# Issues in Estimating the Poverty Line

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## 1. Introduction

This paper aims to provide a systematic approach in analyzing the major issues raised regarding the official methodology for estimating poverty lines in the Philippines. The current methodology could be outlined in three steps (Marquez and Virola, 1995) namely:

(a) For each region and urban/rural combination or domain, and on the basis of a one-day menu, the monthly per capita food threshold or food poverty line (fpl) in pesos of an average-sized Filipino family is derived. The one-day menu is formulated from local food consumption patterns to satisfy 100 % of the recommended dietary allowances (RDAs) for energy and protein, as well as 80% of the RDAs for the other nutrients and vitamins. Both the menu and RDAs were prepared by the Food and Nutrition Research Institute (FNRI)[2]. The RDAs for energy and protein, which vary according to age, sex and body weight, are on the average 2000 kilocalories and 50 grams per person, respectively. Prices from various price surveys of the National Statistics Office (NSO) and the Bureau of Agriculture Statistics (BAS) are used to determine the cost of the one-day menu.

(b) The ratio of food expenditure to the total expenditure (net of expenses for alcohol, tobacco and durable assets) of families with income within plus or minus ten percentile of the fpl is used as denominator of the latter to indirectly estimate the total poverty line (tpl) for each region and urban/rural domain. The income and expenditure data are taken from the triennial Family Income and Expenditure Survey (FIES) of NSO. The poverty line for a region is computed as the weighted average of the urban and rural poverty lines. The national poverty line is the weighted average of all the regional lines.

(c) From FIES, the annual per capita income is estimated per region and urban/rural area. The number of extremely poor (or food poor) families is computed by counting the number of

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[2] FNRI recommended the region-specific menus to the Technical Working Group on Income Statistics of the National Statistical Coordination Board. Once approved at the NSCB the menus became part of the methodology for compiling official poverty statistics.

families with annual per capita income falling below the food poverty line (fpl); the number of poor families is obtained similarly, except that fpl is replaced by the total poverty line (tpl). The number of (extremely) poor families at the national level is the total of all the regions and urban/rural counts. The number of (extremely) poor people is obtained by adding up the sizes of the families classified as such.

The various differences of this methodology from most countries' participating in this workshop (see Table 1 for list) and the relevant issues will be discussed following the steps outlined above. This paper also examines relevant issues regarding the FIES as a major data source for the estimation of the poverty line. In the process, certain recommendations are made, some of which relate to other countries as well. Unresolved issues requiring further study are pointed out which, when taken collectively, outlines a research agenda for improving the accuracy, consistency and comparability of poverty line estimates.

## 2. Estimating the Food Poverty Line (fpl)

The use of menus instead of food basket.

Perhaps the most significant deviation of the Philippine methodology is the use of *menus* to reflect the prescribed RDAs instead of a food basket or bundle that other countries use. For illustration, the menus for the National Capital Region (Metro Manila) and the Cordillera Administrative Region (CAR) are reproduced in Annex 1. In the formulation of these menus FNRI was guided by the cheap foods commonly consumed in the area (i.e. low cost diets), with the quantities adjusted to satisfy the prescribed RDAs.

The use of menus in the Philippine methodology can be traced to early attempts in the 1970s, e.g. Abrera's (1976). A Technical Working Group (TWG) on Poverty Determination set up in 1986 under the National Economic and Development Authority, with very active participation by the FNRI, was instrumental in adopting a menu-based methodology that was applied in the production of the official poverty statistics for 1985 and 1988. The food poverty line was obtained from the costs of the ingredients that went into the menus. The TWG was later renamed Income Statistics and transferred to the NSCB that was created in 1987. Political developments hence has made poverty a very sensitive issue. Changes in the methodology that would lead to significant reductions in the poverty indicators series could lead to partisan charges of "achieving the government's poverty reduction targets through statistical means" (which indeed happened when the method of computing the food expenditure/total expenditure ratio was changed about the mid-1990s). A drastic increase will be just as unacceptable by the other side of the political fence. This and the continued active role of FNRI in the TWG have preserved the use of menus in the methodology for the triennial poverty statistics series of 1985 – 1997. For the poverty statistics to be derived after the year 2000, there is a proposal to revise the menus, but not the menu-based methodology.

Proponents of the menus cite a number of advantages that the approach offer compared to the food basket approach. While both are or should be based on the actual consumption pattern of the population as observed from food consumption surveys, it has been said that menus can be tailored to hue more closely to the consumption patterns of individual domains such as urban-rural, province or region. Menus can be formulated to satisfy other nutrient requirements besides

energy. The menu may be a better benchmark because it is not subject to change as incomes increase or decrease. Last but not least, all that are required to compute fpl are the unit prices of the ingredients that go into the menu.

Criticisms of the menu-based method are focused on two issues. One is the level or *accuracy* of the resulting fpl. Another is *comparability* or *consistency*, i.e. whether or not the method measures the same standard of living across domains like regions or urban and rural areas. Both are serious issues deserving more analytical and empirical study than they have attracted to date. Regarding accuracy, it is reasonable to ask whether a one-day menu could represent adequately what poor families eat all year round. No one eats the same menu every day of the year, of course; but this is not the issue. We can assume that the menus (their formulation includes quantities) provide the prescribed RDAs accurately; whether the kind and quantities actually eaten and the kind and quantities prescribed are in close agreement is an issue, though perhaps not the main one.[3] *The main issue is whether the cost of the one day menu multiplied by 365 will come close to the total annual food budget of the poor Filipino family or individual*. One problem is, that there has been no systematic comparison of the composition, volumes and prices between the actual consumption of the poor in a year and the implied/prescribed annual consumption from the menus. Such empirical study is critically needed. *A priori*, however, that the menus lead to inflated fpls is a tempting conjecture to make. In the first place, it is easy to picture Manila's poor to be having less sumptuous than tomato omelet-fried rice-coffee for adults–milk for children breakfast; two viands each to add to rice for lunch as well as supper, and with pork liver and pork hunk at that (Annex 1). Some have expressed doubts whether this really describes a low-cost menu. In the second place, most recent studies that circumvented the menus have reported significantly smaller fpls (Balisacan, 2001; Kakwani, 2001).

