (some 10) are measured twice by a number of 'observers' and one supervisor. The test results, which are supposed to provide indications of (1) measurement accuracy and (2) measurement precision, are based on comparisons of (a) the two measures of each 'observer' and (b) the measurements of the 'observers' with those of the supervisor. The latter is supposed to produce the most reliable measurements on account of his/her experience.

For the purpose of the test, 10 mothers and their babies were hired and brought into a clinic-like environment, where the babies were measured twice for weight and height by one field supervisor and 20 field workers, first late in the morning and then early in the afternoon. The test results turned out to be absolutely dismal not because of the inability of the 'observers' to take reasonably accurate measurements but on account of the 'subjects' who, after having been handled by a number of observers, could no longer be pacified by their mothers to 'behave as needed': they not only constantly cried but wanted to either eat, sleep, defecate, etc. There is no question that the entire 'test' overtaxed the children, all of them between 6 and 24 month old. Habicht, in the article cited, used four-year olds as his test 'subjects'.

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[3] Jean-Pierre Habicht. Estandarizacion de Metodos Epidemiologicos Cuantitativos Sobre el Terreno. *Boletin de la Oficina Sanitaria Panamericana*, Mayo 1974, Año 53, Vol. LXXVI, No.5, 375-384.

In March of 1985, a second test was arranged, this time in the home of the 'subjects' and spread over more than a week. The mothers were notified before when they would be visited. No baby was measured more than six times on a single day: twice by the supervisor and four times by two observers. Obviously, this procedure weakened the comparability of the different measures, but it overcame, at least in part, the problems encountered during the first illfated test attempt. The results of the height measuring test are appended to this report (Appendix H, pp. 71-72).

5. Control Sample.

One problem supposedly faced by longitudinal surveys investigating the behavior of a population is "behavioral contamination," i.e., the tendency of people exposed to protracted survey operations to eventually adopt behaviors that they perceive as being promoted by the survey staff. While such contamination is the purpose of surveys designed to bring about behavioral changes, it is not in surveys seeking to document existing behavior patterns. If the original patterns are altered in the course of their investigation, their detection becomes extremely difficult or even impossible.

Among the primary aims of the Metro Cebu Child Health and Survival Survey are the documentation of the process of infant growth in terms of its currently existing determinants and the design, on the basis of this documentation, of effective action programs leading to improved infant health and growth. To make the documentation possible, the project's field staff had been instructed at the beginning of the survey operations to avoid telling respondents what to do except in cases in which this was demanded because of acute danger to the respondents' or their infants' health or life.

With respect to the suggested existence of behavioral contamination, the Metro Cebu Survey raises an interesting question. Experiences elsewhere have shown that the changing of traditional behavior patterns is a difficult undertaking. If the Cebu sample population has indeed been "contaminated" through the survey, one will have to ask why this particular operation has succeeded in changing people despite its avowed aim of trying not to do so while other projects explicitly set up for that purpose have failed?

To be able assess to nature and magnitude of the bahavioral contamination, if any, of the Metro Cebu sample population brought about through the latter's exposure for three years to the survey operations, it was decided in 1983 to survey a special sample of approximately 200 mother-infant pairs residing in Metro Cebu but outside of the 33 sample barangays. This group was to be interviewed for the same two-year period applied

Table 15. CONTROL-SAMPLE BARANGAYS, BY LOCATION, STRATUM AND NUMBER OF RESPONDENTS

BRGY CODE*	BARANGAY	CITY/MUNICIPALITY	STRATUM	NUMBER OF RESPONDENTS
134	Bacayan	Cebu City	rural	4
135	Talamban	Cebu City	urban	14
136	Inayawan	Cebu City	urban	44
137	Tabunok	Talisay	urban	40
138	Calajoan	Minglanilla	rural	15
139	Colon	Naga	rural	16
140	Umapad	Mandawe City	urban	15
141	Casili	Consolacion	rural	12
142	Tayud	Liloan	rural	4
143	Pajo	Lapu Lapu City	urban	28
144	Punta Engano	Lapu Lapu City	rural	27
	ALL BARANGAYS			**219**

* Part of ID on taped records.

to the respondents in the regular sample but only five times in half-year intervals instead of 14 times: when the mother was pregnant and when her infant was 6, 12, 18 and 24 months old. The rationale underlying this decision was that behavioral contamination caused by a survey is a function of the latter's duration and intensity and that its magnitude will be minimized by curtailing both or at least one of these determinants.

A "control sample," originally consisting of 220 pregnant women (200 plus additional 20 as provision for eventual losses) living in 11 different (non-sample) barangays in Metro Cebu, was assembled in early 1984. Actually recruited into the sample were 219 women, of whom one refused to participate from the start.

Survey operations were started towards the middle of 1984 and terminated in early 1987. The number of interviews completed and the final survey status of the control-sample women is shown in Table 16 below.

Table 16. NUMBER OF LONGITUDINAL INTERVIEWS, BY FINAL SURVEY STATUS OF SAMPLE WOMAN AND TYPE OF LAST COMPLETED INTERVIEW

FINAL SURVEY STATUS OF SAMPLE WOMAN	TYPE OF INTERVIEW					ALL INTER VIEWS	NO. OF SAMPLE WOMEN
	BS	L3	L6	L9	L12		
12 Complete Records, infant alive	160	160	160	160	160	800	160
13 Outmigrant	33	20	10	7	-	70	33
14 Temporary Migrant	14	14	9	4	14	55	14
15 Refusal	3	3	1	-	-	7	4
16 Infant Died	5	5	4	4	4	22	5
17 Stillbirth	1	1	1	1	1	5	1
19 Twin Birth	1					1	1
23 Dropped	1					1	1
INTERVIEWS MADE	**218**	**203**	**185**	**176**	**179**	**961**	**219**

In terms of final survey-status codes, the respondents of the control sample do not differ very much from the respondents of the main sample, as Table 17 reveals. This is so despite the fact that the proportion of rural respondents in the control sample is considerably larger than the corresponding proportion in the main sample (percent rural in control sample: 35; in main sample: 22).

Table 17. COMPARISON OF FINAL SURVEY STATUS CODES OF RESPONDENTS IN MAIN AND CONTROL SAMPLES (percent)

FINAL SURVEY STATUS CODE	CONTROL SAMPLE	MAIN SAMPLE
12 Complete Records	73.0	58.7
13 Outmigrant	15.0	16.8
14 Temporary Migrant	6.4	10.3
15 Refusal	1.8	3.9
16 Infant Died	2.3	4.5
17 Stillbirth	0.5	1.1
18 Miscarriage	---	1.8
19 Twin Birth	0.5	0.7
20 Discovered Late	---	1.3
23 Dropped	0.5	0.6
24 Missed	---	0.2
ALL RESPONDENTS	**100.0** (219)	**100.0** (3,711)

Another characteristic with respect to which the control-sample respondents were very much like those of the main sample is residential movement. Some 20 percent (45) of the control-sample mothers changed households, with the new households located either within their original barangays or in other non-sample barangays.

6. Survey Problems

During the survey operations, a number of not anticipated difficulties arose, difficulties rooted in the cultural beliefs or social backgrounds of the survey clientele. Such difficulties differ, of course, from one place to the next, but they have to be attended to if a survey is to succeed. The following examples are not exhaustive of all problems of this kind that did occur in Metro Cebu; they are meant to show (once again) that general manuals of survey procedures cannot simply be transported from one locality to another and literally applied.

a. Barangay Reporters and Mananabangs. Mention has been made earlier of the constant supervision that the field personnel had to exercise over the local barangay reporters and birth helpers (Mananabangs) in order to receive timely reports about births, infants' birth weight and infant deaths. Inefficient reporters had to be weeded out, a task requiring a great amount of tact and caution especially in instances in which the reporters concerned were proteges of barangay officials, who easily could have impeded the entire survey operations in their areas. A perhaps even greater difficulty arose from the jealousy developed by some non-reporters toward the official project reporters because of the honoraria that the latter received. In one case, for example, a very efficient reporter happened to belong to an eight-member team of voluntary barangay health workers. As soon as her seven colleagues discovered that she was receiving a honorarium for her cooperation with the project, they accused her of infringing on 'their' territories when reporting a birth that had occurred in an area assigned to them in their capacity as voluntary health worker. In another instance, a Mananabang who also was very good in reporting birth and birth weights got extremely angry when, during a delivery she was attending, the area's official midwife showed up and insisted on doing the weighing of the baby.

A not too uncommon problem of a different kind is exemplified by another Mananabang, also a good reporter. During the editing of the questionnaires it was found that this lady had reported the identical birth weight for all babies she had helped deliver: 3.1 kilos. Upon checking it was discovered that this lady was not only unable to read the infant weighing scale but unable to read at all. Incidences like these, which had to be handled carefully in order not to turn the people against the project, have more than once called the entire institution of barangay reporters into question.

b. Anthropometric Measurements. Anthropometric measurements of mothers and infants, particularly height measurements, often became a delicate issue. Objections were frequently raised not by the mothers but their onlooking husbands who claimed that their wives or children were being 'measured for a coffin'. With respect to the measurements of mothers, the objections were rooted in the folding measuring sticks used, the same type of instrument also used by carpenters when measuring a corpse for a coffin. Special tape measures to be fixed two meters up on the wall, that were originally issued to the field staff, had turned out to be unusable in situations in which the rooms in which the measurements were to be taken were either less than two meters heigh or possessed no straight walls or level flooring. In one instance, the interviewer was literally thrown out of the house when attempting to measure the mother's height.

The idea that infants were measured for a coffin had to do with the infantometers used. When unfolded, these look like small boxes. In addition and unfortunately, the infantometers had been varnished in the same dark-brown color in which coffins usually are varnished. This 'impediment' was overcome by pasting onto the infantometers large numbers of pictures of flowers or animals to make them look like toys.

7. Questionnaire Inserts

To gather information not elicited by the standardized longitudinal questionnaires but needed for specific analysis projects developed or contemplated after the start of the data collection, special questionnaire inserts were added to a number of longitudinal survey rounds.

a. Mass Media Insert. During Longitudinal Survey # 5 (women with infants 10 months old), a "Mass Media Insert" inquired into the exposure of mothers to infant feeding suggestions advertised by the print or broadcast media or in cinemas. The insert, which was administered to all sample women, asked in particular about the types of mass media the respondents had been exposed to and the length of their exposure. Since the households of almost all sample women were in possession of a radio and the cinema still represents one of the more important means of entertainment at least in the urban sector of Metro Cebu, the insert placed special emphasis on these two types of information and potential pressure sources. In mid 1985, all completed inserts were handed over to the Nutrition Center of the Philippines, the principal investigator of a study examining the influence of infant food advertisements on infant feeding behavior.

b. Water Insert. Studies undertaken elsewhere have documented that the incidence of diarrhea among infants is related not only to the quality of water fed to the infant but also the water quantity consumed for hygienic purposes in the dwelling unit occupied by a mother and her child. To elicit more detailed information on water quality and quantity as well as domestic sanitation than contained in the standardized questionnaire used for all longitudinal surveys, the sample women residing ing in houses without a private water connection or water source were asked during the 9th Longitudinal Survey (when the sample child was 18 months old) about the amount of water their households fetch and use per day, their in-house facilities for the storage of drinking water and their usual mode of excreta disposal, especially the disposal of infant feces.

c. Family Planning Insert. This particular addendum, designed to augment the information on family planning practices collected by the standard longitudinal questionnaires, was administered to all sample women who, at the time their infants were 20 months old (10th Longitudinal Survey), were practicing family planning in any form. It inquired into:

(1) the specific family planning method or methods used at the time by the respondent, the kinds of family planning supplies and services she or her husband were using, the location where these supplies and services were obtained and the costs involved, and
(2) the respondent's knowledge of other family planning methods not currently used by her as well as her ideas as to the availability and costs of such other methods.

