

FOOD NEEDS AND ABSOLUTE POVERTY IN URBAN SOUTH AMERICA

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The minimum cost of an adequate diet, following food preferences, is estimated for families in ten South American cities in five countries, allowing for household composition by age and sex. The ratio of actual expenditure on food and beverages to this normative expenditure is then used to rank families in six classes, of which the bottom two correspond to absolute poverty, or to actual expenditure less than the estimated minimum. Three questions can then be explored: which families appear to be poor, on this measure? how do such families allocate their spending toward other items such as housing? and, does this indicator of poverty classify families in much the same way as other proposed measures? The results suggest some under-reporting of food spending in the poorest class, but otherwise the ratio of reported to normative spending gives good results, free from the errors in other parts of the budget and the arbitrariness of indicators which depend on socially-defined rather than physiological "needs." Poor families tend to be large, with many children; to have many dependents per income recipient; to have male working members other than the head; to suffer unemployment of members other than the head; to have relatively low levels of schooling; and to show high density in housing. Even quite poor households spend appreciable amounts on housing and on education, while not satisfying all food needs; both kinds of spending increase rapidly as food requirements are met. There are no consistent relations between poverty and type of employment or the share of income attributed to the head. The data refer to 1966-69 and are highly comparable; all monetary estimates are in dollars of equal purchasing power.

Economic development policy is increasingly focussed on efforts to help poor people directly, rather than counting on their participation in the benefits from economic growth generally. Within this orientation, "the poor" are more and more defined in absolute terms, by reference to some norms of minimum consumption or "basic needs", rather than in the relative terms of their position in the distribution of income or other welfare indicators. The norm(s) of consumption define a poverty line, below which all households and individuals are absolutely poor, and the latter are the target or intended beneficiaries of development.

If a set of norms or needs is defined in physical terms as a vector (m_1, \dots, m_n) of quantities consumed, a poverty line can in principle be drawn to include only consumers who fail to reach one or more norms. In practice this approach is seldom used, because some norms are very difficult to define, and all may be difficult to observe empirically. A poverty line is often drawn, therefore, in financial terms: a consuming unit is poor if its spending is inadequate to buy the vector of needs at prices (p_1, \dots, p_n) or $C < \sum_i p_i m_i$, where C is total spending or spending on those categories for which norms are defined.

A simplification of this approach is to consider only the norms for food intake, which are the easiest to define. Since these are defined in terms of specific nutrients, whereas consumers buy foods each of which may contain some of several nutrients, it is necessary to construct a basic or least-cost diet which will meet all the nutritional requirements: its cost is then C^* . A consuming unit can

be considered poor on the basis of its expenditure on food relative to the norm, or if observed spending $C_f \leq C_f^*$. Alternatively, a relation can be estimated between C_f and total spending (or income) C , from which C^* is the level at which actual C_f should equal the norm C_f^* . The ratio C^*/C_f^* is applied to any estimate of food expenditure needs to define the corresponding poverty line: it may or may not happen that $C^* - C_f^*$ equals the cost of the nonfood minima, if these can be defined. Since the relation $C_f(C)$ is stochastic rather than exact, the criteria $C_f \leq C_f^*$ and $C \leq C^*$ will also not coincide exactly. And, of course, a household may not be poor on either criterion and yet, because of inefficient consumption, fail to reach one or more norms. Alternatively, it may satisfy all its needs even if it is poor, provided its spending pattern is more efficient than that contemplated in the basic diet.

Defining poverty by reference to the cost of an adequate diet raises at least three sorts of questions. First, which households appear to be poor by this test?—that is, what are their typical characteristics? Second, how do such households behave?—that is, how do they allocate their spending, on both food and nonfood necessities? Third, how well does food expenditure relative to the norm serve to classify families?—that is, how does it compare with other measures of poverty? This is a methodological rather than a substantive question, but on the answer to it depends the validity and usefulness of the substantive answers. This paper attempts to answer these questions, relying to some extent on theoretical considerations but drawing primarily on a body of household budget data collected in ten South American cities between 1966 and 1969.

1. LEVEL AND DISTRIBUTION OF ABSOLUTE POVERTY

The empirical investigation of absolute poverty which follows begins with two unpublished papers by Arellano (1975, 1977). He estimates the cost of a minimally adequate diet for each of six types of individual, in each of the five countries represented, using FAO and WHO recommendations for the diet as well as a diet developed by the Chilean National Health Service; the diet varies somewhat among countries to accommodate actual consumer behavior and so is not strictly minimum-cost but rather the cheapest diet consumers could buy with little or no change in their habits. The prices of the different foodstuffs are taken from the ECIEL study of prices and purchasing power described by Salazar-Carrillo (1978). The household budget and descriptive data come from the ECIEL study of household income and consumption described in my book (1978). Since the survey data refer to slightly different dates than the price data, adjustments are made using an overall price index, assuming no changes in relative prices. In the results reported here, but not in Arellano's papers, there is a further adjustment among the trimesters of the survey year in all cities except Caracas, where the data were collected during only one month.

The relative costs of the minimum diet are shown for five types of individual in each country in Table 1. The price data refer to countries rather than individual cities, and a sixth type of individual—pregnant or nursing women—cannot be readily identified in the household survey data. Two features of these costs deserve attention. One is that even very young children cost two-thirds as much to feed

TABLE 1
RELATIVE COST OF MINIMUM DIET, BY TYPE OF FAMILY MEMBER AND COUNTRY
(ADULT MALE 18 YRS. OR OLDER = 1.00)

| Type of Member | Colombia | Chile | Ecuador | Peru | Venezuela |
|--|----------|-------|---------|------|-----------|
| Infant (2 yrs or less) | 0.63 | 0.70 | 0.87 | 0.75 | 0.70 |
| Child (3-5 yrs) | 0.70 | 0.75 | 0.82 | 0.78 | 0.74 |
| Child (6-12 yrs) | 0.91 | 0.95 | 1.00 | 0.96 | 0.94 |
| Adolescent (13-17 yrs) | 1.05 | 1.07 | 1.09 | 1.08 | 1.07 |
| Adult Female (18 yrs or older) | 0.88 | 0.88 | 0.90 | 0.91 | 0.90 |
| Relative price of milk compared to all foods (Colombia = 1.00) | | 1.02 | 1.74 | 1.08 | 1.30 |

adequately as adults. The other is that the relative cost of infants and young children varies considerably among countries, whereas the relative costs of older children and adult females vary little. Both results may be associated with the variation in the relative price of milk among countries (obtained from unpublished tabulations provided by Salazar-Carrillo), since milk is a major element in the proposed diet (Arellano, 1975, Anexo 1). This illustrates the fact that the diet is close to actual consumer buying patterns; in a true cost minimum, breast-feeding would undoubtedly replace purchased milk for infants, at a considerable saving to the family (Berg, 1973).

