PN-AAQ-387
ISN: 25300

PHILIPPINE NATIONAL SCHOOL SURVEY OF NUTRITIONAL STATUS: INTERIM REPORT OF METHODS AND RESULTS FROM REGION VI

Cornell Nutritional Surveillance Program
Division of Nutritional Sciences
Cornell University, Ithaca, New York 14853
in collaboration with
National Nutrition Council, Government of the Philippines

March 1984

This interim report results from the work of Myra Bondad, Luz Candelaria, Larry Clark, John Haaga, Jere Haas, Clarence Henderson, Fe Lisondra, Geoff Marks, John Mason, Karen Test.

The CNSP is supported by Cooperative Agreement # AID DSAN CA-0240 between the Office of Nutrition, Bureau for Science & Technology, USAID, and the Division of Nutritional Science, New York State Colleges of Human Ecology & Agriculture and Life Sciences, Cornell University, Ithaca, New York 14853.

A report of research of the Cornell University Agricultural Experiment Station.

TABLE OF CONTENTS

		Page
1.	INTRODUCTION	1
2.	METHODS	2
3.	AREA ANALYSIS	9
4.	PROVINCIAL DESCRIPTION	11
5.	ASSOCIATION OF NUTRITIONAL STATUS WITH SOME AGRO-ECONOMIC VARIABLES	13
6.	SERVICES	17

FIGURES AND TABLES

ANNEX i Additional Tables

ANNEX ii Additional Analytical Details

ANNEX iii Questionnaire and some details of sampling procedure

PHILIPPINE NATIONAL SCHOOL SURVEY OF NUTRITIONAL STATUS: INTERIM REPORT OF METHODS AND RESULTS FROM REGION VI

1. INTRODUCTION

The National Nutrition Council (NNC) of the Philippines established a nutritional surveillance system in 1980 to ensure that their nutrition-related policies were based upon reliable information concerning the nutrition and health conditions of the Filipino population. The charge of the nutritional surveillance system was to collect, analyse, interpret and disseminate information on nutritional status of the population at the national and sub-national level.

The national school nutrition survey conducted in 1982 was one of the initial efforts of the nutritional surveillance system. This survey was undertaken in order to, first, assess the use of weight and height measurements of first grade school children as related to some selected socio-economic indicators, for measuring the nutritional condition in various areas in the country, and second, develop data analysis procedures for generating countrywide mapping of nutritional status by municipalities and provinces. The school children population was selected as an advantageous population to study since the height and weight of each school child was already being routinely measured and recorded at the beginning and end of each school year as a means of screening individuals. Hence, the purpose of this survey was to determine if already available data could provide meaningful survey results.

In the Philippines, public elementary schools are established in almost every barangay. Entry to the primary level is supposed to be at age seven. Teachers are required to take the weight and height measurement of each student at the beginning and at the end of the school year. These measurements are recorded on the children's health records, which are maintained by the schools. The national school nutrition survey involved the abstraction of these raw data on weight, height, birthday, sex and occupation of the head of the family from the already existing school health records of Grade 1 school children. The data were recorded by the head teacher of the sampled school on a two-paged questionnaire (see Annex 3), and the questionnaires were

collected and mailed directly to the NNC by the district supervisor of each school district.

The school nutrition survey was intended to cover all the municipalities in the country, although only about 60% of the schools in the country responded by sending back the filled in questionnaires. Still, the municipalities that responded were distributed all over the country and provided enough data to allow analysis at the regional, provincial and municipal levels. In Region VI, 100 of the 127 municipalities reported adequate data.

In this paper, we present methods for analyzing data from the nutritional survey applied to the data for one region of the country, Region VI. This region was selected for illustration because it is one of the priority planning regions in the country, where child malnutrition is expected to be more severe than in some of the more favored regions. The present report covers both the methods used for initial analysis (Section 2) and some of the results (Sections 3 to 5). Note that these analyses could be replicated for the other regions and at the national level.

Three types of results for deciding policy and program issues are discussed. First is the identification of priority areas by province and municipality, with some characterizing of the municipalities most and least-affected by nutritional problems (Section 3 and 4). This analysis was performed using aggregated municipal level data (see Annex 2). This information is useful in targetting priorities, and suggests types of development programs that should be considered. This point is further considered in Section 5, where certain economic and environmental correlates of nutrition are examined, using child-level data (as opposed to municipal level for Section 3). Finally, in Section 6, the results of a preliminary analysis of the efficiency of services in reaching the malnourished are given. This could be extended to try to assess the effectiveness of services in improving nutrition, but the necessary analyses have not yet been done.

2. METHODS

During the analysis of the data, many questions arose concerning the data itself and the methods to be used in the analysis. The issues and the methods that were adopted are described below. The analytical techniques involved

editing of the data by range checks and checking for outliers by applying previous knowledge on nutrition in the country and its correlates (e.g. in choice of variables). A screening procedure to verify results based on environmental and economic variables was developed so that certain areas were identified with a high degree of certainty as being badly affected by malnutrition; but these are distinguished from other areas that are probably also affected. This means that attention can be paid, with a fair degree of confidence, to the "definitely affected" areas. This technique also allows classification, with some (defined) confidence, of areas not reporting nutrition data, but with other (i.e. census) data available.

Correlation and regression analyses have been used and details are reported in Annex 2. These methods provide, first, a powerful way to summarize significant associations, and point to cross-tabulations likely to illustrate differences. Second, these methods verify that effects reported from cross-tabulations are not spurious - all the effects discussed are valid when other variables are taken account. For example, associations of malnutrition with topography are not due simply to different crops growing in different areas, and vice versa. And third, they check for consistency between analyses at child level and municipal level. Tabulations are used as the primary means of presentation since they are easier to interpret and are robust (a few extreme values can produce significant but unimportant correlations). The school survey was intended to be a two stage cluster sample of first graders. The first stage of the sample was the selection of schools for the survey within each municipality. The second stage was the selection of a fixed number of students within each school. (See Annex 3 for the sampling instructions). It is important to note that the survey sample is not self weighting for the calculation of prevalence of malnutrition for municipalities, provinces, or regions.

Calculation of Age. The ages of the children were calculated from the raw data file which contains the dates of measurements and the dates of birth of the children. Ages were used to calculate the height-for-age (HA) values for the children.

A substantial portion of the children in the sample had their ages initially miscalculated through an error in the program used to subtract the child's date

of birth from the date of weight measurement. The effect of this error was that half of the ages were overestimated by a year; thus children were being compared to the wrong height and weight standards in the calculation of anthropometric indices and the prevalence of malnutrition among the older children was greatly overestimated. This miscalculation of age caused 10% of the sample, primarily children over 8½ years old, to be excluded from the data set based on the initial editing for age. The anthropometric indices were recalculated for the remaining children.

Restriction of Age Range for Analysis. The irregular pattern found for the mean HA and mean weight for height (WH) over the sample age range led to an initial decision to restrict the age range for analysis to 6-8.99 years. This age restriction also eliminated the problem associated with the systematic loss of older children because of the miscalculation of age, and avoided the difficulties of interpretation caused by the fact that some of the older children would already be starting the growth spurt associated with puberty. From preliminary analysis of the data it was mainly in the poorer, rural areas that the older first grade children over the age of seven were found. Therefore, the two considerations had to be counter balanced, so that the children whose heights and weights were compared were in the same approximate stage of growth, but not too many of the older children were excluded from the sample, since these would include many of the poorest. The initial age cutoff chosen was nine years, thus eliminating about 10% of the total. When ages were correctly recalculated, it turned out that the cutoff had actually eliminated all children over the age of eight years six months: the age range thus used is 6.0 to 8.5 years.

Use of HA as Index of Nutritional Status. The means and prevalence of WH and HA did not exhibit the same pattern with respect to municipalities, cropping, topography etc. In some instances WH was quite low while HA was high and vice versa. Since both are indices of nutritional status, the interpretation of these different patterns simultaneously was difficult. HA was chosen as the index of nutritional status for the analysis. WH is much more liable to change rapidly than is HA and reflect current conditions such as seasonal changes in

food availability and endemic disease. Since the overall purpose of the survey, and the reason for selecting grade one students, was to reflect the general health and nutritional status of the students during their pre-school years, HA was chosen as the index of nutritional status for the analysis. This ignores the transient changes that are detected by the WH measure but does measure the cumulative effect of such changes over the full childhood periods of the students.

Choice of Standards and Cut Off Level for Classifying Malnutrition. The Philippine and NCHs growth standards were used throughout the analysis. The results using Philippine growth standards are presented since the results are consistent for both standards. However, the prevalence estimates depended both on the standard used and the cut off value adopted (i.e. percent of standard below which a child is considered to be malnourished). The cut off value is somewhat arbitrary since the exact functional consequences at any given level are not clear. The cut-off point used in the analysis of the height deficit (stunting or chronic malnutrition) is 90% of the HA standard.

Dealing with Measurement Errors. There are several possible types of measurement errors in height and weight records of the children: transcription errors on dates and actual measures; conversion errors in transforming pounds and inches to kilograms and centimeters; random errors as in the provision of measurements; and, systematic error as in case of inaccurate scales.

The measurement errors were dealt with at two points during the analysis, first, during the creation of data files and second, during the analysis. During the creation of data files, records of children with unreasonably high and low values for anthropometric measurements were excluded from the list. The acceptable ranges were set at 84 to 145 centimeters for height and 10 to 40 kilograms for weight. In the analysis, mean values (as percentages of weight and height standards) were used, since the use of means disregards the bias introduced by random errors. However, the tabulations present the prevalences only for ease in understanding.

Dealing with Non responders. A constant problem in this type of survey is the self selection that takes place when some schools do not submit data. This may introduce serious biases into the sample represented in the data set since these schools are likely to be very different from the responding schools. One method of assessing this bias is to compare the general characteristics of schools that responded with those that did not. For this analysis we did not have the data available for comparisons at the school level. However, by aggregating data for the municipalities the comparisons could be done at that level. Data was missing from 23 municipalities. One province, Guimaras, provided only sparse data (three schools, one in each municipality), so there is not much information ever at the provincial level for Guimaras.

Level of Analysis. The level of analysis varied with the purpose of the particular piece of research. For overall ranking of areas, comparisons of nutritional status, and prevalence of malnutrition, analyses were carried out at the municipal level. Investigating the general association between variables in the data set was generally conducted at both the child level and the municipal level.

Ranking of Areas. The analysis used the mean HA of subgroups for comparisons of nutritional status. It was found that the predicted prevalences based on the mean HA and variance were consistently close to that which was observed. The actual ranking, however, is subject to bias depending upon the representativeness of the sample in each area. Therefore, the rankings have been validated by checking other municipal characteristics which are indicative of the welfare of the area, such as housing, population density, irrigation and cropping pattern.

Information from sources apart from this survey also gave the opportunity to predict the situation in municipalities that were not included in this data set, i.e. the municipalities that did not respond during the survey. The indirect method developed here for imputing the nutritional status of municipalities for which there were no direct measurements proved to be quite accurate when validated against municipalities with data.

Determining Associations. One of the important purposes of the survey was to determine the associations of nutritional status with certain key characteristics of communities/population groups which would be useful for targetting. The characteristics investigated included: topography, remoteness, major services, livelihood, occupation of household head, major crop in farming areas and access to health and related services. The analysis to determine associations was done through cross-tabulation of means and prevalences for each of the selected characteristics both at regional and provincial levels. Correlations and stepwise regression analyses were done to summarize significant associations, to verify that the effects reported from cross-tabulations were not spurious, and to check for consistency between analyses at child and municipal levels.

3. AREA ANALYSIS

The relative prevalence of stunting (defined as the proportion of children below 90% of the median HA in the Philippine standards) is shown for each province in Table 1. Over half the malnourished children of the region (54%) are in Negros Occidental province. Aklan and Antique Provinces should also be considered priority areas based on prevalences of malnutrition.

A municipal level file was created from the child file by calculating a mean value for all variables of interest for all municipalities. The variables are described in Annex 2. Guimaras Province was omitted because of sampling problems, and two municipalities were eliminated due to miscoding. The resultant municipal file included 100 observations.

A full list of municipalities, ranked by prevalence of stunting, is given in Annex 1, Table 1.1. The estimated total numbers affected by malnutrition is given in Annex 1, Table 1.2 - this gives prevalence x total population, i.e. total numbers of all ages associated with stunted school entrants; this number should be reduced by the proportion of school entrants in the population (e.g. 5%) to give total number of stunted school entrants. Prevalences range from around 50% of children stunted, down to about 5%. The indicators for the best and worst ten municipalities of the region are given in Table 2. This demonstrates that only parts of this region are seriously affected by malnutrition, and that there is potential for focusing services and other inputs on those most in need. For example, providing services to the ten worst-affected municipalities would

reach 2.5 times more of the malnourished children, 8% compared with 3%, if the least-affected ten municipalities were covered.

Certain other indicators are shown in Table 2, to summarize selected municipal characteristics that appear to be related to malnutrition. Three of the indicators are taken from independent sources (from MHS municipal profiles, which are derived from updates of the 1975 census). These are: housing - percentage houses built of bamboo (nipa and cogan); population density; and percentage of the rice growing area irrigated ("Palay"). These were found to discriminate quite effectively between municipalities with high and low prevalences of malnutrition. In almost all cases, the municipalities with the lowest average height-for-age also have poorer housing, less rice area irrigated, and lower population density, than those least-affected. The associations of such environmental and economic factors with nutrition are discussed further below. At this stage it is worth noting that the long-term nutritional indicators are substantially in line with other, more general indicators. Apart from anything else, this provides initial confidence that the school nutrition data are likely to be meaningful.

The prevalence of malnutrition by municipality is mapped in Figure 1, in four categories (i.e. 25% most-affected, next 25%, etc.). This map can be used to show priority municipalities for interventions and also to examine the degree of geographical clustering of badly off municipalities. There seems to be clustering in the northwest corner of the region - in the northern areas of Antique and Aklan. The central area of Panay Island - South Capiz and North Iloilo - is also probably more affected, as is the southern area of Negros Occidental. There is also an area of high malnutrition prevalence in the area around San Jose in Antique (e.g. municipalities of Belison and San Jose).

The questionnaire (see Annex 3) included information about school districts such as: topography, distance to municipal central town ("poblacion"), main crops grown, main occupation in the area, etc. This provides further information for classifying municipalities, and for examining associations at municipal level. For the latter, municipal variables are derived as the proportion of schools with a particular characteristic - e.g. proportion of schools in the municipalities and upland areas (called "PREVUP") etc. The relationships of the prevalence of stunting by municipality discussed in this

section comes from (a) correlations between stunting and these municipal variables, see Annex 1, Table 1.3; and (b) from regressions run at municipal level, see Table 3. These results (and analagous results from child-level analysis) pointed to the cross-tabulations discussed in Section 5. Some general observations based on these associations, and on the disaggregated municipal data shown in Table 2 and Annex 1, Table 1.1, are given in this section. More detailed discussion from a child-level file is given later.

The differentiation in nutrition between municipalities can be explained substantially in terms of agro-economic and environmental factors. As mentioned above, municipalities with moderately low population density, poor housing, and only low proportions of irrigated rice fall into the worst-affected category. The worst-affected municipalities tend to grow primarily corn (alone, or with rice), whereas none of the better-off municipalities grow corn alone, and only to a limited extent together with rice. An indicator reflecting the amount of total cropping that is irrigated rice (i.e. proportion of rice irrigated x proportion rice) discriminates well - where this indicator is high, malnutrition tends to be low, and vice versa. Finally, the worst-affected municipalities tend to be in the higher rainfall areas.

There are exceptions to these general rules, such as higher stunting with poor housing, moderately low population density, and corn rather than irrigated rice as the main crop. (These municipalities can be systematically identified as those whose nutrition is extensively different from that predicted from cropping and other indicators). For example, Belison, in Antique Province, has unexpectedly poor nutrition given housing conditions and irrigated rice (see Table 2), but is clearly different from the others in this category in having high population density. At the other extreme, Pandan, also in Antique, has unexpectedly low stunting given housing, and suggests that possible negative effects of coconut growing on nutrition should be examined.

Most municipalities fit this pattern, and a reasonable degree of accuracy in defining nutritionally deprived municipalities can be achieved by using only three independently-derived factors: housing, population density, and irrigated rice growing. The classification is shown in Table 4. This demonstrates that 14 of the 24 most-affected municipalities fall into the group defined by poor housing, low population, and low proportion of rice area irrigated; similarly, 59

of the 74 better-off municipalities have at least 1 indicator of better housing, or higher population, or higher proportion of rice area irrigated. If the three criteria were used to predict the worst 25% of municipalities, about one-half would be correct, compared to the expected 25% without applying these criteria.

The procedure of ranking municipalities and examining associations with other variables has two particular uses: (a) for targetting individual municipalities, and (b) for defining types of municipalities that need assistance.

(a) We can be fairly certain that the municipalities with estimated high prevalences, except those for which the independent variables of housing, population density and irrigated rice are out of line (these exceptions are marked with an asterisk in Table 2), are correctly classified as the 10% of worst-affected municipalities. A similar statement can be made for the 10% least-affected category. Those that are correctly classified with reasonable certainity as worst-affected should be targetted for more and better services and other inputs. If necessary, resources from those similarly categorized in the better-off 10% should be reallocated.

Municipalities which did not report for the school survey (23 out of a total of 130 in the region) can be classified by applying the housing, population density, and rice criteria as discussed above. This analysis has not yet been completed, and will be separately reported in due course.

(b) Defining type of municipalities with high prevalences both gives alternative criteria for targetting, and some indication of the sorts of programs that might be considered. For example, if municipalities with one predominant crop stand out with high prevalences, then programs aimed at this crop (to improve its productivity, profitability, or to encourage adoption of more profitable crops) might be considered.

Areas with lowland rice farming, particularly the irrigated areas, have consistently better nutrition. Upland areas with corn and rice have consistently worse nutrition. A shift of emphasis toward the corn farmer (or mixed corn/rice) - already under consideration with the corn production program (Maisagana) - is clearly needed. Whether the better policy is to improve yields and profitability of growing corn, or to encourage diversification, cannot be determined from this survey. It was noticeable however (from municipal results

not shown here, and results discussed in Section 5) that in upland areas of Negros Occidental, only the sugar-growers were doing well nutritionally; rice, corn, and rice/corn mixed farmers had substantially higher prevalences of stunting, possibly indicating that a shift to increased cash cropping would be at least as good as improving corn production.

In general, the greater the distance from the poblacion the higher the prevalence of stunting, particularly in upland areas. This cannot be explained by differences in cropping pattern and distance, since the trend is found within most cropping patterns. A likely explanation is that services of all types tend to decline with increasing remoteness. The need for outreach of services is emphasized by these results.

Areas where fishing is a major occupation tend to have the highest prevalences of stunting. This is consistent in each province, and is especially true in Aklan province. Again, there are various solutions to be considered. In the long term, one can either improve the economic returns of fishing - especially for the small, (largely subsistence) fisherman - and/or provide alternative and more profitable employment opportunities. The access to certain services of fishing communities should be improved and this group given priority for development of services.

These results indicate possible priorities for the type of intervention within targetted municipalities. Stunting in school entrants results primarily from long-term inadequacies in the child's food consumption in the pre-school years, usually with increased morbidity rates. Interventions can be considered both for the pre-school child, as well as for the family as a whole; family-level interventions and those for the individual children are discussed under services in Section 5. The households whose children enter school with height deficits are among the poorest households, so that interventions designed to improve the economic status of these households are the best long-term solution - in this case nutrition may be regarded as a convenient indicator of low food consumption due to poverty.

4. PROVINCIAL DESCRIPTION

Region VI is diverse in terms of topography, rainfall, cropping areas, and other factors. The nutritional situation varies across the region, as has been

shown by the municipal comparisons discussed above which are intended to help decide priorities on a regional basis. Considering the situation province-by-province may give alternative guidance in setting within province priorities, and also provides another way of looking at differences in the nutritional situation.

ILOILO

Iloilo is the second largest province in the region both in terms of land area and population. It has moderate rainfall (40-110 inches p.a.) and half of the sample population is located in the upland region. The main occupation in the province is rice farming or rice in combination with corn. In general, the areas with high prevalence of undernutrition are the rice/corn farmers. The specific nutritionally worst-off municipalities where there is a high proportion of the rice/corn farmers are: Maasin, Miagao, San Enrique, Carles and Bingawan. These municipalities are either coastal lands far from the provincial capital or inland with poor or no irrigation at all, and with poor housing. There is generally a high proportion of health workers within the province; about half of the worst-off municipalities seem to have reasonable access to health services and include the presence of the Barangay Nutrition Scholar.