8. Infant Mortality Survey

The circumstances surrounding a sample infant's death were captured through an "Infant Mortality Questionnaire" administered to the mother of the deceased infant or child as soon as possible after the death of the infant or child had become known. This questionnaire sought to elicit information such as:

(1) date and place of death;
(2) food given to the child during the last two days before death;
(3) type and extent of professional medical care provided for the child before death;
(4) disease history of the child for the days or weeks before death;
(5) certified or suspected cause or causes of death, and
(6) availability of an official death certificate.

Mortality questionnaires were completed for 151 of the 167 sample children who had died during their first two years of life. As pointed out earlier (cf. p.15), eleven of the 167 deaths were discovered only in mid 1986, and in the other cases, the mothers either

refused to give out any further information after the death of their child or they had left the sample area before the interviewers were able to reach them.

With respect to death registration, 131 mothers of the 167 deceased children claimed to have registered the death of their children with their respective City Health Offices or Offices of the Municipal Treasurer which, in rural areas, function as vital registration offices. Through a check in all registry offices of Metro Cebu in 1985 and 1986, covering all 167 children known to have died in the sample area, the field staff verified the claim of 90 of these mothers. They located, in addition, copies of the death certificates of 12 children whose mothers either had stated that the death of their children had not been registered or who could not remember having done so. Only 14 mothers stated outright that they had not registered the death of their children. On the basis of the death certificates actually found in the registry offices, death registration of children under the age of 2 was twice as high in urban barangays compared to rural ones: 70 percent versus 35 percent.

All information contained on the death certificates was copied by the field staff of OPS and placed on a separate computer file together with (supposedly) comparable information obtained through the mortality questionnaires. A comparison of death certificate information with that of the mortality questionnaires reveals substantial discrepancies with respect to time of death and cause or causes of death. In only a very few instances does the date of death recorded on a death certificate agree with the date given by a mother. Discrepancies range from 1 day to 2 years. The explanation for this is that, according to government regulations, the registration of a death has to take place in a specified time period. Failure to comply with this regulation results in a fine. To avoid this fine, the death date shown on the certificate is more often than not identical with, or close to, the time of registration rather than the time of occurrence of death.
Discrepancies between cause or causes of death appearing on the death certificates and reported by the mothers are, in many instances, even larger, reflecting the understandable and expected lack of medical sophistication on the part of the mothers. Among the causes mentioned by them are: frequent injections, teething, weak heart, "green fluid comes out of the nose," and "infected insect bite." However, in not a few cases have the issuers of the death certificates shown a similar lack of sophistication when they, for example, specify "cardiac arrest" as "cause of death" or simply "high fever." The lack of specificity in the cause-of-death reporting becomes understandable when one considers that not all persons authorized to issue death certificates are medically trained people.

Among the official causes of death placed on the death certificates, respiratory diseases are mentioned most often: Broncho-Pneumonia, in many instances coupled with measles, appears on 59 of the 102 death certificates checked. As single causes of death, prematurity is mentioned five times and diarrhea and malnutrition four times each. Other causes of death mentioned, either singly or in combination with others, include: meningitis, tuberculosis, gastroenteritis, influenza, congenital heart disease, septicemia, aspiration, asphixia, anoxia, and kwashiokor.

9. Survey of Household Water Sources

Among the major interests of the Metro Cebu Child Health and Survival Project is the investigation of the linkages between the water sources from which the water fed to the infants is taken and the incidence of diarrhea. One of the first steps in this endeavor was a visit by the field staff to all water sources in the 33 sample barangays from which the sample women obtained water for their infants. During this visit, information pertaining to the exact location of the water source, its type and its owner was listed onto a "Water Source Form." For each sample women and water source used (many women frequented more than one source or changed sources during the survey period), one such form has been completed and its information incorporated into the Baseline data set.

Contrary to an initial assumption, hardly any water sources shared by entire barangays or neighborhoods can be found in Metro Cebu except the piped water system serving primarily the Cities of Cebu and Mandawe. To this system, however, less than one half of the population in urban Metro Cebu is connected. The water sources ordinarily used by the majority of the population in the Metro Area are the numerous private and public wells dotting the cities as well as the countryside. Each of these sources serves between one and 100 households. The total number of different water sources used at one point in time by the sample population amounted to 770, not counting private connections to the piped water system maintained by the Metropolitan Cebu Water District (MCWD). The initially identified 770 sources were of the following types:

Domestic handpumps	294
Public (government-owned) pumps	185
Springs or other free-flowing sources	119
Open dug wells	106
Privately owned electric pumps	63
Industrial wells	3

A week or so after the initial visit to the out-of-house water source sites, the latter were revisited by a team from the Water Resources Center of the University of San Carlos and the Department of Environmental Engineering of the University of North Carolina at Chapel Hill, which obtained technical information on the pump and/or borehole as well as its surroundings. These data, together with a detailed sketch indicating the exact location of the water source, were transferred to a "Scheme for Location of Borehole" form and used as basis for the classification of all identified water sources into a number of basic "water source types." Subsequently, until December 1985, the same team periodically collected water samples from subsamples of the different water source types and had them analyzed for pathogens of diarrhea and other forms of contamination. This latter analysis was performed by the Water Laboratory of the University of San Carlos and the Microbiology Laboratory of the Cebu Institute of Medicine in cooperation with a microbiologist from the University of North Carolina at Chapel Hill. In early 1986, copies of these data were shipped to CPC, North Carolina.

10. Pregnancy Follow-up Survey

In 1985, the project staff at CPC began work on a proposal for a study on "Child Spacing." Needed for this study was information concerning any pregnancy or pregnancies that the sample women had undergone after the births of their sample babies. To meet this need, the OPS field staff began in July 1986 to revisit all sample women who had been part of the longitudinal survey at any time, including refusers and women who had experienced abnormal pregnancy terminations (miscarriages and stillbirths). Excluded from these revisits were the permanent outmigrants and those women whose pregnancies had terminated in multiple births or who had been dropped from the sample. The "ideal" number of womem to be revisited was 2,979 (Status Codes 12, 14, 15, 16, 17 and 18; cf. Table 1). The operations were extended until February 1987 in order to cover, for every sample woman, a minimum of two years from the time the sample child was born.

The actual number of revisits made was 2,796, or 93.9 percent of the 'ideal' number. Because of the higher mobility of urban women, the proportion of rural women whom the field staff could locate was slightly higher than the proportion of urban women: 95.5 versus 93.3 percent.

All data collected were placed on a special computer file containing:

1. Baseline survey ID
2. Birth date of sample child
3. Final Survey Status code
4. Pregnancy/Birth Information:
    a. Woman died
    b. No information available
    c. Woman has never been pregnant since birth of sample child
    d. Woman is currently pregnant
    e. Woman completed pregnancy after sample child
        (1) Single live birth
        (2) Twin birth
        (3) Miscarriage
        (4) Stillbirth

        → date of pregnancy termination

Table 18. RESULTS OF PREGNANCY FOLLOW-UP SURVEY

STRATUM	MOTHER DIED	NO INFO	NO NEW PREGNANCY	CURRENTLY PREGNANT	TERMINATED PREGNANCY AFTER SAMPLE CHILD				ALL FOLLOW-UPS
					LIVE BIRTH	TWINS	MISCARR.	STILLB.	
Urban	3	13	900	50	1,044	2	88	10	2,110
Rural	1	6	251	22	380	3	20	3	686
TOTAL	**4**	**19**	**1,151**	**72**	**1,424**	**5**	**108**	**13**	**2,796**
(%)	(0.1)	(0.7)	(41.2)	(2.6)	(50.9)	(0.2)	(3.9)	(0.4)	(100.0)

The figures in Table 18 refer to the first pregnancy after the birth of the sample child only. Of the 1,622 sample women with a subsequent pregnancy after the birth of their sample babies, 76 reported two pregnancies, and two of them three. In the follow-up survey data file (FOLLOW), these women have two or three records, one for each reported pregnancy. The 13 urban and 6 rural women listed in Table 18 under the heading "No Information," are survey respondents who were located during the follow-up survey but from or for whom no information could be obtained. Sample women who could not be found at all during the follow-up survey are excluded from Table 18.

B. COMMUNITY-RELATED SURVEYS

The "underlying socioeconomic variables" which the project intends to 'integrate' with biomedical ones into a 'coherent causal model of child growth and survival' (cf. p.2) are of different types or 'levels': individual, household, and community. Variables of the first two of these levels, viz.: individual and household, are collected through the mother-infant questionnaires of the longitudinal survey. For the collection of community-level SES variables, a number of community-related surveys were scheduled. To capture the time varying character of most of these community-level variables, surveys were to be made repeatedly, at least at the start of the longitudinal survey operations and around the time of their termination.

1. Community (Barangay) Surveys

a. Community Baseline Survey. In late 1982, before the start of the longitudinal survey operations, all 33 sample barangays were surveyed with respect to their:

(1) physical and demographic characteristics,
(2) existing infrastructure and available utilities,
(3) locally available social services, including schools and churches,
(4) formal and informal community organizations,
(5) industrial and commercial establishments,
(6) the labor market situation,and
(7) prevailing wage rates for males and females.

The information was obtained either from community (barangay) officials or other knowledgeable people recommended by these officials.

b. Final Community Survey. Immediately upon the termination of the longitudinal survey, a second community survey was undertaken to capture eventual changes in community variables that may have occurred between 1982 and 1986 and significantly influenced the health of children and their prospects for survival. This latter survey was basically a carbon copy of the Community Baseline Survey except for the collection of additional information concerning (a) the presence of Barangay Supply Points (BSPs, established in the context of the Family Planning 'Outreach Program' of the Commission on Population), (b) the current prices of water and water-related installations, and (c) price differentials for different types of soap.

c. Additional Barangay Surveys. To assign 'correct' community variables to mothers and infants who, in the course of the longitudinal survey, had temporarily resided in non-sample barangays in or outside of Metro Cebu, it became necessary to survey some 18

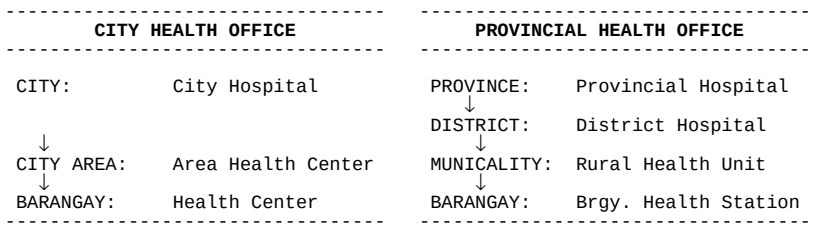
of these non-sample barangays. This was accomplished in March 1989 with the help of the same Community Survey questionnaire used in the 1982 and 1986 surveys (see Appendix I).

2. Surveys of Health Facilities - not included on CD

For the purpose of assessing the sample-area situation with respect to available health services for pregnant and nursing mothers and their young children, existing policies related to child birth and child care and the prevailing attitudes of health institutions towards infant feeding, a large number of health facilities either located in the sample barangays or catering to the needs of the entire Metro Cebu population were surveyed a number of times during the survey period 1983 to 1986. The surveys were repeated to (a) capture eventual changes in health care and (b) collect information not sought earlier but of importance for analysis projects developed during the survey period.