Table 2 shows the average cost per person per day, in 1968 U.S. cents of equal purchasing power. These are derived from estimates in national currency via parity exchange rates (Musgrove, 1978, pp. 27-31). For comparison, the table also shows cost estimates derived by Altimir (1982), using 1970 purchasing power parity rates. The two estimates are nearly identical in Chile and Venezuela, and higher in 1968 for the other three countries.

TABLE 2
AVERAGE COST OF MINIMUM DIET (OVER ALL TYPES OF FAMILY MEMBERS) BY COUNTRY (U.S. CENTS PER DAY)

| | Colombia | Chile | Ecuador | Peru | Venezuela |
|---|----------|-------|---------|------|-----------|
| Arellano's estimate, at 1968 purchasing-power-parity (1975) | 51 | 36 | 58 | 39 | 48 |
| Altimir's (1982; Table 21, Part II) estimate at 1970 purchasing-power-parity. (Metropolitan areas in Chile and Perú; urban averages in Colombia, Ecuador and Venezuela) | 40 | 37 | 40 | 31 | 45 |
| Ratio of estimates | 1.28 | 0.98 | 1.45 | 1.25 | 1.08 |

The range of dollar costs is fairly small, from 36 cents per person per day in Chile to 58 cents per person per day in Ecuador. Differences among countries in average family composition account for little if any of the variation, since

children, who are somewhat cheaper to feed than adults, are relatively least numerous in Chile and most numerous in Colombia and Ecuador.

For each household surveyed in each of the ten cities, the cost of the minimum diet is computed taking account of the family's age and sex composition. Actual food expenditures (including spending on alcoholic beverages and on meals away from home, items excluded from the minimum diet) are then expressed as a percentage of this norm, and that percentage or relative food expenditure defines the family's absolute poverty status. Home-produced food and gifts of food are, so far as possible, valued at market prices and included in actual expenditure. Table 3 shows the distribution of the sample observations, and of the number of families and of individuals in the population, among five levels of food expenditure. The first two classes, where spending is below the norm, constitute those in absolute poverty. The top class, in which there are very few observations in any city except Santiago, consists of households so far from poverty that they are not considered in most of what follows. The fourth class, where spending ranges from 1.5 to 5 times the norm, includes most families who can be safely assumed to be eating an adequate diet, although the next lower class will also be assumed not to be in absolute poverty.

Table 3 shows slightly more than half of all families in absolute poverty in the poorest cities, Quito and Guayaquil, and only about one fifth of families in Barranquilla, Lima and Caracas. Except for Barranquilla, the pattern among cities within a country matches that of relative real income levels (Table 8, below, and Musgrove, 1978, Table 2-3). The share of people in poverty is always higher than that of families. Only 29 observations are found in the lowest class in the

TABLE 3
DISTRIBUTIONS OF SAMPLE AND OF POPULATION BY FOOD EXPENDITURE RELATIVE TO NORM,
BY CITY. (NUMBER OF OBSERVATIONS AND PERCENTAGE SHARES)

| | Food Expenditure as a Percentage of Norm | | | | | Share in Absolute Poverty 0-100 |
|--------------------------------------|--|-------|---------|---------|------|--|
| | 0-64 | 65-99 | 100-149 | 150-499 | ≥500 | |
| Bogota: | | | | | | |
| Sample observations | 85 | 110 | 199 | 342 | 53 | 204 |
| Share of population (families) | 11.8 | 17.0 | 27.5 | 39.1 | 4.6 | 28.9 |
| Share of population (individuals) | 16.0 | 19.3 | 27.3 | 33.8 | 3.6 | 35.3 |
| Barranquilla: | | | | | | |
| Sample observations | 37 | 64 | 168 | 417 | 41 | 111 |
| Share of population (families) | 7.1 | 10.9 | 28.2 | 50.4 | 3.4 | 18.0 |
| Share of population (individuals) | 10.2 | 12.4 | 30.1 | 44.4 | 3.0 | 22.6 |
| Cali: | | | | | | |
| Sample observations | 50 | 89 | 123 | 326 | 48 | 139 |
| Share of population (families) | 11.1 | 19.2 | 22.7 | 43.2 | 3.9 | 30.3 |
| Share of population (individuals) | 14.4 | 22.9 | 22.1 | 37.2 | 3.3 | 37.3 |

TABLE 3 cont.

| | Food Expenditure as a Percentage of Norm | | | | | Share in Absolute Poverty 0-100 |
|--------------------------------------|--|-------|---------|---------|-------|--|
| | 0-64 | 65-99 | 100-149 | 150-499 | ≥ 500 | |
| Medellin: | | | | | | |
| Sample observations | 134 | 142 | 143 | 324 | 45 | 276 |
| Share of population (families) | 24.3 | 21.1 | 19.7 | 32.4 | 2.6 | 45.4 |
| Share of population (individuals) | 32.8 | 23.0 | 17.1 | 25.4 | 1.6 | 61.8 |
| Santiago: | | | | | | |
| Sample observations | 231 | 427 | 698 | 1,737 | 284 | 658 |
| Share of population (families) | 8.9 | 16.6 | 24.8 | 45.4 | 4.3 | 25.5 |
| Share of population (individuals) | 13.0 | 20.9 | 26.6 | 37.3 | 2.1 | 33.9 |
| Quito: | | | | | | |
| Sample observations | 241 | 186 | 188 | 302 | 12 | 427 |
| Share of population (families) | 31.0 | 25.5 | 20.3 | 23.0 | 0.3 | 56.4 |
| Share of population (individuals) | 40.2 | 25.5 | 18.5 | 15.7 | 0.1 | 65.7 |
| Guayaquil: | | | | | | |
| Sample observations | 226 | 244 | 253 | 322 | 10 | 470 |
| Share of population (families) | 25.8 | 26.7 | 23.1 | 24.0 | 0.4 | 52.5 |
| Share of population (individuals) | 32.8 | 29.5 | 19.5 | 18.0 | 0.3 | 62.3 |
| Lima: | | | | | | |
| Sample observations | 29 | 131 | 301 | 775 | 58 | 160 |
| Share of population (families) | 3.9 | 16.2 | 31.7 | 46.1 | 2.2 | 20.1 |
| Share of population (individuals) | 4.5 | 20.3 | 34.2 | 39.5 | 1.1 | 24.8 |
| Caracas: | | | | | | |
| Sample observations | 59 | 107 | 203 | 536 | 22 | 166 |
| Share of population (families) | 6.4 | 11.6 | 21.8 | 57.7 | 2.4 | 18.1 |
| Share of population (individuals) | 9.9 | 16.6 | 25.0 | 47.1 | 1.4 | 26.5 |
| Maracaibo: | | | | | | |
| Sample observations | 152 | 230 | 337 | 444 | 10 | 382 |
| Share of population (families) | 11.9 | 19.3 | 28.9 | 39.1 | 0.8 | 31.1 |
| Share of population (individuals) | 13.5 | 21.9 | 31.1 | 33.3 | 0.2 | 35.4 |

sample for Lima, and only 37 in Barranquilla; otherwise, each of the poverty classes always includes at least 50 sample families.