CAPIZ

Capiz, which is located in the northern part of Iloilo, is the third largest province in the region. It has a moderately wet rainfall (40-110 inches) and the major livelihood is either farming or farming combined with fishing. The farmers grow rice, mostly in upland areas. The worst-off municipalities in the province are Naayon, Sapian, Pilar, Dao and Tapaz, which are mostly inland rice/corn farming areas with very poor irrigation and, also, poor housing. In these municipalities health services are available although there is little or no barangay nutrition scholar (BNS), home management technician (HMT) or barangay health worker (BHW) services at all.

ANTIQUE

The province of Antique which is located on the eastern side of Panay has higher rainfall, more than 110 inches per year. Since it is very mountainous inland, most of the municipalities (and presumably population) are along the

coast and the biggest proportion of population are engaged in farming/fishing. The main crop produced is rice and in some areas coconut. The worst off municipalities in the province are located mostly in the northernmost part and around San Jose. These are Belison, Libertad, Patnogon, San Jose, Bugasang and Hamtie. The municipalities are commonly characterized only by poor housing. They have varying characteristics in agro-economic and service indicators.

NEGROS OCCIDENTAL

Negros Occidental is the largest and most thickly populated province. Most of its municipalities are in the coastal side of the island. With its moderately high rainfall (more than 110 in. p.a. only in north and southwestern part), farming is the major livelihood but there is also a great number who are engaged in farm/fishing or farm/industy. The main crop grown is sugar. In general, upland rice/corn farming groups are in poor shape nutritionally and located mostly in the identified worst-off municipalities which are Candoni, Ilog, M. Padilla, Pulupandan and Sipalay. As in the other provinces, these municipalities have poor irrigation and poor housing, but there is no general pattern in terms of access to services.

AKLAN

Aklan is the smallest province in the island of Panay. It is predominantly lowland with the majority of the population engaged in farming. This province has the highest prevalence rate of stunting, especially among those located in the municipalities of Bowanga Nabas and Balete. Common to these municipalities are poor irrigation and housing but they differ in terms of population density as well as in access to services.

5. ASSOCIATION OF NUTRITIONAL STATUS WITH SOME AGRO-ECONOMIC VARIABLES

The data analysis discussed in this section was based on individual children's heights and ages, their parent's occupations, as well as characteristics of schools such as topography, etc. This is distinct from the area analysis in Section 3, which used municipal level variables (e.g. mean prevalences by

municipality). The height-for-age of the Grade 1 school entrants was used as the nutrition indicator both in terms of the means and the prevalences of stunting (i.e. height-for-age less than 90 percent of the Filipino reference mean) since this best indicates long-term undernutrition. The selected agro-economic variables which were hypothesized to be associated with undernutrition include (1) topography, (2) distance of the barangay to center of the municipality, (3) major livelihood in the barangay where the school is located, and (4) major crop in the barangay. The results of regression analyses on these variables are given in Annex 2, Table 2-1.

Topography. Overall, the majority of the children in region VI come from the lowland areas (Table 5) where the prevalence of stunting is consistently the lowest. Stunting is generally more extensive in upland areas, particularly in Antique and Aklan. In the provinces of Iloilo and Capiz, stunting appeared to be greatest in the coastal areas.

Distance. In general and in each of the six provinces within the region (Table 6), the largest group of children in the sample are within the 0-3 kilometer radius of the center of towns. In three of the five provinces, the prevalence of stunting is lower in the schools nearest to (0-3 km) the poblacion. However, beyond 4 km distance, the prevalence is not consistently related to distance from the poblacion. Antique province registered an extremely high prevalence in the small group of children living more than 10 kilometers away from the town, in which almost one-third of the children are stunted. In the province of Capiz and Aklan, however, the proportion of stunted children in areas more than 10 kilometers away is smaller when compared to the proportion within the 4-10 kilometer radius. The association of stunting with distance could be confounded by topography, for example where nearby areas may be lowland. The association of low-distance with better nutrition remains when topography is taken account of, as seen in Table 7, and in both the child-level regressons shown in Annex 2, Table 2.1, and in the municipal regressions discussed earlier (Table 3). Examining Table 8 (discussed below), it looks as if this may be due to the distant, coconut-growing (and missing crop) groups doing well.

The association of distance with stunting occurs only in specific crop areas (Table 8); in particular, in the rice growing areas (29% of the sample) and the sugar growing areas where there is a general pattern of increase in the prevalence of stunting as barangays in these areas become more distant from the town centers. This is evident in rice growing areas in the provinces of Iloilo, Capiz and Negros Occidental but only in the sugar growing areas in Negros Occidental. Most of the children in sugar growing areas, however, are in Negros Occidental. For other cropping areas, there is no similar pattern associating stunting in crop areas with distance.

Occupation. The relation between occupation and stunting is examined both by main occupation in the school area (Table 9), and by the occupation of individual children's parents (Table 10). In other words, from Table 9 for example, 803 sample children come from schools where the main occupation in the area is fishing; whereas from Table 10, there are 996 children whose parents occupation is fishing - but these would come from both fishing areas, and farming/fishing areas. The implications of Table 9 and 10 thus apply, respectively, to area characteristics and to household characteristics.

From Table 9, over two-thirds of the children sampled (68%) lived in areas where farming, either solely or in combination with fishing was the main occupation. Only a very small proportion of the area is involved in purely fishing or industry as major means of livelihood; it is, however, with these two occupations that the least as well as the highest prevalence of stunting is most associated. There is only a 10.6% prevalence of stunting in areas where industry is the major source of livelihood as against the 22.9% prevalence in fishing areas. Provinces where fishing areas are most affected by stunting are Aklan, Capiz, Negros Occidental. Among areas engaged in farming or farming combined with fishing/industry, Antique and Iloilo have the highest prevalence of stunting.

Table 10 gives the prevalence of stunting by parents occupation for the whole region and by province, and shows the proportion of the population engaged in different activities. The largest occupation group is laborers (45% of sample), which are usefully distinguished into rural (26%) and urban (19%); rural laborers are likely to be predominantly farm workers, urban more wage-

earners from non-farming activities. The children of urban laborers are similar in terms of stunting to the professional/business/government group, with consistently substantially less stunting than other groups: in some provinces there is about double the prevalence of stunting in the worst off groups (Aklan, and Antique) compared with the professional etc. group. The children of rural laborers, on the other hand, are similar if somewhat better off to those of farmers. Farmers are the second largest group with 37% of the sample. The children of farmers are consistently somewhat worse off than the average (see below for discussion by crop). Finally, fisherman are consistently the worst off occupation group. The range of stunting prevalence by occupation group relates to different socio-economic conditions and access to services, and illustrates clearly that chronic malnutrition is not pervasive - the children of the highest socio-economic group (professionals etc.) has much lower stunting - throughout the population; thus actions to improve socio-economic conditions for the affected groups are likely to be relevant for nutrition.

Crop. Prevalences of malnutrition by cropping area for the sample as a whole, and by province, are shown in Table 11A. Results for farmers only are given in Table 11B - essentially these show the same pattern as for the whole sample. Since associations with crop depends substantially on topographical area, the associations with crop by topographical area are shown in Table 12. Among the communities in the region, those children in areas with rice as the main crop are generally better off (Table 9), particularly in lowland and coastal areas (Table 12). The small sample of children in areas where either corn or coconuts are the principal crop grown have the highest prevalences of stunting. Sugar is primarily grown in Negros Occidental, and in fact is generally associated with better nutrition. In the upland areas of Negros Occidental all crops except sugar are associated with higher prevalences of malnutrition.

As discussed earlier, see Table 8, the effect of distance depends substantially on crop, and is primarily evident in the rice and sugar growing communities. This effect also overlaps with topography - i.e. lowland rice is better off - but both effects occur also independently of each other - see Annex 2, Table 2.1.

The distinction between crop - topography groups is highlighted in Table 13, where prevalences for selected groups are shown. Thus, for example, the lowland rice growers in Iloilo and Capiz have relatively low prevalences of around 15% stunting (and in groups representating substantial proportions of the sample) compared with prevalences of around 25-30% for the upland corn and corn/rice areas, particularly in Negros Occidental.

6. SERVICES

Six of the common government services offered throughout the country were assessed by province, and for the worst-off and best-off municipalities in the region. The percentage of the population receiving services by province is given in Table 14, and indicates that for the region as a whole the least outreach was for Home Management Technicians (HMT's) (29% of the sample was in villages with an assigned HMT). The most extensive service was Rural Health Midwives (RHM): 74% of the villages in the sample had an RHM. Barangay Nutrition Scholars (BNS) were assigned to 42% of the sample areas. The other services fell inside this range. There is however substantial variation in access to services between provinces, particularly for BNS and HMT. For example, in Capiz only about 15% of the sample had access to either BNS or HMT, compared with 40-60% in Aklan. Similarly, the proportion of the sample with access to a rural health doctor in Antique (24%) is substantially lower than the average for the region. A list of these indicators by municipality is given in Annex 1, Table 1.4.

A number of indicators are used to assess the association of outreach of services with malnutrition. Essentially, these are used to indicate how different services reach malnourished groups in the population, malnourished being defined as less than 90% of the height-for-age standard as in the earlier analysis. The indicators used are as follows:

- Proportion of sample with access to service - i.e. the indicators given in Table 14.
- Coverage. The percentage of those that are malnourished that receive the service.
- Focus/PP. This is the ratio of the prevalence in the group receiving the service (known elsewhere as "focus") to the population

prevalence (PP). The ratio F/PP provides an index of how much the service is concentrated on those subgroups that are malnourished. A value less than 1.0 indicates discrimination against the malnourished, greater than 1.0 a positive orientation towards the malnourished.

These indicators by province are summarized in Table 15. The two indicators easiest to use are those showing the ratio of the prevalence of malnutrition in the target group (focusing) to the overall population prevalence. This indicates whether the service is oriented toward the malnourished. From Table 15, it can be seen that for almost all services in all provinces there is an orientation neither towards nor away from the malnourished population. This conclusion is reached because the indicator F/PP is nearly 1 is most cases. In other words, there appears to be little or no degree of targetting, at least as can be detected at this level of aggregation. This applies specifically for nutrition in the case of the BNS, but insofar as the nutrition indicators reflect overall need, we can probably be reasonably sure that the other services also are not targetted on the basis of, for example, poverty. The exception is in Capiz, where some degree of effective targetting seems to be taking place; in Negros Occidental, on the other hand, there is a certain orientation towards the better-off areas. In almost all the provinces and services, there is a greater number of recipients than there are needy defined in the present nutritional terms. This indicates that in all cases there is potential for targetting, if suitable mechanisms can be found.

These associations can be examined by municipality, as is illustrated in Table 16 for the highest and lowest stunting prevalence municipality. The F/PP indicator is given for Barangay Nutrition Scholars (BNS), Home Management Technicians (HMT's) and Rural Health Midwifes (RHN's). In the highest-prevalence municipality, BNS' are oriented to some extent toward the malnourished; HMT's, on the other hand, are quite heavily oriented to the better-off in four municipalities, and are not assigned at all to three. This tendency of HMT's to reach the better-off can also be seen in lowest prevalence municipalities. In general, the RHM services seem to be fairly evenly spread. Two high-prevelance municipalities (again, by way of illustration) have low F/PP values for both HMT and RMW (i.e. M. Padilla and Nabas), which would

suggest that the distribution of services for these municipalities should be examined more closely.

Implications for Targetting. The way in which such estimates can be used to determine how targetting can be improved can be illustrated by considering the distribution of barangay nutrition scholars (BNS) in Iloilo province. The figures discussed are shown in Table 17. With the present targetting method in Iloilo, it is estimated that about 60,000 children who are stunted are in areas with a BNS, and 103,000 stunted children in areas without a BNS. The objective of improved targetting is to increase the coverage of the malnourished, which means including as many malnourished as possible in the "with BNS" cell, i.e. the top left hand cell. A secondary objective may be to decrease the number receiving BNS who are not stunted, i.e. those in the top right hand cell. Thus an improved targetting strategy, without changing the total number of beneficiaries and hence not greatly altering the resources required, is to shift numbers from the bottom left hand cell to the top left hand cell and top right hand cell to the bottom right hand cell, as indicated by the arrows in Table 17a. Clearly one common way of doing this is by individual screening, but this is not appropriate for a village-level intervention such as BNS. In Table 17b, a procedure that produced total coverage of the malnourished, but allowed non-malnourished to be covered would give the results shown. Here the proportion of malnourished in the recipient group need not be 100%, given the same number of recipients, in order to achieve the objective. Another example would be to target the most affected muncipalities, and again setting the total number of recipients at about the same level, as shown in Table 17c. Concentrating on these municipalities would increase the coverage of the malnourished from about 37% (with the present method of targetting) to about 52%, and would obviously increase the proportion of malnourished that are targetted, i.e. the focusing. Finally, the best targetting method would probably be directly to barangays, but as yet the necessary analysis has not been done to show how redistribution of existing BNS resources could improve the coverage - however it would certainly be better than that shown in Table 17c.

Such calculations can obviously be improved when the cost of reaching different areas is known. Previous results have clearly indicated that outreach to the more distant and remote barangays is of prime importance. The extent to which such outreach will improve coverage can be calculated by methods similar to those shown above.

LIST OF FIGURES OF TABLES

Figure 1	Prevalences of Stunting by Municipality
Table 1	Prevalences of Stunting by Province
Table 2	Ranking of Municipalities by Prevalence of Stunting
Table 3	Regression Results on Municipal File
Table 4	Classification of Municipalities Ranked by Stunting Prevalence, Compared with Predicted Classification Based on Indicators of Housing, Irrigated Rice Area, and Population Density
Table 5	Prevalences of Stunting by Province and Topography
Table 6	Prevalence of Stunting by Province and Distance of Village (In Which School Located) from Poblacion
Table 7	Prevalence of Stunting by Distance and Topography
Table 8	Prevalence of Stunting by Distance and Main Crop
Table 9	Prevalences of Stunting by Province and Main Occupation in Village from School-Level Data
Table 10	Prevalences of Stunting by Province and Child's Father's Occupation from Child-Level Data
Table 11A	Prevalences of Malnutrition by Province and Main Crop, All Occupations
Table 11B	Prevalences of Malnutrition by Province and Main Crop, Only for Children Whose Fathers are Farmers
Table 12	Prevalences of Stunting by Topography and Main Crop
Table 13	Examples of Extreme Prevelances, by Province, Crop and Topography
Table 14	Percentage of Populations by Province Receiving Services, Defined as Presence of Personnel in Village in Which School was Located
Table 15	Service Indicators by Province
Table 16	Indicator (Ratio of Prevalence in Recipient Group to Population Prevalence) or Orientation of Services to Malnourished, by Highest and Lowest Stunting Prevalence Municipalities
Table 17	Example for Iloilo of Options for Targetting Barangay Nutrition Scholars

ANNEX TABLES

A.1.1 Rankings of municipality by MNPHIL worst to best

A.1.2 Including rank by malpop and percentages

A.1.3 Correlation matrix

A.1.4 Coverage of services by municipality

A.2.1 Child level stepwise regression by province

FIGURE 1

Prevalences of stunting by Municipality

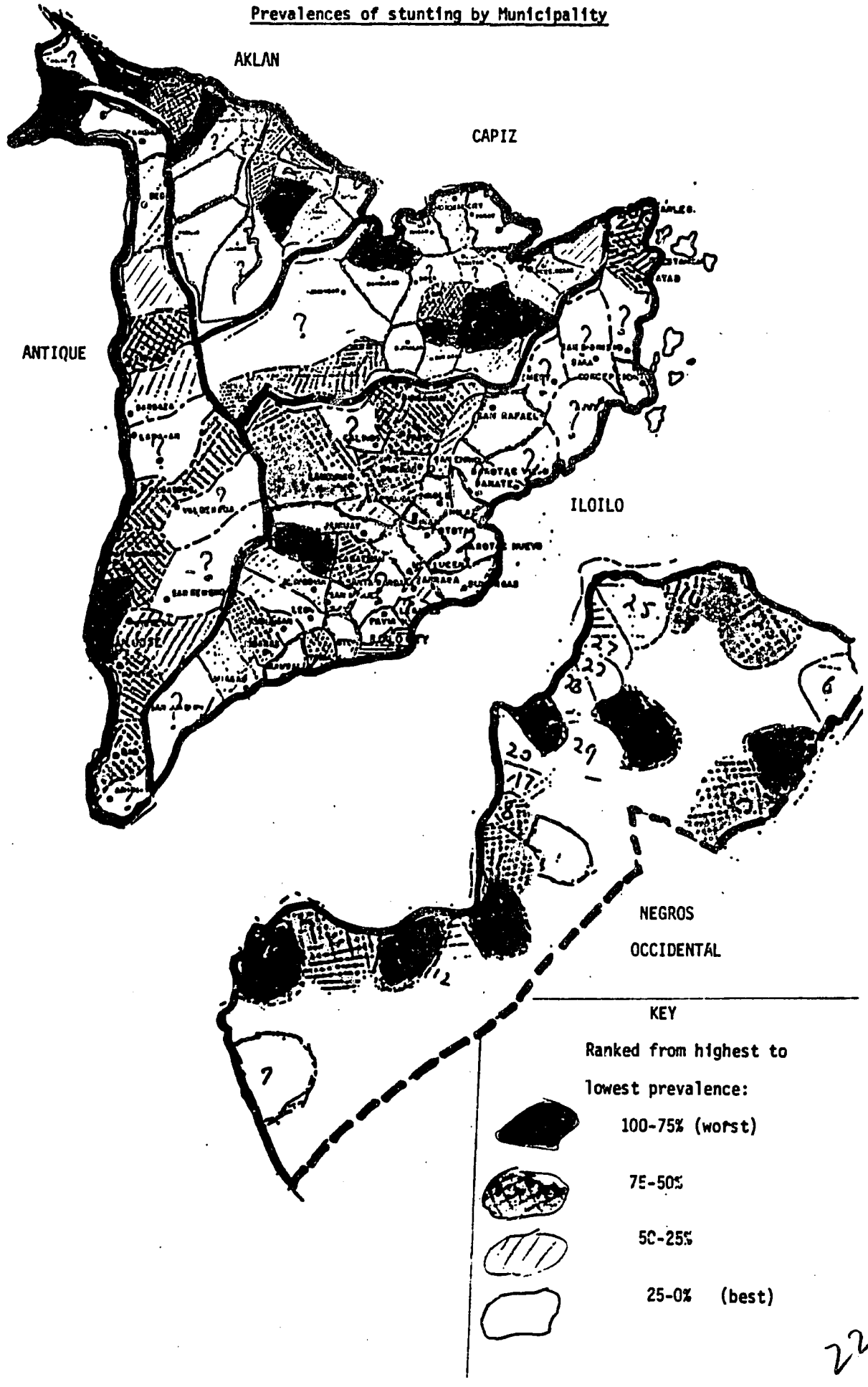

TABLE 1

PREVALENCES OF STUNTING BY PROVINCE

Province	Sample number	Prev<90%* HA (Phil. standard)	Prev<80% WH (NCHS standard)	Population	% Total Stunted
AKLAN	1055	21.7	10.8	346,000	8
NEGROS OCC.	1276	19.1	8.2	2,996,000	54
ANTIQUE	6155	18.9	12.3	401,000	8
CAPIZ	1618	15.3	7.2	704,000	11
ILOILO	4841	15.2	9.0	1,063,000	16
GUIMARAS	60	10.0	5.0	92,000	1
TOTAL REGION VI	15015	17.6	8.9	5,602,000	100

*Note: Provincial prevalence estimates are an unweighted average of all individuals in the survey.

TABLE 2

RANKING OF MUNICIPALITIES BY PREVALENCE OF STUNTING (<90% HEIGHT-FOR-AGE USING PHILIPPINE STANDARDS): THE HIGHEST AND LOWEST PREVALENCE MUNICIPALITIES ARE SHOWN.