The facilities surveyed include a total of 82 public and private hospitals and clinics, puericulture centers and government-maintained or subsidized health centers spread throughout the Metro Cebu area. The latter, which constitute more than one half of all covered facilities and which are of special importance since they are affordable for most of the population, are structured in the following manner:

At the subregional level in the Philippines, public health services in cities are directed by City Health Offices, and by Provincial Health Offices in rural areas. In Metro Cebu, four such offices can be found: the City Health Offices of the Cities of Cebu, Mandawe and Lapu Lapu and the Health Office of the Province of Cebu. Larger cities like Cebu are divided into Areas, each one of which is served by an Area Health Center which, in turn, maintains and supervises smaller Health Centers



located in various neighborhoods (barangays). Rural areas under the jurisdiction of the Provincial Health Office are subdivided into Districts, each one of which is equipped with a usually small District Hospital. Every municipality in a district contains one or more Rural Health Units depending on population size which, on their part, maintain a number of Barangay Health Stations (BHS) in at least the larger barangays (villages) of the municipality.

While, in organizational terms, Area Health Centers in cities are the equivalent of the Rural Health Units in the countryside and City Health Centers comparable to Barangay

Health Stations, the Health Centers in Cebu City are somewhat better equipped than their rural counterparts. The latter are staffed by midwives only, while the former, like the (city) Area Health Centers and Rural Health Units, usually employ also a physician and one or more nurses. On the other hand, the population served by individual city health centers usually is substantially larger than that attended to by a rural health center, a fact which, more often than not, cancels the staffing and equipment advantages enjoyed by the urban centers.

a. First Survey of Health Facilities. In early 1983, before the start of the longitudinal survey operations, a first survey of health facilities was undertaken, covering the larger hospitals in Cebu City as well as a number of city and rural health centers, 48 in all. This particular survey concentrated on the availability of health services for pregnant and nursing mothers and their infants and institutional policies and attitudes concerning infant care and infant feeding.

b. Second Survey of Health Facilities. A second survey of health facilities was undertaken in April 1984. Its specific purpose was the collection of information on the facilities' interaction with milk and infant food companies as well as their policies with respect to the distribution of milk and infant food samples to their clients. For this second survey, the list of health facilities covered was enlarged to include all city and rural health units actually used by the sample population. Likewise included were a number of other facilities that had refused to respond to the first survey. The total number of facilities covered was 74. The survey questionnaire was also administered to 88 private practitioners, 76 of them birth helpers without any formal training (mananabang).

c. Surveys of Natal and Family Planning Servives. All health facilities covered during the Second Survey of Health Facilities were visited two more times, in mid 1984 and early 1985. The purpose of the first of these additional visits was to obtain information on the kinds of child-birth related services offered and the fees normally charged for such services. The specific kinds of services inquired into were:

(1) prenatal services,
(2) delivery services,
(3) postnatal services,
(4) well-baby visits, and
(5) pediatric consultations.

From the health facilities, the information pertaining to these services was collected not through questionnaires and interviews but informal talks with the facilities' cashiers, who were contacted either personally or by phone.

Through a Natal Services questionnaire, similar information was elicited also from private practitioners active in the sample barangays: 9 midwives, 79 mananabangs and 5 other health persons.

The second visit, using formal questionnaires, inquired into the family planning services offered, the kinds of family planning supplies available, distributed or sold, and the prices charged for services and supplies.

d. Third Survey of Health Facilities. All health facilities previously covered were visited once again in mid 1986. The survey covered the same subject matter as the First Survey of Health Facilities and the Natal Services (except prenatal care) and Family Planning inquiries. In addition, it elicited information on (a) the availability and cost of medicines (Iodine Supplements, Vitamin A, Iron Elixir) and vaccines (BCG, DPT, Polio, Measles) frequently needed by pregnant women or small children, and (b) practices of diarrhea control and the promotion, if any, of oral rehydration as well as the availability of rehydration solutions (Oresol, Oretab).

Included in the Third Survey of Health Facilities were a number of specialized agencies from which information concerning the availability and costs of medicines, oral rehydration preparations and/or family planning supplies only was elicited. These specialized agencies include:

(1) Commercial drug stores in Cebu City (14),
(2) Botica sa Barangay (small village drug stores) located in the sample barangays (13),
(3) SarSari stores (small food stores) located in the sample barangays (12), and
(4) Barangay Supply Points (BSP, distribution points of family planning supplies) located in the sample barangays (170).

Drug stores were asked about medical, diarrhea control and family planning supplies, Sari Sari stores about their sales of diarrhea controls such as Diatab and Polymagma, and BSPs about type and amount of family planning supplies distributed.

e. Final Survey of Health Facilities. A final round of all health facilities was undertaken in August of 1988. Like the Second Survey of Health Facilities in 1984 (cf. (b) above), it concentrated on practices of infant feeding, specifically the free distribution of breastmilk substitutes by commercial manufacturers. Between the Second and Final survey, the Philippine government, in accordance with WHO recommendations, had issued its own breastmilk substitute code which prohibits all free distribution of substitute milks. The survey also dealt with one particular problem: the availability of breastmilk substitutes to children who cannot be breastfed because of various health related reasons.

The following table lists the numbers and kinds of medical facilities, private practitioners and specialized agencies covered by all five health facility surveys.

Table 19. TYPE AND NUMBER OF FACILITIES AND HEALTH AGENTS COVERED IN ALL HEALTH FACILITY SURVEYS

TYPE OF FACILITY/HEALTH AGENT	FIRST SURVEY	SECOND SURVEY	NATAL SERV/ FP SURVEYS	THIRD SURVEY	FINAL SURVEY
FACILITIES					
Public (Govt.) Hospital	3	4	4	4	4
Private Hospital	8	11	12	12	12
Military Hospital	2	2	2	2	1
Maternity Hospital/Clinic	2	4	4	4	3
Private Clinic	5	8	8	8	6
Puericulture Center	4	3	5	5	4
(City) Area Health Center	3	5	5	5	5
(City) Health Center	6	12	11	12	11
Rural Health Unit	4	6	6	6	7
Barangay Health Station	8	18	20	20	19
Special Institution*	3	1	3	1	0
ALL FACILITIES	**48**	**74**	**80**	**79**	**72**
OTHER HEALTH AGENTS					
Private Midwife		11	9		
Mananabang		76	79		
Other			5		
Commercial Drug Store				14	
Botica sa Barangay				13	
Sari Sari Store				12	
Barangay Supply Point				170	
ALL OTHER AGENTS		**87**	**93**	**209**	

* Eversley Child Sanitarium; Philippine Women's Auxiliary; Mactan Airport Clinic.

Of the 83 medical facilities covered in the six surveys, 37 responded all five times, 34 four times, 9 three times, 2 two times, and 1 once. A detailed list of all surveyed facilities can be found in App.J.

3. Surveys of Health Personnel - not included on CD

To augment the information on the official policies and practices of the health institutions obtained through the various Health Facility Surveys, two surveys of health practitioners either working in the health facilities of the Metro Cebu Area or operating as private practitioners in the sample barangays were undertaken. The first of these surveys was begun in late 1982, and the second in mid 1986, shortly before all longitudinal survey activities were terminated. Both surveys inquired into the professional training of health workers, their current positions and activities as well as their attitudes and practices related to infant feeding in general, and breastfeeding in particular.

a. First Health Personnel Survey. The first survey went into the field in November 1982, i.e., before the start of the longitudinal survey of pregnant women, and lasted until early 1985. During its first phase, all larger hospitals as well as City, Provincial and Municipal Health Offices in the Metro Cebu Area were visited and permission was obtained from the administrators to interview members of the hospital staff or the workers employed in the government-operated health units located in the sample barangays. In smaller units, attempts were made to obtain information from all health workers, while

in hospitals three physicians, preferably pediatricians and obstetricians, and three nurses were asked to complete a questionnaire.

It was only during the longitudinal survey, after the project staff had become familiar with the sample area and its population, that health practitioners not connected with the government's public health system or centrally located private hospitals but extensively used by the population could be identified and interviewed. These private practitioners include not only physicians and independently operating midwives but, most importantly from the viewpoint of the project, large numbers of generally untrained birth helpers or hilots (mananabangs). The survey records show that the largest portion of all sample babies in Metro Cebu was delivered with the help of mananabangs, whose services almost everyone can afford.

Table 20. NUMBER OF HEALTH PRACTITIONERS INTERVIEWED DURING THE FIRST SURVEY OF HEALTH PERSONNEL, BY TYPE OF PRACTITIONER AND INSTITUTIONAL AFFILIATION

TYPE OF HEALTH PRACTITIONER	INSTITUTIONAL AFFILIATION												
	PUBL HOSP	PRIV HOSP	MILI TARY HOSP	MATR NITY HOSP	PRIV CLIN	PUERI CULT. CTR	AREA HLTH CTR	CITY HLTH CTR	RURAL HLTH UNIT	BRGY HLTH STAT	SPEC. INSTI TUT.	PRIV PRAC TICE	ALL AFFILI ATIONS
Municpl. Health Officer							1		1	1			3
Medical Officer					1			2					3
Medical Director		1											1
Govt. Physician						2		1	3	1			7
Private Physician		5		1	3								9
Resident Physician	14	29	2	4									49
Medical Specialist	1												1
Nurse	11	21	7	3	4		9	8	3	2			68
Public Health Midwife	4	6				3	6	12	13	9	1	1	55
Midwife		12	3	1								13	29
Trained (licensed) Hilot										4		13	17
Mananabang (Hilot)								1		1		76	78
ALL PRACTITIONERS	**30**	**74**	**12**	**9**	**8**	**5**	**16**	**24**	**20**	**18**	**1**	**103**	**320**

To assure itself of the cooperation of the mananabangs and to benefit from their intimate knowledge of the "fertility situation" in the sample barangays, the project hired the latter as birth informants and paid them an extra bonus whenever they not only reported, within two days of its occurrence, the birth of a baby in whose delivery they had assisted but also obtained the birth weight in the first hour post partum with a scale provided them by the project. Through this arrangement, the project succeeded in obtaining birth weights for approximately 70 percent of all sample children.

Table 20 on the previous page lists the types of health practitioners who responded to the first survey and illustrates the wide range of health services available in Metro Cebu.

b. Second Health Personnel Survey. This survey, executed in April and May 1986, was partly a repetition of the first one, making it possible to assess eventual changes in child-

health services and attitudes towards child care and feeding that have occurred between 1983 and 1986. In view of the severe economic depression experienced in the Philippines during these years, such changes are likely to have occurred (see Table 21).

Table 21. NUMBER OF HEALTH PRACTITIONERS INTERVIEWED DURING THE FINAL SURVEY OF HEALTH PERSONNEL, BY TYPE OF PRACTITIONER AND INSTITUTIONAL AFFILIATION

TYPE OF HEALTH PRACTITIONER	INSTITUTIONAL AFFILIATION												
	PUBL HOSP	PRIV HOSP	MILI TARY HOSP	MATR NITY HOSP	PRIV CLIN	PUERI CULT. CTR	AREA HLTH CTR	CITY HLTH CTR	RURAL HLTH UNIT	BRGY HLTH STAT	SPEC. INSTI TUT.	PRIV PRAC TICE	ALL AFFILI ATIONS
Municpl. Health Officer									3	2			5
Medical Officer		1					5	7		1			14
Govt. Physician	17						1				1		19
Private Physician				1								3	4
Resident Physician		40	2	5	1	1							49
Intern		2											2
Nurse	13	33	4	5	4	1	9	11	10	3	3		96
Nursing Aid	2	2					1	3					8
Public Health Midwife	8	6	2			3	6	15	14	13			67
Midwife (private)		16		3	2	3					1	11	36
Trained (licensed) Hilot											1	62	63
Mananabang (Hilot)												21	21
Barangay Health Worker*							1	7	7	11			26
ALL PRACTITIONERS	**40**	**100**	**8**	**14**	**7**	**8**	**23**	**43**	**34**	**30**	**6**	**97**	**410**

* Including Primary Health Care Administrators (11), Barg. Health Workers (13), and Barg. Nutrit. Scholars (2).