2. POVERTY AND THE FOOD BUDGET SHARE

Drawing a poverty line at an income twice the norm for food expenditure implies that households should spend more or less than half their total budget on food, as they are below or above the food norm. This depends on Engel's

Law for food expenditure beyond the minimum diet, and on the assumption that all other “basic needs” together cost as much as the minimum diet. This approach is used by Arellano (1975) and by Altimir (1982). Whether or not this expectation is satisfied, Engel’s Law alone implies that the food budget share should fall monotonically as food expenditure rises relative to the norm. To the extent that this does not happen, observed food spending is an inadequate indicator of welfare.

TABLE 4
FOOD EXPENDITURE AS A PERCENTAGE OF TOTAL CONSUMPTION, BY CITY AND RELATIVE FOOD EXPENDITURE

| | Food Expenditure as a Percentage of Norm | | | | | All Families | |
|--------------|--|-------|---------|---------|------|--------------|------------|
| | 0-64 | 65-99 | 100-149 | 150-499 | ≥500 | Global | Individual |
| Bogota | 45.6 | 48.1 | 45.5 | 36.9 | 32.2 | 39.5 | 46.6 |
| Barranquilla | 58.5 | 62.1 | 57.6 | 46.9 | 39.4 | 49.8 | 56.8 |
| Cali | 61.2 | 59.1 | 55.7 | 44.6 | 38.7 | 48.0 | 56.3 |
| Medellin | 53.1 | 54.6 | 47.9 | 41.0 | 31.0 | 44.6 | 51.7 |
| Santiago | 33.0 | 37.0 | 36.2 | 33.1 | 32.0 | 34.0 | 40.8 |
| Quito | 43.7 | 39.5 | 34.1 | 29.2 | * | 34.4 | 45.7 |
| Guayaquil | 55.7 | 48.7 | 41.7 | 34.3 | * | 41.0 | 53.2 |
| Lima | * | 39.9 | 36.8 | 32.1 | 35.1 | 34.3 | 43.4 |
| Caracas | 35.8 | 35.9 | 31.5 | 26.4 | * | 27.9 | 35.6 |
| Maracaibo | 33.5 | 43.6 | 49.7 | 47.6 | * | 46.7 | 52.4 |

Food expenditure includes beverages and meals away from home. Individual food budget share from Musgrove (1978), Table 4-3.

*Fewer than 30 observations

Relative Price of Food, compared to total consumption (Colombia = 1.00):

| | | | |
|--------------|----------------|-------------|------------------|
| <i>Chile</i> | <i>Ecuador</i> | <i>Peru</i> | <i>Venezuela</i> |
| 0.76 | 0.90 | 0.86 | 0.83 |

Table 4 shows, for each class of food spending, the ratio of mean expenditure on food to mean total expenditure. The Engel’s Law expectation is verified for all but the lowest class in nine of the ten cities, Maracaibo being the exception. There and also in four other cities, however, the food budget share appears *lower* in the lowest class than in the next higher class. These cases are italicized in the table. The 50-percent-of-budget expectation is verified, very approximately, in Bogota, Medellin and Guayaquil, but in Santiago, Quito, Lima and Caracas the poverty line corresponds more closely to a budget share of 40 percent than to 50 percent. However, this result may be due in large measure to the use of a “global” percentage, in which families are in effect weighted by their total spending. An “individual” mean, or average of the spending shares across all families, shows a much larger part of the budget devoted to food. This difference, which is sensitive to the inequality of incomes, is shown for all families together in Table 4: typically, the individual share is seven to ten percentage points larger than the global share. Without studying families individually, and without some estimate of the cost of non-food necessities, it does not seem profitable to pursue this point. It should also be noted that there are substantial differences in the price of food relative to private consumption generally, food being 24 percent

cheaper in Chile than in Colombia, and also at least 10 percent cheaper in the other three countries. Obviously these relative price differences shift the relative costs of food and of other necessities, so the 50 percent expectation becomes reasonable at *some* relative price rather than generally.

The failure to observe a steadily declining food budget share is a more serious problem, because it suggests that relative food expenditure compared to the norm mis-classifies many families as poor. There are at least three sources of error which could vitiate this poverty index. One is transitory variation in food spending. Over intervals of several weeks or months, expenditure on necessities such as food should probably show very little transitory variation in the sense defined by Friedman (1957), although the budget share could still be biased by transitory components in other parts of the budget. One might argue that the poor must spend nearly all their income on necessities, so they should not be able to devote any significant sum to those items likely to show transitory changes. However, the poor are also likely to be exposed to much transitory variation in employment and income, and if they do not accommodate these changes through monetary saving but instead “save” transitory receipts in the form of durables, expenditure could be given a substantial transitory shock. The fact that conceptually “consumption” means use or depreciation rather than expenditure does not help much in empirical analysis of budget data. In any case, food spending is not observed over long intervals but only over one week in these data, as in most household surveys; then even if consumption is quite stable, expenditure may vary appreciably because of transitory bulk purchases or fluctuations in supplies and prices.

The second source of error is also related to the difference between spending and eating: it is that spending on food away from home is included, without any deflation for the service component of restaurant food and drink. Again there is a conceptually clear way to adjust the data, but in practice it is very difficult to apply. This problem probably has the greatest effect in inflating relative food expenditure at high income levels, since eating out is a luxury compared to food at home. Except in Ecuador, elasticities are higher than for total food spending; see Musgrove (1978, Table 6-1). However, even poor families are likely to vary considerably in spending on food away from home, because of differences in household composition, places of employment, and other factors.

Finally, both the low budget share of food and the low relative food expenditure may simply reflect under-reporting of food purchases. Such response errors will also lead to underestimation of total spending, but not by so large a fraction. Transitory variation in purchases aside, if the “minimum” diet were really the cheapest that could be bought, then any family reporting a food expenditure of 50 percent of the norm, as some do in these samples, would almost have to be omitting a large part of its actual spending—it could not stay long at that level of consumption without one or more members becoming sick or even dying. It is only because the diet is cheap and adequate, rather than the cheapest essential diet, that one cannot be sure that all the relatively low food spending represents simple omissions in the data.

These considerations tell us that to group families by observed food spending has all the same risks as to group them by observed income. Grouping data can

be a valuable way to overcome transitory bias, but only if the grouping criterion is unrelated to the transitory component of the variable analyzed, and even then the bias due to under-reporting may remain. However, they do not lead to the conclusion that the apparently poorest class is in fact randomly distributed over all welfare levels. Both reporting errors and transitory components might reasonably be expected to be proportional—or at least, monotonically related—to true, permanent expenditure; in that case the absolutely poor are less poor on average than they seem, but still likely to be poor. This prospect can be checked to some extent by seeing whether the families in apparent absolute poverty share the characteristics usually associated with poverty as defined in other ways. Finally, it is obvious that any bias in the food budget share imparts an opposite bias to the shares spent on other items. These points are taken up in what follows.