MUNICPAL	PROVINCE	MNPHIL	PHILPREV	WHPREV	MNPOP	POPDEN	NIPA	PALAY	RAIN
* CUARTERO	CAPIZ	90.6280	0.482439	0.000000	18513	111.8	72.7	4.7	0
* BURUANGA	AKLAN	90.8396	0.549296	0.884507	10764	124.1	90.3	68.0	1
* PULUPANDAN	NEGROS OCC	91.5784	0.387097	0.016129	24824	115.6	84.7	33.0	1
CANDONI	NEGROS OCC	91.9120	0.320755	0.028302	10831	65.5	87.0	12.7	.
M PADILLA	NEGROS OCC	91.9493	0.338462	0.138462	22916	134.0	88.1	40.0	.
TABOSO	NEGROS OCC	92.5171	0.285128	0.051282	36415	365.6	81.0	14.3	.
SIPALAY	NEGROS OCC	92.5675	0.238532	0.073394	51254	141.6	86.5	15.6	1
ILOG	NEGROS OCC	92.7736	0.296703	0.032967	38956	76.0	87.6	28.6	0
MABAS	AKLAN	92.8113	0.254545	0.018182	16637	164.7	89.0	6.3	.
* BELISON	ANTIQUE	92.8297	0.268293	0.178862	8626	401.2	68.5	58.0	1
MAAYON	CAPIZ	92.8323	0.210000	0.140000	25715	176.7	95.0	33.4	0
SAPIAN	CAPIZ	92.8363	0.351331	0.067568	18753	200.5	90.4	33.3	0
MAASIN	ILOILO	92.9847	0.274194	0.040323	26962	151.9	61.4	2.4	0
PILAR	CAPIZ	92.9922	0.138199	0.030090	30134	271.0	92.1	0.0	0

MUNICPAL	PREVUP	PREVRICE	PREVCORN	PREVSGR	PREVRCCN	PREVRCCO	IRRIG1	IRRIG2
CUARTERO	0.158537	0.000000	0.000000	0.000000	1.00000	0.000000	0.0000	4.7000
BURUANGA	0.408451	0.000000	0.000000	0.000000	0.00000	0.507042	0.0000	34.4789
PULUPANDAN	0.000000	0.322581	0.080645	0.000000	0.17742	0.112903	10.6452	20.2258
CANDONI	0.915094	0.094340	0.000000	0.066038	0.83962	0.000000	1.1981	11.8613
M PADILLA	0.637769	0.000000	0.138462	0.369231	0.44615	0.000000	0.0000	17.8462
TABOSO	0.512821	0.000000	0.384615	0.000000	0.00000	0.000000	0.0000	0.0000
SIPALAY	0.422018	0.174312	0.059633	0.174312	0.57339	0.000000	2.7193	11.6642
ILOG	0.428571	0.527473	0.065934	0.340659	0.00000	0.065934	15.0837	16.9714
MABAS	0.000000	0.000000	0.000000	0.000000	0.00000	0.654545	0.0000	4.1236
BELISON	0.048780	0.617886	0.000000	0.000000	0.00000	0.382114	35.8374	58.0000
MAAYON	0.490000	0.050000	0.000000	0.000000	0.73000	0.220000	1.6700	33.4000
SAPIAN	0.229730	0.000000	0.000000	0.000000	0.16216	0.837838	0.0000	33.3000
MAASIN	0.314516	0.112903	0.040323	0.000000	0.84677	0.000000	0.2710	2.3032
PILAR	0.103109	0.000000	0.000000	0.000000	0.51351	0.486486	0.0000	0.0000

RANKINGS OF MUNICIPALITIES BY PNPHIL
13 BEST MUNICIPALITIES

MUNICPAL	PROVINCE	PNPHIL	PHILPREV	WHPREV	MNPOP	POPDEN	NIPA	PALAY	RAIN
MINA	ILOILO	95.5463	0.080545	0.233871	12293	288.9	68.0	67.9	0
NEW LUCENA	ILOILO	95.5579	0.025888	0.067416	13457	301.1	59.1	27.3	0
JANIUAY	ILOILO	95.5845	0.064935	0.064935	40123	189.3	52.6	7.0	0
E MAGALONA	NEGROS OCC	95.7332	0.179487	0.051282	44411	430.9	70.1	38.7	.
ISABELA	NEGROS OCC	95.8151	0.067797	0.135593	39704	205.6	79.2	54.4	0
SAN MIGUEL	ILOILO	96.3350	0.079545	0.055818	14241	437.9	60.3	42.1	0
SAN RAFAEL	ILOILO	96.1453	0.089109	0.029703	8742	31.2	82.4	63.7	0
PANAY	CAPIZ	96.1455	0.091837	0.112245	31550	255.6	91.3	46.7	0
VALLADOLID	NEGROS OCC	96.3006	0.031746	0.111111	21728	487.6	77.9	87.6	.
DUMANGAS	ILOILO	96.3095	0.081533	0.351320	41241	332.4	73.8	57.2	0
ANILAO	ILOILO	96.3169	0.066667	0.057143	15782	198.2	65.2	11.6	0
DION	ILOILO	96.8293	0.055118	0.188976	41044	458.1	75.8	90.8	0
* PANCAN	ANTIQUE	97.2877	0.160000	0.056000	20335	134.0	87.9	54.9	0

MUNICPAL	PREVUP	PREVRICE	PREVCORN	PREVSGR	PREVRCCN	PREVRCCO	IRRIG1	IRRIG2
MINA	0.322581	0.89516	0	0.000000	0.104839	0.000000	60.7815	67.9000
NEW LUCENA	0.000000	1.00000	0	0.000000	0.000000	0.000000	27.3000	27.3000
JANIUAY	0.000000	0.12987	0	0.000000	0.740260	0.000000	0.9391	6.0909
E MAGALONA	0.333333	0.16239	0	0.393162	0.000000	0.000000	6.2846	6.2846
ISABELA	0.316384	0.35028	0	0.096045	0.293040	0.175141	19.0554	39.9548
SAN MIGUEL	0.000000	1.00000	0	0.000000	0.000000	0.000000	42.1000	42.1000
SAN RAFAEL	0.217822	0.62376	0	0.316832	0.059406	0.000000	39.7337	43.5178
PANAY	0.000000	0.85714	0	0.000000	0.000000	0.000000	40.0286	40.0286
VALLADOLID	0.000000	1.00000	0	0.000000	0.000000	0.000000	87.6000	87.6000
DUMANGAS	0.091837	0.76531	0	0.000000	0.112245	0.000000	43.7755	53.1959
ANILAO	0.228571	0.06667	0	0.657143	0.219048	0.000000	8.7733	3.3143
DION	0.110236	0.48031	0	0.000000	0.102362	0.000000	43.6126	52.9071
PANCAN	0.064000	0.31200	0	0.000000	0.000000	0.624000	17.1268	51.3864

* means doubtful at this ranking

TABLE 3

REGRESSION RESULTS ON MUNICIPAL FILE

Dependent variable is mean height for age
(Philippine Standard)

Variable	B	P Value
Intercept	95.128	
PrevLow	1.063	.0257
PrevRice	0.749	.0465
PrevCorn	-3.904	.0535
PrevCoco	4.243	.0212
PrevCcn	-1.064	.0167
PrevNear	1.088	.0491
PrevFar	1.442	.0757
Nipa	-0.029	.0001

$R^2 = 0.3065$ n = 99

*Note: For definition of variables see Annex 2

TABLE 4

CLASSIFICATION OF MUNICIPALITIES RANKED BY STUNTING PREVALENCE, COMPARED WITH PREDICTED CLASSIFICATION BASED ON INDICATORS OF HOUSING, IRRIGATED RICE AREA, AND POPULATION DENSITY

		OBSERVED CLASSIFICATION		
		Worst 25%	Best 75%	
Predicted* Classification	Worst 25%	14	15	29
	Best 75%	10	59	69
		24	74	98

Sensitivity = 14/24 = 0.58

Specificity = 59/74 = 0.80

Positive Predictive Value = 0.48

* Predicted valued based on the following cutoffs (see Table 2 for definition of variables)

Palay < 50, ≥ 50

NIPA < 80, ≥ 80

POPDEN < 300, ≥ 300

The group predicted to be the bottom 25% would have PALAY < 50, and NIPA ≥ 80, and POPDEN < 300. All else would be in the top 75%.

Values in cells are numbers of municipalities falling into each of four categories, e.g. 14 municipalities were in the worst 25% by observed stunting prevalence and also classified in this group by the housing (NIPA), irrigated rice (PALAY) and population density (POPDEN) variables.

TABLE 5

PREVALENCES OF STUNTING BY PROVINCE AND TOPOGRAPHY

(SAMPLE SIZES IN PARENTHESES)

PROV TOPOG	OVERALL	ILOILO	CAPIZ	ANTIQUE	NEGROS OCC.	AKLAN
OVERALL	17.6 (15015)	15.2 (4841)	15.3 (1618)	18.9 (1276)	19.1 (6165)	21.7 (1055)
LOWLAND	14.7 (7431)	12.6 (2355)	13.0 (948)	17.6 (735)	15.3 (2792)	15.7 561)
COASTAL	19.4 (2305)	20.2 (752)	21.2 (118)	18.0 (239)	19.1 (1055)	17.7 (141)
UPLAND	20.7 (3639)	17.3 (1272)	16.6 (331)	28.2 (181)	22.6 (1604)	26.4 (231)
MISSING TOPOG.	21.0 (1640)	14.3 (462)	20.4 (221)	14.9 (121)	22.5 (714)	45.1 (122)

*Note: In this and subsequent tabulations by province, the province of Guimaras has been omitted, having a sample size of 60; Guimaras is however included in the "overall" column; hence sample sizes total vertically, but horizontally 60 are excluded.

TABLE 6

PREVALENCES OF STUNTING BY PROVINCE AND DISTANCE OF VILLAGE (IN WHICH SCHOOL LOCATED) FROM POBLACION (SAMPLE SIZES IN PARENTHESES)

PROV DISTANCE	OVERALL	ILOILO	CAPIZ	ANTIQUE	NEGROS OCC.	AKLAN
OVERALL	17.6 (15015)	15.2 (4841)	15.3 (1618)	18.9 (1276)	19.1 (6165)	21.7 (1055)
0-3 KM	15.6 (7293)	14.3 (2572)	13.2 (785)	18.3 (650)	16.0 (2661)	20.5 (585)
4-10 KM	19.4 (4391)	15.9 (1599)	17.9 (446)	16.8 (374)	23.3 (1625)	21.7 (327)
10 KM	19.9 (2302)	20.4 (363)	15.8 (291)	32.6 (92)	20.0 (1486)	12.9 (70)
MISSING DIST.	18.9 (1029)	13.4 (307)	18.8 (96)	18.1 (160)	19.6 (393)	39.7 (73)

TABLE 7

PREVALENCE OF STUNTING BY DISTANCE AND TOPOGRAPHY
(SAMPLE SIZES IN PARENTHESES)

	OVERALL	0-3 KM POB	0-3 KM NON-POB	4-10 KM	10 KM	MISSING DIST.
OVERALL	17.8 (15076)	14.4 (4303)	17.4 (2989)	19.7 (4441)	19.8 (2313)	18.9 (1029)
LOWLAND	14.8 (7461)	13.5 (2840)	14.3 (1689)	16.3 (2200)	15.9 (370)	18.0 (362)
UPLAND	20.7 (3639)	15.8 (373)	18.0 (434)	23.4 (1253)	21.0 (1440)	15.1 (139)
COASTAL	19.8 (2336)	17.5 (793)	20.5 (726)	23.0 (512)	19.1 (267)	13.2 (38)
MISSING TOPOG.	21.0 (1640)	12.8 (298)	37.9 (140)	22.1 (476)	19.5 (236)	21.0 (490)

TABLE 8

PREVALENCES OF STUNTING BY DISTANCE AND MAIN CROP GROWN IN VILLAGE (SAMPLE SIZES IN PARENTHESES)

	OVERALL	0-3 KM	4-10 KM	10 KM	MISSING DIST.
OVERALL	17.6 (15015)	15.6 (7293)	19.4 (4391)	19.9 (2302)	18.9 (1029)
RICE	14.4 (4358)	12.6 (2335)	14.5 (1395)	23.9 (398)	15.2 (230)
CORN	26.4 (318)	26.9 (78)	25.0 (56)	26.6 (184)	--- ---
COCONUT	23.3 (317)	19.2 (120)	32.3 (130)	16.4 (55)	0.0 (12)
SUGAR	17.1 (2644)	14.7 (1208)	20.2 (784)	19.5 (527)	9.6 (125)
RICE/ CORN	19.7 (2772)	18.9 (1047)	21.1 (777)	19.5 (747)	18.9 (201)
RICE/ COCONUT	18.4 (1599)	17.8 (799)	19.9 (612)	11.0 (118)	24.3 (70)
OTHERS	19.5 (221)	19.2 (125)	17.4 (23)	22.1 (68)	0.0 (5)
MISSING CROP	18.7 (2786)	16.3 (1581)	23.5 (614)	13.2 (205)	23.8 (386)

TABLE 9

PREVALENCES OF STUNTING BY PROVINCE AND MAIN OCCUPATION IN VILLAGE FROM SCHOOL-LEVEL DATA (SAMPLE SIZES IN PARENTHESES)

PROV LIVELIHOOD	OVERALL	ILOILO	CAPIZ	AKLAN	ANTIQUE	NEGROS OCC
OVERALL	17.6 (15015)	15.2 (4841)	15.3 (1618)	21.7 (1055)	18.9 (1276)	19.1 (6165)
FARMING	17.5 (6653)	14.2 (2768)	15.6 (768)	18.5 (455)	20.2 (494)	21.5 (2168)
FISHING	22.9 (803)	16.8 (173)	23.8 (101)	37.7 (114)	11.1 (27)	21.9 (388)
FARMING/ FISHING	18.4 (3493)	19.7 (873)	16.4 (434)	18.3 (333)	18.8 (544)	18.0 (1269)
INDUSTRY	10.6 (329)	11.1 (134)	4.5 (22)	0.0 (37)	--- ---	11.1 (170)
FARMING/ INDUSTRY	15.2 (1757)	13.9 (288)	9.6 (114)	18.9 (74)	15.7 (185)	16.1 (1076)
OTHERS	16.9 (828)	17.0 (218)	13.5 (74)	7.1 (28)	12.5 (8)	18.0 (500)
MISSING OCC.	18.3 (1152)	13.1 (387)	10.5 (105)	52.0 (48)	33.3 (18)	19.9 (594)

TABLE 10

PREVALENCES OF STUNTING BY PROVINCE AND CHILD'S FATHER'S OCCUPATION FROM CHILD-LEVEL DATA (SAMPLE SIZES IN PARENTHESES)

	OVERALL	ILOILO	CAPIZ	AKLAN	ANTIQUE	NEGROS OCC.
OVERALL	17.6 (15015)	15.2 (4841)	15.3 (1618)	21.7 (1055)	18.9 (1276)	19.1 (6165)
PROF/BUS/ GOVT.	13.9 (1672)	13.8 (566)	14.3 (140)	6.7 (104)	17.6 (119)	14.6 (728)
FARMERS	19.1 (5488)	15.8 (2215)	17.2 (664)	25.3 (495)	21.0 (693)	22.2 (1412)
FISHERMAN	21.3 (996)	17.7 (226)	17.6 (165)	25.2 (103)	27.5 (102)	22.2 (398)
LABORERS	16.8 (6781)	14.7 (1820)	13.2 (642)	20.2 (341)	12.9 (341)	18.6 (3603)
RETIRED	0.0 (8)	0.0 (1)	--- ---	0.0 (2)	0.0 (3)	0.0 (2)
UNEMPLOYED	(70)	10.0 (13)	0.0 (7)	0.0 (10)	20.0 (18)	11.1 (22)
URBAN LABORERS	15.7 (2887)	14.0 (535)	11.6 (216)	12.1 (107)	12.1 (173)	17.2 (1834)
RURAL LABORERS	17.7 (3874)	14.9 (1285)	13.8 (413)	23.9 (234)	13.7 (168)	20.0 (1762)

TABLE 11A

PREVALENCES OF MALNUTRITION BY PROVINCE AND MAIN CROP, ALL OCCUPATIONS (SAMPLE SIZES IN PARENTHESES)

PROV. LIVELIHOOD	OVERALL	ILOILO	CAPIZ	AKLAN	ANTIQUE	NEGROS. OCC.	
OVERALL	17.6 (15015)	15.2 (4841)	15.3 (1618)	21.7 (1055)	18.9 (1276)	19.1 (6165)	10.0
RICE	14.4 (4358)	12.9 (2026)	9.4 (660)	13.1 (220)	19.8 (736)	18.0 (716)	--- ---
CORN	26.4 (318)	11.1 (18)	--- ---	0.0 (5)	--- ---	27.8 (295)	--- ---
COCONUT	23.3 (317)	17.2 (87)	12.0 (25)	24.2 (62)	12.5 (8)	29.6 (135)	--- ---
SUGAR	17.1 (2644)	9.4 (171)	6.7 (89)	--- ---	--- ---	18.0 (2384)	---
RICE/ CORN	19.7 (2722)	19.1 (1370)	21.1 (445)	13.2 (53)	19.8 (207)	20.5 (697)	--- ---
RICE/ COCONUT	18.4 (1599)	17.9 (212)	22.3 (197)	20.8 (602)	16.7 (294)	13.7 (234)	--- ---
OTHERS	19.5 (221)	31.3 (32)	20.0 (15)	20.0 (5)	--- ---	17.2 (169)	10.0 (60)
MISSING	18.7 (2786)	14.4 (926)	19.3 (187)	48.1 (108)	12.9 (31)	19.3 (1535)	---

TABLE 11B

PREVALENCES OF MALNUTRITION BY PROVINCE AND MAIN CROP,
ONLY FOR CHILDREN WHOSE FATHERS ARE FARMERS (SAMPLE SIZES IN PARENTHESES)

	OVERALL	ILOILO	CAPIZ	AKLAN	ANTIQUE	NEGROS OCC.
CROP						
RICE	15.9% (2045)	13.7% (1007)	8.5% (269)	18.3% (109)	21.5% (405)	22.7% (255)
CORN	26.0% (204)	(0) (14)	(0) (-)	(0) (3)	-- --	28.3% (187)
COCONUT	30.2% (43)	(50.0%) (2)	(0) (6)	(57.1%) (7)	(50%) (2)	26.9% (26)
SUGAR	15.0% (440)	8.4% (119)	(0) (12)	-- --	-- --	18.1% (309)
RICE/ CORN	20.9% (1729)	18.8% (911)	21.8% (261)	10.0% (30)	24.6% (130)	24.7% (397)
RICE/ COCONUT	21.4% (678)	17.0% (53)	31.1% (103)	23.4% (308)	17.1% (146)	10.3% (68)
OTHERS	20.2% (89)	(100%) (1)	--	(0) (2)	-- --	19.7% (86)
TOTALS	18.8% (5228)	15.7% (2107)	17.2% (651)	21.6% (459)	21.2% (683)	22.3% (1328)

TABLE 12

PREVALENCES OF STUNTING BY TOPOGRAPHY AND MAIN CROP

(SAMPLES SIZES IN PARENTHESES)

	OVERALL	LOWLAND	COASTAL	UPLAND	MISSING TOPOG.
OVERALL	17.6 (15015)	14.7 (7431)	19.4 (2305)	20.7 (3639)	21.0 (1640)
RICE	14.4 (4358)	13.4 (2808)	12.5 (271)	17.7 (979)	14.3 (300)
CORN	26.4 (318)	17.5 (63)	31.8 (22)	28.0 (211)	31.8 (22)
COCONUT	23.3 (317)	22.5 (71)	11.2 (134)	53.6 (56)	23.2 (56)
SUGAR	17.1 (2644)	16.4 (1318)	16.1 (397)	17.0 (672)	22.2 (257)
RICE/ CORN	19.7 (2772)	15.5 (1029)	22.3 (283)	23.0 (1232)	17.5 (228)
RICE/ COCONUT	18.4 (1599)	14.5 (835)	23.7 (299)	22.0 (254)	21.8 (211)
OTHERS	19.5 (221)	20.8 (53)	26.1 (65)	20.0 (55)	8.3 (48)
MISSING CROP	18.7 (2786)	14.7 (1254)	21.1 (834)	14.4 180	26.1 (518)

TABLE 13

EXAMPLES OF EXTREME PREVELANCES, BY PROVINCE, CROP AND TOPOGRAPHY (SAMPLE SIZES IN PARENTHESES)

	OVERALL	ILOILO	CAPIZ	AKLAN	ANTIQUE	NEGROS OCC.
LOWLAND RICE	13.4 (2808)	12.0 (554)	9.5 (148)	12.9 (163)	21.4 (439)	13.9 (476)
UPLAND CORN	28.0 (211)	11.1 (18)	---	---	--	29.5 (193)
UPLAND CORN/RICE	23.0 (1232)	19.6 (626)	23.9 (134)	29.4 (17)	38.2 (76)	25.0 (379)
SUGAR	17.1 (2644)	9.4 (171)	6.7 (89)	---	---	18.0 (2384)

TABLE 14

PERCENTAGE OF POPULATIONS BY PROVINCE RECEIVING SERVICES, DEFINED AS PRESENCE OF PERSONNEL IN VILLAGE IN WHICH SCHOOL WAS LOCATED