Aside from repeating the first survey, the questionnaire used for the second contained two additional sections. In the first, physicians were asked about their usual prescriptions for watery diarrhea and dysentery, and nurses, midwives and mananabangs were requested to indicate what they knew about diarrhea symptoms and diarrhea control. With respect to the latter, specific questions were asked about Oresol and its use. The second additional section incorporates a series of questions taken from the Health Facility Questionnaire related to (a) the types and costs of child-health related services, and (b) the family planning services and supplies offered by the health facility with which the respondent is affiliated. The incorporation of this latter section into the Health Personnel Questionnaire made it unnecessary for private practitioners to answer both the Health Personnel and Health Facility Questionnaire, a cumbersome procedure followed during the first survey that ultimately resulted in a number of refusals.

c. Linkage of Mother-Infant Pairs with Health Facilities and Health Agents. In 1987, ideas were formulated to investigate not only health services available and obtained but to look also into the manner in which health policies related especially to infant care and infant feeding as promulgated by the Department of Health or expressed by private health institutions (cf. Health Facility Surveys) are carried out in practice by health agents working in or through these institutions. A first step required to undertake such study was to link specific mother-infant pairs tp specific health institutions and health agents. During the longitudinal data collection phase, information on the specific health institutions and health agents consulted by individual mothers on their own behalf and that of their sample babies was elicited, but this information was encoded onto the computerized

data files in categorical form only, i.e., in terms of 'type' of health facility (hospital, RHU, Barangay Health Station, etc.) and 'type' of health agent (physician, nurse, midwife, etc.). However, the names of individual health institutions and health agents were written into most longitudinal survey questionnaires.

In early 1988, efforts were made to recover this specific information from the approximately 40,000 longitudinal survey questionnaires including every survey round from Baseline to the 14th longitudinal. A sample of the coding form used for this purpose is included in Section III of this volume. This coding form specifies the exact questions of the survey questionnaires involved.

In the course of this information recovery effort, 172 public and private health institutions were identified together with 3,624 individual health agents, both modern and traditional. Their numbers exceed by far the numbers of those institutions and agents included in the Health Facility and Health Personnel surveys described above and indicate the extensive use, by the sample population, of health providers beyond the boundaries of its residential localities. The recovered data are found in data file HLTFC5 which contains, for almost every woman contacted during the longitudinal survey rounds, one record, or 3,327 records in all. Included among these records are those for women with abnormal pregnancy terminations,twin births, refusers, and even a substantial portion of women officially classified as permanent outmigrants. Unfortunately (though not unexpectedly), the 3,327 records contain a good number of 'Don't Know' codes. The coverage of HLTFC5 in terms of sample women is specified in the following comparison between women ever contacted by the survey and women with a record in the HLTFC5 file.

Status Code	Final Survey Status	Women Contacted	Women in HLTFC5
12	Complete Records	2,179	2,179
13	Outmigrants	625	446
14	Temporary Migrants	382	382
15	Refusal	143	66
16	Infant Died	167	155
17	Stillbirth	40	38
18	Miscarriage	68	13
19	Twin Birth	27	26
23	Dropped	22	22
	T O T A L	**3,653**	**3,327**

In the context of this report, it is impossible to outline actual linkages between specific health providers and their clients. What the following four tables illustrate are some general patterns of health care use.

Table 22. PERCENT OF SAMPLE WOMEN WHO RECEIVED PRENATAL CARE, BY TYPE OF SERVICE PROVIDER AND PLACE OF SERVICE

SERVICE PROVIDER		SERVICE PLACE	
Type	% Mothers	Place	% Mothers
Gov't Personnel	40.6	Mother's Home	13.7
Private Personnel	16.5	Gov't Health Station	36.3
Mananabangs	29.1	Hospital (publ/priv)	9.8
Mananambals	2.0	Priv. Clinic/Office*	28.4
No Prenatal Care	11.8	No Prenatal Care	11.8

* Including residences of mamanabangs and mananambals.

Some 88 percent of all women included in HLTFC5 obtained some form of prenatal care. The majority of the women consulted one particular practitioner during their pregnancies, one third two different ones, and 2.6 percent three. As Table 22 shows, the bulk of all prenatal care was provided by nurses and midwives working out of Rural Health Units and Barangay Health Stations. The second most important providers of prenatal services were traditional ones, mananabangs and mananambals, most of them working independently of any agency (a few professionally trained mananabangs worked for and under the supervision of modern health practitioners; cf. Tables 20 and 21). The proportion of women able to afford care provided by hospitals was relatively small.

With respect to deliveries, the importance of traditional health providers was even more in evidence. One third of all sample babies were delivered by mananabangs in the homes of their mothers, about as many as were delivered by physicians or professional nurses in hospital environments. In all, home deliveries accounted for about two thirds of all deliveries (see Table 23).

Table 23. PERCENT OF DELIVERIES OF SAMPLE CHILDREN, BY TYPE OF SERVICE PROVIDER AND PLACE OF SERVICE

SERVICE PROVIDER		PLACE OF DELIVERY	
Type	% Deliveries	Place	% Deliveries
None or Relatives	6.4	Mother's Home	61.1
Public Physician	14.2	Bar'g. Health Stat.	0.3
Public Nurse	1.5	Public Hosp./Clinic	17.5
Public Midwife	15.8	Priv. Hosp./Clinic	20.6
Private Physician	19.2	Other	0.5
Private Nurse	1.1		
Private Midwife	7.8		
Mananabang	33.5		
Other	0.5		
	(3,111)		(3,111)

Especially during their first year of life, the sample babies were brought to professional health providers relatively frequently. By contrast, postpartum care for the mothers was requested rarely. Close to one half of all infants (under 1 year of age) received care from modern practitioners (traditional ones were of almost no importance). During the second

year of life, the proportion of children brought to modern health providers declined to about one third (see Table 24).

Table 24. PERCENT OF SAMPLE BABIES WHO RECEIVED HEALTH CARE, BY AGE OF INFANT AND TYPE OF CARE PROVIDER

HEALTH PROVIDER	Month 0 & 1	Month 11 & 12	Month 23 & 24
Public Physician	15.5	9.2	4.8
Other Publ. Practitioner	6.7	2.6	1.1
Private Physician	20.8	15.7	7.6
Other Priv. Practitioner	4.3	18.7	20.8
Mananabang/Mananambal	0.7	0.1	0.1
No Care	52.0	53.2	65.6

Of all sample mothers, only 15 percent requested postpartum services during the first two months after the delivery of their sample babies. Of the few mothers who sought care and in contrast to the care they gave their babies, a significant portion went not to modern but traditional care providers. Whether medical consultations one or two years after the delivery of the sample child had anything to do with the latter's delivery, a detailed study of the data will have to show.

Table 25. PERCENT OF SAMPLE MOTHERS WHO SOUGHT POSTPARTUM HEALTH CARE, BY TYPE OF CARE PROVIDER AND TIME POSTPARTUM

HEALTH PROVIDER	Month 0 & 1	Month 11 & 12	Month 23 & 24
Public Physician	2.2	1.4	1.6
Other Publ. Practitioner	0.8	0.4	0.8
Private Physician	4.2	2.0	2.0
Other Priv. Practitioner	0.1	0.1	0.1
Mananabang/Mananambal	4.7	2.9	2.8
Other	3.6	0.3	0.3
No Care	84.4	92.9	92.4

4. Bimonthly Food Price Surveys

Since the beginning of 1983, twenty bimonthly surveys of food prices have been conducted in the project's 33 sample barangays and some large and centrally located public markets in Metro Cebu. The data collected through these surveys provide time series of prevailing prices for a number of general food items (rice, corn, meat, poultry, fish, vegetables, cooking oil and salt) as well as all milks and infant foods carried by two stores in each sample barangay, provided the barangay has or had two stores. The purpose of these surveys was twofold: to ascertain (a) the current price level of, and recent price change for, the most common and important food items and, by implication, the latter's affordability for the sample population, and (b) the availability of these food items in or near the communities of the sample population. The surveys were undertaken at the following points in time:

January	1983	November	1984
May	1983	January	1985
July	1983	March	1985
September	1983	May	1985
November	1983	July	1985
January	1984	September	1985
March	1984	November	1985
May	1984	January	1986
July	1984	March	1986
September	1984	May	1986

During most of the three-year longitudinal survey period, only stores directly located in the sample barangays were checked for prices of available food items, However, since these stores are not necessarily identical with those usually frequented by all the survey respondents residing in the sample barangays, four larger and, for substantial portions of the entire sample population, centrally located public markets elsewhere in Metro Cebu were included in the surveys beginning with May 1985.

In connection with the community surveys in 18 non-sample barangays needed to obtain community-level SES information for mother-infant pairs who, during the longitudinal survey, had temporarily migrated into such localities (cf. p.42), additional price surveys were undertaken (Food Price File FP8903. Furthermore, in March 1989, infant and general food prices were checked in the stores of 10 non-sample barangays in which temporary outmigrants had resided and compared with the current (1989) prices of 10 sample barangays. If the current prices in the stores of the sample and non-sample barangays are roughly the same in 1989, it can be assumed that they were also comparable between 1984 and 86.

C. COMPUTERIZED DATA FILES

Preparations for the computerization of the project data began in 1982, when OPS ordered an AlphaMICRO computer. The latter was delivered on 29 December of that same year. The present configuration of the AlphaMICRO 1042, a multi-user and multi-tasking system, is 3 MB of internal memory, a 150 MB hard disk, a 1.2 MB floppy disk drive (8"), an open-reel tape drive, six terminals (work stations), and four printers. Over the years, OPS' computer system has been enlarged through five IBM clones: one AT and four XT's. Two of the latter are connected to the AlphaMICRO for direct communications.

For the inputting of the project data, a prototype program was developed by Jeff Bass of Bass Cybernetics Laboratories in Pittsboro, North Carolina. This program provides for a multi-file structure depending on the different types of units of analysis included in any particular survey or data set. Built into the program are a number of editing and skipping features. Additional editing routines for the project data were developed by the computer staff of OPS.

The data inputting process began in mid 1983 and was completed toward the end of 1987. Data were inputted into the computer directly from the (precoded) questionnaires. Before the

questionnaires were delivered to the computer staff, they underwent a thorough manual editing by the editing staff of OPS.

The completed data tapes contain, for every data file, a corresponding "query file" and code book. The first of these contains the labels and definitions of every variable in the file, and the latter a printable version of the file code book. This particular arrangement not only keeps data files and code books together but also makes it relatively easy to incorporate into the code books changes and/or additions that may become necessary.

All data files are encoded in ASCII and available on open-reel tapes. By the middle of 1988, OPS had provided CPC in Chapel Hill with copies of all computerized data files.

1. Longitudinal Survey Files

Table 26 provides a summary of all data files created for the data collected with the help of the longitiudinal survey questionnaires during the 14 longitudinal survey rounds. For each longitudinal survey, a separate set of files was created, i.e., 14 sets. Within each survey set, files are distinguished in terms of the unit of analysis for which they contain information: household, mother-infant pair, spouse of sample woman, household members, income earners within the household, crops, and livestock. Nutrition-related information for the sample mothers is contained in dish files, for the sample infants in files for different types of food, viz.: milk, other liquids, semi-solid and solid foods. Separate files exist for infant feeding during the infants' first and second days of life as well as for food preparation. In all, there are 18 different files, corresponding to 18 different units of analysis.

Longitudinal surveys differ in terms of the amount of information collected: basic household and mother-infant information was collected in all surveys (with the exception of the Birth Information Survey), while other kinds of information such as that relating to income, livestock or crops was collected only intermittently (see Appendix A). In consequence, the number of data files varies (between 8 and 11) from one longitudinal survey to the next. The Birth Information Survey, which collected not repeatable information, is the smallest in terms of files: five. The number of data files for all 14 longitudinal surveys together is 121, containing a total of 903,796 data records. The file with the largest number of records is the Baseline Mother Dish File, which contains 46,956 (rather small) data records; The file with the smallest number of data records is the semi-solid food file for infants 2 months of age. In terms of number of variables, file records vary from 317 (Baseline Mother File) to 10 (Baseline Livestock File).