3. HOUSEHOLD SIZE AND COMPOSITION

In previous analyses of these data using relative rather than absolute poverty as a welfare indicator—the bottom four deciles of consumption per person—one of the strongest associations found is with household size and composition. Poor families tend to be large, with more children per adult and more dependents per income earner than average (Musgrove, 1980). Table 5 shows that mean family size and mean number of children aged 13 or less are inversely, and monotonically, related to food expenditure relative to the norm, even in the poorest class where

TABLE 5
MEAN FAMILY SIZE AND MEAN NUMBER OF CHILDREN UNDER 14 BY
CITY AND RELATIVE FOOD EXPENDITURE

| City | | Food Expenditure as a Percentage of Norm | | | | |
|---------------|----------|--|-------|---------|---------|--------------|
| | | 0-64 | 65-99 | 100-149 | 150-449 | All Families |
| Bogota: | Size | 8.30 | 6.94 | 6.09 | 5.29 | 6.13 |
| | Children | 4.51 | 3.60 | 2.65 | 1.67 | 2.56 |
| Barranquilla: | Size | 9.47 | 7.53 | 7.06 | 5.83 | 6.62 |
| | Children | 4.51 | 3.34* | 3.19 | 1.92 | 2.57 |
| Cali: | Size | 7.72 | 7.08 | 5.80 | 5.12 | 5.94 |
| | Children | 4.35 | 3.72 | 2.51 | 1.45 | 2.40 |
| Medellin: | Size | 9.01 | 7.30 | 5.81 | 5.25 | 6.68 |
| | Children | 4.62 | 3.00 | 2.17 | 1.33 | 2.62 |
| Santiago: | Size | 6.86 | 5.97 | 5.07 | 3.89 | 4.73 |
| | Children | 3.24 | 2.57 | 1.94 | 1.09 | 1.71 |
| Quito: | Size | 7.13 | 5.63 | 5.14 | 3.85 | 5.63 |
| | Children | 3.88 | 2.35 | 1.80 | 1.16 | 2.43 |
| Guayaquil: | Size | 7.64 | 6.62 | 5.05 | 4.50 | 6.00 |
| | Children | 3.95 | 2.84 | 1.78 | 1.17 | 2.47 |
| Lima | Size | 7.43* | 8.03 | 6.93 | 5.50 | 6.42 |
| | Children | 4.01 | 3.32 | 2.55 | 1.76 | 2.33 |
| Caracas: | Size | 8.23* | 7.67 | 6.17 | 4.39 | 5.38 |
| | Children | 3.69 | 3.08 | 2.07 | 1.22 | 1.77 |
| Maracaibo: | Size | 7.00* | 6.99* | 6.63 | 5.24 | 6.16 |
| | Children | 2.40* | 2.34* | 2.23 | 1.70 | 2.05 |

*Means of adjacent classes not distinguishable at the 95 percent confidence level.

the data on food spending probably contain the most errors. Differences in mean size between classes are often as large as one person, and are usually statistically significant. (Since Maracaibo is again an exception, it appears that the data for that city are especially contaminated with errors of under-reporting or of transitory purchases.) Children typically account for half or more of all family members in the poorest class but are only one-third or less of the population in the class where food spending is 1.5 times the norm, or more. These relations hold despite considerable differences among cities in mean family size.

Table 6 extends this comparison by showing the percentage of families spending below the food norm, for each of four size classes. One-person households are omitted because of their relatively high spending on food away from home. With one exception in the case of Lima, the share of families in poverty always rises monotonically with family size. In any particular size class, the share varies greatly among cities. Arellano (1977) has carried this analysis further, showing the distribution of food spending, and also of income and total expenditure, relative to the food expenditure norm, within each of three size classes. His results are not exactly comparable to those shown here, because of the slight difference in adjustments for inflation.

TABLE 6
PERCENTAGE OF FAMILIES IN ABSOLUTE POVERTY
(FOOD EXPENDITURE LESS THAN NORM) BY CITY AND FAMILY SIZE

| City | Number of Members | | | | All |
|--------------|-------------------|------|------|-----------|------|
| | 2-3 | 4-5 | 6-7 | 8 or more | |
| Bogota | 6.9 | 20.2 | 31.0 | 46.9 | 28.9 |
| Barranquilla | 4.6 | 10.1 | 17.2 | 30.5 | 18.0 |
| Cali | 5.0 | 17.3 | 38.7 | 51.9 | 30.3 |
| Medellin | 18.2 | 29.3 | 40.9 | 72.7 | 45.4 |
| Santiago | 9.2 | 21.4 | 38.9 | 58.7 | 25.5 |
| Quito | 36.4 | 48.3 | 66.5 | 80.5 | 56.4 |
| Guayaquil | 20.8 | 37.9 | 59.9 | 82.1 | 52.5 |
| Lima | 11.1 | 8.0 | 18.8 | 35.4 | 20.1 |
| Caracas | 3.6 | 7.9 | 19.8 | 53.2 | 18.1 |
| Maracaibo | 16.5 | 20.0 | 40.6 | 42.9 | 31.1 |

Note: One person households were not included in the survey in Lima; in other cities where they were included in the survey, such individuals spent a relatively large budget share on food away from home, and so are excluded from this analysis.

These results suggest that while the food expenditure data contain errors, their use as an absolute poverty indicator does not classify families very differently from what one obtains with a relative poverty indicator, which is subject, of course, to the same errors. At least, the picture of *which* families are poor is substantially the same in the two cases, provided a relative indicator refers to needs or to per capita income or expenditure.

4. EMPLOYMENT AND INCOME

The relatively large share of children in poor households leads almost necessarily to high dependency rates or low shares of income recipients, as Table

TABLE 7
INCOME RECIPIENTS AS A PERCENTAGE OF ALL FAMILY MEMBERS, BY
CITY AND FOOD EXPENDITURE

| City | Food Expenditure as a Percentage of Norm | | | | All Families |
|--------------|--|-------|---------|---------|--------------|
| | 0-64 | 65-99 | 100-149 | 150-499 | |
| Bogota | 14.3 | 18.2 | 19.5 | 22.6 | 19.5 |
| Barranquilla | 11.9 | 15.3 | 16.4 | 17.2 | 16.2 |
| Cali | 12.7 | 14.8 | 18.3 | 21.0 | 17.6 |
| Medellin | 11.3 | 14.3 | 18.3 | 18.0 | 14.9 |
| Santiago | 22.4 | 24.6 | 27.9 | 34.2 | 29.2 |
| Quito | 23.7 | 29.0 | 33.5 | 35.2 | 28.7 |
| Guayaquil | 19.4 | 25.2 | 32.0 | 39.3 | 27.3 |
| Lima | 20.0 | 23.1 | 24.7 | 26.2 | 24.8 |
| Caracas | 22.2 | 22.8 | 26.8 | 33.7 | 29.1 |
| Maracaibo | 19.3 | 20.0 | 20.4 | 25.1 | 21.8 |

7 confirms. Typically, the percentage of household members who earn income increases by about 50 percent between the poorest and least poor of the four classes, and the increase is always monotonic. There seems to be little if any association between the average income level of a city (shown in Table 8, below) and its overall dependency rate, but the poverty/dependency relation is evident in all cities. Among the poorest households, each income recipient supports five or more other people, while in richer families the ratio is as low as three.