		SERVICE[1]					
PROVINCE	N	BNS	HMT	RHM	RHDR	RHN	BHW
OVERALL	15015	42.2	28.7	74.0	45.5	52.3	36.9
ILOILO	4841	40.4	33.3	75.4	51.8	53.8	30.9
CAPIZ	1618	12.8	15.8	72.0	42.1	52.1	27.8
AKLAN	1055	62.9	44.0	87.8	67.3	67.5	34.0
ANTIQUE	1276	32.3	34.7	79.3	23.5	50.3	33.3
NEGROS OCC.	6165	48.9	25.0	69.8	42.7	49.0	44.1

[1] Abbreviations for services:

BNS - barangay nutrition scholar

HMT - home management technician

RHM - rural health midwife

RHDR - rural health doctor

RHN - rural health nurse

BHW - barangay health worker

TABLE 15
SERVICE INDICATORS BY PROVINCE

SERVICE[1]	BNS	HMT	RHM	RHDR	RHN	BHW
ILOILO (n = 3744)						
Coverage[2]	36.7	32.3	74.6	51.1	52.8	31.0
F/PP[3]	0.90	0.97	0.99	0.99	0.98	1.0
CAPIZ (n = 1496)						
Coverage	12.2	22.1	78.8	46.8	58.1	48.6
F/PP	0.95	1.4	1.08	1.11	1.11	1.75
ANTIQUE (n = 1195)						
Coverage	29.7	32.8	78.9	22.8	45.7	36.2
F/PP	0.93	0.96	0.99	0.92	0.90	1.06
AKLAN (n = 998)						
Coverage	66.7	32.4	83.8	67.6	69.8	33.3
F/PP	1.06	0.74	0.96	1.00	1.04	0.98
NEGROS OCC. (n = 6005)						
Coverage	48.0	22.9	66.3	36.4	45.0	39.3
F/PP	0.98	0.92	0.95	0.85	0.92	0.89
TOTAL						
Coverage	38.1	26.5	72.3	42.9	49.0	36.6
F/PP	92.6	94.9	97.2	93.2	92.0	98.3

[1] See abbreviations given in Table 14

[2] Percentage of malnourished living in village with service personnel

[3] Ratio of prevalence of stunting in recipient group to population prevalence (see text)

TABLE 16

INDICATOR (RATIO OF PREVALENCE IN RECIPIENT GROUP TO POPULATION PREVALENCE) OF ORIENTATION OF SERVICES TO MALNOURISHED, BY HIGHEST AND LOWEST STUNTING PREVALENCE MUNICIPALITIES

		F/PP		
PROV.	MUNICIPALITY	BARANGAY NUTRITION SCHOLAR	HOME MANAGEMENT TECHNICIAN	RURAL HEALTH MIDWIFE
WORST OFF				
Aklan	Buruanga	1.05	0.57	1.05
Negros. Occ.	Pulupandan	1.00	0.78	1.00
Negros Occ.	Candoni	1.11	NA	1.15
Negros Occ.	M. Padilla	NA	0.36	0.28
Negros Occ.	Sipalay	0.95	1.05	0.75
Negros Occ.	Ilog	1.68	NA	1.12
Negros Occ.	Taboso	1.22	NA	0.73
Antique	Belison	1.00	1.00	1.00
Aklan	Nabas	1.02	0.56	0.74
BEST OFF				
Negros Occ.	E. Magalona	0.62	0.60	1.39
Negros Occ.	Isabela	1.18	1.47	0.96
Iloilo	San Miguel	NA	NA	1.00
Iloilo	San Rafael	NA	NA	0.89
Negros Occ.	Valladolid	0.03	0.50	1.00
Iloilo	Dumangas	1.00	0.68	1.07
Capiz	Panay	NA	0.73	1.05
Iloilo	Anilao	0.90	NA	1.18
Iloilo	Oton	NA	0.47	0.51
Antique	Pandan	0.95	1.76	0.95
OVERALL:		0.93	0.95	0.97

TABLE 17
EXAMPLE FOR ILOILO OF OPTIONS FOR TARGETTING BARANGAY NUTRITION SCHOLARS

A. Present Targetting

	Estimated Numbers (x 10^3)			
	90% HA	90% HA		PP[1] = 163/1062 = 15.3
With BNS	60	369	429	Focus 60/429 = 14.0%
Without BNS	103	530	633	F/PP = 0.91
	163	899	1062	Cov = 60/163 = 36.8%

B. **Retargetting,** with same no. of recipients, including all needy

	Estimated Numbers (x 10^3)			
	90% HA	90% HA		
With BNS	163	266	429	Focus = 38.0%
Without BNS	0	633	633	F/PP = 2.48
	163	899	1062	Cov = 100%

C. **Selecting** 16 most-affected municipalities same number of recipients

	Estimated Numbers (x 10^3)			
	90% HA	90% HA		
With BNS	85	341	426	Focus = 20.0%
Without BNS	78	558	636	F/PP = 1.31
	163	899	1062	Cov = 52.1%

[1] See Section 6 of text for definitions of indicators.

ANNEX 1

TABLE 1.1

RANKING OF MUNICIPALITIES BY MEAN HEIGHT-FOR-AGE BASED ON PHILIPPINE STANDARDS. FOR DEFINITION OF VARIABLES SEE ANNEX 2.

* MEANS DOUBTFUL AT THIS RANKING

RANKINGS OF MUNICIPALITIES BY MNPHIL
WORST TO BEST

MUNICPAL	PROVINCE	MNPHIL	PHILPREV	WHPREV	MNPOP	POPDEN	NIPA	PALAY	RAIN
CUARTERO *	CAPIZ	90.6280	0.402439	0.000000	18513	111.8	72.7	4.7	0
BURUANGA *	AKLAN	90.8396	0.549296	0.084507	10764	124.1	90.3	68.0	1
PULUPANDAN	NEGROS OCC	91.5784	0.387097	0.016129	24824	115.6	84.7	33.0	1
CANDONI	NEGROS OCC	91.9120	0.320755	0.028302	10831	65.5	87.0	12.7	.
M PADILLA	NEGROS OCC	91.9493	0.338462	0.138462	22916	134.0	88.1	40.0	.
TABOSO *	NEGROS OCC	92.5171	0.205128	0.051282	36415	365.6	81.0	14.3	.
SIPALAY	NEGROS OCC	92.5675	0.238532	0.073394	51264	141.6	86.5	15.6	1
ILOG	NEGROS OCC	92.7736	0.296703	0.032967	38956	76.0	87.6	28.6	0
NABAS	AKLAN	92.8113	0.254545	0.018182	16607	164.7	89.0	6.3	.
BELISON *	ANTIQUE	92.8297	0.268293	0.178862	8626	401.2	68.5	58.0	1
MAAYON	CAPIZ	92.8323	0.210000	0.140000	25715	176.7	95.0	33.4	0
SAPIAN	CAPIZ	92.8363	0.351351	0.067568	18753	200.5	90.4	33.3	0
MAASIN *	ILOILO	92.9847	0.274194	0.340323	26962	151.9	61.4	2.4	0
PILAR	CAPIZ	92.9922	0.198198	0.090090	30104	271.0	92.1	0.0	0
MIHAMAYLAN	NEGROS OCC	93.0345	0.258027	0.157303	70467	192.2	90.1	26.3	0
CALATRAVA	NEGROS OCC	93.0517	0.230088	0.053097	58163	124.1	82.5	15.6	0
MIAGIAO E	ILOILO	93.0944	0.380282	0.093897	45816	.	.	.	0
MURCIA *	NEGROS OCC	93.1150	0.301587	0.074074	45162	113.0	83.2	68.7	0
BALUD	AKLAN	93.1176	0.207547	0.056604	17300	101.0	97.0	37.8	0
LIBERTAD	ANTIQUE	93.1781	0.203704	0.166667	9870	112.3	89.8	30.4	1
CADIZ CITY *	NEGROS OCC	93.2295	0.204331	0.051075	129632	523.4	80.5	52.3	1
TANGALAN *	AKLAN	93.2390	0.263153	0.289474	11174	124.1	90.0	99.0	0
SAN ENRIQUE	ILOILO	93.2844	0.187500	0.125000	19663	257.3	81.8	12.8	0
PATNONGON *	ANTIQUE	93.3155	0.224719	0.123596	24262	139.2	75.6	3.0	1
SAN JOSE *	ANTIQUE	93.3177	0.200000	0.066667	30266	575.4	76.0	69.9	1
CAUYAN	NEGROS OCC	93.3358	0.186645	0.032258	70017	153.5	93.3	21.9	1
CARLES	ILOILO	93.3997	0.182927	0.085365	32184	269.0	81.8	0.0	0
BUGASANG	ANTIQUE	93.4272	0.209302	0.023255	21619	140.1	86.4	45.1	1
HAMTIC	ANTIQUE	93.4703	0.183333	0.166667	28526	192.9	86.3	29.2	1
DAO	CAPIZ	93.5068	0.081818	0.018182	23921	555.5	87.2	12.0	0
BINGAWAN	ILOILO	93.5455	0.218045	0.030075	9229	194.2	82.8	0.0	0
BALASAN	ILOILO	93.5699	0.250000	0.044643	17979	307.0	86.4	15.1	0
IBAJAY	AKLAN	93.6411	0.164835	0.120879	31214	178.4	85.3	73.9	0
LA CASTELLANA	NEGROS OCC	93.6549	0.223684	0.052632	44684	999.9	71.9	51.1	.
TIBIAO	ANTIQUE	93.7100	0.216867	0.048193	17200	141.3	93.3	74.1	1
BANGA	AKLAN	93.7416	0.177419	0.016129	25034	287.0	91.4	55.3	0
SAN CARLOS	NEGROS OCC	93.7904	0.229947	0.046346	91627	202.9	80.9	69.2	0
TAPAZ	CAPIZ	93.7910	0.081395	0.023256	35129	62.2	85.5	1.3	0
HINIGARAN	NEGROS OCC	93.7921	0.210843	0.050241	54717	348.3	80.0	21.3	0
TIGBAUAN	ILOILO	93.7972	0.128713	0.059406	34548	544.0	63.6	4.2	0
BATAD	ILOILO	93.8217	0.168000	0.120000	11790	206.0	88.9	10.5	0
MANAPLA	NEGROS OCC	93.8311	0.135593	0.203390	40524	385.5	75.4	42.0	1
PASSI	ILOILO	93.8391	0.175610	0.048780	47988	198.6	63.3	7.8	0
QUINAS	ILOILO	93.9554	0.154472	0.081301	23962	278.3	45.7	0.1	0
BINALBAGAN	NEGROS OCC	94.0084	0.233161	0.176165	49428	265.2	79.2	59.0	0
DAO	ANTIQUE	94.0630	0.105769	0.182692	22511	206.9	67.2	55.6	1
IGBARAS	ILOILO	94.0828	0.165517	0.041379	22173	146.9	30.6	11.1	0
CABATUAN	ILOILO	94.1311	0.139344	0.106557	34468	289.2	69.2	0.0	0
PONTEVEDRA	NEGROS OCC	94.1426	0.213018	0.047337	33258	293.4	78.1	5.0	0
SERASTE	ANTIQUE	94.1661	0.200000	0.040000	10369	56.9	86.9	67.9	1
BARBAZA	ANTIQUE	94.2795	0.184211	0.175439	14703	121.4	90.6	73.[illegible]	1
ALTAVAS	AKLAN	94.3675	0.168317	0.059406	17443	168.5	94.3	9.8	0
BADIANGAN	ILOILO	94.3985	0.170455	0.125000	19239	200.8	38.9	0.9	0
TUBUNGAN	ILOILO	94.4071	0.174419	0.034884	14510	194.4	19.4	8.8	0
SILAY	NEGROS OCC	94.4251	0.160410	0.097270	111131	631.9	61.4	25.0	1

(cont next page)

TABLE 1.1 CONT

RANKINGS OF MUNICIPALITIES BY MNPHIL
WORST TO BEST

MUNICPAL	PROVINCE	MNPHIL	PHILPREV	WHPREV	MNPOP	POPDEN	NIPA	PALAY	RAIN
KABANKALAN	NEGROS OCC	94.4385	0.159664	0.142857	92109	140.8	87.5	19.3	0
SIBALON	ANTIQUE	94.4474	0.182927	0.128049	35515	135.5	74.1	43.2	1
CULASI	ANTIQUE	94.4541	0.166667	0.095238	25574	101.3	91.2	74.6	1
PRES ROXAS	CAPIZ	94.4699	0.082192	0.013699	21805	298.2	34.8	0.0	0
SAN ENRIQUE	NEGROS OCC	94.4917	0.160714	0.035714	14662	553.8	80.7	94.8	0
BACOLOD	NEGROS OCC	94.5248	0.168889	0.112222	262415	153.8	46.5	16.9	1
VICTORIAS	NEGROS OCC	94.5400	0.205882	0.071429	55959	307.5	62.4	32.3	1
ESTANCIA	ILOILO	94.5834	0.149606	0.070866	19817	589.9	96.3	33.7	0
KALIBO	AKLAN	94.5966	0.123288	0.123288	39894	721.8	79.4	75.0	0
TALISAY	NEGROS OCC	94.5974	0.132653	0.096939	53624	315.4	74.9	58.0	1
ROXAS CITY	CAPIZ	94.7226	0.131519	0.052154	81183	659.4	81.2	29.8	0
ALIMODIAN	ILOILO	94.7874	0.093023	0.069767	22906	160.9	42.9	0.0	0
MALINAO	AKLAN	94.7925	0.114583	0.031250	18117	105.1	88.2	12.3	0
LEON	ILOILO	94.8426	0.102857	0.028571	31552	180.2	27.6	26.5	0
ZARRAGA	ILOILO	94.8475	0.144320	0.115456	12673	354.4	75.4	99.0	0
DUMARAO	CAPIZ	94.8510	0.145540	0.073812	29934	131.6	78.8	14.9	0
ESCALANTE	NEGROS OCC	94.8864	0.142857	0.047619	71293	395.0	76.5	31.8	0
PONTEVERDA	CAPIZ	94.8917	0.157407	0.277778	30489	214.3	94.5	31.3	0
MANDALAG	AKLAN	94.8988	0.153846	0.261538	14128	15.5	98.4	50.0	0
BAGO	NEGROS OCC	94.9827	0.085603	0.081712	99631	261.7	81.1	60.9	0
DINGLE	ILOILO	94.9995	0.133333	0.106667	29175	279.2	76.5	35.4	0
MAMBUSAO	CAPIZ	95.0193	0.085714	0.057143	32097	251.5	82.7	34.8	0
POTOTAN	ILOILO	95.1608	0.119149	0.161702	44624	482.9	76.3	68.6	0
BATAN	AKLAN	95.1696	0.125000	0.182692	23373	152.2	88.1	3.2	0
N WASHINGTON	AKLAN	95.1940	0.107143	0.083333	26119	377.3	92.3	67.2	0
PAVIA	ILOILO	95.2852	0.054688	0.007813	17330	425.2	69.9	77.4	0
IVISAN	CAPIZ	95.3646	0.074074	0.000000	17414	3.1	90.0	4.3	0
GUIMBAL	ILOILO	95.4518	0.112069	0.181034	19532	488.9	45.4	20.1	0
HINOBAAN	NEGROS OCC	95.4572	0.111940	0.074627	45819	213.6	83.7	80.0	1
CONCEPCION	ILOILO	95.4731	0.178571	0.035714	21121	211.1	76.3	10.4	0
DUMALAG	CAPIZ	95.5357	0.066667	0.033333	22198	192.5	64.2	16.4	0
MINA	ILOILO	95.5463	0.080645	0.233871	12290	288.9	68.0	67.9	0
127	ILOILO	95.5579	0.089888	0.067416	13457	301.1	59.1	27.3	0
JANIUAY	ILOILO	95.5845	0.064935	0.064935	40120	189.3	52.6	7.0	0
E MAGALONA	NEGROS OCC	95.7332	0.179487	0.051282	44411	430.9	70.1	38.7	.
ISABELA	NEGROS OCC	95.8151	0.067797	0.135593	39704	205.6	79.2	54.4	0
SAN MIGUEL	ILOILO	96.0350	0.079545	0.056818	14241	437.9	60.3	42.1	0
SAN RAFAEL	ILOILO	96.1453	0.089109	0.029703	8742	31.2	82.4	63.7	0
PANAY	CAPIZ	96.1455	0.091837	0.112245	31650	255.6	81.3	48.7	0
VALLADOLID	NEGROS OCC	96.3006	0.031746	0.111111	21728	487.6	77.9	87.6	.
DUMANGAS	ILOILO	96.3095	0.081633	0.051020	41241	332.4	73.8	57.2	0
ANILAO	ILOILO	96.3169	0.066667	0.057143	15782	198.2	65.2	11.6	0
OTON	ILOILO	96.8293	0.055118	0.188976	41044	458.1	75.8	90.8	0
PANDAN	ANTIQUE	97.2877	0.160000	0.096000	20396	134.0	87.9	54.9	0

TABLE 1.2

RANKS OF MUNICIPALITIES FOR TOTAL ESTIMATED MALNOURISHED POPULATION.

MALRANK IS THE RANK ORDER (HIGHEST NUMBER = 99),MALPOP THE POPULATION NUMBER

I.E. PREVALENCE (PHILPREV) X POPULATION (MNPOP)

GOS	MUNICID	MUNICPAL	PROVINCE	MAPHIL	PHILPREV	MNPOP	POPDEN	MALPOP	MALRANK
1	301	CUARTERO	CAPIZ	90.6230	0.402439	18513	111.8	7450.4	75
2	405	BURUANGA	AKLAN	90.6396	0.549296	10764	124.1	5912.6	67
3	618	PULUPANDAN	NEGROS OCC	91.5794	0.387097	24824	119.6	9609.3	91
4	603	CANDONI	NEGROS OCC	91.9120	0.320755	10831	65.5	3474.1	41
5	615	M PACILLA	NEGROS OCC	91.9493	0.339462	22916	134.0	7756.2	77
6	623	TABOCO	NEGROS OCC	92.5171	0.205126	36415	365.6	7469.7	76
7	621	SIPALAY	NEGROS OCC	92.5675	0.238532	51264	141.6	12228.1	89
8	610	ILOG	NEGROS OCC	92.7736	0.296703	33956	76.0	11558.4	89
9	414	NABAS	AKLAN	92.8113	0.254545	16607	164.7	4227.2	49
10	503	BELISON	ANTIQUE	92.8297	0.268293	8626	401.2	2314.3	22
11	307	MAAYON	CAPIZ	92.8323	0.210000	25715	176.7	5400.1	63
12	314	SAPIAN	CAPIZ	92.8363	0.351351	18753	200.5	6588.9	71
13	125	MAASIN.	ILOILO	92.9547	0.274194	26952	151.9	7392.8	74
14	311	PILAR	CAPIZ	92.9922	0.198198	30134	271.0	5966.6	68
15	607	HINAMAYLAN	NEGROS OCC	93.0345	0.255427	70467	152.2	18210.6	96
16	602	CALATRAVA	NEGROS OCC	93.0517	0.230088	58163	124.1	13382.5	91
17	126	MIAGIAO E	ILOILO	93.0944	0.360282	45816	.	17423.0	94
18	616	MURCIA	NEGROS OCC	93.1150	0.301587	45162	113.0	13620.3	92
19	402	BALOE	AKLAN	93.1176	0.207547	17300	101.0	3590.6	42
20	510	LIBERTAD	ANTIQUE	93.1791	0.203704	9870	112.3	2010.6	15
21	620	CADIZ CITY	NEGROS OCC	93.2295	0.204301	129532	523.4	26484.0	98
22	417	TANGALAN	AKLAN	93.2590	0.263158	11174	124.1	2940.5	35
23	134	SAN ENRIQUE	ILOILO	93.2844	0.187500	19663	232.3	3686.8	44
24	512	PATNONGON	ANTIQUE	93.3155	0.224719	24262	139.2	5452.1	64
25	513	SAN JOSE	ANTIQUE	93.3177	0.200000	30266	575.4	6053.2	69
26	604	CAUYAN	NEGROS OCC	93.3358	0.180645	70517	153.5	12648.2	90
27	113	CAPLES	ILOILO	93.3997	0.182927	32184	269.0	5887.3	66
28	504	BUGASANG	ANTIQUE	93.4272	0.209302	21619	140.1	4524.9	55
29	506	HAMTIC	ANTIQUE	93.4703	0.133333	23526	192.9	5229.8	61
30	302	DAO	CAPIZ	93.5063	0.081818	23921	555.5	1957.2	13
31	110	BINGAWAN	ILOILO	93.5455	0.218045	9229	154.2	2012.3	16
32	105	BALASAN	ILOILO	93.5695	0.250000	17979	307.0	4494.9	54
33	405	IBAJAY	AKLAN	93.6411	0.164635	31214	178.4	5145.2	60
34	613	LA CASTELLANA	NEGROS OCC	93.6549	0.223684	44634	999.9	9995.1	82
35	517	TIBIAO	ANTIQUE	93.7100	0.216867	17200	141.3	3730.1	46
36	403	BANGA	AKLAN	93.7415	0.177419	25034	207.0	4441.5	52
37	630	SAN CARLOS	NEGROS OCC	93.7904	0.229947	91627	202.9	21069.3	97
38	316	TAPAZ	CAPIZ	93.7910	0.081395	35129	62.2	2859.3	31
39	609	HINIGARAN	NEGROS OCC	93.7921	0.210843	54717	348.3	11536.7	87
40	139	TIGBAUAN	ILOILO	93.7972	0.128713	34548	544.0	4446.8	53
41	109	BATAD	ILOILO	93.8217	0.162000	11750	206.0	1980.7	14
42	614	MANAPLA	NEGROS OCC	93.8311	0.135593	40524	355.5	5494.8	65
43	130	PASSI	ILOILO	93.8391	0.175610	47335	198.6	8427.2	79
44	116	CUENAS	ILOILO	93.8554	0.154472	23562	270.3	3701.4	45
45	601	BINALBAGAN	NEGROS OCC	94.0084	0.233161	49428	265.2	11524.7	86
46	507	DAO	ANTIQUE	94.0530	0.105769	22511	266.9	2381.0	24
47	120	IGBARAS	ILOILO	94.0825	0.165517	22173	146.9	3670.0	43
48	111	CABATUAN	ILOILO	94.1311	0.139344	34462	299.2	4802.9	57
49	617	PONTEVEDRA	NEGROS OCC	94.1426	0.213018	33254	293.4	7054.5	72
50	515	SEBASTE	ANTIQUE	94.1651	0.090000	10369	56.9	829.5	3
51	302	BARBAZA	ANTIQUE	94.2735	0.184211	14703	121.4	2708.4	28
52	401	ALTAVAS	AKLAN	94.3675	0.168317	17443	168.5	2936.0	34
53	104	BADIANGAN	ILOILO	94.3985	0.170455	19239	200.9	3279.4	39
54	140	TUBUNGAN	ILOILO	94.4071	0.174419	14510	194.4	2530.8	25
55	627	SILAY	NEGROS OCC	94.4251	0.160410	111131	631.9	17826.5	95