Regarding consistency/comparability, it should be kept in mind that, in the context of developing countries, what we are trying to measure is absolute poverty, not relative poverty. And absolute poverty should be identified with a certain standard or level of living that, once defined conceptually and operationally, should stay constant across space and for a reasonable length of time. In this regard, the menu-based method has been criticized for being likely to lead to fpls' that do not mirror the true differences in the standard of living among the domains like regions and rural-urban stratifications. Conceptually, an ideal methodology should be capable of producing estimates that are decomposable into two components – one component measures a welfare parameter or standard that remains constant among the domains and the second the difference among welfare levels in the domains – so that the observed differences in the fpl estimates reflect the latter. Because the menus vary not only in their ingredients but also in the quality of the ingredients, they may be incapable of measuring a constant welfare parameter. It has been pointed out that there are quality and price differences in (the same quantity of) protein from meat, fish and vegetables, for example. And people in richer domains tend to get their protein from higher quality and higher priced sources. Furthermore, these price-quality differences cannot be completely eliminated by deflation, not even spatial price deflation (in the event they have been built into the menus).

Determining the energy threshold,

[3] For example, one is entitled to ask why saltwater fish (galunggong) and milkfish (bangus) which would not be readily available to people living in mountain ranges, are in the menu for CAR (Annex 1).

Although amounts corresponding to the RDAs for the other nutrients are given also, attention tended to be focused on the energy threshold. For example, Kakwani (2001) interpreted the procedure as assigning 2000 daily kilocalories for all Filipinos regardless of age and sex. As an alternative, he proposes applying the age-sex disaggregated calorie norms specified by FNRI to every family in the sample to determine whether the family satisfied the 2000 per capita kilocalorie threshold. The procedure has been applied in computing the official poverty statistics in Thailand and Laos (Table 1). In Laos where age-sex disaggregated calorie norms do not exist, Thai norms were borrowed (Kakwani, et al, 2001). The latter, however, do not include norms for the under one year (infants) segment of the population, the effect of which is to increase the average calorie requirement.

There is however, another way of looking at the calorie threshold, namely, as a weighted average of the age-sex disaggregated calorie norms, with the corresponding age-sex distribution of the population from the census as weights. The computations for the Philippines using the 1980, 1990 and 1995 census counts are shown in Annex 2, which gave 1940, 1960, and 1970 kilo calories (kcal) respectively (rounded to the nearest 10). The values are inching slowly towards 2000 kcal due to a slowly aging population. A similar computation for Indonesia in the 1980s gave an average of 2,049 kcal, which was the basis for the 2100 kcal threshold that is in use until today (Abuzar and Virola, 1993). Thus, when viewed as a weighted average, with sampling error-free census counts as weights, assumptions that the Philippine procedure (and others like Indonesia's) assigns the same calories to all individuals regardless of age or sex emerge as *not entirely accurate.*

Table 1 shows the calorie thresholds corresponding to the fpls in some East Asian developing countries. In round numbers, these range from 1980 to 2100. All use 2100 kcal except Malaysia and the Philippines. These include temperate countries China and Mongolia, where the prevailing opinion is that people require higher calorie intakes than in tropical countries. Indeed, the recommendation from China's Center for Preventative Medicine is an average of 2400 kcal/capita/day; however, when measuring poverty, the recommendation is reduced to 2100 kcal. Similarly, Mongolia's Food Research Institute in the Ministry of Health and Social Welfare, provides detailed "physiological needs for food and nutrition" that range from 2200 – 3200 kcal for adult females and 3000 – 4300 kcal for adult females depending on whether the person is engaged in white collar or blue collar work; however, for determining the fpl, 2100 kcal is adopted which is based on a reference population that occupies the lowest three deciles in the consumption distribution. *These raise the possibility that the countries could improve the comparability of their fpls by agreeing on a common energy threshold; or, if they continue to use different thresholds for their individual needs, they could agree to do additional computations based on a single threshold, e.g. 2100 kcal*.

<u>More stringent requirements for the energy threshold.</u>

In constructing fpls, most countries in this workshop set a minimum food intake expressed solely in terms of kilocalories. The assumption is that if an individual's food intake fulfills his or her calorie requirements, then his/her protein, vitamins and other nutritional requirements are automatically satisfied as well. The Philippine official methodology differs from this norm by specifying not only calories, but proteins and minerals as well. The food intake corresponding to

the food poverty line should meet 100% of the RDAs for energy and protein and 80% of the RDAs for vitamins, minerals and other nutrients.[4] It is not difficult to imagine that these stricter requirements could result in higher poverty incidence estimates relative to other countries in similar circumstances. This assertion has not been verified or disproved empirically.