TABLE 8
MEAN INCOME OF HEAD, OF OTHER INCOME RECIPIENTS, AND OF FAMILY,
BY CITY AND RELATIVE FOOD EXPENDITURE
(1968 U.S. DOLLARS PER YEAR)

| City and Recipient | Food Expenditure as a Percentage of Norm | | | | All Families |
|----------------------|--|-------|---------|---------|--------------|
| | 0-64 | 65-99 | 100-149 | 150-499 | |
| Bogota: | | | | | |
| Head (E) | 1,180 | 1,577 | 2,317 | 4,372 | 3,326 |
| (Percentage) | 74.3 | 75.1 | 78.7 | 80.0 | 80.1 |
| Other earners | 408 | 524 | 628 | 1,092 | 827 |
| (Percentage) | 25.7 | 24.9 | 21.3 | 20.0 | 19.9 |
| Family | 1,589 | 2,101 | 2,945 | 5,464 | 4,153 |
| Barranquilla: | | | | | |
| Head (E) | 1,007 | 1,194 | 1,990 | 3,710 | 2,903 |
| (Percentage) | 76.7 | 85.9 | 88.6 | 88.4 | 87.7 |
| Other earners | 306 | 196 | 257 | 485 | 408 |
| (Percentage) | 23.3 | 14.1 | 11.4 | 11.6 | 12.3 |
| Family | 1,313 | 1,390 | 2,246 | 4,194 | 3,310 |
| Cali: | | | | | |
| Head (E) | 888 | 1,358 | 1,830 | 3,680 | 2,718 |
| (Percentage) | 86.1 | 82.5 | 86.2 | 86.0 | 85.7 |
| Other earners | 143 | 289 | 293 | 600 | 454 |
| (Percentage) | 13.9 | 17.5 | 13.8 | 14.0 | 14.3 |
| Family | 1,031 | 1,647 | 2,123 | 4,280 | 3,172 |

TABLE 8 cont.

| City and Recipient | Food Expenditure as a Percentage of Norm | | | | |
|--------------------|--|-------|---------|---------|--------------|
| | 0-64 | 65-99 | 100-149 | 150-499 | All Families |
| Medellin: | | | | | |
| Head (E) | 1,222 | 1,620 | 2,231 | 5,321 | 3,047 |
| (Percentage) | 81.5 | 83.3 | 85.1 | 92.2 | 87.5 |
| Other earners | 277 | 326 | 390 | 450 | 437 |
| (Percentage) | 18.5 | 16.7 | 14.9 | 7.8 | 12.5 |
| Family | 1,500 | 1,945 | 2,622 | 5,772 | 3,484 |
| Santiago: | | | | | |
| Head (S) | 1,131 | 1,280 | 1,675 | 2,547 | 2,133 |
| (Percentage) | 56.9 | 56.7 | 62.9 | 60.7 | 61.6 |
| Other earners | 857 | 979 | 986 | 1,646 | 1,329 |
| (Percentage) | 43.1 | 43.3 | 37.1 | 39.3 | 38.4 |
| Family | 1,988 | 2,259 | 2,661 | 4,193 | 3,462 |
| Quito: | | | | | |
| Head (E) | 1,353 | 1,812 | 4,192 | 5,321 | 2,789 |
| (Percentage) | 84.9 | 71.6 | 77.8 | 76.6 | 76.1 |
| Other earners | 240 | 717 | 1,197 | 1,625 | 875 |
| (Percentage) | 15.1 | 28.4 | 22.2 | 23.4 | 23.9 |
| Family | 1,593 | 2,530 | 5,388 | 6,946 | 3,664 |
| Guayaquil: | | | | | |
| Head (E) | 1,591 | 2,118 | 2,974 | 5,616 | 3,067 |
| (Percentage) | 87.4 | 77.8 | 77.8 | 77.4 | 78.5 |
| Other earners | 230 | 606 | 849 | 1,644 | 842 |
| (Percentage) | 12.6 | 22.2 | 22.2 | 22.6 | 21.5 |
| Family | 1,821 | 2,724 | 3,823 | 7,260 | 3,909 |
| Lima: | | | | | |
| Head (S) | 997 | 1,434 | 2,090 | 3,663 | 2,863 |
| (Percentage) | 39.2 | 46.2 | 54.0 | 64.8 | 60.6 |
| Other earners | 1,548 | 1,672 | 1,781 | 1,993 | 1,863 |
| (Percentage) | 60.8 | 53.8 | 46.0 | 35.2 | 39.4 |
| Family | 2,545 | 3,106 | 3,871 | 5,656 | 4,726 |
| Caracas: | | | | | |
| Head (E) | 2,184 | 2,165 | 3,484 | 4,938 | 4,198 |
| (Percentage) | 55.5 | 59.7 | 64.1 | 71.1 | 68.2 |
| Other earners | 1,749 | 1,463 | 1,950 | 2,054 | 1,961 |
| (Percentage) | 44.6 | 40.3 | 35.9 | 28.9 | 31.8 |
| Family | 3,933 | 3,628 | 5,434 | 6,992 | 6,159 |
| Maracaibo: | | | | | |
| Head (E) | 1,672 | 2,040 | 1,779 | 3,067 | 2,319 |
| (Percentage) | 73.6 | 76.8 | 61.2 | 69.5 | 68.7 |
| Other earners | 600 | 616 | 1,126 | 1,349 | 1,054 |
| (Percentage) | 26.4 | 23.2 | 38.8 | 30.5 | 31.3 |
| Family | 2,274 | 2,656 | 2,905 | 4,416 | 3,374 |

Note: Head of Household is defined socially (S), or by the family, in Santiago and Lima, and is defined economically (E), or as the chief income earner, elsewhere.