(continued on next page)

TABLE 1.2 (cont)

DHS	MUNICID	MUNICPAL	PROVINCE	MNPHIL	PHILPREV	MNPOP	POPDEN	MALPOP	MALRANK
56	612	KABANKALAN	NEGROS OCC	94.4345	0.159664	92109	140.8	14705.5	93
57	516	CIBALON	ANTIQUE	94.4474	0.162927	35515	135.5	6496.6	70
58	505	CULASI	ANTIQUE	94.4541	0.166667	25674	101.3	4279.0	50
59	313	PRES ROXAS	CAPIZ	94.4699	0.082192	21505	296.2	1792.2	11
60	620	SAN ENRIQUE	NEGROS OCC	94.4917	0.160714	14662	553.5	2356.4	23
61	626	BACOLOD	NEGROS OCC	94.5245	0.160669	262415	153.9	44319.0	99
62	625	VICTORIAS	NEGROS OCC	94.5430	0.205882	55959	307.5	11521.0	85
63	113	ESTANCIA	ILOILO	94.5534	0.149606	19517	559.9	2964.7	36
64	407	KALIBO	AKLAN	94.5756	0.123295	39894	721.5	4918.4	58
65	622	TALISAY	NEGROS OCC	94.5974	0.132653	53624	315.4	7113.4	73
66	317	ROXAS CITY	CAPIZ	94.7226	0.131519	81143	659.4	10677.1	84
67	102	ALIMODIAN	ILOILO	94.7574	0.093023	22906	160.9	2130.2	16
68	413	MALINAO	AKLAN	94.7925	0.114583	15117	105.1	2075.9	17
69	124	LEON	ILOILO	94.9436	0.102657	31552	190.2	3245.3	37
70	143	ZARRAGA	ILOILO	94.9475	0.144320	12573	354.4	1529.0	12
71	304	DUMARAO	CAPIZ	94.9510	0.145540	29934	131.6	4356.6	51
72	606	ESCALANTE	NEGROS OCC	94.6864	0.142857	71293	395.0	10164.7	83
73	312	PONTEVERDA	CAPIZ	94.8917	0.157407	30469	214.3	4799.2	56
74	410	MANDALAG	AKLAN	94.8986	0.153846	14128	15.5	2173.5	19
75	629	BAGO	NEGROS OCC	94.9627	0.095603	99631	261.7	8525.7	80
76	115	DINGLE	ILOILO	94.9995	0.133333	29175	279.2	3890.5	49
77	308	MAMBUSAO	CAPIZ	95.0193	0.085714	32097	257.3	2751.2	29
78	132	POTOTAN	ILOILO	95.1609	0.119149	44624	452.9	5316.5	62
79	404	BATAN	AKLAN	95.1636	0.125000	23373	352.2	2921.6	33
80	415	N WASHINGTON	AKLAN	95.1940	0.107143	25119	377.3	2798.5	30
81	131	PAVIA	ILOILO	95.2852	0.054688	17330	425.2	947.7	4
82	305	IVISAN	CAPIZ	95.3646	0.074074	17414	3.1	1289.9	9
83	119	GUIMBAL	ILOILO	95.4516	0.112069	15502	466.9	2185.6	20
84	609	HINOBAAN	NEGROS OCC	95.4572	0.111940	45819	113.5	5129.0	59
85	114	CONCEPCION	ILOILO	95.4731	0.175571	21121	211.1	3771.6	47
86	303	DUMALAG	CAPIZ	95.5357	0.066667	22198	152.5	1479.9	10
87	128	MINA	ILOILO	95.5463	0.080645	12290	2[illegible].5	991.1	5
88	127	NEW LUCENA	ILOILO	95.5578	0.069836	13457	301.1	1209.6	6
89	121	JANIUAY	ILOILO	95.5945	0.084935	40120	199.3	2605.2	26
90	605	E MAGALONA	NEGROS OCC	95.7332	0.179487	44411	430.9	7971.2	78
91	611	ISABELA	NEGROS OCC	95.8151	0.067797	35704	205.6	2691.8	27
92	136	SAN MIGUEL	ILOILO	95.8350	0.079545	14241	437.9	1132.8	7
93	142	SAN RAFAEL	ILOILO	95.1453	0.059109	5742	31.2	779.0	2
94	309	PANAY	CAPIZ	95.1455	0.091837	31650	255.6	2906.6	32
95	624	VALLADOLID	NEGROS OCC	96.3006	0.031746	21729	487.6	689.8	1
96	117	DUMANGAS	ILOILO	96.3095	0.041633	41241	332.4	3366.6	40
97	103	ANILAO	ILOILO	96.3158	0.066667	15782	156.2	1052.1	6
98	123	OTON	ILOILO	96.3213	0.055119	41044	455.1	2262.3	21
99	511	PANDAN	ANTIQUE	97.2377	0.160000	20396	134.0	3263.4	35

Best Available Document

TABLE 1.3 Descriptive statistics and correlation matrix for municipal variables. For definition of variables see Annex 2. (Table continues on next 7 pages)

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
PROVINCE	101	3.53415842	2.05556477	362.000000	1.0000000	6.0000000
MUNIC	101	15.34613861	10.90410342	1554.000000	1.0000000	43.0000000
RAIN	94	0.25531915	0.43837949	24.000000	0	1.0000000
TYPE	101	3.00000000	0	303.000000	3.0000000	3.0000000
FREQ	101	150.36633663	150.66515391	15137.000000	25.0000000	1074.0000000
MNNCHS	101	91.01071445	1.15655413	9192.082159	87.7567156	93.9645304
MNPHIL	101	94.19546639	1.21179592	9512.732105	90.6230307	97.2877112
MNWH	101	93.62560164	3.61966837	9456.205965	85.5586710	105.1134146
PHILPREV	101	0.17431543	0.08550252	17.605659	0.0317460	0.5492956
NCHSPREV	101	0.42565578	0.11865594	42.991233	0.1811024	0.7195122
WHPREV	101	0.09734126	0.06123335	9.831470	0	0.2694737
MNDIST	70	52.22000000	45.06497613	3654.000000	0	198.0000000
MNPOP	101	35465.16831683	32069.51241019	3581982.000000	8626.0000000	262415.0000000
PREVUP	101	0.25565534	0.24014564	25.821189	0	1.0000000
PREVCST	101	0.49327789	0.25911495	49.816067	0	1.0000000
PREVLOW	101	0.12990715	0.19425915	13.120622	0	1.0000000
PREVRICE	101	0.33781815	0.33072093	34.119734	0	0.9291339
PREVCORN	101	0.01543440	0.05463496	1.564935	0	1.0000000
PREVCOCO	101	0.01975996	0.06237491	1.995756	0	0.3846154
PREVSGR	101	0.13100555	0.24417455	13.231561	0	0.4614615
PREVRCCN	101	0.21147338	0.26942199	21.358611	0	0.9411765
PREVRCCO	101	0.16026496	0.26793739	16.186761	0	1.0000000
PREVOTH	101	0.00741399	0.05185234	0.748813	0	1.0000000
PREVFARM	101	0.50889459	0.31326194	51.398354	0	0.5132743
PREVFISH	101	0.04696755	0.10995877	4.743722	0	1.0000000
PREVFF	101	0.24833094	0.27226987	25.131925	0	0.6666667
PREVIND	101	0.00641734	0.02748753	0.648151	0	1.0000000
						0.2101167

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
PREVNEAR	101	0.49590646	0.23039879	49.177554	0	1.0000000

PREVMID	101	0.29326019	0.17769126	29.621300	0	1.0000000
PREVFAR	101	0.13994512	0.16222824	14.126356	0	0.6387097
OPDEN	100	460.64300000	170.61636793	46064.300000	3.1000000	999.9000000
ALAY	100	35.59400000	28.19594433	3559.400000	0	99.0000000
IPA	100	75.75100000	15.72635701	7575.100000	19.4000000	98.4000000
ATER	97	55.59735632	31.80476437	5393.100000	0	100.0000000
HYS	52	1.48634615	2.99138635	98.030000	0	20.4100000

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PROVINCE	MUNIC	RAIN	_TYPE_	_FREQ_	MNNCHS	MNPHIL	MNWH	PHILPREV	NCHSPREV	WHPREV	MNDIST
PROVINCE	1.00000	-0.33574	-0.01583	0.00000	0.09359	-0.26337	-0.27234	0.20374	0.26563	-0.27352	0.06719	0.19002
	0.0000	0.0006	0.8801	1.0000	0.3217	0.0079	0.0055	0.0410	0.0072	0.0066	0.5044	0.1161

PREVMID	101	0.29326019	0.17758126	29.621300	0	1.0000000
PREVFAR	101	0.13934512	0.16222424	14.126396	0	0.6387097
POPDEN	100	260.64300000	170.61636703	26064.300000	3.1000000	999.9000000
PALAY	100	35.39400000	26.19594433	3539.400000	0	99.0000000
NIPA	100	76.76600000	15.72635701	7676.400000	19.4000000	96.4000000
MATWK	97	36.58735632	31.60476427	3123.100000	0	100.0000000
PHYS	52	1.48834615	2.99139635	98.030000	0	20.4100000

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PROVINCE	MUNIC	RAIN	_TYPE_	_FREQ_	MNNCHS	MNPHIL	MNWH	PHILPREV	NCHSPREV	WHPREV	MNDIST
PROVINCE	1.00000	-0.33674	0.51583	0.00000	0.09959	-0.26337	-0.27234	0.20374	0.26583	0.27352	0.06719	0.19002
	0.0000	0.0006	0.0001	1.0000	0.3217	0.0078	0.0059	0.0410	0.0072	0.0056	0.5044	0.1151
	101	101	94	101	101	101	101	101	101	101	101	70
MUNIC	-0.33674	1.00000	-0.04193	0.00000	0.40257	0.19601	0.20941	-0.10181	-0.17233	-0.20026	-0.05251	-0.13009
MUNICIPALITY	0.0006	0.0000	0.6882	1.0000	0.0001	0.0495	0.0356	0.3110	0.0848	0.0447	0.6020	0.2831
	101	101	94	101	101	101	101	101	101	101	101	70
RAIN	0.51583	-0.04193	1.00000	0.00000	0.11964	-0.29203	-0.29390	0.07667	0.23095	0.22792	0.09147	0.04417
	0.0001	0.6882	0.0000	1.0000	0.2507	0.0043	0.0040	0.4615	0.0251	0.0272	0.3806	0.7247
	94	94	94	94	94	94	94	94	94	94	94	66
TYPE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	101	101	94	101	101	101	101	101	101	101	101	70
FREQ	0.09959	0.40257	0.11964	0.00000	1.00000	0.02672	0.04281	-0.02191	0.02303	0.00815	0.02552	-0.01603
	0.3217	0.0001	0.2507	1.0000	0.0000	0.7751	0.6708	0.8279	0.8192	0.9355	0.8000	0.8952
	101	101	94	101	101	101	101	101	101	101	101	70
MNNCHS	-0.26337	0.19601	-0.29203	0.00000	0.02679	1.00000	0.39680	-0.34495	-0.81785	-0.92460	0.11653	-0.20153
	0.0078	0.0495	0.0043	1.0000	0.7751	0.0000	0.0001	0.0004	0.0001	0.0001	0.2459	0.0943
	101	101	94	101	101	101	101	101	101	101	101	70
MNPHIL	-0.27234	0.20941	-0.29390	0.00000	0.04281	0.39680	1.00000	-0.34637	-0.82323	-0.91974	0.12184	-0.18926
	0.0059	0.0356	0.0040	1.0000	0.6708	0.0001	0.0000	0.0004	0.0001	0.0001	0.2249	0.1166
	101	101	94	101	101	101	101	101	101	101	101	70
MNWH	0.20374	-0.10181	0.07667	0.00000	-0.02191	-0.34495	-0.34637	1.00000	0.27306	0.35925	-0.61574	0.27031
	0.0410	0.3110	0.4615	1.0000	0.8279	0.0004	0.0004	0.0000	0.0057	0.0001	0.0001	0.0236
	101	101	94	101	101	101	101	101	101	101	101	70

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PROVINCE	MUNIC	RAIN	_TYPE_	_FREQ_	MNNCHS	MNPHIL	MNWH	PHILPREV	NCHSPREV	WHPREV	MNDIST
PHILPREV	0.26583	-0.17233	0.23095	0.00000	0.02303	-0.81785	-0.82323	0.27306	1.00000	0.81126	-0.04901	0.24019
	0.0072	0.0848	0.0251	1.0000	0.8192	0.0001	0.0001	0.0057	0.0000	0.0001	0.6265	0.0452
	101	101	94	101	101	101	101	101	101	101	101	70
NCHSPREV	0.27352	-0.20026	0.22792	0.00000	0.00815	-0.92460	-0.91974	0.35925	0.81126	1.00000	-0.07219	0.26618
	0.0056	0.0447	0.0272	1.0000	0.9355	0.0001	0.0001	0.0001	0.0001	0.0000	0.4731	0.0259
	101	101	94	101	101	101	101	101	101	101	101	70
WHPREV	0.06719	-0.05251	0.09147	0.00000	0.02552	0.11653	0.12184	-0.61574	-0.04901	-0.07219	1.00000	-0.16114
PREVALENCE OF WASTING	0.5044	0.6020	0.3806	1.0000	0.8000	0.2459	0.2249	0.0001	0.6265	0.4731	0.0000	0.1826
	101	101	94	101	101	101	101	101	101	101	101	70
MNDIST	0.19002	-0.13009	0.04417	0.00000	-0.01603	-0.20153	-0.18926	0.27031	0.24019	0.26618	-0.16114	1.00000
	0.1151	0.2831	0.7247	1.0000	0.8952	0.0943	0.1166	0.0236	0.0452	0.0259	0.1826	0.0000
	70	70	66	70	70	70	70	70	70	70	70	70
MNPOP	0.35496	0.13515	0.21294	0.00000	0.62987	0.01097	0.01899	0.07608	-0.01576	0.02733	-0.00695	-0.01776
	0.0003	0.0505	0.0394	1.0000	0.0001	0.9132	0.8805	0.4495	0.8757	0.7862	0.9449	0.8940
	101	101	94	101	101	101	101	101	101	101	101	70
PREVUP	-0.09555	0.02209	-0.11355	0.00000	-0.02274	-0.24315	-0.22487	0.16243	0.15868	0.26313	-0.09735	0.10565
	0.3418	0.8264	0.2754	1.0000	0.8207	0.0143	0.0212	0.1046	0.1130	0.0078	0.3328	0.3841

Best Available Document

	101	101	94	101	101	101	101	101	101	101	101	70	
REVCST	0.01017	0.02708	-0.05731	0.00000	0.00167	0.38055	0.37609	-0.12843	-0.38242	-0.34422	0.01607	-0.34462	
	0.9196	0.7681	0.5192	1.0000	0.9868	0.0001	0.0001	0.2006	0.0001	0.0004	0.8577	0.0035	
	101	101	94	101	101	101	101	101	101	101	101	70	
REVLOW	0.10602	-0.01556	0.14037	0.00000	0.11347	0.01453	0.02226	-0.11557	0.06225	-0.01523	0.17362	0.30511	
	0.3196	0.8538	0.1772	1.0000	0.2546	0.8541	0.8251	0.2498	0.5363	0.6564	0.0825	0.0102	
	101	101	94	101	101	101	101	101	101	101	101	70	
REVRICE	-0.29512	0.15580	-0.04678	0.00000	-0.13977	0.32956	0.33856	-0.15106	-0.35943	-0.32873	0.05060	-0.23110	
	0.0327	0.1198	0.6543	1.0000	0.1633	0.0009	0.0005	0.1316	0.0002	0.0006	0.6153	0.0542	
	101	101	94	101	101	101	101	101	101	101	101	70	
REVCORN	0.27705	0.11247	-0.02400	0.00000	0.10045	-0.22139	-0.22237	0.16796	0.17863	0.18697	-0.12119	0.34562	
	0.0050	0.2628	0.8184	1.0000	0.3176	0.0257	0.0251	0.0931	0.0739	0.0612	0.2274	0.0034	
	101	101	94	101	101	101	101	101	101	101	101	70	
REVCOCO	0.10222	-0.11901	-0.03552	0.00000	0.01795	0.03716	0.03407	-0.06597	-0.00568	-0.14505	-0.11491	0.02229	
	0.3091	0.2359	0.9579	1.0000	0.8593	0.7122	0.7352	0.5121	0.9551	0.1476	0.2525	0.8547	
	101	101	94	101	101	101	101	101	101	101	101	70	
REVSGR	0.40800	-0.02157	0.02047	0.00000	0.18006	-0.01122	-0.00525	0.05141	0.06376	0.06828	-0.07980	0.06120	
	0.0001	0.8505	0.5447	1.0000	0.0716	0.9112	0.9269	0.5418	0.5264	0.3800	0.4276	0.5040	
	101	101	94	101	101	101	101	101	101	101	101	70	
REVRCCN	-0.23686	0.07994	-0.05209	0.00000	-0.06918	-0.24788	-0.23752	0.24859	0.16396	0.24629	-0.13498	-0.04886	
	0.0036	0.4268	0.6181	1.0000	0.4919	0.0124	0.0168	0.0122	0.1013	0.0130	0.1727	0.6875	
	101	101	94	101	101	101	101	101	101	101	101	70	