Table 1. Calorie Thresholds Corresponding to the Food Poverty Lines in Some East Asian Countries

| Country | Kilo calories per day per person | Remarks |
|---|---|---|
| Cambodia | 2100 | Source: National Institute of Statistics (personal communication). |
| China, People's Republic of | 2100 | A compromise between 1800 international recommendation and 2400 Center for Preventive Medicine recommendation (Source: Wang Xingqui et. al., 2000) |
| Indonesia | 2100 | Food poverty line is rupiahs needed to consume total of 2100 kcal from 52 food items on first two individuals in the deciles of population distribution by expenditure (Source: Said and Widyanto, 2001) |
| Laos | 1983; changed to 2100 after year 2000 | Initially borrowed Thailand's recommended calorie norms and applied these to the households in the recent Living Standards Survey ( Kakwani et. al., 2001); current figure from personal communication with Director B. Sisouphantong, State Statistics Center). |
| Malaysia | 1982 | The minimum expenditure for food is based on a daily 9910 kilocalories for a family of five (Source: Rahman and Hasan, 2001) |
| Mongolia | 2100 | Determined from the consumption of 18 food items by the lowest 30% of households (Source: NSO Poverty Report 1998) |
| Philippines | 2000 | Low cost menus that satisfy the 100% RDA for energy and protein and 80% of the other nutrients are used to determine the food poverty line. |
| Thailand | 2100 | Obtained as an average of the recommended age-sex disaggregated calorie norms applied to every |

[4] The rationale for the additional nutrient thresholds is that the Filipino diet is thought to be less varied than other Asians' (e.g. less variety in terms of fruits and vegetables), so that adequate calorie intake (mainly from rice and root crops) does not guarantee adequate intake of the other essential nutrients.

| | | |
|---|---|---|
| | | household in the sample. The threshold becomes a random variable that varies with the sample. (NESDB, 1998) |
| Vietnam | 2100 | Source: Nguyen van Tien, 2001 |

## 3. Estimating the Total Poverty Line (tpl)

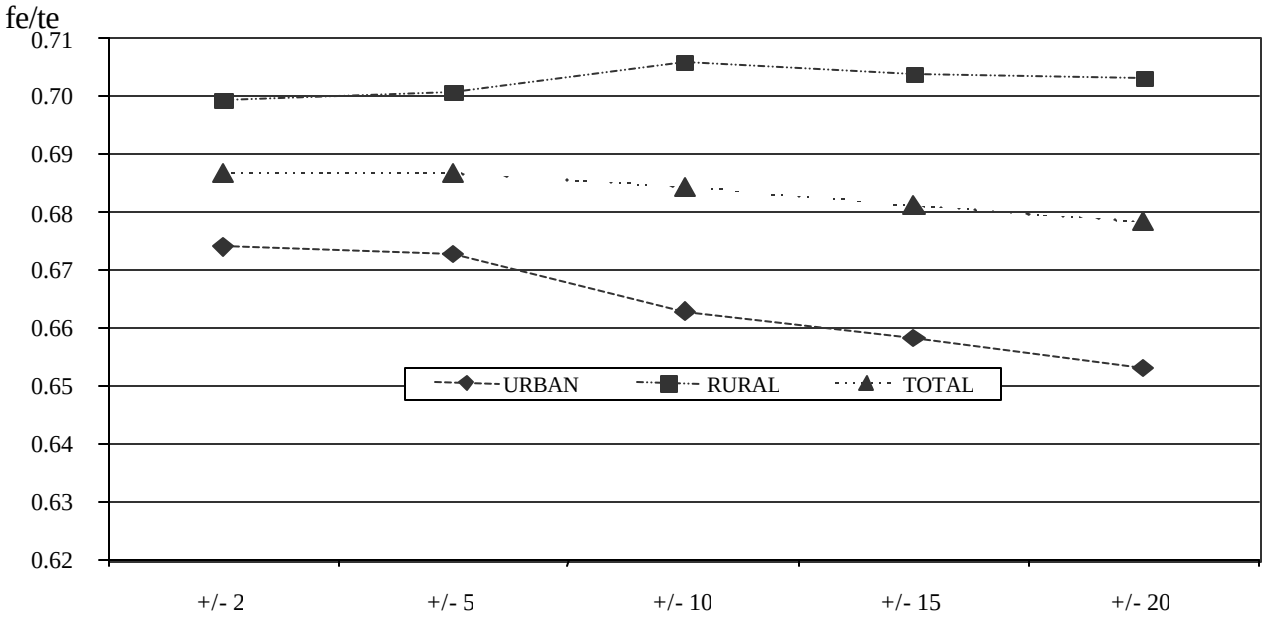
Indirect estimation of the non-food component.

The critical importance of an accurate food poverty line (fpl) derives from the fact that most countries in this workshop compute the total poverty line (tpl) as a non-linear function of the former, i.e. tpl = fpl / (fe/te), with fe and te as food and total expenditures respectively of a reference population. The ratio fe/te is popularly known as Engel coefficient. An overstated fpl, which could be the case in the Philippines, will lead to an inflated tpl, hence much higher poverty indicators. It may be pointed out also that a non-linear tpl that involves a stochastic denominator between (0,1) will tend to jump up and down much more than a linear tpl; i.e. tpl = fpl + non-food component.

Estimation and reference population for fe/te

The reference population is more or less agreed to be the households whose incomes or expenditures are "close" to the fpl. Ravallion bases the fe/te on households whose total income or expenditure equals fpl. The assumption is that households who have just enough income for food will have to buy non-food items also, and those that they decide to buy must be essential. Since you cannot make two things exactly equal, two approaches are used. One is to regress the household's share of spending on food to the log (te/fe) using ordinary least squares with intercept a. Since log (te/fe) = 0 when te=fe, the intercept a is the Engel coefficient. This approach is used in Mongolia. Balisacan (op cit.) used it with Philippines data. Nobody, however, has suggested what to do if the fit is not good.

Figure 1. Ratio of Food Expenditures to Total Expenditures, 1994



Another approach is as what the Philippines does officially: compute fe/te from the families with incomes in the 10 % band around fpl; Laos does the same and uses the same 10% band but based on expenditure, not income. Why 10% and not another? To search for an answer and remove some of the arbitrariness in the choice of a band, fe/te is computed for values of the band in the 2% to 20% range, with the results in 1994 shown in Figure 1. There is little difference in the results between 2% and 5%; but there is a noticeable change as the band is increased to 10%. As the band is increased further, fe/te declines much faster in the urban domain, whereas it remains stable in the rural domain. Recalling that Ravallion's idea coincides with the band at zero on the one hand, while the number of sample families inside the band increases with the band width on the other hand, the results in Figure 1 support a recommendation of a band at around 5 %.