It is not obvious *a priori* whether poor households depend on the income of the household head more or less than non-poor families. There are few other recipients, but those who do work might earn as much on average as the head, if his or her income is low. Empirically, no clear pattern emerges. Table 8 shows mean family income (in equivalent 1968 dollars per year) and the shares contributed by family heads and other recipients. The fraction of income attributed

to the head, which is likely to include any unearned income or receipts from a family business in which other members work without pay, is roughly constant in Cali, Santiago and Maracaibo, falls sharply in Quito and Guayaquil, and rises in the remaining cities. The variety of results is doubtless due in large part to differences in the definition of household and of the head, and in the way income is attributed to members. In the extreme case of Lima, where the head is defined independently of his or her contribution to income, he or she appears to provide less than half of income among families in absolute poverty.

To learn more about which members work and why, it will probably be advisable to estimate all members' potential incomes on the basis of observable personal characteristics, and to relate total potential family income both to needs (or at least to the minimum food budget) and to family composition. Lamas (1983) has used a utility-maximizing model to estimate such relations for Lima, using the same estimates of food needs as are used here. Two model-free features of the income recipients other than the head may be noted. The first, as shown in Table 9, is that such members are more often male among families in poverty than among better-off families. At high levels of food expenditure relative to the norm, a second income recipient is very likely to be the spouse of the household head, and therefore female; at lower levels, such workers are more likely to be sons, brothers or other males. This is partly because the household is much more likely to be large enough to include two or more adult males, and partly because adolescents are more likely to have to leave school and take employment.

TABLE 9
PERCENTAGE OF INCOME RECIPIENTS (OTHER THAN HOUSEHOLD HEAD)
WHO ARE MALE, BY CITY AND RELATIVE FOOD EXPENDITURE

| City | Food Expenditure as a Percentage of Norm | | | | All Families |
|--------------|--|-------|---------|---------|--------------|
| | 0-64 | 65-99 | 100-149 | 150-499 | |
| Bogota | 66.6 | 45.2 | 32.9 | 26.5 | 34.7 |
| Barranquilla | 29.9 | 14.0 | 30.5 | 27.4 | 26.0 |
| Cali | 24.5 | 48.4 | 20.0 | 20.6 | 27.4 |
| Medellin | 68.8 | 49.2 | 25.7 | 37.8 | 45.6 |
| Santiago | 55.6 | 51.4 | 45.5 | 40.5 | 45.2 |
| Quito | 40.7 | 29.8 | 24.8 | 15.7 | 29.6 |
| Guayaquil | 57.8 | 40.7 | 38.3 | 37.1 | 42.0 |
| Lima | 59.0 | 53.5 | 43.0 | 36.6 | 43.3 |
| Caracas | 48.7 | 51.0 | 47.7 | 32.8 | 40.4 |
| Maracaibo | 42.5 | 56.4 | 51.8 | 34.5 | 45.3 |

Note: One-member households are excluded by definition.

The second feature, which may be inferred from Table 10, is that the working-age members other than the head are quite likely to suffer unemployment among poor families, but not among those better off. In general, the unemployed are a sharply decreasing share of *all* family members, as food expenditure rises; since poor families include more children, the unemployed as a fraction of working-age members must be still higher among the poor, and decline more rapidly.

TABLE 10
UNEMPLOYED FAMILY MEMBERS AS A PERCENTAGE OF TOTAL MEMBERS,
BY CITY AND RELATIVE FOOD EXPENDITURE

| City | Food Expenditure as a Percentage of Norm | | | | All Families |
|--------------|--|-------|---------|---------|--------------|
| | 0-64 | 65-99 | 100-149 | 150-499 | |
| Bogota | 5.2 | 2.3 | 2.3 | 1.2 | 2.4 |
| Barranquilla | 9.8 | 6.4 | 4.4 | 2.3 | 4.4 |
| Cali | 4.9 | 4.3 | 4.0 | 3.2 | 3.9 |
| Medellin | 4.7 | 5.7 | 2.0 | 2.5 | 3.9 |
| Santiago | 2.2 | 1.4 | 1.4 | 0.9 | 1.3 |
| Quito | 1.0 | 1.3 | 1.3 | 0.7 | 1.1 |
| Guayaquil | 3.7 | 2.5 | 2.7 | 2.1 | 2.9 |
| Lima | 1.6 | 1.3 | 3.0 | 1.1 | 1.8 |
| Caracas | 4.6 | 5.2 | 3.8 | 1.7 | 3.1 |
| Maracaibo | 7.5 | 6.2 | 5.7 | 3.0 | 5.1 |

Both of these features are of interest because they are not evident among household heads. In the survey data, relatively few families are headed by women, and very few household heads are unemployed, in part because the head is, in eight of the ten cities, defined as the chief income earner. For poor households, unemployment may be an unaffordable luxury where the head is concerned, but the pressure of need and the difficulty of finding work combine to produce relatively high unemployment among the remaining members. Their temporary unemployment is less of a luxury, and can be tolerated by the family, but their withdrawal from the labor force cannot, because on average they contribute significantly to income. Thus while it is correct to say, as Berry (1975) indicates, that open urban unemployment is not primarily a problem of the very poor, such unemployment still affects poor families disproportionately.

A final observation on employment and income is that the poor cannot be reliably identified by their chief *source* of income, at least not on the usual classification of salaried employment, independent or self-employment, capital income, transfers, transitory receipts, etc. Labor income, including income from self-employment together with wages and salaries, is the chief support of a majority of households at all incomes, but it is derived from such a variety of jobs that there is essentially no association between income type and income level. The rich can, it is true, be distinguished by the possession of financial capital (Musgrove and Ferber, 1979), but when imputed rents on owned dwellings are counted as capital incomes, then even the very poor may get a substantial share of their income from capital. And because retirement and social security benefits make up the bulk of transfer payments, poor families do not depend on transfers any more than wealthier households.

5. OCCUPATION, SECTOR OF EMPLOYMENT AND HUMAN CAPITAL

Since labor income is almost equally important at all income levels, total family income is very low for families in absolute poverty, and the average number

of income recipients does not differ greatly among income levels, much of the difference in income per adult member—leaving aside the influence of different numbers of children—must be due to differences in remuneration among jobs. It does not follow, however, that “poverty jobs” are easy to classify by sector or occupation, because within any large category there is great heterogeneity of skills and of incomes. For example, two classifications applied to the household survey data yielded results that hardly distinguish rich from poor households. The first approach is to group household heads, or all other earners, by the sector of employment—industry, construction, agriculture, mining, government services, etc. The other is to try to distinguish “formal” from “informal” activities, in the expectation that poverty jobs will be concentrated in the latter. Unfortunately, it is difficult or impossible to draw the distinction without detailed information on work places and work arrangements. In addition, household surveys which are large enough for the study of spending patterns are much too small to give reasonable samples of each of many specific jobs, and there is a great variety of jobs within occupational and sectoral groupings.