MUNICPAL FILE, FULL CORRELATION MATRIX 10:20 FRIDAY, SEPTEMBER 2, 1983 4

CORRELATION COEFFICIENTS / FROM > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PROVINCE	MUNIC	RAIN	_TYPE_	_FREQ_	MNNCMS	MNPHIL	MNWH	PHILPREV	NCMSPREV	WHPREV	MNDIST
REVRCCO	0.11064	-0.32708	0.03413	0.00000	-0.22165	-0.05493	-0.10122	-0.11322	0.15184	0.06880	0.19325	0.12378
	0.2707	0.0008	0.7440	1.0000	0.0259	0.3984	0.3139	0.2596	0.1296	0.4542	0.0528	0.3073
	101	101	94	101	101	101	101	101	101	101	101	70
REVOTH	0.12036	-0.09814	-0.05243	0.00000	0.13876	-0.08512	-0.03532	0.02246	0.05734	0.07758	-0.05002	0.16314
	0.2306	0.3299	0.5500	1.0000	0.1564	0.3374	0.3962	0.8236	0.5690	0.4406	0.6150	0.1772
	101	101	94	101	101	101	101	101	101	101	101	70
REVFARM	-0.34401	0.09217	-0.35915	0.00000	-0.18689	0.03151	0.04357	-0.04563	-0.16789	-0.06577	-0.09597	-0.24152
	0.0001	0.3593	0.0004	1.0000	0.0613	0.7544	0.6652	0.6505	0.0933	0.5135	0.3199	0.0440
	101	101	94	101	101	101	101	101	101	101	101	70
REVFISH	0.04072	-0.03967	0.02956	0.00000	0.05857	0.00191	-0.01159	0.01301	0.05223	-0.03279	0.03636	0.05936
	0.6660	0.6922	0.7773	1.0000	0.5560	0.9249	0.8252	0.8973	0.6039	0.7448	0.7033	0.4135
	101	101	94	101	101	101	101	101	101	101	101	70
REVFF	0.17654	-0.20635	0.22167	0.00000	-0.07947	-0.04390	-0.04844	-0.05503	0.17685	0.06113	0.16012	0.31658
	0.0723	0.0354	0.0318	1.0000	0.4296	0.6529	0.6305	0.5847	0.0769	0.5436	0.1097	0.0076
	101	101	94	101	101	101	101	101	101	101	101	70
REVIND	0.13275	0.21604	0.01111	0.00000	0.55928	0.06357	0.05164	-0.09685	-0.06076	-0.07623	0.08795	-0.12129
	0.1857	0.0278	0.9154	1.0000	0.0001	0.5277	0.5403	0.3351	0.5461	0.4456	0.3816	0.3172
	101	101	94	101	101	101	101	101	101	101	101	70
REVNEAR	-0.20795	0.37690	-0.14957	0.00000	-0.02064	0.29151	0.30315	-0.18293	-0.17034	-0.24857	0.03724	-0.10223
	0.0369	0.4446	0.1502	1.0000	0.8377	0.0031	0.0021	0.0671	0.0876	0.0122	0.7116	0.3995
	101	101	94	101	101	101	101	101	101	101	101	70
REVMID	-0.03550	-0.05245	0.02606	0.00000	-0.00253	-0.11064	-0.12159	-0.08035	0.01176	0.03965	-0.02703	-0.11966
	0.7149	0.3557	0.8031	1.0000	0.9792	0.2707	0.2254	0.4244	0.9069	0.6538	0.7284	0.3237
	101	101	94	101	101	101	101	101	101	101	101	70
REVFAR	0.26037	-0.02445	0.01924	0.00000	0.09965	-0.15958	-0.14743	0.21147	0.12967	0.20155	-0.06574	0.28376
	0.0071	0.4084	0.6540	1.0000	0.3215	0.0539	0.0605	0.0336	0.1962	0.0432	0.9230	0.0173
	101	101	94	101	101	101	101	101	101	101	101	70
PDEN	-0.02222	0.15956	-0.03069	0.00000	0.18792	0.18717	0.18182	-0.03282	-0.23146	-0.17540	0.01270	-0.17574
	0.8263	0.0585	0.3873	1.0000	0.0612	0.0622	0.0555	0.7456	0.0205	0.0609	0.9002	0.1466
	100	100	93	100	100	100	100	100	100	100	100	69

PALAY	0.30256	0.10964	0.19537	0.00000	0.16141	0.21291	0.21237	-0.16275	-0.05672	-0.20803	0.32687	-0.00722
	0.0022	0.2767	0.0606	1.0000	0.1096	0.0334	0.0335	0.1057	0.5752	0.0378	0.0009	0.9531
	100	100	93	100	100	100	100	100	100	100	100	69
NIPA	0.41274	-0.39765	0.06789	0.00000	-0.17091	-0.21251	-0.21923	0.09506	0.22741	0.22863	0.12249	0.27683
	0.0001	0.0001	0.5180	1.0000	0.0951	0.0339	0.0224	0.3468	0.0229	0.0221	0.2247	0.0213
	100	100	93	100	100	100	100	100	100	100	100	69
WATWK	-0.29562	0.02676	-0.30241	0.00000	-0.02037	0.05628	0.06498	-0.12642	-0.14737	-0.04901	0.02479	-0.01570
	0.0054	0.9056	0.0056	1.0000	0.8514	0.5918	0.5498	0.2433	0.1731	0.6521	0.8197	0.9044
	87	87	82	87	87	87	87	57	87	87	87	61

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PROVINCE	MUNIC	RAIN	_TYPE_	_FREQ_	MNNCHS	MNPHIL	MNWH	PHILPREV	NCHSPREV	WHPREV	MNDIST
PHYS	0.03812	-0.03407	-0.05691	0.00000	0.00621	0.43310	0.43112	-0.04461	-0.09884	-0.26900	0.07179	0.23303
	0.7831	0.8105	0.6916	1.0000	0.9651	0.0013	0.0014	0.7535	0.4857	0.0538	0.6130	0.1714
	52	52	51	52	52	52	52	52	52	52	52	36
	MNPOP	PREVUP	PREVCST	PREVLOW	PREVRICE	PREVCORN	PREVCOCO	PREVSGR	PREVRCCN	PREVRCCO	PREVOTH	PREVFARM
PROVINCE	0.35456	-0.03555	0.01017	0.10002	-0.29512	0.27735	0.10222	0.40800	-0.28622	0.11064	0.12036	-0.35401
	0.0003	0.3419	0.9196	0.3156	0.0027	0.0050	0.3091	0.0001	0.0036	0.2707	0.2306	0.0001
	101	101	101	101	101	101	101	101	101	101	101	101
MUNIC	0.19515	0.02209	0.02708	-0.01856	0.15550	0.11247	-0.11901	-0.02157	0.07594	-0.32708	-0.09814	0.09217
MUNICIPALITY	0.0505	0.8264	0.7881	0.8538	0.1158	0.2626	0.2355	0.8305	0.4265	0.0008	0.3289	0.3593
	101	101	101	101	101	101	101	101	101	101	101	101
RAIN	0.21234	-0.11355	-0.06731	0.14037	-0.04678	-0.02400	-0.00552	0.02047	-0.05209	0.03413	-0.06243	-0.35815
	0.0354	0.2758	0.5192	0.1772	0.6543	0.8164	0.9579	0.6447	0.6151	0.7440	0.5500	0.0004
	94	94	94	94	94	94	94	94	94	94	94	94
TYPE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	101	101	101	101	101	101	101	101	101	101	101	101
FREQ	0.02567	-0.02234	0.00167	0.11347	-0.13577	0.10045	0.01739	0.18006	-0.06918	-0.22169	0.13876	-0.18688
	0.0001	0.8207	0.9868	0.2566	0.1633	0.3176	0.8582	0.0716	0.4918	0.0259	0.1664	0.0613
	101	101	101	101	101	101	101	101	101	101	101	101
MNNCHS	0.01097	-0.24315	0.35055	0.01853	0.32856	-0.22189	0.03716	-0.01122	-0.24788	-0.08493	-0.08512	0.03151
	0.9133	0.0143	0.0001	0.8541	0.0005	0.0257	0.7122	0.9113	0.0124	0.3984	0.3974	0.7544
	101	101	101	101	101	101	101	101	101	101	101	101
MNPHIL	0.01399	-0.22887	0.37603	0.02226	0.33856	-0.22257	0.03407	-0.00925	-0.23752	-0.10122	-0.08532	0.04357
	0.8905	0.0213	0.0001	0.8251	0.0005	0.0251	0.7352	0.9269	0.0168	0.3139	0.3962	0.6653
	101	101	101	101	101	101	101	101	101	101	101	101
MNWH	0.07608	0.16243	-0.12943	-0.11557	-0.15106	0.16798	-0.03597	0.06141	0.24855	-0.11322	0.02246	-0.04563
	0.4495	0.1046	0.2006	0.2495	0.1316	0.0931	0.5121	0.5418	0.0122	0.2596	0.8235	0.6505
	101	101	101	101	101	101	101	101	101	101	101	101
PHILPREV	-0.01576	0.15968	-0.35242	0.06225	-0.35943	0.17563	-0.06569	0.06376	0.16396	0.15194	0.05734	-0.16769
	0.8757	0.1130	0.0001	0.5363	0.0002	0.0739	0.9551	0.5264	0.1013	0.1296	0.5690	0.0933
	101	101	101	101	101	101	101	101	101	101	101	101
NCHSPREV	0.02733	0.26313	-0.34422	-0.01823	-0.32873	0.18597	-0.14505	0.08828	0.24629	0.06880	0.07759	-0.06577
	0.7852	0.0076	0.0004	0.8564	0.0008	0.0612	0.1478	0.3800	0.0130	0.4942	0.4406	0.5135
	101	101	101	101	101	101	101	101	101	101	101	101
WHPREV	-0.00596	-0.09735	0.01807	0.17362	0.05060	-0.12119	-0.11491	-0.07980	-0.13486	0.19329	-0.05009	-0.05997
PREVALENCE OF WASTING	0.9449	0.3328	0.8577	0.0825	0.6153	0.2274	0.2525	0.4276	0.1787	0.0528	0.6190	0.3199
	101	101	101	101	101	101	101	101	101	101	101	101
MNDIST	-0.01776	0.10565	-0.34462	0.30511	-0.23110	0.34582	0.02229	0.08120	-0.04886	0.12378	0.16314	-0.24152
	0.8440	0.3841	0.0035	0.0102	0.0542	0.0034	0.8547	0.5040	0.6879	0.3073	0.1772	0.0440
	70	70	70	70	70	70	70	70	70	70	70	70

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	MNPOP	PREVUP	PREVCST	PREVLOW	PREVRICE	PREVCORN	PREVCOCO	PREVSGR	PREVRCCN	PREVRCCO	PREVOTH	PREVFARM
MNPOP	1.00000	0.00206	-0.05577	0.09255	-0.23510	0.12595	-0.00325	0.38417	-0.11033	-0.26553	0.15616	-0.22936
	0.0000	0.9837	0.5796	0.3573	0.0120	0.2095	0.9345	0.0001	0.2720	0.0073	0.1189	0.0210
	101	101	101	101	101	101	101	101	101	101	101	101
PREVUP	0.00206	1.00000	-0.56210	-0.34696	-0.11337	0.18899	-0.20523	0.02815	0.36384	-0.21518	-0.03595	0.44667
	0.9837	0.0000	0.0001	0.0004	0.2590	0.0524	0.0395	0.7799	0.0002	0.0307	0.7212	0.0001
	101	101	101	101	101	101	101	101	101	101	101	101
PREVCST	-0.05577	-0.56210	1.00000	-0.38261	0.38768	-0.20032	-0.17683	-0.02764	-0.28719	0.04729	-0.06526	0.14731
	0.5796	0.0001	0.0000	0.0001	0.0001	0.0446	0.0765	0.7838	0.0036	0.6386	0.5167	0.1415
	101	101	101	101	101	101	101	101	101	101	101	101
PREVLOW	0.09255	-0.34696	-0.38261	1.00000	-0.15193	0.02481	0.24724	0.02016	-0.10261	0.09666	0.06364	-0.54864
	0.3573	0.0004	0.0001	0.0000	0.1294	0.8055	0.0127	0.8413	0.3072	0.3363	0.5259	0.0001
	101	101	101	101	101	101	101	101	101	101	101	101
PREVRICE	-0.23510	-0.11337	0.38768	-0.15193	1.00000	-0.18256	-0.24162	-0.38903	-0.26823	-0.32845	-0.09515	0.33551
	0.0120	0.2590	0.0001	0.1294	0.0000	0.0677	0.0143	0.0001	0.0067	0.0008	0.3368	0.0006
	101	101	101	101	101	101	101	101	101	101	101	101
PREVCORN	0.12595	0.18899	-0.20032	0.02481	-0.18256	1.00000	0.07915	0.07874	-0.03516	-0.11300	-0.03989	-0.04164
	0.2095	0.0524	0.0446	0.8055	0.0677	0.0000	0.4314	0.4338	0.7271	0.2399	0.6921	0.6793
	101	101	101	101	101	101	101	101	101	101	101	101
PREVCOCO	-0.00325	-0.20523	-0.17683	0.24724	-0.24162	0.07915	1.00000	-0.05599	-0.15374	0.25456	-0.02633	-0.27959
	0.9345	0.0395	0.0765	0.0127	0.0143	0.4314	0.0000	0.5781	0.1248	0.0102	0.7934	0.0046
	101	101	101	101	101	101	101	101	101	101	101	101
PREVSGR	0.38417	0.02815	-0.02764	0.02016	-0.38903	0.07874	-0.05599	1.00000	-0.24368	-0.27175	0.08442	-0.13232
	0.0001	0.7799	0.7838	0.8413	0.0001	0.4338	0.5781	0.0000	0.0141	0.0060	0.4013	0.1871
	101	101	101	101	101	101	101	101	101	101	101	101
PREVRCCN	-0.11033	0.36384	-0.28719	-0.10261	-0.26823	-0.03516	-0.15374	-0.24368	1.00000	-0.25456	-0.09332	0.34688
	0.2720	0.0002	0.0036	0.3072	0.0067	0.7271	0.1248	0.0141	0.0000	0.0101	0.3533	0.0004
	101	101	101	101	101	101	101	101	101	101	101	101
PREVRCCO	-0.26553	-0.21518	0.04729	0.09666	-0.32845	-0.11300	0.25456	-0.27175	-0.25456	1.00000	-0.04831	-0.33591
	0.0073	0.0307	0.6386	0.3363	0.0008	0.2399	0.0102	0.0060	0.0101	0.0000	0.6314	0.0006
	101	101	101	101	101	101	101	101	101	101	101	101
PREVOTH	0.15616	-0.03595	-0.06526	0.06364	-0.09615	-0.03989	-0.02633	0.08442	-0.09332	-0.04831	1.00000	-0.07435
	0.1189	0.7212	0.5167	0.5259	0.3368	0.6921	0.7934	0.4013	0.3533	0.6314	0.0000	0.4600
	101	101	101	101	101	101	101	101	101	101	101	101
PREVFARM	-0.22936	0.44667	0.14731	-0.54864	0.33551	-0.04164	-0.27959	-0.13232	0.34688	-0.33591	-0.07435	1.00000
	0.0210	0.0001	0.1415	0.0001	0.0006	0.6793	0.0046	0.1871	0.0004	0.0006	0.4600	0.0000
	101	101	101	101	101	101	101	101	101	101	101	101
PREVFISH	0.11604	-0.22695	-0.25242	0.53152	-0.12235	0.05549	0.19430	-0.02357	-0.22117	0.06660	-0.03913	-0.43893
	0.2478	0.0224	0.0109	0.0001	0.2228	0.5738	0.0515	0.8150	0.0262	0.5077	0.6976	0.0001
	101	101	101	101	101	101	101	101	101	101	101	101

MUNICPAL FILE, FULL CORRELATION MATRIX 10:20 FRIDAY, SEPTEMBER 2, 1983 7

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	MNPOP	PREVUP	PREVCST	PREVLOW	PREVRICE	PREVCORN	PREVCOCO	PREVSGR	PREVRCCN	PREVRCCO	PREVOTH	PREVFARM
PREVFF	-0.07763	-0.37861	-0.12488	0.49290	-0.16031	-0.06357	0.26562	-0.16087	-0.17179	0.53443	0.07713	-0.65830
	0.4392	0.0001	0.2134	0.0001	0.1100	0.5277	0.0072	0.1080	0.0356	0.0001	0.4433	0.0001
	101	101	101	101	101	101	101	101	101	101	101	101
PREVIND	0.41640	-0.00243	-0.00122	0.01043	-0.11203	-0.01360	0.04553	0.09876	-0.13985	-0.08230	0.03464	-0.16181
	0.0001	0.9239	0.9903	0.9176	0.2647	0.8926	0.6512	0.3258	0.1631	0.4133	0.7309	0.1060
	101	101	101	101	101	101	101	101	101	101	101	101
PREVNEAR	-0.14758	-0.34256	0.38583	0.12117	0.36471	-0.16075	-0.16359	-0.06793	-0.15405	-0.07634	-0.06560	0.10408
	0.1458	0.0005	0.0001	0.2274	0.0002	0.1082	0.1021	0.4997	0.1240	0.4480	0.5145	0.3003
	101	101	101	101	101	101	101	101	101	101	101	101
PREVMID	-0.07463	0.21515	-0.20531	-0.07605	-0.05102	-0.07733	0.27347	-0.13559	0.02536	0.14036	0.01618	-0.05175
	0.4579	0.0307	0.0394	0.4497	0.6124	0.4421	0.0057	0.1764	0.8011	0.1615	0.8724	0.6070
	101	101	101	101	101	101	101	101	101	101	101	101

PREVFAR	0.27915	0.30840	-0.29747	-0.00475	-0.37197	0.30538	-0.05195	0.25437	0.18855	-0.06558	0.12991	0.05080
	0.0047	0.0017	0.0025	0.9624	0.0001	0.0019	0.6059	0.0103	0.0590	0.5146	0.1554	0.6139
	101	101	101	101	101	101	101	101	101	101	101	101
POPDEN	0.14702	-0.22360	0.14929	0.12692	0.17232	0.07174	-0.13279	0.11555	-0.20180	-0.24651	-0.03542	-0.13364
	0.1416	0.0253	0.1392	0.2011	0.0865	0.4741	0.1878	0.2523	0.0441	0.0133	0.7043	0.1850
	100	100	100	100	100	100	100	100	100	100	100	100
PALAY	-0.02802	-0.29056	0.29668	0.16473	0.21870	0.03988	-0.05547	-0.03537	-0.33424	0.12457	-0.05117	-0.23633
	0.7520	0.0034	0.0027	0.1015	0.0288	0.6937	0.5175	0.7268	0.0007	0.2169	0.6131	0.0179
	100	100	100	100	100	100	100	100	100	100	100	100
NIPA	-0.14040	-0.23492	0.04430	0.21564	0.03718	0.03384	0.19736	-0.01704	-0.41238	0.41273	0.01546	-0.34041
	0.1636	0.0196	0.6617	0.0312	0.9435	0.7012	0.0490	0.8664	0.0001	0.0001	0.8786	0.0005
	100	100	100	100	100	100	100	100	100	100	100	100
WATWK	-0.13412	0.05335	-0.06059	-0.05475	0.02150	-0.10983	0.03763	-0.05347	0.13483	-0.02078	-0.02661	0.19060
	0.2155	0.6236	0.5772	0.6145	0.8433	0.3112	0.4196	0.6228	0.2131	0.8485	0.8068	0.0770
	87	87	87	87	87	87	87	87	87	87	87	87
PHYS	-0.04855	-0.15171	0.19960	0.00133	0.33532	-0.00737	0.02739	-0.12034	-0.12695	0.16460	-0.01985	-0.26555
	0.7325	0.2830	0.1550	0.9925	0.2037	0.9536	0.8472	0.3954	0.3696	0.2436	0.8889	0.0570
	52	52	52	52	52	52	52	52	52	52	52	52
	PREVFISH	PREVFF	PREVIND	PREVNEAR	PREVMID	PREVFAR	POPDEN	PALAY	NIPA	WATWK	PHYS	
PROVINCE	0.04072	0.17964	0.13275	-0.20793	-0.03680	0.26637	-0.02222	0.30250	0.41274	-0.25592	0.03912	
	0.6960	0.0723	0.1857	0.0369	0.7148	0.0071	0.8263	0.0022	0.0001	0.0054	0.7931	
	101	101	101	101	101	101	100	100	100	87	52	
MUNIC	-0.03987	-0.20635	0.21904	0.07690	-0.09285	-0.02443	0.15986	0.10984	-0.35765	0.02676	-0.03407	
MUNICIPALITY	0.6922	0.0384	0.0278	0.4446	0.3557	0.8084	0.0585	0.2767	0.0001	0.8056	0.8105	
	101	101	101	101	101	101	100	100	100	87	52	
RAIN	0.02956	0.22167	0.01111	-0.14957	0.02606	0.01924	-0.09069	0.19537	0.06788	-0.30241	-0.05691	
	0.7773	0.0318	0.9154	0.1502	0.5031	0.8540	0.3973	0.0606	0.5180	0.0058	0.6916	
	94	94	94	94	94	94	93	93	93	82	51	