Just like with the energy threshold where we raised in the previous section the likelihood that countries would in future agree to compute fpl using a common threshold, e.g. 2100 kcal, the same could be suggested with the fe/te ratio; e.g. 2/3, which in addition to being somewhere in the midst of the countries' values (Table 2), also has a nice ring to it. *The idea of a common fe/te is appealing if: we can get around to accepting that regionally (internationally) comparable absolute poverty incidence estimates are desirable and there is a simpler way of producing them; that absolute poverty as a concept may be defined in terms of a more or less uniform standard of living across developing countries; and that standard of living corresponds to that segment of the population that spends 2/3 of its income on food.*

Table 2. Explicit or Implicit Engel Coefficients in Some East Asian Developing Countries

| Country | fe/te | Remarks |
|---|---|---|
| Cambodia | 0.75-0.79 | Source: San Sythan (2001). |
| China, People's Republic of | 0.60 until 1994; 0.83 since 1995 | For rural poverty only. It was said that the value was chosen because it was comparable to that used by other countries and that it was derived from the 1984 Survey of Rural Households (Wang, 2000). |
| Indonesia | 0.90; 0.70 – 0.75 | Up to the early 1990, when the cost of a prescribed list of non-food items was simply added to fpl, the implicit Engel Coefficient was 0.90 (Asra and Virola, 1993). Using regression, Said and Widyanti, 2001) arrived at fe/te in the 0.70-0.75 range. |
| Lao PDR | 0.80 | Observed fe/te from the sample households in the 1998 Living Standards Measurement Survey (LSMS) whose total expenditures were within ± 10% of the food poverty line (Kakwani, et. al., 2001). |

| | | |
|---|---|---|
| Mongolia | 0.67 – 0.74 | Range of fe/te among six regions, obtained as regression equation intercept fitted to the 1998 LSMS sample (Mongolia, 1998 Poverty Report) |
| Philippines | 0.65 – 0.71 | Range of 1985-1997 fe/te values obtained from sample households with total income within ± 10% of fpl (NSCB, 2000) |
| Thailand | 0.60 | Based on an assumption that poor people (in Bangkok) spend 60% of their income in food. The ratios for other regions are price-adjusted around the Bangkok base ratio. (DED-NESDB) |
| Viet Nam | 0.72 | Computed from Table 1.1, Vietnam Development Report 2000. |

## 4. Locating the Poverty Line in the Per Capita Income Distribution

Income vs. Expenditure Distribution

The Philippines belongs to the minority of countries that use income instead of expenditure as the metric for compiling poverty statistics. (China belongs to this group also.) Conceptual and theoretical arguments for and against the two metrics abound in the literature; e.g. borrowings and transfers which offer added opportunities for consumption (expenditure) are not part of the usual operational definition of income, so that expenditure is a broader measure of welfare and is more able to reflect consumption smoothing which might lead to more meaningful and stable poverty statistics. From a practical standpoint, it has been argued that expenditure can be more accurately measured and cheaper to obtain (from surveys); e.g., a year of income data obtained over a number of visits would normally be needed, while a week for certain expenditure items like food, a month for semi-expendable items, and a longer recall period for durable items but obtained in one visit may suffice for expenditure. Thus, on the face of things, it looks like expenditure has it. However, it has been pointed out that the Philippines' FIES questionnaire is 70 pages long, 42 of which are on expenditure and only 12 are on income, so that cost comparisons may be more complicated than they seem (Virola et. al., 2000). The difficulty in getting at the income of the very rich has much to do with the perception that income survey data are less accurate than expenditure data. On the other hand, salaried and other fixed income workers can more accurately tally their total incomes than their expenditures. Moreover, the poverty line can be estimated from families in the bottom portion (say 50%) of the income distribution. There is little if any empirical developing country research comparing the accuracy and costs of measuring income and expenditure in this bottom half of the distribution.

There is also need for more empirical work comparing poverty statistics and profiles if, *ceteris paribus*, income is used as welfare measure on the one hand, and expenditure on the other hand. The problem is keeping other things equal. The latest proposals for shifting to expenditure by Balisacan (2001) and Kakwani (2001) both involved changing other aspects of the official methodology as well, so that attribution of the observed differences in the results to the various sources was not straightforward (Table 3). Both proposals yielded smaller poverty incidence estimates at the national level (Balisacan, 25%; Kakwani, 32%) compared with the official

estimate (37%). Kakwani, however, used a 1998 data set that is different from the 1997 FIES data set used by the other two. The rank correlation coefficients show greater disagreement in regional rankings between the official estimates and Balisacan's (0.39) than Kakwani's (0.60). The latter two show higher (0.74) but far from perfect concordance. A major source of the discordance is Eastern Visayas region which is ranked 10th in both the official and Kakwani results, but 15th or highest poverty incidence according to Balisacan's results.

Balisacan proposes an alternative which involves choosing a reference population, say the lower 30% of families in the consumption distribution determined nationally.[5] A single food bundle may be constructed based on the consumption of this reference population, one that allows some changes in food item availability and preferences among the domains. He also proposed other changes, including the computation of the Engel coefficient and arrived at a 25% poverty incidence for the country in 1997. The 12 percentage points difference from the official 37% incidence could pose a serious impediment to the proposal; hence further experimentation and fine tuning may be needed.