TABLE 11
PERCENTAGE OF FAMILIES IN ABSOLUTE POVERTY
(FOOD EXPENDITURE LESS THAN NORM) BY CITY AND SELECTED OCCUPATIONAL GROUPS

| City | Office Workers | Vendors | Drivers | Manual Workers | Personal Services | All Families |
|---------------|----------------|---------|---------|----------------|-------------------|--------------|
| Bogota: | | | | | | |
| Family heads | 18.3 | 24.1 | 34.5 | 41.3 | 46.5 | 28.9 |
| Other workers | 13.4 | 26.9 | * | 49.1 | * | — |
| Barranquilla: | | | | | | |
| Family heads | 0.0 | 14.6 | 19.8 | 18.9 | 42.8 | 18.0 |
| Other workers | * | 16.4 | * | 34.6 | * | — |
| Cali: | | | | | | |
| Family heads | 9.1 | 25.2 | 31.8 | 39.8 | 58.1 | 30.3 |
| Other workers | * | * | * | * | * | — |
| Medellin | | | | | | |
| Family heads | 31.7 | 37.2 | 47.5 | 66.9 | 49.9 | 45.4 |
| Other workers | * | * | * | 62.7 | * | — |
| Santiago: | | | | | | |
| Family heads | 11.1 | 23.0 | 21.4 | 36.6 | 27.5 | 25.5 |
| Other workers | 13.0 | 33.6 | 41.3 | 39.3 | 37.1 | — |
| Quito: | | | | | | |
| Family heads | 31.4 | 46.2 | 59.6 | 79.4 | 70.9 | 56.4 |
| Other workers | 36.1 | 67.3 | * | 79.3 | 45.8 | — |
| Guayaquil: | | | | | | |
| Family heads | 41.1 | 51.5 | 61.1 | 69.3 | 60.9 | 52.5 |
| Other workers | 23.5 | 54.8 | * | 68.4 | 32.3 | — |
| Lima: | | | | | | |
| Family heads | 15.0 | 21.6 | 16.1 | 31.4 | 22.6 | 20.1 |
| Other workers | 17.1 | 27.0 | 31.7 | 35.2 | 32.7 | — |
| Caracas: | | | | | | |
| Family heads | 12.9 | 12.0 | 16.4 | 32.1 | 34.1 | 18.1 |
| Other workers | 19.1 | 34.9 | * | 42.4 | 21.6 | — |
| Maracaibo: | | | | | | |
| Family heads | 22.6 | 23.2 | 24.5 | 35.1 | 36.8 | 31.1 |
| Other workers | 27.2 | 37.4 | * | 45.6 | 34.6 | — |

*Fewer than 30 observations in the occupational group.

The one variable in these data which shows some clear association between employment and poverty is a grouping by occupation, without reference to the sector of employment. Table 11 shows the results for five groups sufficiently well represented in the surveys. Office workers are systematically less likely to be poor than the population generally, while manual workers are more likely to be in poverty. The differences in the percentages in poverty are sometimes as large as ten percentage points or more, but in a few cases (Medellin and Maracaibo, for manual workers) they are small. Personal service employment is also systematically associated with poverty. Drivers of trucks, busses and taxis do not appear regularly more or less likely than others to be poor, while the group of vendors—including store clerks together with street sellers—is usually slightly less poor than the general population. In many cases, there are in a given occupation and city too few workers represented who are not household heads for the employment of other earners in the family to be clearly associated with poverty. (The Colombian samples in particular are small, because some “supplementary members” whose incomes and expenses were poorly recorded were excluded from the data.) Where there are sufficient observations, no pattern seems to emerge: that is, unlike the situation with respect to sex or to unemployment described in Tables 9 and 10, the other working members do not differ in any regular way from household heads in their relation of poverty to employment.

Previous work with these data suggests that education is a much more powerful variable than occupation in explaining income and welfare, and that

TABLE 12
YEARS OF SCHOOLING COMPLETED BY PERSONS AGED 25 AND OLDER,
BY CITY AND RELATIVE FOOD EXPENDITURE

| City and Person(s) | | Food Expenditure as a Percentage of Norm | | | | All Families |
|--------------------|------------|--|-------|---------|---------|--------------|
| | | 0-64 | 65-99 | 100-149 | 150-499 | |
| Bogota: | Head | 4.2 | 5.2 | 6.4 | 8.7 | 7.1 |
| | All adults | 4.0 | 4.7 | 5.8 | 8.3 | 6.6 |
| Barranquilla: | Head | 3.5 | 3.5 | 5.1 | 8.2 | 6.6 |
| | All adults | 2.7 | 3.7 | 4.9 | 7.6 | 6.1 |
| Cali: | Head | 3.6 | 5.0 | 5.2 | 7.4 | 6.2 |
| | All adults | 3.0 | 4.2 | 4.8 | 6.7 | 5.5 |
| Medellin: | Head | 4.1 | 5.3 | 5.6 | 8.1 | 6.1 |
| | All adults | 3.8 | 4.9 | 5.0 | 7.5 | 5.5 |
| Santiago: | Head | 3.2 | 3.7 | 4.7 | 7.0 | 5.7 |
| | All adults | 3.0 | 3.5 | 4.5 | 6.5 | 5.2 |
| Quito: | Head | 4.9 | 6.5 | 8.5 | 10.6 | 7.4 |
| | All adults | 4.2 | 6.3 | 7.9 | 9.7 | 6.8 |
| Guayaquil: | Head | 4.6 | 5.8 | 7.2 | 9.7 | 6.8 |
| | All adults | 4.3 | 5.4 | 6.6 | 8.8 | 6.3 |
| Lima: | Head | 5.0 | 6.4 | 7.4 | 10.0 | 8.4 |
| | All adults | 4.9 | 6.2 | 6.7 | 9.0 | 7.7 |
| Caracas: | Head | 4.3 | 4.9 | 6.9 | 8.3 | 7.4 |
| | All adults | 4.3 | 4.4 | 5.8 | 7.2 | 6.4 |
| Maracaibo: | Head | 4.4 | 4.1 | 4.2 | 5.5 | 4.7 |
| | All adults | 3.9 | 3.8 | 3.9 | 5.1 | 4.4 |

those occupations which pay particularly well are usually those requiring higher education. In fact, as Table 12 shows, years of schooling are quite strongly associated with satisfaction of food expenditure norms, whether one examines only household heads or all the adults in a family. Typically the schooling level doubles between the poorest class and the class which is definitely spending enough on food to eat adequately. Except in Ecuador, which is the poorest of the five countries, the average adult schooling level in the population roughly coincides with a food expenditure of 150 percent of the norm, which assures adequate nutrition unless the family spends, or consumes, inefficiently.

6. SATISFYING OTHER NEEDS

The notion of a norm or minimum level for food expenditure is connected, however imperfectly, to physiological requirements. A family which spends less than the norm for its size and composition will suffer a deficit of one or more essential nutrients, unless it departs markedly from the usual spending pattern so as to obtain a good diet more cheaply than customary behavior would allow. For no other category of consumption can a norm be so well defined; any "minimum" is largely a matter of social judgement. Moreover, particular "needs" are no longer associated one-for-one with particular spending categories: health, for example, is not a function of medical expenditures alone but depends on diet, type and amount of work, sanitary facilities and practices, and exposure to risks of accident or disease.