MUNICPAL FILE, FULL CORRELATION MATRIX 10:20 FRIDAY, SEPTEMBER 2, 1983

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PREVFISH	PREVFF	PREVIND	PREVNEAR	PREVMID	PREVFAR	POPDEN	PALAY	NIPA	WATWK	PHYS
TYPE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	101	101	101	101	101	101	100	100	100	87	52
FREQ	0.05897	-0.07947	0.55908	-0.02064	-0.00263	0.09965	0.15792	0.16141	-0.17091	-0.02037	0.00621
	0.5560	0.4256	0.0001	0.8377	0.9792	0.3215	0.0012	0.1086	0.0891	0.8514	0.9651
	101	101	101	101	101	101	100	100	100	87	52
MNNCHS	0.00191	-0.04390	0.06357	0.25151	-0.11064	-0.14858	0.15717	0.21291	-0.21251	0.05628	0.43310
	0.9849	0.6629	0.5277	0.0031	0.2707	0.0539	0.0522	0.0334	0.0338	0.5915	0.0013
	101	101	101	101	101	101	100	100	100	87	52
MNPHIL	-0.01197	-0.04844	0.06164	0.30315	-0.12169	-0.18743	0.19182	0.21237	-0.21523	0.06458	0.43112
	0.9053	0.6305	0.5403	0.0021	0.2254	0.0605	0.0559	0.0339	0.0284	0.5498	0.0014
	101	101	101	101	101	101	100	100	100	87	52
MNWH	0.01301	-0.05503	-0.09689	-0.18293	-0.05035	0.21147	-0.03282	-0.16275	0.09506	-0.12642	-0.04461
	0.8973	0.5847	0.3351	0.6671	0.6244	0.0333	0.7458	0.1057	0.3468	0.2433	0.7535
	101	101	101	101	101	101	100	100	100	87	52
PHILPREV	0.05223	0.17685	-0.06076	-0.17084	0.01178	0.12967	-0.23146	-0.05672	0.22741	-0.14737	-0.09684
	0.6039	0.0769	0.5461	0.0876	0.9069	0.1362	0.0205	0.5752	0.0229	0.1731	0.4857
	101	101	101	101	101	101	100	100	100	87	52
NCHSPREV	-0.03279	0.06113	-0.07623	-0.24857	0.03965	0.20159	-0.17540	-0.20803	0.22863	-0.04901	-0.26900
	0.7444	0.5436	0.4496	0.0122	0.6938	0.0432	0.0809	0.0374	0.0221	0.6521	0.0539
	101	101	101	101	101	101	100	100	100	87	52
WHPREV	0.03836	0.16012	0.09799	0.03724	-0.02703	-0.00374	0.01270	0.32657	0.12249	0.02479	0.07179
PREVALENCE OF WASTING	0.7035	0.1097	0.3816	0.7116	0.7834	0.9230	0.9002	0.0009	0.2247	0.8197	0.6130

52

	101	101	101	101	101	101	100	100	100	87	52
MNDIST	0.09935	0.31658	-0.12129	-0.10228	-0.11966	0.28376	-0.17574	-0.00722	0.27683	-0.01570	0.23303
	0.4130	0.0076	0.3172	0.3995	0.3237	0.0173	0.1486	0.9531	0.0213	0.9044	0.1714
	70	70	70	70	70	70	69	69	69	61	36
MNPOP	0.11604	-0.07783	0.41640	-0.14756	-0.07469	0.27915	0.14502	-0.02802	-0.14040	-0.13412	-0.04655
	0.2476	0.4392	0.0001	0.1408	0.4579	0.0047	0.1416	0.7220	0.1636	0.2155	0.7325
	101	101	101	101	101	101	100	100	100	87	52
PREVUP	-0.22699	-0.37661	-0.02243	-0.34256	0.21515	0.30640	-0.22360	-0.29056	-0.23492	0.05335	-0.15171
	0.0224	0.0001	0.8239	0.0005	0.0307	0.0017	0.0253	0.0034	0.0186	0.6236	0.2630
	101	101	101	101	101	101	100	100	100	87	52
PREVCST	-0.25242	-0.12468	-0.00122	0.35523	-0.20531	-0.29747	0.14929	0.29698	0.04430	-0.06059	0.19560
	0.0109	0.2134	0.9903	0.0001	0.0394	0.0025	0.1382	0.0027	0.6617	0.5772	0.1560
	101	101	101	101	101	101	100	100	100	87	52
PREVEQK	0.53102	0.49290	0.01043	0.12117	-0.07605	-0.00475	0.12392	0.16473	0.21564	-0.05475	0.00133
	0.0001	0.0001	0.9176	0.2274	0.4497	0.9624	0.2011	0.1015	0.0312	0.6145	0.9925
	101	101	101	101	101	101	100	100	100	87	52

MUNICPAL FILE, FULL CORRELATION MATRIX 10:20 FRIDAY, SEPTEMBER 2, 1983 9

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PREVFISH	PREVFF	PREVIND	PREVNEAR	PREVMID	PREVFAR	POPDEN	PALAY	NIPA	WATWK	PHYS
PREVRICE	-0.12233	-0.16001	-0.11203	0.36471	-0.05102	-0.37197	0.17232	0.21870	0.00718	0.02150	0.03532
	0.2226	0.1100	0.2647	0.0002	0.6124	0.0001	0.0865	0.0298	0.9435	0.8433	0.8037
	101	101	101	101	101	101	100	100	100	87	52
PREVCORN	0.05559	-0.06357	-0.01360	-0.15075	-0.07733	0.30538	0.07174	0.03995	0.03954	-0.10583	-0.00737
	0.5798	0.5277	0.8926	0.1023	0.4421	0.0019	0.4761	0.6937	0.7012	0.3112	0.9586
	101	101	101	101	101	101	100	100	100	87	52
PREVCOCO	0.19430	0.06562	0.04553	-0.16359	0.27347	-0.05155	-0.13279	-0.06547	0.15736	0.08763	0.02738
	0.0515	0.0073	0.6512	0.1021	0.0057	0.6059	0.1872	0.5175	0.0490	0.4196	0.8472
	101	101	101	101	101	101	100	100	100	87	52
PREVSSR	-0.02357	-0.16027	0.09876	-0.06793	-0.13559	0.25437	0.11553	-0.03537	-0.01704	-0.05347	-0.12034
	0.8150	0.1080	0.3258	0.4997	0.1764	0.0103	0.2523	0.7268	0.8664	0.6228	0.3954
	101	101	101	101	101	101	100	100	100	87	52
PREVRCCN	-0.22117	-0.17179	-0.13985	-0.15405	0.02538	0.16855	-0.23160	-0.33424	-0.41235	0.13483	-0.12695
	0.0262	0.0858	0.1631	0.1240	0.8011	0.0590	0.0441	0.0007	0.0001	0.2131	0.3698
	101	101	101	101	101	101	100	100	100	87	52
PREVRCCO	0.06666	0.53443	-0.09230	-0.07634	0.14036	-0.06558	-0.24691	0.12457	0.41273	-0.02078	0.16460
	0.5077	0.0001	0.4133	0.4460	0.1615	0.5146	0.0133	0.2169	0.0001	0.8465	0.2436
	101	101	101	101	101	101	100	100	100	87	52
PREVOTH	-0.03513	0.07713	0.03464	-0.06560	0.01618	0.12391	-0.03842	-0.05117	0.01546	-0.02661	-0.01985
	0.6976	0.4433	0.7309	0.5145	0.3724	0.1954	0.7042	0.6131	0.8786	0.8068	0.8869
	101	101	101	101	101	101	100	100	100	87	52
PREVFARM	-0.43853	-0.69830	-0.16181	0.10409	-0.05179	0.05390	-0.13364	-0.23633	-0.34041	0.19060	-0.26559
	0.0001	0.0001	0.1063	0.3003	0.6070	0.6135	0.1850	0.0179	0.0005	0.0770	0.0570
	101	101	101	101	101	101	100	100	100	87	52
PREVFISH	1.00000	0.11654	0.02539	0.02121	-0.07732	0.01751	0.17922	0.02689	0.22094	0.04264	-0.06433
	0.0000	0.2446	0.8011	0.8333	0.4422	0.8620	0.0744	0.7906	0.0272	0.6549	0.6505
	101	101	101	101	101	101	100	100	100	87	52
PREVFF	0.11654	1.00000	-0.06490	-0.09146	0.17370	-0.10491	-0.10390	0.15300	0.39515	-0.12517	0.22485
	0.2446	0.0000	0.5191	0.4160	0.0721	0.2964	0.3036	0.1286	0.0001	0.2450	0.1090
	101	101	101	101	101	101	100	100	100	87	52
PREVIND	0.02539	-0.06490	1.00000	-0.03901	-0.03819	0.08365	0.05266	0.22318	-0.03838	-0.10751	0.00934
	0.8011	0.5191	0.0000	0.3246	0.7045	0.4056	0.6357	0.0256	0.7046	0.3216	0.9476
	101	101	101	101	101	101	100	100	100	87	52
PREVNEAR	0.02121	-0.09146	-0.03901	1.00000	-0.57145	-0.49257	0.24374	0.27625	0.01132	0.02008	0.19188
	0.8333	0.4160	0.3246	0.0000	0.0001	0.0001	0.0145	0.0054	0.9110	0.8536	0.1730
	101	101	101	101	101	101	100	100	100	87	52

MUNICPAL FILE, FULL CORRELATION MATRIX 10:20 FRIDAY, SEPTEMBER 2, 1983 10

CORRELATION COEFFICIENTS / PROB > R UNDER HO:RHO=0 / NUMBER OF OBSERVATIONS

	PREVFISH	PREVFF	PREVIND	PREVNEAR	PREVMID	PREVFAR	POPDEN	PALAY	NIPA	WATWK	PHYS
PREVMID	-0.07732	0.17970	-0.03819	-0.57145	1.00000	-0.21038	-0.25162	-0.17296	-0.03063	0.07043	-0.12519
	0.4422	0.0721	0.7045	0.0001	0.0000	0.0343	0.0116	0.0653	0.7607	0.5168	0.3765
	101	101	101	101	101	101	100	100	100	87	52
PREVFAR	0.01751	-0.10491	0.08365	-0.49257	-0.21088	1.00000	-0.07366	-0.11013	0.05467	0.02924	-0.16150
	0.8620	0.2964	0.4056	0.0001	0.0343	0.0000	0.4664	0.2754	0.5890	0.7861	0.2527
	101	101	101	101	101	101	100	100	100	87	52
POPDEN	0.17922	-0.10390	0.06266	0.24374	-0.25162	-0.07366	1.00000	0.19539	-0.14173	-0.07996	0.16093
	0.0744	0.3036	0.5357	0.0145	0.0116	0.4664	0.0000	0.0514	0.1595	0.4616	0.2544
	100	100	100	100	100	100	100	100	100	87	52
PALAY	0.02689	0.15300	0.22313	0.27625	-0.17296	-0.11013	0.19539	1.00000	0.27200	-0.25815	0.26624
	0.7906	0.1286	0.0256	0.0054	0.0653	0.2754	0.0514	0.0000	0.0062	0.0158	0.0564
	100	100	100	100	100	100	100	100	100	87	52
NIPA	0.22094	0.39515	-0.03938	0.01132	-0.03063	0.05467	-0.14173	0.27200	1.00000	0.02967	0.05541
	0.0272	0.0001	0.7046	0.9110	0.7607	0.5890	0.1595	0.0062	0.0000	0.7850	0.6964
	100	100	100	100	100	100	100	100	100	87	52
WATWK	0.04264	-0.12517	-0.10751	0.02003	0.07043	0.02924	-0.07996	-0.25815	0.02967	1.00000	-0.05711
	0.6949	0.2480	0.3216	0.8536	0.5168	0.7861	0.4616	0.0158	0.7850	0.0000	0.6276
	87	87	87	87	87	87	87	87	87	87	52
PHYS	-0.06433	0.22495	0.06934	0.19166	-0.12519	-0.16150	0.16093	0.26624	0.05541	-0.05711	1.00000
	0.6505	0.1090	0.9476	0.1730	0.3765	0.2527	0.2544	0.0564	0.6964	0.6276	0.0000
	52	52	52	52	52	52	52	52	52	52	52

25

TABLE 1.4

COVERAGE OF SERVICES: % OF CHILDREN IN AREAS WITH BARANGAY NUTRITION SCHOLAR (PCBNS), HOME MANAGEMENT TECHNICIAN (PCHMT), RURAL HEALTH MIDWIFE (PCRHM), DOCTOR (PCRHDR), NURSE (PCRHN), BARANGAY HEALTH WORKER (PCBHW). In this printout, %s are given as proportions, i.e. cells X 100 for %s.

MUNICPAL	_TYPE_	_FREQ_	PCBNS	PCHMT	PCRHM	PCRHDR	PCRHN	PCBHW
	0	15015	0.42233	0.28668	0.73954	0.45494	0.52344	0.36929
ALIMODIAN	1	43	0.00000	0.00000	0.47873	0.00000	0.00000	0.33333
ANILAO	1	105	0.47573	0.13592	0.40544	0.13592	0.13592	0.11650
BADIANGAN	1	88	0.98864	0.46591	1.00000	0.31818	0.31818	0.47727
BALASAN	1	112	0.52679	0.00000	0.56250	0.00000	0.15179	0.58036
BATAD	1	125	0.74400	0.00000	0.83200	0.95200	0.95200	0.14400
BINGAWAN	1	133	0.60150	0.00000	0.49624	0.00000	0.00000	0.15038
CABATUAN	1	122	0.83607	0.46721	0.86885	0.57377	0.57377	0.75410
CARLES	1	82	0.73171	0.00000	0.78049	0.26829	0.26829	0.00000
CONCEPCION	1	56	0.00000	0.35714	0.64286	0.35714	0.48214	0.00000
DINGLE	1	75	1.00000	0.24000	1.00000	0.57333	0.61333	0.09333
DUENAS	1	123	0.00000	0.21951	0.95122	0.47967	0.82927	0.26016
DUMANGAS	1	98	1.00000	0.18367	0.58163	0.72449	0.21429	0.18367
ESTANCIA	1	127	0.00000	0.62205	0.77165	0.62205	0.92126	0.70079
GUIMBAL	1	116	1.00000	0.73276	1.00000	0.50862	0.70690	0.57759
IGBARAS	1	145	0.00000	0.00000	0.29545	0.17424	0.17424	0.29545
JANIUAY	1	77	1.00000	0.00000	1.00000	0.00000	0.00000	0.00000
LEON	1	175	0.00000	0.27660	0.97234	0.00000	0.39362	0.41489
MAASIN	1	124	0.84677	0.54839	0.92742	0.40323	0.40323	0.30645
MIAGIAO E	1	213	0.00000	0.70423	0.95775	1.00000	0.92488	0.14085
127	1	89	0.00000	0.64045	0.66292	0.40449	0.66292	0.59551
MINA	1	124	1.00000	0.25688	0.74312	0.83486	0.76147	0.42202
OTON	1	127	0.07087	0.60630	0.28346	0.71654	0.23622	0.04724
PASSI	1	235	0.22927	0.28293	0.94146	0.37073	0.57561	0.42927
PAVIA	1	129	0.00000	0.41408	0.54688	0.28906	0.28906	0.24219
POTOTAN	1	235	0.35319	0.48085	0.96383	0.41979	0.51489	0.23630
SAN ENRIQUE	1	112	1.00000	0.17857	0.83036	0.91750	0.93750	0.00000
SAN MIGUEL	1	88	0.00000	0.15909	1.00000	0.62500	0.62500	0.00000
TIGBAUAN	1	101	1.00000	0.88119	0.92079	0.45545	0.45545	0.35644
TUBUNGAN	1	86	0.11628	0.41860	0.81395	0.81395	0.81395	0.41860
141	1	232	0.82936	0.16239	0.73504	0.58120	0.52137	0.60684
SAN RAFAEL	1	101	0.00000	0.00000	0.37624	0.21782	0.42574	0.34653
ZARRAGA	1	1074	0.00000	0.29520	0.58255	1.00000	0.79336	0.29520
201	1	20	.	.	.	.	.	.
202	1	20	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
203	1	20	1.00000	0.00000	1.00000	1.00000	1.00000	0.00000
CUARTERO	1	62	0.00000	0.15854	1.00000	0.00000	0.89024	1.00000
DAO	1	110	0.00000	0.00000	1.00000	0.00000	0.69091	0.00000
DUMALAG	1	60	0.48333	0.51667	1.00000	1.00000	1.00000	0.70000
DUMARAO	1	213	0.00000	0.00000	0.20188	0.20188	0.20188	0.00000
IVISAN	1	27	0.00000	0.00000	1.00000	0.00000	0.00000	0.00000
MAAYON	1	100	.	.	.	.	.	.
MAMBUSAO	1	35	0.00000	0.00000	1.00000	1.00000	1.00000	0.00000
PANAY	1	98	0.00000	0.15306	0.94898	0.78571	0.78571	0.29592
PILAR	1	111	0.00000	0.45946	0.95495	0.54054	0.54054	0.26126
PONTEVERDA	1	108	0.00000	0.13889	1.00000	0.96296	0.87037	0.27778
PRES ROXAS	1	73	0.95890	0.00000	1.00000	0.95890	0.95890	0.00000
SAPIAN	1	74	0.21622	0.00000	0.91892	0.91892	0.62162	0.91892
TAPAZ	1	86	0.00000	0.00000	0.70930	0.00000	0.00000	0.00000
ROXAS CITY	1	441	0.18139	0.26492	0.53938	0.26969	0.34845	0.32458
ALTAVAS	1	101	0.08911	0.56436	1.00000	0.79208	0.94059	0.83198
BALETE	1	106	0.00000	0.10606	1.00000	0.75758	0.40909	0.00000
BANGA	1	62	0.79032	0.67742	1.00000	0.90323	0.98387	0.53226
BATAN	1	104	0.78846	0.17308	1.00000	0.60577	0.79192	0.00000
BURUANGA	1	142	0.88028	0.42958	0.98028	0.91549	0.91549	0.51408
IBAJAY	1	91	0.37363	0.71429	0.78022	0.78022	0.78022	0.18681

TABLE 1.4 (cont)

MUNICPAL	_TYPE_	_FREQ_	PCRNS	PCHMT	PCRHP	PCRHCR	PCRHN	PCHHW
KALIBO	1	73	1.00000	0.61644	1.00000	0.49315	0.15068	0.12329
MANDALAG	1	65	0.32308	0.38462	0.53846	0.29231	0.29231	0.03077
MALINAO	1	96	0.82278	0.00000	0.79747	0.51899	0.51899	0.00000
NABAS	1	55	0.41818	0.12727	0.67273	0.00000	0.21818	0.00000
N WASHINGTON	1	84	0.91667	0.86905	0.93333	0.83333	0.83333	1.00000
TANGALAN	1	76	0.92105	0.52632	0.89474	0.73684	0.84211	0.52632
BARBAZA	1	114	0.12281	0.78070	0.94737	0.45614	0.82456	0.53509
BELISON	1	123	1.00000	0.93684	1.00000	0.93684	1.00000	0.93684
BUGASANG	1	86	0.00000	0.34651	1.00000	0.65116	0.65116	0.08140
CULASI	1	84	0.00000	0.27381	0.92857	0.11905	0.09524	0.27381
DAO	1	104	1.00000	0.40385	0.94231	0.00000	0.52885	0.52885
HAMTIC	1	120	0.00000	0.10577	0.77885	0.32692	0.44231	0.11538
LIBERTAD	1	54	.	.	.	.	.	.
PANDAN	1	125	0.91200	0.25600	0.89600	0.00000	0.59200	0.69600
PATNONGON	1	89	0.15730	0.29213	0.13483	0.00000	0.10112	0.00000
SAN JOSE	1	105	0.00000	0.07619	0.40952	0.00000	0.22857	0.00000
SEBASTE	1	25	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SIBALON	1	164	0.00000	0.28049	0.84146	0.14634	0.44512	0.20732
TIBIAO	1	83	0.48193	0.46988	1.00000	0.15663	0.71084	0.28916
BINALBAGAN	1	193	0.31606	0.34197	0.73057	0.41451	0.43523	0.24352
CALATRAVA	1	226	0.32870	0.00000	0.55000	0.24074	0.30556	0.57870
CANDONI	1	106	0.52830	0.00000	0.43396	0.00000	0.23585	0.09434
CAUYAN	1	155	0.14839	0.35484	0.93544	0.03871	0.52903	0.16129
E MAGALONA	1	117	0.44545	0.55455	0.51818	0.52727	0.44545	0.00000
ESCALANTE	1	126	0.05556	0.41270	0.80952	0.87302	0.87302	0.87302
HIMAMAYLAN	1	178	0.83193	0.57983	0.91597	0.38655	0.47899	0.68067
HINIGARAN	1	168	0.33333	0.50641	0.97436	0.37179	0.44231	0.23077
HINOBAAN	1	134	0.08955	0.00000	0.33582	0.18657	0.29104	0.00000
ILOG	1	91	0.06593	0.00000	0.85714	0.34066	0.06593	0.00000
ISABELA	1	177	0.14124	0.16949	0.78531	0.55367	0.43503	0.46893
KABANKALAN	1	119	0.72269	0.00000	1.00000	0.44538	0.44538	0.00000
LA CASTELLANA	1	228	0.50439	0.23439	0.32942	0.12719	0.36404	0.28947
MANAPLA	1	59	1.00000	0.90476	1.00000	0.45238	0.45238	0.90476
M PADILLA	1	65	0.00000	0.18868	0.18868	0.00000	0.18868	0.18868
MURCIA	1	159	0.10056	0.43575	0.65475	0.29609	0.22346	0.37989
PONTEVEDRA	1	169	0.10791	0.10791	0.76253	0.26619	0.17266	0.17266
PULUPANDAN	1	62	1.00000	0.48387	1.00000	0.48387	1.00000	1.00000
SAN ENRIQUE	1	112	0.78571	1.00000	0.93929	0.75000	0.92857	0.69643
SIPALAY	1	210	0.92661	0.61927	0.79358	0.00000	0.47706	0.41743
TALISAY	1	196	0.97959	0.97959	1.00000	0.86224	0.88265	0.85224
TABOSO	1	39	0.41026	0.00000	0.89744	1.00000	1.00000	0.00000
VALLADOLID	1	126	0.50794	0.50794	1.00000	0.50794	0.50794	0.95823
VICTORIAS	1	238	0.00000	0.43697	0.68487	0.59664	0.66807	0.44118
CADIZ CITY	1	372	0.65323	0.00000	0.75538	0.31720	0.34946	0.56452
SILAY	1	586	0.41638	0.23157	0.64505	0.50171	0.51365	0.50683
BACOLOD	1	900	0.65333	0.00000	0.38222	0.59444	0.62444	0.47111
BAGO	1	257	1.00000	0.37302	1.00000	0.36508	0.36508	0.50794
SAN CARLOS	1	561	0.43350	0.00000	0.57576	0.43316	0.46524	0.42424