Table 3. Comparison of Estimates of Poverty Incidence (Rounded to Whole Numbers) by Region and Source, Philippines.

| | Official | | Balisacan | | Kakwani | |
|---|---|---|---|---|---|---|
| Region | (%) | Rank | (%) | Rank | (%) | Rank |
| ARMM | 62 | (15) | 50 | (14) | 49 | (15) |
| Bicol | 57 | (14) | 46 | (13) | 47 | (13) |
| Central Mindanao | 56 | (13) | 33 | (10) | 42 | (9) |
| Northern Mindanao | 53 | (12) | 30 | (8) | 43 | (11) |
| CAR | 50 | (11) | 22 | (6) | 34 | (6) |
| Eastern Visayas | 48 | (10) | 51 | (15) | 43 | (10) |
| Western Visayas | 46 | (9) | 22 | (5) | 37 | (7) |
| Western Mindanao | 46 | (8) | 35 | (11.5) | 48 | (14) |
| Southern Mindanao | 44 | (7) | 28 | (7) | 39 | (8) |
| Ilocos | 44 | (6) | 21 | (4) | 33 | (5) |
| Central Visayas | 39 | (5) | 35 | (11.5) | 46 | (12) |
| Cagayan Valley | 38 | (4) | 30 | (9) | 32 | (4) |
| Southern Tagalog | 30 | (3) | 20 | (3) | 21 | (3) |
| Central Luzon | 18 | (2) | 13 | (2) | 18 | (2) |
| NCR | 8 | (1) | 4 | (1) | 11 | (1) |
| Philippines | 37 | | 25 | | 32 | |

Per Capita Approach

[5] Note that these issues also extend to regional or international comparability of poverty lines. Just like regional or urban fpls within a country are not comparable if based on different reference populations (different standards of living), national fpls based on varying national reference populations will not be comparable. A reference population chosen regionally or internationally will improve comparability, but may be more difficult to sell to the countries.

The per capita approach in locating the poverty line in the income distribution may also cause the poverty statistics to be overestimated considering economies of scale, i.e. that an additional member of the family does not really cause an equal incremental increase in food requirements of the family and that poorer families are significantly bigger. The latter is reflected in the surprisingly large difference between the proportion of poor families (32%) and poor population (37%) in 1997.

## 5. Examining the Major Source of Data: Family Income and Expenditure Survey (FIES)

The FIES that NSO conducts every three years since 1985[6] is the major source of data for the Philippines' official poverty estimates. FIES collects data on family income and living expenses and related information affecting income and expenditure levels and patterns. Until 1994, the basic sampling design of FIES is stratified two-stage where the primary sampling units (psus) are the barangays (villages) and the ultimate sampling units (usus) are households. The usus have equal probability of selection within the domain[7] but usus have different selection probabilities in urban and rural areas. FIES was re-designed in 1997 to stratified multi-stage where an intermediate stage of selection is added when a barangay that is drawn has more than 300 households. The barangay is divided into enumeration areas and only one enumeration area is selected from the said barangay from which households will be selected (usus). The domains, however, remain the urban and rural areas of each province.

The choice of domains.

FIES is designed to produce separate estimates for cities, urban and rural domains in each province, urban and rural domains in each region, urban and rural at the national level, and country. The official poverty statistics released by the NSCB are regional and national estimates with urban and rural breakdowns only. One reason for this may be that the sampling errors of estimates for the smaller domains are too high. Pacificador et. al. (1996) investigated the coefficient of variation (CVs) of several indicators computed from the 1994 FIES, including the proportion of poor families for all three area levels -- urban and rural areas in provinces, for provinces and for urban and rural areas in the regions. Table 4 shows the distributions of the CVs for the proportion of poor families in these areas. Note that only 18% of these CVs fall within 10% in the province-urban/rural areas; the comparable proportions for the provinces and region-urban/rural areas are 28% and 78% respectively.

Table 4. Distribution of CVs for Proportion of Poor in Various Areas, 1994 FIES

| Range of CVs | Province-Urban/Rural | | Province | | Region-Urban/Rural | |
|---|---|---|---|---|---|---|
| | Frequency | % | Frequency | % | Frequency | % |
| < 5.00 | 2 | 1.1 | 1 | 1 | 4 | 14.8 |
| 5.01 - 10.00 | 30 | 16.9 | 27 | 27 | 17 | 63.0 |

[6] Similar surveys have been undertaken in 1957, 1961, 1965, 1971, 1975 and 1979.

[7] A domain is a statistical term denoting a part of the population for which separate estimates are planned in the sample design.

| | | | | | | |
|---|---|---|---|---|---|---|
| 10.01 - 15.00 | 40 | 22.5 | 27 | 27 | 5 | 18.5 |
| 15.01 - 20.00 | 24 | 13.5 | 16 | 16 | 1 | 3.7 |
| 20.01 - 25.00 | 13 | 7.3 | 7 | 7 | | |
| > 25.00 | 69 | 38.8 | 22 | 22 | | |
| TOTAL | 178 | | 100 | | 27 | |

Other researchers who undertook the computation of poverty incidences and sampling errors for the smaller areas obtained similar results. Barrios (1998), working on data of 20 cities (excluding National Capital Region or Metropolitan Manila) from the 1991 and 1994 FIES, reported CVs that ranged from 20% to 72%. These were from samples that ranged from 34 to 195 families. Albacea and Gironella (2001) reported provincial level CVs that ranged from 5 to 127 %. Subject to an accurate reading of the sampling designs of the FIES by these authors[8], it appears that these CVs were correctly calculated. If that were the case, such high CVs imply that making useful inferences regarding time-induced changes, as well as geographic differences in poverty incidence, is problematic.[9]

More recently, Balisacan (2001) reported CVs of the 1997 official poverty incidence estimates. Those for the 14 regions ranged from 1.9% to 4.5%; and that for Metro Manila was 6.6% on account of a much smaller poverty incidence estimate compared to the other regions. (The correctness of these estimates is also conditional upon accurate representation of the 1997 FIES sampling design, including the weights applied to the sampling units). The Metro Manila result is a reminder that as poverty incidences decline, the relative errors of the estimates become more difficult to control within acceptable levels. At the national-urban, national-rural and national levels, the cvs were 1.5%, 0.9% and 0.8%. Some implications of these error levels on statistical inference for monitoring and evaluation of poverty programs, as well as on the design and frequency of monitoring, have been discussed elsewhere (e.g. David, 2000). The results are useful also in designing the surveys.