For the linking of different units of analysis (e.g., all records in different files pertaining to one household or one mother-infant pair), each file record contains a BASELINE ID composed of three elements: (a) Barangay Number, (b) Household Number, and (c) Woman Number. These numbers, assigned during the Baseline Survey and never changed during the survey, uniquely identify, when used in combination (!), every household, sample mother and sample child, with the latter always being tied to the mother. In case

two sample women reside in one and the same household, their IDs differ only with respect to the third (Woman Number) component. To account for changes in residence and/or household composition, e.g., move into another barangay, another household, break-up or combinations of households, all data records except those in the Baseline files carry a second ID, likewise composed of a barangay, household and woman element, the CURRENT ID. The first two of these elements may change from one survey to the next; the Woman Number does not. In instances in which sample women never changed households or residences, the Current ID is identical with the Baseline ID.

In instances in which two sample women reside in one household, each one of them has a complete set of household records. To call attention to the fact that, e.g., their household members appear twice in the survey files, the line numbers of these "duplicated" household members are augmented by 100, i.e., a person with line number 7 in the records of the first sample woman appears under line number 107 in the records of the second woman.

Table 27 shows the data files created from the information collected from the control sample in 11 control-sample barangays (cf. Table 15). These files, covering a total of 219 women and their infants, are exactly parallel to those of the longitudinal survey of 3,711 women just described except that the control-sample files pertain to the Baseline, Longi 3, Longi 6, Longi 9 and Longi 12 surveys only, i.e., those surveys for which control-sample information was collected. As a comparison of Tables 26 and 27 shows, the file names given to the control-sample data files are identical with those given to the main-sample files.

2. Other Data Files

Table 28 lists other data files created from information collected through community-related surveys as well as other supplementary data collection activities. All of these files, with exception of the Pregnancy Follow-up file, are small in terms of number of records but large with respect to the number of variables per record.

Table 28. OTHER DATA FILES, NUMBER OF FILE RECORDS AND RECORD VARIABLES

FILE NAME	FILE CONTENTS	RECORDS/FILE	VARIABLES/RECORD
COBAS1	Community Baseline Survey	33	336
COBAS2	Final Community Survey	33	489
COBAS3	Additional Barangay Surveys	18	489
HLTFC1	First Survey of Health Facilities	48	183
HLTFC2	Second Survey of Health Facilities	161	235
FAMPLN	Natal Services/Family Planning, Health Facilities	80	112
NATAL	Natal Services, Birth Helpers	93	23
HLTFC3	Third Survey of Health Facilities	288	752
HLTFC4	Final Survey of Health Facilities	72	443
HLTFC5	Linkage of Mother-Infant Pairs with Health Facilities and Agents	3,327	211
HLTPE1	First Health Personnel Survey	320	102
HLTPE2	Second Health Personnel Survey	410	306
MORTAL	Infant Mortality Survey	151	127
FPyymm*	13 Food Price Surveys (33 barangays)	33	328
FPyymm*	7 Food Price Surveys (33 barangays + 4 markets)	37	328
FP8903**	1 Food Price Survey (18 barangays)	18	328
FOLLOW	Pregnancy Follow-up Survey	3,531	22

* yy refers to the year and mm to the month in which the survey was made.
** Food prices in 18 non-sample barangays, March 1989.

APPENDIXES

APPENDIX B: DESIGN OF LONGITUDINAL MOTHER-INFANT PAIR SAMPLE

DESIRED SAMPLE SIZE: 1,500 urban and 500 rural mothers delivering a live birth between 1 May 1983 and 30 April 1984. To compensate for expected drop-outs, the desired number of urban sample women was increased to 1,900, and that of rural sample women to 600.

ESTIMATED NUMBER OF HOUSEHOLDS CONTAINING 1,900 URBAN AND 600 RURAL WOMAN WHO WILL HAVE A LIVE BIRTH BETWEEN 1 MAY 1983 AND 30 APRIL 1984:

	URBAN	RURAL
1. Estimated proportion of households with a pregnant woman (any pregnancy duration) at any given point in time: [1]	0.085	0.121
2. Assuming that (a) all pregnancies are evenly distributed throughout a year, (b) all pregnant womnen report their pregnancies, and (c) all reported pregnancies result in a live birth, then:		
a. estimated proportion of households with women pregnant for x months (x = 1 or 2 or 3 .... or 9 months:)	0.085 / 9 = 0.009	0.121 / 9 = 0.013
b. estimated proportion of households with women in their 9th month of pregnancy in a 12-month period:	0.009 x 12 = 0.113	0.013 x 12 = 0.161
c. Number of households needed to obtain the desired number of women delivering a live birth in a 12-month period:	1900 /.113 = 16815	600 / .161 = 3727

SAMPLING FRAME: 1980 Census of Population (Preliminary Results) [2]

TYPE OF SAMPLE: Two independent two-stage cluster samples, one urban, the other rural.

Stage 1: Urban - Random sample of as many urban barangays in Metro Cebu (95) as needed to obtain 16,815 urban households;

Rural - Random sample of as many rural barangays in Metro Cebu (148) as needed to obtain 3,727 rural households.

Stage 2: Urban/Rural - All resident women in the random samples of barangays delivering a live birth during the period 1 May 1983 through 30 April 1984.

[1] Based on Metro Cebu Survey of 1981. Office of Population Studies, University of San Carlos, Cebu City.
[2] Final Census results not released in 1983.

APPENDIX C: BARANGAYS OF METRO CEBU, BY REVISED STRATUM: 1983

BARANGAY	CITY/MUNICIPALITY	STRAT.
Adlaon	Cebu City	rural
Agsungod	Cebu City	rural
Agus	Lapu-Lapu City	rural
@Alang-alang	Mandawe City	urban
Alfaco	Naga	rural
Alegria	Cordova	rural
@Apas	Cebu City	urban
Babag	Cebu City	rural
@Babag	Lapu-Lapu City	rural
#Bacayan	Cebu City	rural
*Bairan	Naga	rural
@Bakilid	Mandawe City	urban
*Balirong	Naga	rural
Bangbang	Cordova	rural
@Banilad I	Mandawe City	urban
@Banilad II	Mandawe City	urban
Bankal	Lapu-Lapu City	rural
@Baring	Lapu-Lapu City	rural
*Basak	Lapu-Lapu City	urban
*Basak	Mandawe City	urban
*Basak, Pardo	Cebu City	urban
@Basak, San Nicolas	Cebu City	urban
@Binaliw	Cebu City	rural
@Bonbon	Cebu City	rural
Buagsong	Cordova	rural
Buaya	Lapu-Lapu City	rural
*Budlaan	Cebu City	rural
Buhisan	Cebu City	rural
@Bulacao	Cebu City	urban
Bulacao	Talisay	urban
Buot-Taup	Cebu City	rural
@Busay	Cebu City	rural
Cabadiangan	Liloan	rural
@Cabankalan	Mandawe City	urban
Cabangahan	Consolacion	rural
Cabungahan	Naga	rural
Cadulawan	Minglanilla	rural
#Calajoan	Minglanilla	rural
@Calamba	Cebu City	urban
Calawisan	Lapu-Lapu City	rural
Calero	Liloan	rural
@Cambaro	Mandawe City	urban
@Guizo	Mandawe City	urban
@Gun-ob	Lapu-Lapu City	urban
@Hippodromo	Cebu City	urban
@Ibabao	Cordova	rural
@Ibabao-Estancia	Mandawe City	urban
Ibo	Lapu-Lapu City	rural
@Inayagan	Naga	rural
#Inayawan	Cebu City	urban
*Inoburan	Naga	rural
Jaclupan	Talisay	rural
@Jagobiao	Mandawe City	urban
*Jaguimit	Naga	rural
Jubay	Liloan	rural
@Jugan	Consolacion	rural
Kalubian	Cebu City	urban
Kalunasan	Cebu City	rural
@Kamagayan	Cebu City	urban
@Kamputhaw	Cebu City	urban
Kasambagan	Cebu City	urban
@Kinasang-an	Cebu City	urban
*Labangon	Cebu City	urban
@Labogon	Mandawe City	urban
@Lagtang	Talisay	urban
@Lahug	Cebu City	urban
@Lamac	Consolacion	rural
Lanas	Naga	rural
@Langtad	Naga	rural
Lanipga	Consolacion	rural
Lataban	Liloan	rural
@Lawaan	Talisay	urban
Linao	Minglanilla	rural
Linao	Talisay	urban
@Looc	Lapu-lapu City	urban
@Looc	Mandawe City	urban
*Lorega-San Miguel	Cebu City	urban
Lusaran	Cebu City	rural
Lutac	Naga	rural
@Luz	Cebu City	urban
Cambinocot	Cebu City	rural
Camp 7	Minglanilla	rural
Camp 8	Minglanilla	rural
Candulawan	Talisay	rural
Canduman	Mandawe City	rural
Canjulao	Lapu-Lapu City	rural
*Cansaga	Consolacion	urban
@Cansojong	Talisay	urban
*Cantao-an	Naga	rural
*Caohagan	Lapu-Lapu City	rural
*Cao-oy	Lapu-Lapu City	rural
@Capitol Site	Cebu City	urban
@Carreta	Cebu City	urban
#Casili	Consolacion	rural
@Casili	Mandawe City	rural
*Casuntingan	Mandawe City	urban
Catarman	Cordova	rural
@Catarman	Liloan	rural
Caubian	Lapu-Lapu City	rural
Central Proper	Cebu City	urban
*Cogon	Cordova	rural
Cogon, F.Ramos	Cebu City	urban
Cogon, Pardo	Cebu City	urban
Cogon	Naga	rural
#Colon	Naga	rural
@Cotcot	Liloan	rural
Cuanos	Minglanilla	rural
Cubacub	Mandawe City	rural
*Danglag	Consolacion	rural
Dapitan	Cordova	rural
@Day-as	Cebu City	urban
@Day-as	Cordova	rural
@Duljo	Cebu City	urban
@Dumlog	Talisay	urban
@Ermita	Cebu City	urban
Gabi	Cordova	rural
Garing	Consolacion	rural
Gilutongan	Cordova	rural
@Guadeloupe	Cebu City	urban
Guba	Cebu City	rural
@Guindarohan	Minglanilla	rural
Mabini	Cebu City	rural
@Mabolo Poblacion	Cebu City	urban
@Mactan	Lapu-Lapu City	rural
Maghaway	Talisay	rural
@Maguikay	Mandawe City	urban
@Mainit	Naga	rural
Malubog	Cebu City	rural
@Mambaling	Cebu City	urban
Manduang	Minglanilla	rural
Manipis	Talisay	rural
*Mantuyong	Mandawe City	urban
@Maribago	Lapu-Lapu City	rural
@Marigondon	Lapu-Lapu City	rural
Mayana	Naga	rural
*Mojon	Talisay	urban
Mulao	Liloan	rural
Naalad	Naga	rural
@Nangka	Consolacion	urban
*Opao	Mandawe City	urban
@Pagsabungan	Mandawe City	urban
@Pahina Central	Cebu City	urban
*Pahina San Nicolas	Cebu City	urban
Pajac	Lapu-Lapu City	rural
#Pajo	Lapu-Lapu City	urban
@Paknaan	Mandawe City	urban
Pakigne	Minglanilla	rural
*Pamutan	Cebu City	rural
Panas	Consolacion	rural
Pangan-an	Lapu-Lapu City	rural
@Pangdan	Naga	rural
*Panoypoy	Consolacion	rural
Pardo (Poblacion)	Cebu City	urban
Parian	Cebu City	urban
Paril	Cebu City	rural
@Pasil	Cebu City	urban
Patag	Naga	rural
Pilipog	Cordova	rural
Pitogo	Consolacion	rural
Pit-os	Cebu City	rural
*Poblacion	Consolacion	urban
@Poblacion	Cordova	rural

APPENDIX C: (cont'd.)