ANNEX 2
ADDITIONAL ANALYTICAL DETAILS

A. CREATION OF A MUNICIPAL FILE

A municipal level file was created from the child file by calculating a mean value for all variables of interest for all municipalities. Variables included:

Philippine Height for age	MNPHIL
NCHS Height for age	MNNCHS
NCHS Weight for height	NCHSWH
Philippine height for age prevalence	PHILPREV
NCHS Height for age prevalence	NCHSPREV
NCHS Weight for height prevalence	WHPREV
Mean distance to provincial capital	MNDIST
Mean municipal population	MNPOP
Proportion of children in Upland	PREVUP
Proportion of children in Lowland	PREVLOW
Proportion of children in Coastal	PREVCST
Proportion who grow rice	PREVRICE
Proportion who grow corn	PREVCORN
Proportion who grow coconut	PREVCOCO
Proportion who grow sugar	PREVSGR
Proportion who grow rice/corn	PREVRCCN
Proportion who grow rice/coconut	PREVRCCO
Proportion who grow other crops	PREVOTH
Proportion who farm	PREVFARM
Proportion who fish	PREVFISH
Proportion in industry	PREVIND
Proportion within 0-3 km of poblacion	PREVNEAR
Proportion within 3-10 km of poblacion	PREVMID
Proportion within 10 km of poblacion	PREVFAR

All prevalence and proportion variables listed above were derived from the average of all 0, 1 (yes,no) on the child level. Province 2 was omitted because

of sampling problems, and two municipalities were eliminated due to miscoding. The resulting municipal file included 100 observations.

This file was merged with information from the 1979 OPT file, including population density (POPDEN), % of rice land irrigated (PALAY), % poor housing (NIPA), % having water works (WATWK) and % with a physician (PHYS).

B. REGRESSION

Municipal File Analyses:

Regression was performed on the municipal file using the 'proc reg' procedure in SAS. The total sample was 99 municipalities, one having been omitted for missing data. Selection of independent factors was based on a stepwide regression procedure with a significance level of .10 for remaining in the model. All-'prev' variables are proportions of children within the municipality.

Results are in Table 3 of the main text. All factors except 'prev far' show expected trends and are in agreement with child level regression analysis. Proportion in lowland areas shows a positive association with nutritional status; rice and coconut growers appear better off as expected, and corn and rice and corn growers are worse off nutritionally which is verified on the child level (see Province 1,3, 6). Municipalities with a greater proportion of children 0-3 km from the poblacion show higher values for mean height for age. However, this was also true for those 10 km away, which was an unexpected finding but substantiated by the data tabulations discussed earlier. Finally "NIPA" which is a measure of the proportion of poor housing shows a negative association with nutritional status. The regression on the municipal level file explains 31 percent (R^2 = .3065) of the variability between municipalities.

Child File (see Table 2.1):

Stepwise regression was performed on the child level file, both on the total sample and by province. Because the large sample size allows the detection of very small differences in the dependent factor the significance level for remaining in the model was reduced to .01. Although the R^2 was low, .02, eleven factors show strong associations with Philippine height for age, as seen in Table 2.1. All of the independent factors were dummy variables and took on a value of "1" for yes and "0" for no. Each dummy variable specified a particular group which was compared to all others, with the baseline group being the largest, (i.e. the baseline group for distance was 0-3 km which included nearly half of the total sample).

All coefficients show expected trends in the data. Children 4-10 km from the poblacion were worse than others (primarily 0-3 km group) as seen in Table 2.1. Upland is worse than Coastal and Lowland areas combined. The significant negative coefficient on TOP3, or children who are missing topography, is of some concern because it indicates that these individuals are different from the rest of the sample. Since it is assumed in this data that all missing values are randomly distributed among the children, these individuals should not be different from the rest of the population. This need checking in subsequent analyses. Rice shows a positive trend with height for age, and those in poblacions are better off nutritionally than non-poblacions. The baseline occupation group is farmers, which constitute about 33% of the total sample. The three higher level occupations; professional, government and business, show higher values for height for age when compared to the rest of the sample. Laborers are slightly better off, but fishermen are worse off, as expected.

PROVINCE 1 ILOILO

The trend of increasing prevalence of malnutrition with increased distance from poblacion is verified in the regression (DIST 1, DIST 1B). All crops in Iloilo except corn appear badly off when compared to one another. Sugar growers were the baseline group in the regression, and are the best off group in Iloilo (albeit one of the smallest) followed by corn growers. Coconut, rice/corn and rice/coconut have similar negative coefficients reflecting the higher prevalences of malnutrition in these groups (17.2, 19.1 and 17.9 percent respectively). Of all occupation groups, only professionals and government employees show a relationship with height for age, and in the expected direction.

PROVINCE 3 CAPIZ

Rice growers appear better of nutritionally than the other growers and again sugar growers have the lowest prevalence of malnutrition in Capiz. Rice/corn and "others" are the only other crop groups which appear in the regression showing a negative association with height for age. As expected, poblacion children are better off than non-poblacion, and professionals are better than other occupation groups. The positive coefficient for laborers seen in the total sample is also found in Capiz.

PROVINCE 4 AKLAN

The regression coefficient for DIST1 (3-10 km) indicates that this group is better off nutritionally than the 0-3 km group. The group farthest away from

the poblacion shows the least malnutrition. Coastal appears better off than lowland and upland combined. Rice and rice/corn groups show substantially better nutrition than other crop groups. and although rice/coconut show a similar trend, in the regression analysis, prevalence of stunting in this group is one of the highest. Other associations between height for age and occupation groups and URB1 follow expected trends.

PROVINCE 5 ANTIQUE

Children in the upland areas in Antique are substantially worse off than the other topographical regions, and it is likely this province which contributes the most to this same association found in the total sample. Unlike the total sample, rice growers in Antique are not well off as seen in the regression results as well as in the prevalences. Rice/corn growers show a similar trend. Coconut growers are markedly better off than anyone else; however only 8 children out of 1276 are included in this group. Finally, the unemployed show an unexpected positive relationship with height for age, the explanation for which requires further analyses.

PROVINCE 6 NEGROS OCCIDENTAL

In Negros Occidental, children who live 4-10 km from the poblacion are the worst off group compared to both 0-3 and 10 km. Upland shows the expected negative association with height for age; no obvious cropping patterns emerge which is surprising given the variability in prevalences between the groups. The sex differences seen in the total sample appear only in this province. Future analyses should explore this relationship. Similar to the total sample, in Negros Occidental URB1, professionals, government employees, businessmen and laborers show positive associations with height for age.

TABLE 2.1

REGRESSION COEFFICIENTS FROM STEPWISE PROCEDURE FOR INDEPENDENT FACTORS ON MEAN HEIGHT FOR AGE (PHILIPPINE STANDARD)

		PROVINCE				
	TOTAL	1	3	4	5	6
INTERCEPT	94.28*	95.91*	93.56*	90.94*	94.97*	94.25*
DIST1 3-10 km	-0.23	-0.59*	---	1.18*	---	-0.54*
DIST1B 10	---	-0.96*	---	2.58*	---	---
TOP1 UPLAND	-0.45*	---	---	---	-2.34*	-0.40
TOP2 COASTAL	---	---	---	1.11	---	---
TOP3 (MISSING)	-0.51*	---	-0.82	---	---	-0.66*
CROP1 (RICE)	0.46*	-0.89	0.82*	2.16*	-0.93*	---
CROP2 (CORN)	---	---	---	---	---	---
CROP3 (COCONUT)	---	-1.95*	---	---	7.01*	---
CROP4 (RICE/CORN)	---	-1.53*	-0.94*	2.49*	---	---
CROP5 (RICE/COCO)	---	-1.72*	---	1.46*	---	---
CROP6 (OTHER)	---	-3.54*	-3.47	---	---	1.01
CROPS 7 (MISSING)	---	-1.00	---	---	---	-0.54*
SEX (FEMALE)	-0.25*	---	---	---	---	-0.40*
URB1 (POBL)	0.36*	---	0.84*	1.30*	---	0.55*
URB2 (MISSING)	---	---	---	---	---	---
DOCC1 (PROF)	2.05*	2.04*	2.15	2.44*	---	2.04*
DOCC2 (BUS)	0.86*	---	---	---	---	1.22*
DOCC3 (GOVT)	1.32*	1.00	---	---	---	1.95*
DOCC4 (FISH)	-0.56*	---	---	---	-1.36	---
DOCC5 (LAB)	0.40*	---	1.02*	---	---	0.62*
DOCC6 (RETD)	---	---	---	---	---	---
DOCC7 (UNEMP)	---	---	---	---	3.19	---
DOCC8 - (MISSING)	---	---	---	---	---	---
n	14950	4841	1618	1054	1276	6160
R^2	0.025	0.028	0.075	0.086	0.057	0.033
F	35.0*	14.0*	18.8*	12.3*	15.5*	19.3*

* $P < 0.001$

Others < 0.01

ANNEX 3

Questionnaire and some details of sampling procedure.

#22

PNSB Form No. 1

PHILIPPINE NUTRITION SURVEILLANCE PROJECT
SCHOOL REPORT ON HEIGHT AND WEIGHT MEASUREMENT
OF SEVEN YEAR OLD GRADE I PUPILS:
BEGINNING OF SY 1981-82

1.0 IDENTIFICATION — CODE
1.1 Region
1.2 Province
1.3 Municipality/City
1.4 District
1.5 School
1.6 Section
1.7 Total No. of Grade I Pupils in your Section
1.8 Classification of Mun./City

INSTRUCTIONS

Required No. of Sample Pupils in your Section

Sampling Instruction:
Select _____ Pupil

READ ATTACHED INSTRUCTIONS BEFORE ACCOMPLISHING FORM

2.0 GENERAL INFORMATION: Please Check One: — CODE
2.1 Distance of School From Municipal Hall: ☐ 0-3 Km. ☐ 4-10 Km. ☐ More than 10 Km.
2.2 Area Topography: ☐ Upland ☐ Lowland ☐ Coastal
2.3 Main Source of Livelihood: ☐ Farming ☐ Fishing ☐ Farming/Fishing Combination ☐ Industrial ☐ Mining ☐ Farming/Indust./Combination ☐ Others _____
2.4 If Farming, Main Crop: ☐ Rice ☐ Corn ☐ Coconut ☐ Sugar ☐ Tobacco ☐ Rice/Corn Combin. ☐ Rice/Coconut Combin. ☐ Others _____
2.5 If Main Crop is Rice: ☐ With Masagana 99 ☐ No Masagana 99

3.0 WEIGHT AND HEIGHT RECORDS FOR SCHOOL YEAR 1981-1982.

	Month 01-12	Day 01-31	Year
3.1 Date of Height Measurement			
3.2 Date of Weight Measurement			

	SEX (M/F)	DATE OF BIRTH Month 01-12	Day 01-31	Year	HEIGHT (CENTIMETERS)	WEIGHT (KILOGRAM)	OCCUPATION OF THE FATHER/HEAD OF THE FAMILY	CODE
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
19.								
20.								

Prepared by _____ Date _____
Teacher-in-charge

Certified Correct:

_____
Principal/Head Teacher

IMPORTANT!
Indicate whether you have past records of height and weight measurements for ____ 1979? ____ 1980? (Please Check if Yes)

PNSS Form I-A

SURVEY FOR PRINCIPAL/HEAD TEACHER

IMPORTANT TO BE SUBMITTED TO THE DISTRICT SUPERVISOR TOGETHER WITH SCHOOL REPORT ON HEIGHT/WEIGHT

CODE

Province _____
Municipality /City _____
School _____
Barangay _____
Population of Barangay _____
No. of Households in Barangay _____

IMPORTANT QUESTIONS REFER TO BARANGAY WHERE YOUR SCHOOL IS LOCATED.

1.0 Please check the programs presently operating in youre barangay.

CHECK HERE		CODE	CHECK HERE		CODE
☐	Barangay Nutrition Scholar Project		☐	ANICARE-YCAP Program	
☐	Mother craft Nutrition Project (MOH)		☐	Rice-Fish Culture Program (BFAR)	
☐	Targetted Maternal and Child Health (BAEX-CRS)		☐	Alay Tanim (MEC)	
☐	Supplementary Feeding (MSSD)		☐	Backyard Food Production (BAEX)	
☐	Applied Nutrition Project		☐	Seed Production Program (BAEX)	
☐	School Feeding Program		☐	Plant Material Production (BPI)	
☐	Immunization, Deworming of Pre-schooler (MEC)		☐	Fingerling Dispersal (BFAR)	
☐	Nutribut Project (MOH)		☐	Rural Improvement Club (BAEX)	
☐	Malward Project (MOH)		☐	Rural Improvement Club Children's Center (BAEX)	
☐	Malnutrition Prevention Project (BAEX)		☐	Homemakers Classes (BAEX)	
☐	Deworming and Health Education (MEC)		☐	Integrated Planning for Improved Living (BAEX)	
☐	Medical and Nursing Services (MEC)		☐	Environment Education Program (MEC)	
☐	School Dental Health Program (MEC)				

2.0 How many percent of the households in your barangay are covered by the above nutrition and health related programs? Please check appropriate box.

CHECK HERE		CODE
___	0-25%	
___	26-50%	
___	51-75%	
___	76-100%	

3.0 Please check the community workers operating in your barangay.

CHECK HERE		CODE
___	Barangay Nutrition Scholar	
___	Home Management Technician (BAEX)	
___	Rural Health (Barangay) Midwife	
___	Rural Health Doctor	
___	Rural Health Nurse	
___	Barangay Health Worker	
___	Farm Management Technician (BAEX)	
___	Day-Care Worker (MSSD)	
___	Barangay Supply Point Officer (Population Program)	

_____ Date

_____ Principal/Head Teacher

This survey is part of the Philippine Nutrition Surveillance Project (PNSP), and is intended to provide information on the nutritional status of grade school entrants (seven year old grade one pupils). This form is to be completed by the teacher-in-charge of grade one classes only, certified correct by the Principal or Head Teacher, and submitted to the National Nutrition Council (Manila) through the District Supervisor.

INSTRUCTIONS

IMPORTANT: Do not write on columns marked "CODE".

1.0 Identification

This section provides a means of identifying the schools. Enter the data for item nos. 1.6, 1.7 and 1.8.

2.0 General Information

This section generates information on the general and most predominant characteristics within the general vicinity of the school, i.e. the barangay. Check the most appropriate answer for each item.

3.0 Height and Weight Records

This section provides the height and weight measurements of sample pupils using existing records. Only those measurements carried out at the beginning of school year 1981-82 should be recorded. To accomplish this section, follow these steps:

a. Get your record of height and weight measurements.

b. Assign a number for each grade one pupil in your list. Be sure to write the number before the name of each pupil.

c. Refer to the instruction box found on the form to find out the number of sample pupils to be taken from your section, as well as the sampling instruction that you will use in selecting the sample pupils.

EXAMPLE: If your sampling instruction says "SELECT EVERY 2ND PUPIL", then your sample pupils are children with assigned numbers 2, 4, 6, 8, 10, 12, 14 and so on, until you complete the required number of sample pupils from your section.

EXAMPLE: If your sampling instruction says "SELECT EVERY 3RD PUPIL", then your sample pupils are children with assigned numbers 3, 6, 9, 12, 15, 18, and so on until you complete the required number of sample pupils.

EXAMPLE: If your sampling instruction says "SELECT THE FIRST 10 PUPILS", then your sample pupils are children with assigned numbers of 1, 2, 3, up to 10.

If you have reached the last child in the list and you have not completed the required number of pupils, then select any child/children from your list to complete the required number of sample pupils.

d. Encircle the assigned number of your sample pupils.

e. Copy the data for each sample pupil into this form. Do not record the name of the child.

f. Procedure for recording data for each sample pupil:

Sex. If your sample pupil is male, place M in space provided. If your sample pupil is female, place F in space provided.

Date of Birth. The codes for months are 01 for January, 02 February, 03 for March, 04 for April and so on.

Height. The unit measurement should be centimeters. There are 4 columns provided. Thus a pupil who is 125.5 centimeters should be entered as: | 1 | 2 | 5 | 5 |

Weight. The unit measurement is kilogram. There are three columns provided. Thus a pupil who is 15.7 kilograms should be entered as: | 1 | 5 | 7 |

Occupation of the Father or Head of the Family. The occupational categories for purposes of this survey are: farmer, fisherman, professional (i.e. doctor, teacher, lawyer, government official etc.), self-employed (i.e. businessman, sari-sari store owner, etc.), unemployed, casual worker, skilled worker (i.e. carpenter, mechanic, driver), laborer.

g. Review the data that you copied, and sign the form in the portion indicated.

4.0 Submission of Completed Form

Only the completed form should be submitted. [illegible] submit the accomplished form to the principal or head teacher for certification NOT LATER THAN APRIL 15, 1982.

Sampling procedure: extract from letter from Marito Garcia, March 1982.

All survey questionnaires would have been sent out nationwide by the end of this month. To recap, the sample children would roughly total 209,000 taken from 9,500 sample schools (out of 30,000, roughly every 3rd school), from all of approximately 1,900 districts, from all of the 1,650 towns and cities in the country. Sampling characteristics and features:

1) the grade one child is the primary sampling unit;

2) sample size was designed to be statistically significant at the district (or municipality) level;

3) the sample selection process was done in two stages: first, select the sample schools within the district, then select the children within the schools. (It is not operationally feasible to get the list of all grade one children, per discussion with MEC);

4) the sampling of schools was stratified as to whether the school is located in the poblacion or outside the poblacion;

5) the required number of samples per district was based on the grade one population of that district, i.e. probability proportion to their size (pps); therefore, the samples are considered self-weighting;

6) the p. p. s. shows that at least 100 sample children are required per district, and increasing according to the size of grade one population in that district;

7) the number of sample schools varies according to the number and grade one population of schools within the district. Sample schools per district range from 4 to 10 schools. Two alternate schools per district were taken as buffer for possible rejected samples;

8) the number of sample children per school is dependent on the grade one population of the school. The respondent teacher was asked to systematically select every 2nd or 3rd child in her class from her alphabetical listing; the sampling interval was dependent on the population in her section;

9) sampling intervals and the required number of samples per school, and per section was pre-determined from a list available at MEC (Manila Office).

NOTE
Table used in computing required sample children per school.

WORKING TABLE FOR SAMPLING SCHOOL CHILDREN

District	Total Population (Grade I) in district N	Sample Size (Grade I) in District n	Population (Grade I) in sample schools M	mi	$pi = \frac{mi}{M}$	ni = Pi X n	$Ki = \frac{mi}{ni}$	Name of Sample Schools

PNSS-CNSU form for basic computations

This can be punched into Commodore PET tape.

SAMPLING PLAN FOR SURVEY
ON HEIGHT AND WEIGHT OF
GRADE ONE (SCHOOL ENTRANTS), SCHOOL YEAR 1980-81

Region _____
Province _____
Municipality _____
District _____

School Entrants Population of District _____

Name of School	1 Poblacion / Non-Poblacion	Total No. of School Entrants	Sample Size	Remarks
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				