Although NSO or NSCB have definite plans to release poverty estimates at the urban and rural areas of provinces from the 2000 FIES, the CVs of poverty statistics at the provincial-urban/rural level from the 1997 FIES have yet to be published. The change of domain of analysis to a smaller area may result in larger CVs as indicated in Table 4, although it is noted that the sample size at the national level have been increased from 25,516 households in 1994 to about 41,000 in 1997.

Different units of analysis and ultimate sampling units (usus).

FIES uses the family instead of the household as unit of analysis. The major reason given is that live-in helpers, such as baby sitters, maids and drivers who by operational definition are part of the household, are to be excluded in the (unit of) analysis. The resulting family is not necessarily the nuclear family, but still an extended family. Since not many poor families employ drivers

[8] This cannot be assumed as correct because of the lack of complete documentation on the sampling and operational procedures of even the most recent FIES.

[9] These results could be useful to other countries who are trying, or have plans, to produce poverty statistics down to their provinces, e.g. Cambodia, Thailand, Vietnam.

and live-in maids, it is assumed that the use of either household or family will have little effect on the resulting poverty statistics. Hence, the words family and household tend to be used interchangeably in poverty papers, including the official poverty reports (NSCB, 2000).

Actually, the Philippines' integrated household surveys (which include FIES, the Labor Force Surveys, National Demographic and Health Surveys, etc.) use the household as ultimate sampling units. In the FIES, sample household's returns (and in FIES only) the information on the relationship of the household members to the head is used to screen out non-family members, resulting in the family as unit of analysis. While this may not cause any appreciable effect on the poverty statistics as mentioned previously, it introduces inconsistencies with the labor force and other socio-demographic statistics that have not been seriously studied.

Reclassification of urban-rural areas.

The Philippines' definition of urban and rural areas dates back to 1970 and is applied to individual barangays (villages). Like many definitions, its urbanity criteria are a combination of population size, density and the presence of urban characteristics or amenities. While the definition has not been changed, it is applied to new village data after every population and housing census (except the special census of 1995). Thus, geographically, the urban-rural division of the country can and does change significantly. The new data are also used as sampling frame for household surveys, which is one main reason for doing censuses in the first place. The implication of changed survey designs, such as the use of urbanity to re-stratify, of population size as basis for unequal probability sampling, or of revising the sampling unit weights but not the units as in panel surveys, carry theoretical and practical difficulties that have not been given adequate research attention particularly when the object is to monitor change. Splitting and creating new sampling units (villages) add to the difficulties in survey design, estimation and preserving the comparability/consistency of statistics.

Under such circumstances, presenting statistics as time series broken down into urban and rural classes for years that span more than one census can be misleading. Table 5 provides a good illustration. Based on the 1980 and 1990 censuses, the total number of villages increased by 2.7% from 40.2 thousand to 41.3 thousand. However, the proportion of urban villages increased much more, by 32.5% or from 7.7 thousand to 10.2 thousand villages. The changes in urban and rural population counts will not be amenable to straightforward interpretation as these are confounded with the change in geographical coverage of urban and rural areas. The same goes with other statistics, including poverty statistics. The situation can lead to seemingly arithmetical paradoxes (Table 6). From 1988 to 1991, the official poverty statistics show that the national poverty incidence declined from 50% to 45%; on the other hand, both the urban and rural incidences increased from 34% to 36%, and 52% to 55%, respectively. This is possible only with a big shift in weights in favor of the urban area, coupled perhaps with the higher probability of less poor areas being reclassified from rural to urban.

Table 5. Population and Number of Barangays in 1980 and 1990.

| | 1980 | 1990 |
|---|---|---|
| Population (million) | 48.1 | 60.7 |
| Of which: Urban (million) | 18.0 | 29.4 |

| | | |
|---|---|---|
| Urban (%) | 37.5 | 48.5 |
| | | |
| Barangays (thousand) | 40.2 | 41.3 |
| Of which: Urban (thousand) | 7.7 | 10.2 |
| Urban (%) | 19.2 | 24.8 |

Table 6. Poverty Incidences, 1985 – 1997.

| | 1985 | 1988 | 1991 | 1994 | 1997 |
|---|---|---|---|---|---|
| Poverty Incidence (%) | 49 | 50 | 45 | 41 | 37 |
| Urban (%) | 38 | 34 | 36 | 28 | 22 |
| Rural (%) | 56 | 52 | 55 | 53 | 51 |

It is clear that the pre-1990 and post-1990 urban-rural statistics are not comparable and should not be interpreted as continuous series. Following past practice, villages most likely will be reclassified yet again based on the 2000 census. Urban-rural breakdowns from the 2000 FIES will be comparable to the 1991, 1994 and 1997 estimates only if the 1980 census-based classifications are used. Producing a continuous and consistent series from 1985 (the first year that official poverty statistics were released) will require reprocessing of the FIES surveys based on a constant urban-rural geographic classification and with the estimation procedure taking correctly into account the differences in the sampling designs of the different surveys. This would be possible only if the survey databases are available in user-friendly format and the sampling designs of the surveys have been accurately and comprehensively documented.