BARANGAY	CITY/MUNICIPALITY	STRAT.
*Poblacion	Lapu-Lapu City	urban
@Poblacion	Liloan	rural
@Poblacion	Mandawe City	urban
Poblacion	Minglanilla	rural
*Poblacion Central	Naga	rural
Poblacion East	Naga	rural
@Poblacion North	Naga	rural
@Poblacion South	Naga	rural
Poblacion West	Naga	rural
@Poblacion	Talisay	urban
Polog	Consolacion	rural
@Pooc	Talisay	urban
Pulang Bato	Cebu City	rural
*Pulpogan	Consolacion	rural
Pungol-Sebugay	Cebu City	rural
#Punta Engano	Lapu-Lapu City	rural
@Punta Princesa	Cebu City	urban
@Pusok	Lapu-Lapu City	urban
*Quiot Pardo	Cebu City	urban
Sabang	Lapu-Lapu City	rural
Sacsac	Consolacion	rural
@Sambag I	Cebu City	urban
*Sambag II	Cebu City	urban
San Antonio	Cebu City	urban
@San Isidro	Talisay	urban
@San Jose	Cebu City	rural
@San Miguel	Cordova	rural
San Nicolas Central	Cebu City	urban
@San Roque	Cebu City	urban
San Roque	Liloan	rural
*San Roque	Talisay	urban
@San Vicente	Liloan	rural
Sapangdaku	Cebu City	rural
@Sawang Calero	Cebu City	urban
Sinsin	Cebu City	rural
Sirao	Cebu City	rural
Sta. Cruz	Cebu City	urban
*Sta. Cruz	Liloan	rural
@Sta. Rosa	Lapu-Lapu City	rural
Suba Basbas	Lapu-Lapu City	rural
@Subangdaku	Mandawe City	urban
Suba Pasil	Cebu City	urban
Sudlon	Cebu City	rural
Tabla	Liloan	rural
@Tabok	Mandawe City	urban
#Tabunok	Talisay	urban
Tabusan	Cebu City	rural
Tagbao	Cebu City	rural
Tagjaguimit	Naga	rural
#Talamban	Cebu City	urban
@Talima	Lapu-Lapu City	rural
Tangke	Naga	rural
@Tangke	Talisay	urban
Tapol	Talisay	rural
Taptap	Cebu City	rural
Tawason	Mandawe City	rural
@Tayud	Consolacion	urban
#Tayud	Liloan	rural
@Tilhaong	Consolacion	rural
@Tinaan	Naga	rural
@Tinago	Cebu City	urban
Tingo	Lapu-Lapu City	rural
Tingub	Mandawe City	rural
@Tipolo	Mandawe City	urban
@Tisa	Cebu City	urban
*Tolo Tolo	Consolacion	rural
@To-ong	Cebu City	rural
*T. Padilla	Cebu City	urban
@Tubod	Minglanilla	rural
@Tugbungan	Consolacion	urban
Tulay	Minglanilla	rural
@Tungasan	Lapu-Lapu City	rural
Tunghaan	Minglanilla	rural
@Tungkop	Minglanilla	rural
@Tuyan	Naga	rural
Uling	Naga	rural
#Umapad	Mandawe City	urban
@Villagonzalo (Tejero)	Cebu City	urban
Vito	Minglanilla	rural
@Yati	Liloan	rural
Zapatera	Cebu City	urban

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* Sample Barangay
\# Control Sample Barangay
@ Non-sample Barangays in which Temporary Outmigrants resided

APPENDIX E: SAMPLE BARANGAYS OF CEBU LONGITUDINAL HEALTH AND NUTRITION PROJECT, BY NUMBER OF HOUSEHOLDS AND NUMBER OF PERSONS: 1980 CENSUS OF POPULATION AND 1983 HOUSEHOLD CANVASS

BRGY NO.	BARANGAY	1980 CENSUS OF POPULATION*				1983 HOUSEHOLD CANVASS**			
		Hhlds	Male	Female	Both	Hhlds	Male	Female	Both
	Urban Barangays								
1	Quiot, Pardo, Cebu City	937	2,700	2,842	5,542	969	3,031	3,290	6,321
2	Pahina, San Nicolas, Cebu C.	793	1,909	2,079	3,988	779	2,018	2,281	4,299
3	Sambag II, Cebu City	1,877	4,741	5,370	10,111	1,749	4,739	5,698	10,437
4	Opao, Mandawe	581	1,750	1,811	3,561	763	2,087	2,256	4,343
5	Cansaga, Consolacion	154	457	461	918	170	434	438	872
6	Poblacion, Consolacion	694	2,042	2,071	4,113	833	2,275	2,385	4,660
7	Basak, Pardo, Cebu City	724	2,009	2,194	4,203	1,125	3,257	3,560	6,817
8	Mantuyong, Mandawe	529	1,516	1,525	3,041	688	1,938	2,037	3,975
9	Basak, Lapu Lapu	1,041	2,887	2,923	5,810	1,218	3,227	3,352	6,579
10	T. Padilla, Cebu City	1,828	4,617	4,897	9,514	1,765	4,764	5,207	9,971
11	San Roque, Talisay	762	2,211	2,196	4,407	962	2,677	2,860	5,537
12	Poblacion, Lapu Lapu	1,021	2,869	3,166	6,035	1,096	2,917	3,306	6,223
13	Labangon, Cebu City	3,283	8,816	9,436	18,252	4,010	10,566	11,710	22,276
14	Basak, Mandawe	457	1,270	1,305	2,575	520	1,434	1,526	2,960
15	Mojon, Talisay	465	1,270	1,288	2,558	672	1,743	1,821	3,564
16	Casuntingan, Mandawe	607	1,677	1,739	3,416	798	2,043	2,310	4,353
17	Lorega, San Miguel, Cebu C.	1,744	4,745	4,956	9,701	1,851	5,072	5,696	10,768
	Rural Barangays								
18	Jaguimit, Naga	196	509	503	1,012	206	559	511	1,070
19	Danglag, Consolacion	132	325	341	666	170	425	420	845
20	Balirong, Naga	267	750	702	1,452	312	878	862	1,740
21	Panoypoy, Consolacion	100	250	218	468	110	280	263	543
22	Cao-oy, Lapu Lapu	158	428	418	846	158	413	420	833
23	Bairan, Naga	201	490	520	1,010	224	534	578	1,112
24	Caohagan, Lapu Lapu	37	111	106	217	42	110	94	204
25	Sta. Cruz, Liloan	120	311	336	647	157	382	418	800
26	Budla-an, Cebu City	309	774	766	1,540	314	896	914	1,810
27	Cantao-an, Naga	431	1,052	1,145	2,197	421	1,079	1,118	2,197

28	Pulpogan, Consolacion	562	1,678	1,743	3,421	908	2,426	2,622	5,048
29	Inoburan, Naga	344	993	977	1,970	370	992	1,098	2,090
30	Cogon, Cordova	183	565	537	1,102	204	582	583	1,165
31	Pamutan, Cebu City	219	593	580	1,173	280	765	780	1,545
32	Tolo Tolo, Consolacion	175	485	471	956	183	465	523	988
33	Poblacion Central, Naga	166	466	470	936	152	383	443	826
	All Barangays	**18,097**	**57,266**	**60,092**	**117,358**	**24,179**	**65,391**	**71,380**	**136,771**
	Urban Barangays	14,497	47,486	50,259	97,745	19,968	54,222	59,733	113,955
	Rural Barangays	3,600	9,780	9,833	19,613	4,211	11,169	11,647	22,816

* Source: National Census and Statistics Office. 1980 Census of Population by City/Municipality and Barangay, Special Report No.2: Cebu. Manila, April 1982.
** Source: OPS Household Canvass of Sample Barangays, February/March 1983.

APPENDIX G: REPORTED DESTINATIONS OF SAMPLE WOMEN WHO OUTMIGRATED FROM THE SAMPLE AREA (Number and Percent of All Outmigrants)

A. **Metro Cebu**		**76 (12.2 %)**
Cebu City	40	
Mandawe City	11	
Lapu Lapu City	6	
Talisay	8	
Minglanilla	3	
Naga	4	
Consolacion	4	
B. **Cebu Province***		**149 (23.8 %)**
Alcantara	2	
Alcoy	2	
Aloguinsan	1	
Argao	7	
Asturias	2	
Badian	2	
Bantayan Isl.	11	
Barili	5	
Bogo	13	
Boljoon	3	
Borbon	5	
Camotes Isl.	9	
Carmen	4	
Carcar	6	
Compostela	3	
Daanbantayan	4	
Dalaguete	8	
Danao City	12	
Dumanjug	1	
Guinatilan	1	
Malabuyog	2	
Medellin	4	
Moalboal	4	
Oslob	1	
Pinamungahan	2	
Ronda	3	
Samboan	1	
San Fernando	4	
San Remigio	3	
Santander	1	
Sibonga	1	
Sogod	2	
Cebu Province (cont'd.)		
Tabogon	4	
Tabuelan	2	
Toledo City	8	
Tuburan	4	
Not specified	2	
C. **Visayas Islands**		**114 (18.2 %)**
Bohol	35	
Negros	30	
Panay	9	
Leyte	36	
Samar	4	
D. **Mindanao****		**53 (8.5 %)**
Butuan City	4	
Iligan City	3	
Ozamis City	4	
Cotabato	5	
Davao	5	
Jolo	1	
Lanao	1	
Misamis	8	
Surigao	6	
Zamboanga	5	
Not specified	11	
E. **Luzon**		**52 (8.3 %)**
Metro Manila	33	
Baguio City	1	
Bicol	5	
Masbate	11	
Central Luzon	2	
F. **Destination Unknown**		**181 (29.0 %)**
ALL MIGRANTS		**625 (100.0 %)**

* Municipalities and Cities of Cebu Province.
** Cities, Provinces or Regions.

APPENDIX H. ANTHROPOMETRIC MEASUREMENTS: RESULTS OF AN INTER-OBSERVER RELIABILITY TEST

HEIGHT MEASUREMENTS (Centimeters) OF TEN INFANTS OBTAINED BY ONE SUPERVISOR AND NINE FIELD WORKERS[1] MARCH 1985

INFANT NO.	SUPERVISOR		FIELD WORKER # 1		# 2		# 3		# 4	
	a[2]	b[3]	a	b	a	b	a	b	a	b
1	72.1	72.2	71.9	71.1	71.7	71.8	72.2	72.1	71.6	71.9
2	72.9	72.8	71.7	73.1	72.2	72.3	72.6	72.2	71.9	71.9
3	79.3	78.7	79.1	79.3	79.0	78.7	79.1	79.1	79.0	78.6
4	74.8	74.8	74.5	74.9	75.4	74.9	75.2	75.7	75.5	75.1
5	76.4	76.4	75.8	76.4	76.0	75.9	76.4	76.3	76.0	76.0
6	81.3	81.1	81.3	81.6	81.4	81.3	81.4	81.0	81.4	81.2
7	76.8	77.1	75.7	76.5	76.4	76.7	76.6	77.0	76.3	76.6
8	78.2	78.2	77.9	78.5	76.9	78.5	77.7	78.2	78.1	78.4
9	72.5	72.3	72.9	72.6	72.0	72.7	72.6	72.9	72.4	72.4
10	75.3	75.4	75.5	75.7	75.9	75.7	75.7	76.1	75.2	75.5

INFANT NO.	FIELD WORKER # 5		# 6		# 7		# 8		# 9	
	a	b	a	b	a	b	a	b	a	b
1	72.2	72.1	71.6	71.7	72.1	72.2	71.8	72.0	71.8	71.7
2	72.4	72.4	72.8	72.9	72.2	72.5	72.5	72.3	72.7	72.6
3	78.9	78.9	78.9	78.6	79.5	79.6	79.5	79.5	79.3	78.9
4	75.0	75.1	75.0	74.5	75.2	75.0	74.9	74.9	74.6	75.3
5	75.5	76.4	75.6	76.4	77.0	77.1	76.5	76.3	76.0	76.1
6	81.2	81.2	81.0	80.9	81.4	81.2	81.9	81.7	81.9	80.7
7	76.5	77.3	76.9	77.4	76.4	77.5	77.2	77.3	77.7	77.7
8	78.5	77.8	77.7	77.9	78.6	78.1	79.3	78.0	78.5	78.2
9	72.7	72.3	72.8	72.4	73.4	72.4	73.4	72.9	72.7	72.5
10	76.2	76.0	76.0	75.9	76.6	76.4	76.4	76.4	75.3	75.8

[1] Measuring Instrument: Infantometer produced by Nutrition Center of the Nutrition Center of the Philippines.
[2] **a** - First measurement, taken in the morning.
[3] **b** - Second measurement, taken in the afternoon.