Similarly, future redesign of the system of household surveys (which include FIES) should take into consideration: (a) the advantages of stratifying based on stable geographic criteria; (b) addressing the need for (non-stable) domain estimates at the estimation stage rather than at the sampling design stage, e.g. post-stratification, dummy variables, ratio- or regression-type estimators; (c) the design criteria should be strongly oriented towards the monitoring and evaluation functions of the surveys, i.e. estimating change instead of point parameters, composite estimators that make use of the combined datasets from the previous and current surveys instead of the current survey only; and (d) the advantages of replicated sampling as a simplifying procedure, especially the replacement of sampling units and of the estimation method.

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NCR: Food Menu, 1997

| FOOD MENU | FOOD ITEMS | Approx. Weight Required (Grams) |
|---|---|---|
| Breakfast: | Rice, White, ordinary | 350 |
| | Pandesal (salt bread in small loaves) | 50 |
| Tomato Omelet | Sugar, white | 15 |
| Fried Rice | Margarine | 5 |
| Coffee-Adults | Cooking Oil | 20 |
| Milk-Children | Milk, filled, evaporated | 33 |
| | Egg, Chicken | 23 |
| | Small shrimps | 15 |
| Lunch: | Galunggong (Decapterus specie) | 49 |
| | Pork, liver | 5 |
| Fried Galunggong | Pork, liempo (barbecued hunk of pork) | 15 |
| Munggo Guisado with small shrimp and malunggay leaves | Munggo (mung beans), green | 10 |
| | Tomatoes | 30 |
| Boiled Rice | Petsay (Chinese cabbage) , native | 32 |
| Banana, Latundan | Malunggay (Moringa oleifera), leaves | 18 |
| | Banana, latundan (sweet, small banana) | 68 |
| | Vinegar, coconut | 5 |
| Supper: | Onion | 6 |
| | Garlic | 1 |
| Pork Adobo | Toyo (Soy Sauce) | 5 |
| Pechay Guisado (sauted) | Salt | 6 |
| Boiled Rice | Coffee, soluble | 1 |

**CORDILLERA AUTONOMOUS REGION (CAR), FOOD MENU, 1997**

| URBAN | | | RURAL | | |
|---|---|---|---|---|---|
| FOOD MENU | FOOD ITEMS | Approx. Weight Required (Grams) | FOOD MENU | FOOD ITEMS | Approx. Weight Required (Grams) |
| Breakfast: | Rice, White, ordinary | 360 | Breakfast: | Rice, White, ordinary | 360 |
| | Pandesal (salt bread in small loaves) | 30 | | Kamote (sweet potato), Yellow | 125 |
| Eggplant Omelet | Sugar, white | 20 | Boiled eggplant with Bagoong | Sugar, brown | 20 |
| Fried Rice | Cooking Oil | 18 | Tomato slices | Cooking Oil | 20 |
| Coffee-Adults | Margarine | 8 | Boiled Rice | Margarine | 5 |
| Milk-Children | Egg, Chicken | 17 | Coffee-Adults | Milk, filled, evap. | 33 |
| | Milk, filled, evap. | 33 | Milk-Children | Bangus (milkfish) | 37 |
| | Galunggong (Decapterus specie) | 49 | | Galunggong (Decapterus specie) | 61 |
| Lunch: | Small shrimps | 10 | Lunch: | Bagoong (wet-salted tiny fish), isda (fish) | 15 |
| | Pork, liver | 15 | | Pork, liver | 15 |
| Igado | Pork, liempo (hunk of pork) | 20 | Fried Bangus | Munggo (mung beans), green | 15 |
| Boiled Rice | Munggo (mung beans), green | 15 | Pinakbet (vegetable dish) | Tomatoes | 20 |
| Ripe Papaya | Tomatoes | 30 | Boiled Rice | Malunggay (Moringa oleifera), leaves | 9 |
| | Papaya ripe | 78 | | Squash, fruit | 28 |
| | Eggplant | 22 | | Banana, bungulan | 75 |
| | Malunggay (Moringa oleifera), leaves | 9 | | Sitaw (variety of string beans) | 22 |
| Supper: | | | Supper: | | |
| | Vinegar, coconut | 10 | | Ampalaya (bitter gourd) | 18 |
| Fried Galunggong | Onion | 5 | Fried Galunggong | Eggplant | 33 |
| Munggo Guisado with small | Garlic | 1 | Munggo Guisado with pork liver | Onion | 5 |
| shrimp and malunggay leaves | Salt | 5 | Boiled Rice | Garlic | 1 |
| Boiled Rice | Coffee, soluble | 1 | Banana | Salt | 5 |
| | | | | Coffee, soluble | 1 |
| Snack: | | | Snack: | | |
| Pandesal | | | Boiled Yellow Kamote | | |
| Margarine | | | Margarine | | |

Total Calorie Threshold by Age-Sex Distribution, 1980.