APPENDIX H. ANTHROPOMETRIC MEASUREMENTS: RESULTS OF AN INTER-OBSERVER RELIABILITY TEST (cont'd.)

EVALUATION OF HEIGHT MEASURES OF TEN INFANTS OBTAINED BY ONE SUPERVISOR AND NINE FIELD WORKERS WITH RESPECT TO PRECISION AND ACCURACY

	PRECISION				ACCURACY			
	Difference Between Measures		Systematic Bias		Difference from Supervisor		Systematic Bias	
	d^2	Remark	Sign	Remark	D^2	Remark	Sign	Remark
Supervisor	0.31		+ 4/7					
Fld. Wk. # 1	3.78	Large discrepancy between measures of baby 2	-8/10	none	5.74	Large deviation from supervisor for baby 7	- 5/9	none
Fld. Wk. # 2	3.56	Large discrepancy between measures of baby 7	+ 5/10	none	6.02	Lower than supervisor for babies 2 and 7	- 7/10	none
Fld. Wk. # 3	1.25	No difference in excess of 5 mm	- 5/9	none	4.59	Higher than supervisor for babies 4 and 10	+ 4.8	none
Fld. Wk. # 4	0.72	No difference in excess of 4 mm	- 4/7	none	7.10	Deviates from supervisor for babies 4 and 7	- 5/8	none
Fld. Wk. # 5	2.16	All differences less than 1 cm	+ 4/7	none	4.22	Extreme deviations from supervisor for baby 10	- 5/8	none
Fld. Wk. # 6	1.47	No extreme differences	+ 5/10	none	4.55	Large deviations from supervisor for babies 1 & 10	- 6/9	none
Fld. Wk. # 7	2.70	Large discrepancies between measures of babies 7 and 9	+ 5/10	none	10.68	Higher than supervisor for babies 3, 5, 9, and 10	+ 7/8	Tendency to measure high
Fld. Wk. # 8	2.32	Large discrepancy between measures of baby 8	+ 4/7	none	10.60	Higher than supervisor for babies 3, 6, 9 and 10	+ 7/9	none
Fld. Wk. # 9	2.50	Large discrepancy between measures of baby 6	+ 6/9	none	4.12	Higher than supervisor for baby 7	+ 7/10	none

EXPLANATIONS: $d = a - b$; $D = (a-b)_{fieldworker} - (a-b)_{supervisor}$.

Acceptable values for field workers: $d^2 = 2 \times d^2_{supervisor}$; $D^2 = 3 \times d^2_{supervisor}$

APPENDIX I: NON-SAMPLE BARANGAYS IN WHICH SAMPLE WOMEN TEMPORARILY RESIDED, BY MATCH WITH NEIGHBORING BARANGAYS, SIZE AND 1980 POPULATION DENSITY

BASE BRGY	BASE WMAN	BASE STRATUM	NON-SAMPLE BARANGAY No*	Name	N-S BAR STRATUM	MATCH 1	MATCH 2	1980 POP.	AREA km2	POPULAT. DENSITY	
1	64	urban	1	Punta Princesa	urban	13		14,879	2.49	5,976	
1	154	urban	2	Pakna-an, Mand.	urban	14		5,763	1.69	3,410	
1	113	urban	3	Kinasang-an	urban	1	7	5,875	2.76	2,129	
17	207	urban	4	Villagonzalo	urban	10	17	12,391	.31	39,971	
1	194	urban	5	Villagonzalo	urban	10	17	12,391	.31	39,971	
28	90	rural	6	Hippodromo	urban	17		7,929	.79	10,037	
2	27	urban	7	Ermita	urban	2		6,316	.28	22,557	
2	35	urban	8	Pasil	urban	2		6,390	.15	42,600	
2	53	urban	9	Calamba	urban	13	3	9,996	.62	16,123	
2	61	urban	10	Mambaling	urban	13		18,559	.85	21,834	
2	79	urban	11	Duljo	urban	13	2	11,215	.40	28,038	
2	82	urban	12	Tisa	urban	1	13	14,376	3.72	3,865	
2	100	urban	13	Pahina Central	urban	2		8,085	.29	27,879	
2	103	urban	14	Sawang Calero	urban	2		5,995	.16	37,469	
2	119	urban	15	Capitol Site	urban	3		9,659	.83	11,637	
3	53	urban	16	Lahug	urban	***		16,608	4.43	3,749	
3	242	urban	17	Guadalupe	urban	***		32,831	3.73	8,802	
3	247	urban	18	Luz	urban	***		10,341	.28	36,932	
3	247	urban	19	Mabolo	urban	***		18,281	3.62	5,050	
3	279	urban	20	Carreta	urban	17		4,524	.25	18,096	
7	47	urban	21	Basak, San Nicol.	urban	7		21,339	1.40	15,242	
7	147	urban	22	Toong	rural	31		1,598	8.10	197	
10	170	urban	23	Hippodromo	urban	17		7,929	.79	10,037	
10	176	urban	24	Tinago	urban	10		5,137	.64	8,027	
10	230	urban	25	Villagonzalo	urban	10	17	12,391	.31	39,971	
10	232	urban	26	Banilad	urban	***		3,623	2.64	1,371	
10	261	urban	27	Apas	urban	***		5,381	1.40	3,844	
11	123	urban	28	Bulacao	urban	7	1	9,611	3.78	2,543	
13	432	urban	29	Kamputhaw	urban	***		17,136	1.02	16,800	
13	461	urban	30	Sambag I	urban	3		14,758	.69	21,388	
15	98	urban	31	Bonbon	rural	31		2,724	12.85	212	
17	190	urban	32	Day-as	urban	10	17	5,592	.18	31,017	
17	191	urban	33	Kamagayan	urban	10		2,290	.13	17,615	
26	15	rural	34	Busay	rural	26		1,539	6.70	230	
26	21	rural	35	Talamban	urban	***		5,929	7.92	749	
26	42	rural	36	San Jose	rural	26		1,540	1.53	1,007	
28	127	rural	37	San Roque	urban	10		3,423	.47	7,283	
28	146	rural	38	Binaliw	rural	21		1,435	7.95	181	
10	143	urban	39	Pobl. Compostela	rural	***		3,734	3.57	1,046	1/
17	60	urban	40	Guiwanon, Compost.	rural	***		3,734	3.57	1,046	2/
19	14	rural	41	Sak-on, Liloan	rural	***		563	3.32	170	3/
6	47	urban	42	Tugbungan, Cons.	urban	6		2,308	1.84	1,254	
6	101	urban	43	Nangka, Cons.	urban	5		1,345	1.6	796	
10	123	urban	44	Tayud, Cons.	urban	5		3,802	6.10	623	
5	12	urban	45	Lamac, Cons.	rural	28	25	978	.88	1,111	
10	188	urban	46	Pitogo, Cons.	rural	***		757	1.62	467	

APPENDIX I: (cont'd.)

BASE BRGY	BASE WMAN	BASE STRATUM	NON-SAMPLE BARANGAY No*	Name	N-S BAR STRATUM	MATCH 1	MATCH 2	1980 POP.	AREA km2	POPULAT. DENSITY	
19	11	rural	47	Casili, Cons.	rural	32		1,989	1.26	1,578	
19	17	rural	48	Tilhaong, Cons.	rural	19	25	380	.93	408	
9	134	urban	49	Ibabao, Cord.	rural	30		1,335	1.03	1,296	
30	7	rural	50	Pobl. Cordova	rural	30		3,320	.91	3,648	
30	23	rural	51	San Miguel, Cord.	rural	30		844	.58	1,455	
30	25	rural	52	Day-as, Cord.	rural	30		1,466	.59	2,485	
2	73	urban	53	Pusok, Lapu	urban	12		5,980	1.57	3,809	
4	134	urban	54	St.Rosa, Lapu	rural	22		3,457	3.20	1,080	
9	91	urban	55	Babag, Lapu	rural	30		3,431	3.24	1,059	
9	125	urban	56	Timpoloc, Lapu	urban	12		11,527	2.94	3,921	4/
9	182	urban	57	Gun-ob, Lapu	urban	12	9	11,527	2.94	3,921	
10	235	urban	58	Maribago, Lapu	rural	30		3,744	3.60	1,040	
11	130	urban	59	Mactan, Lapu	rural	30		6,781	4.98	1,362	
12	41	urban	60	Baring, Lapu	rural	22		1,560	.90	1,733	
12	51	urban	61	Tungasan, Lapu	rural	22		1,128	.59	1,912	
12	75	urban	62	Looc, Lapu	urban	12		4,601	1.21	3,802	
18	6	rural	63	Talima, Lapu	rural	22		2,202	1.52	1,449	
24	14	rural	64	Marigondon, Lapu	rural	30		4,579	4.50	1,018	
	100	urban	65	Cotcot, Liloan	rural	25		2,097	2.92	718	
6	31	urban	66	Yati, Liloan	rural	28	25	4,278	4.46	959	
6	37	urban	67	Catarman, Liloan	rural	***		4,422	3.25	1,361	
7	124	urban	68	Pobl. Liloan	rural	***		5,181	4.54	1,141	
10	133	urban	69	Cotcot, Liloan	rural	25		2,097	2.92	718	
2	18	rural	70	Cogon, Liloan	rural	***		5,181	4.54	1,141	5/
25	30	rural	71	San Vicente, Lil.	rural	25		1,720	4.01	429	
1	90	urban	72	Tipolo, Mand.	urban	8		8,033	1.48	5,428	
2	71	urban	73	Subangdaku, Mand.	urban	8		10,801	1.13	9,558	
3	79	urban	74	Casili, Mand.	rural	32		689	1.21	569	
3	90	urban	75	Labogon, Mandawe	urban	14		5,257	1.41	3,728	
3	196	urban	76	Cabancalan, Mand.	urban	16		3,518	2.95	1,193	
3	257	urban	77	Tabok, Mand.	urban	14	16	3,979	1.56	2,551	
3	323	urban	78	Pakna-an, Mand.	urban	14	4	5,763	1.69	3,410	
4	157	urban	79	Alang Alang, Mand.	urban	8	4	4,615	.95	4,858	
6	72	urban	80	Ibabao, Mand.	urban	8		5,358	.63	8,505	
8	30	urban	81	Cambaro, Mand.	urban	4		4,945	.33	14,985	
8	35	urban	82	Looc, Mandawe	urban	4		6,667	1.35	4,939	
8	100	urban	83	Pobl. Mandawe	urban	8		2,775	.36	7,708	
8	110	urban	84	Bakilid, Mand.	urban	16		4,946	.36	13,739	
8	110	urban	85	Banilad, Mand.	urban	16		5,998	2.82	2,127	
8	130	urban	86	Maguikay, Mand	urban	16		5,757	1.52	3,788	
9	233	urban	87	Guizo, Mand.	urban	8		3,941	.40	9,853	
14	20	urban	88	Jagobiao, Mand	urban	14	6	4,310	1.12	3,848	
14	35	urban	89	Pagsabungan, Mand	urban	14		2,522	.88	2,866	
17	134	urban	90	Cambaro, Mand.	urban	4		4,945	.33	14,985	
11	107	urban	91	Tungkop, Mingl.	rural	27		2,978	2.36	1,268	
15	41	urban	92	Tubod, Mingl.	rural	***		1,829	5.82	314	
18	27	rural	93	Tuyan, Naga	rural	27		4,445	2.10	2,116	

APPENDIX I: (cont'd.)