| Age Group (1) | Total (2) (000) | Male (M) (3) (000) | Female (F) (4) (000) | Kcal,M (5) | (5)*(3) Total (3) | Kcal,F (7) | (7)*(4) Total (4) | (7)*(4)+(5)*(3) Total (2) |
|---|---|---|---|---|---|---|---|---|
| under 1 year | 1,742.9 | 894.0 | 848.9 | 700 | 25.94 | 700 | 24.79 | 25.37 |
| 1-3 | 4,507.6 | 2,313.1 | 2,194.5 | 1350 | 129.42 | 1350 | 123.60 | 126.52 |
| 4-6 | 4,095.4 | 2,103.1 | 1,992.3 | 1600 | 139.46 | 1600 | 132.99 | 136.23 |
| 7-9 | 3,925.7 | 2,019.3 | 1,906.4 | 1725 | 144.36 | 1725 | 137.20 | 140.79 |
| 10-12 | 3,720.6 | 1,909.9 | 1,810.7 | 2090 | 165.43 | 1930 | 145.80 | 155.64 |
| 13-15 | 3,353.0 | 1,687.7 | 1,665.3 | 2390 | 167.17 | 2010 | 139.64 | 153.45 |
| 16-19 | 4,132.0 | 2,005.3 | 2,126.7 | 2580 | 214.42 | 2020 | 179.22 | 196.88 |
| 20-39 | 13,860.1 | 6,877.6 | 6,982.5 | 2570 | 732.55 | 1900 | 553.48 | 643.31 |
| 40-49 | 3,738.0 | 1,871.2 | 1,866.8 | 2440 | 189.23 | 1800 | 140.18 | 164.79 |
| 50-59 | 2,481.3 | 1,211.5 | 1,269.8 | 2320 | 116.49 | 1710 | 90.59 | 103.58 |
| 60-69 | 1,623.8 | 790.3 | 833.5 | 2090 | 68.45 | 1540 | 53.55 | 61.03 |
| 70 and over | 918.0 | 445.8 | 472.2 | 1880 | 34.73 | 1390 | 27.38 | 31.07 |
| All ages | 48,098.5 | 24,128.8 | 23,969.7 | | 2,127.64 | | 1,748.43 | 1,938.66 |

Total Calorie Threshold by Age-Sex Distribution, 1990

| Age Groups (1) | Total (2) ('000) | Male (M) (3) ('000) | Female (F) (4) ('000) | Kcal,M (5) | (5)*(3) Total (3) | Kcal, F (7) | (7)*(4) Total (4) | (7)*(4)+(5)*(3) Total (2) |
|---|---|---|---|---|---|---|---|---|
| under 1 year | 1817.2 | 929.6 | 887.6 | 700 | 21.38 | 700 | 20.63 | 21.00 |
| 1-3 | 5028.6 | 2584.5 | 2444.1 | 1350 | 114.61 | 1350 | 109.56 | 112.10 |
| 4-6 | 4847.7 | 2481.2 | 2366.5 | 1600 | 130.41 | 1600 | 125.73 | 128.08 |
| 7-9 | 4834.1 | 2472.1 | 2362.0 | 1725 | 140.08 | 1725 | 135.29 | 137.70 |
| 10-12 | 4647.7 | 2378.4 | 2269.3 | 2090 | 163.28 | 1930 | 145.43 | 154.40 |
| 13-15 | 4193.8 | 2115.4 | 2078.4 | 2390 | 166.07 | 2010 | 138.72 | 152.47 |
| 16-19 | 5264.4 | 2626.0 | 2638.4 | 2580 | 222.55 | 2020 | 176.97 | 199.88 |
| 20-39 | 17714.7 | 9203.8 | 8510.9 | 2570 | 776.99 | 1900 | 536.95 | 657.61 |
| 40-49 | 4974.8 | 2502.7 | 2472.1 | 2440 | 200.59 | 1800 | 147.75 | 174.32 |
| 50-59 | 3344.9 | 1650.0 | 1694.9 | 2320 | 125.74 | 1710 | 96.24 | 111.07 |
| 60-69 | 1934.8 | 923.5 | 1011.3 | 2090 | 63.40 | 1540 | 51.71 | 57.59 |
| 70 and over | 1956.3 | 575.8 | 1380.5 | 1880 | 35.56 | 1390 | 63.72 | 49.56 |
| All ages (Total) | 60,559 | 30,443 | 30,116 | | 2,160.65 | | 1,748.69 | 1,955.79 |

Table 3. Total Calorie Threshold by Age-Sex Distribution, 1995

| Age Groups (1) | Total (2) (000) | Male (M) (3) (000) | Female (F) (4) (000) | Kcal,M (5) | (5)*(3) Total (3) | Kcal, F (7) | (7)*(4) Total (4) | (7)*(4)+(5)*(3) Total (2) |
|---|---|---|---|---|---|---|---|---|
| under 1 year | 1878.3 | 970.0 | 908.3 | 700 | 19.63 | 700 | 18.68 | 19.16 |
| 1-3 | 5572.3 | 2873.6 | 2698.7 | 1350 | 112.17 | 1350 | 107.05 | 109.63 |
| 4-6 | 5597.2 | 2877.9 | 2719.3 | 1600 | 133.14 | 1600 | 127.85 | 130.52 |
| 7-9 | 5207.4 | 2671.9 | 2535.5 | 1725 | 133.27 | 1725 | 128.52 | 130.91 |
| 10-12 | 4883.4 | 2491.5 | 2391.9 | 2090 | 150.57 | 1930 | 135.65 | 143.17 |
| 13-15 | 4816.6 | 2428.6 | 2388.0 | 2390 | 167.83 | 2010 | 141.04 | 154.54 |
| 16-19 | 5805.5 | 2887.7 | 2917.8 | 2580 | 215.43 | 2020 | 173.19 | 194.48 |
| 20-39 | 21201.7 | 10648.6 | 10553.1 | 2570 | 791.32 | 1900 | 589.18 | 691.06 |
| 40-49 | 6136.7 | 3114.1 | 3022.6 | 2440 | 219.71 | 1800 | 159.87 | 190.03 |
| 50-59 | 3778.0 | 1876.5 | 1901.5 | 2320 | 125.88 | 1710 | 95.54 | 110.83 |
| 60-69 | 2277.5 | 1090.0 | 1187.5 | 2090 | 65.87 | 1540 | 53.74 | 59.85 |
| 70 and over | 1461.4 | 653.6 | 807.8 | 1880 | 35.53 | 1390 | 32.99 | 34.27 |
| All ages | 68,616 | 34,584 | 34,032 | | 2,170.35 | | 1,763.30 | 1,968.46 |