BASE BRGY	BASE WMAN	BASE STRATUM	NON-SAMPLE BARANGAY No*	Name	N-S BAR STRATUM	MATCH 1	MATCH 2	1980 POP.	AREA km2	POPULAT. DENSITY	
20	16	rural	94	Mainit, Naga	rural	18	23	1,116	3.30	338	
20	73	rural	95	Pobl. South, Naga	rural	33		5,821	2.80	2,079	6/
23	8	rural	96	Pangdan, Naga	rural	18	27	2,151	4.00	538	
23	9	rural	97	Langtad, Naga	rural	29	23	2,511	7.00	359	
29	14	rural	98	Tinaan, Naga	rural	29	33	3,559	3.56	1,000	
33	11	rural	99	Pobl. North, Naga	rural	33		5,821	2.80	2,079	6/
33	14	rural	100	Inayagan, Naga	rural	27		2,690	5.40	498	
2	42	urban	101	Petalo, San Fern.	rural	***		3,197	2.87	1,108	7/
7	147	urban	102	Panadtaran, S.F.	rural	***		1,472	1.47	1,101	8/
3	221	urban	103	Lawaan, Talisay	urban	15		6,404	5.20	1,231	
3	308	urban	104	Camp II, Talisay	rural	31		2,522	7.50	336	9/
7	196	urban	105	Pobl. Talisay	urban	15		4,486	.69	6,501	
11	83	urban	106	San Isidro, Tal.	urban	15		4,637	.98	4,732	
11	124	urban	107	Tangke, Talisay	urban	11		5,971	1.20	4,976	
11	139	urban	108	Cansojong	urban	11		4,607	1.51	3,051	
13	196	urban	109	Lagtang, Talisay	urban	***		4,688	2.56	1,831	
15	46	urban	110	Pooc, Talisay	urban	15		3,459	1.66	2,083	
15	81	urban	111	Dumlog, Talisay	urban	15		4,226	.60	7,043	
15	92	urban	112	Lawaan, Talisay	urban	15		6,404	5.20	1,231	
10	210	urban	113	Cantabaco, Toledo	rural	***		3,418	11.85	288	10/

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* Non-sample Barangay Number
1/ Part of Municipality Compostela (outside of sample area)
2/ Sitio of Poblacion Compostela (outside of sample area)
3/ Part of Barangay Mulao, Liloan
4/ Part of Barangay Gun-ob, Lapu Lapu
5/ Sitio of Poblacion Liloan
6/ Figures are for Total Poblacion Naga (five barangays)
7/ Barangay in Municipality San Fernando (outside of sample area)
8/ Barangay in Municipality San Fernando (outside of sample area)
9/ Part of Barangay Jaclupan, Talisay
10/ Part of City of Toledo (outside of sample area)
*** "New" Community Baseline Survey

Figures for Talisay and Naga barangays given by Municipal Tax Assessor's Office adjusted on the basis of WRC map.

APPENDIX J: HEALTH CENTERS SURVEYED DURING THE METRO CEBU CHILD HEALTH AND SURVIVAL PROJECT: 1983 - 1988

FAC. CODE	FACILITY TYPE & NAME	FACILITY LOCATION*	FAC. No	SURVEY* 1	2	NS	FP	3	F
	PUBLIC (GOVT.) HOSPITALS (4)								
0	Cebu City Medical Center	Cebu City	03	x	x	x	x	x	x
0	Southern Islands Hospital	Cebu City	02	x	x	x	x	x	x
0	Lapu Lapu City District Hospital	Lapu Lapu	27	x	x	x	x	x	x
0	Minglanilla Emergency Hospital	Minglanilla	60		x	x	x	x	x
	PRIVATE HOSPITALS (12)								
1	Cebu Community Hospital	Cebu City	07		x	x	x	x	x
1	Cebu Doctors Hospital	Cebu City	04		x	x	x	x	x
1	Chong Hua Hospital	Cebu City	05	x	x	x	x	x	x
1	Gullas Memorial Hospital	Cebu City	10	x	x	x	x	x	x
1	Kauswagan Community Hospital	Cebu City	12	x	x	x	x	x	x
1	Miller Sanitarium	Cebu City	13		x	x	x	x	x
1	Perpetual Soccour Hospital	Cebu City	09	x	x	x	x	x	x
1	Sacred Heart Hospital	Cebu City	08	x	x	x	x	x	x
1	St. Vincent Hospital	Cebu City	14		x	x	x	x	x
1	Velez Hospital	Cebu City	06	x	x	x	x	x	x
1	Cortes Hospital	Mandawe	20	x		x	x	x	x
1	Consolacion Community Hospital	Consolacion	32	x	x	x	x	x	x
	MILITARY HOSPITALS (2)								
2	Army Station Hospital	Cebu City	01	x	x	x	x	x	x
2	Mactan Airbase Military Hospital	Lapu Lapu	28	x	x	x	x	x	
	MATERNITY HOSPITALS/CLINICS (4)								
3	Cebu Maternity Hospital	Cebu City	15	x	x	x	x	x	x
3	Emmanuel Maternity Clinic	Cebu City	16		x	x	x	x	x
3	Mandawe Emergency Hospital	Mandawe	21		x	x	x	x	
3	Amores Maternity & Medical Clinic	Lapu Lapu	29	x	x	x	x	x	x
	PRIVATE CLINICS (8)								
4	Tojong Clinic	Cebu City	11	x	x	x	x	x	
4	Mumar Medical Clinic, Pan-an	Cebu City	79		x	x	x	x	x
4	San Nicolas Medical Clinic	Cebu City	73		x	x	x	x	x
4	San Miguel Corporation Clinic	Mandawe	23	x	x	x	x	x	x
4	Ermac Clinic	Mandawe	24	x	x	x	x	x	x
4	IMCH Clinic (govt. subsidized)	Lapu Lapu	31	x	x	x	x	x	
4	Orlanes Clinic	Naga	58		x	x	x	x	x
4	Dr. Bacho-Estrada Clinic	Talisay	33	x	x	x	x	x	x
	PUERICULTURE CENTERS (5)								
5	Mabolo Puericulture Center	Cebu City	17	x		x	x	x	x
5	San Nicolas Puericulture Center	Cebu City	18	x		x	x	x	
5	Mandawe Puericulture & FP Center	Mandawe	26	x	x	x	x	x	x
5	Opon Pueric. Ctr. & Maternity House	Lapu Lapu	30	x	x	x	x	x	x
5	Talisay Puericulture Center	Talisay	80		x	x	x	x	x
	(CITY) AREA HEALTH CENTERS (5)								
6	Basak (Pobl. Pardo) Fam. Serv. Stat.	Cebu City	36		x	x	x	x	x
6	Mabolo Health Center	Cebu City	69		x	x	x	x	x
6	Pari-an Health Center	Cebu City	35	x	x	x	x	x	x
6	San Nicolas Health Center	Cebu City	38	x	x	x	x	x	x
6	Mandawe City Health Clinic	Mandawe	22	x	x	x	x	x	x
	(CITY) HEALTH CENTERS (12)								
7	Labangon Health Center	Cebu City	34	x	x	x	x	x	x
7	Pardo Health Ctr. (Basak Fam. S. S.)	Cebu City	55		x	x	x	x	x
7	Quiot Health Center	Cebu City	37	x	x	x	x	x	x
7	Sambag I Health Center	Cebu City	61		x	x	x	x	x
7	Talamban Health Center	Cebu City	40	x	x	x	x	x	x
7	Tejero Health Center	Cebu City	41	x	x	x	x	x	x
7	Tisa Health Center	Cebu City	67		x	x	x	x	x
7	To-ong Health Center	Cebu City	39		x	x	x	x	
7	Bliss Site Labangon Fa, Serv. Stat.	Cebu City	65		x			x	x
7	Buhisan Health Center	Cebu City	57	x	x	x	x	x	x
7	Basak Health Center	Mandawe	42	x	x	x	x	x	x
7	Casuntingan Health Center	Mandawe	62		x	x	x	x	x
	RURAL HEALTH UNITS (7)								
8	Municpl. Health Center, Unit I	Naga	47	x	x	x	x	x	x
8	Municpl. Health Center, Unit II	Naga	46	x	x	x	x	x	x
8	Municpl. Health Center, Unit I	Talisay	63		x	x	x	x	x
8	Poblacion Health Center	Consolacion	49	x	x	x	x	x	x
8	Main Health Center, Liloan	Liloan	59		x	x	x	x	x
8	Main Rural Health Clinic	Cordova	53	x	x	x	x	x	x
8	Municpl. Health Center, Unit II	Talisay		(added facility!)					x

BARANGAY HEALTH STATIONS (21)

9	Bairan Health Center	Naga	82			x	x	x	x
9	Balirong Health Center	Naga	68		x			x	x
9	Inayagan Brgy. Health Center	Naga	76		x	x	x	x	x
9	Inoburan Health Center	Naga	66		x	x	x	x	x
9	Lutac Health Center	Naga	77		x	x	x	x	x
9	Pangdan Health Center	Naga	75		x	x	x	x	x
9	Mojon Health Center	Talisay	45	x	x	x	x	x	x
9	San Roque Health Center	Talisay	44	x		x	x	x	x
9	Tangke Health Center	Talisay	64		x	x	x	x	x
9	Cansaga Brgy. Health Center	Consolacion	72		x	x	x	x	x
9	Casili Health Center	Consolacion	50	x	x	x	x	x	x
9	Danglag Brgy. Health Center	Consolacion	71		x	x	x	x	x
9	Nangka Health Center	Consolacion	51	x	x	x	x	x	x
9	Panoypoy Brgy. Health Station	Consolacion	74		x	x	x		
9	Polog Health Center	Consolacion	52	x	x	x	x	x	
9	Pulpogan Health Center	Consolacion	54	x	x	x	x	x	x
9	San Vicente Health Center	Liloan	48	x	x	x	x	x	x
9	Marigondon Health Ctr. & FP Clinic	Lapu Lapu	81		x	x	x	x	x
9	Tingo Health Center	Lapu Lapu	83			x	x	x	x
9	Santa Rosa Health Center	Lapu Lapu	43	x	x	x	x	x	x
9	Dapitan Brgy. Health Station	Cordova	78		x	x	x	x	x

SPECIAL INSTITUTIONS (3)

10	Philipp. Women's Auxiliary	Cebu City	25	x		x	x		
10	Eversley Child Sanatorium	Mandawe	19	x		x	x	x	
10	Mactan Airport Clinic	Lapu Lapu	56	x	x	x	x		

* City or Municipality of location
1 - First Survey;
2 - Second Survey;
NS - Natal Services;
FP - Family Planning;
3 - Third Survey;
F - Final Survey.