Housing appears to be the easiest non-food need to examine, because any household included in the survey has a place of residence and because the physical characteristics of housing are fairly easily observed. For these reasons, several dwelling characteristics were analyzed, but most showed no systematic relation to poverty as defined by food expenditure. Very few dwellings, for example, are described by their occupants as "invaded" or given free by others; nearly all are owned or rented. Almost all dwellings, 80 percent or more in six of the ten cities, can also be described as "houses" or apartments—the former class including all free-standing structures. The only class of housing associated with poverty is that of a room in a house or other multifamily dwelling, where such facilities as toilets and even kitchens may be shared. Differences among countries probably reflect differences in classification rather than in actual situation. The material of which a dwelling is made similarly presents difficulties, since while the poor often live in shacks of metal and scrap materials, they may also be crowded into relatively well-built structures of brick or concrete. The kind of fuel used is more clearly associated with poverty, since as relative food spending rises, both kerosene and charcoal or firewood give way to gas or electricity for cooking.

Table 13 shows two variables which are associated quite closely with poverty status. Mean housing expenditure per person rises quite rapidly as the family is better off, and, largely in consequence, the mean number of people per room declines sharply. Not until the class which is clearly out of food poverty (spending 1.5 times the norm, or more) does per capita spending on housing usually catch up to per capita norms for food. For families out of poverty, density usually drops to about one person per room, although there are considerable differences

TABLE 13
 MEAN EXPENDITURE ON HOUSING (PAID OR IMPUTED RENT) AND HOUSING DENSITY,
 BY CITY AND RELATIVE FOOD EXPENDITURE.
 (1968 U.S. CENTS PER PERSON PER DAY, AND NUMBER OF PERSONS PER ROOM)

| City and Concept | | Food Expenditure as a Percentage of Norm | | | | All Families |
|------------------|-------------|--|-------|---------|---------|--------------|
| | | 0-64 | 65-99 | 100-149 | 150-499 | |
| Bogota: | Expenditure | 14 | 19 | 29 | 56 | 38 |
| | Density | 1.70 | 1.37 | 1.17 | 0.95 | 1.15 |
| Barranquilla: | Expenditure | 4 | 6 | 11 | 28 | 19 |
| | Density | 2.73 | 2.01 | 1.65 | 1.16 | 1.44 |
| Cali: | Expenditure | 6 | 10 | 17 | 39 | 24 |
| | Density | 2.13 | 1.66 | 1.20 | 0.94 | 1.20 |
| Medellin: | Expenditure | 10 | 13 | 24 | 52 | 26 |
| | Density | 1.80 | 1.40 | 1.12 | 0.86 | 1.22 |
| Santiago: | Expenditure | 12 | 16 | 23 | 51 | 34 |
| | Density | 2.44 | 2.05 | 1.63 | 1.12 | 1.46 |
| Quito: | Expenditure | 11 | 26 | 60 | 119 | 41 |
| | Density | 3.99 | 2.33 | 1.49 | 0.94 | 1.99 |
| Guayaquil: | Expenditure | 6 | 16 | 36 | 96 | 32 |
| | Density | 4.80 | 3.00 | 1.91 | 1.18 | 2.36 |
| Lima: | Expenditure | 6 | 12 | 19 | 49 | 30 |
| | Density | 3.20 | 2.52 | 1.97 | 1.29 | 1.69 |
| Caracas: | Expenditure | 18 | 25 | 46 | 95 | 66 |
| | Density | — | — | — | — | — |
| Maracaibo: | Expenditure | 12 | 12 | 12 | 25 | 17 |
| | Density | — | — | — | — | — |

Note: "Rooms" do not include kitchens and bathrooms. The number of rooms in the dwelling is not reported for Caracas and Maracaibo.

Relative Price of Housing, Compared to Total Consumption (Colombia = 1.00)

| | | | |
|--------------|----------------|-------------|------------------|
| <i>Chile</i> | <i>Ecuador</i> | <i>Peru</i> | <i>Venezuela</i> |
| 1.17 | 1.14 | 0.68 | 1.22 |

due to differences in the definition of the household. It is clear that housing is a less urgent need than food, but it is also clear that families somewhat *below* the food norm still spend on housing something like one-third as much as they spend on food. Housing price variation among countries is substantial, as it is for food.

Apart from density, which is a continuous variable with no threshold, the quality of housing may be judged by the presence or absence of particular services. In these data, nearly all households have electricity, except in Lima; there the inclusion of the *pueblos jovenes*, squatter settlements which are sometimes quite distant from the city, gives an electrification rate of only 59 percent in the poorest class. It is 78 percent in the next class, which is comparable to the lowest rate observed in other cities. The degree to which families enjoy urban service depends on where, for survey purposes, the "city" stops. As Table 14 shows, almost all families have piped water, even among the very poor. Here Guayaquil and Lima are both exceptions. The share is often appreciably lower, however, for sewerage, which costs much more to install. Since without sewers the health benefits of safe drinking water may be lost (Churchill, 1979), this service is perhaps the most crucial to health needs. Beliefs and customs are at least as important in determining

TABLE 14
PERCENTAGE OF FAMILIES WITH PIPED WATER AND WITH SEWERAGE BY CITY AND
RELATIVE FOOD EXPENDITURE

| | | Food Spending as a Percentage of Norm | | | | |
|-----------|--------------|---------------------------------------|-------|---------|---------|-----------------|
| | | 0-64 | 65-99 | 100-149 | 150-499 | All Families |
| Water: | Bogota | 96.4 | 96.0 | 100.0 | 99.7 | 98.8 |
| | Barranquilla | 100.0 | 98.0 | 97.8 | 99.5 | 98.9 |
| | Cali | 89.8 | 90.7 | 93.6 | 99.0 | 95.2 |
| | Medellin | 96.3 | 97.1 | 99.3 | 99.2 | 98.1 |
| | Santiago | 87.6 | 94.7 | 93.4 | 97.3 | 95.1 |
| | Quito | 91.0 | 96.3 | 98.2 | 96.7 | 95.2 |
| | Guayaquil | 62.3 | 73.2 | 88.5 | 94.3 | 79.1 |
| | Lima | 61.9 | 79.2 | 85.1 | 91.4 | 81.2 |
| Sewerage: | Santigao | 43.5 | 50.7 | 63.6 | 74.0 | 65.7 |
| | Quito | 90.1 | 96.3 | 99.6 | 96.4 | 95.1 |
| | Guayaquil | 60.1 | 73.5 | 87.0 | 96.1 | 78.7 |
| | Lima | 35.8 | 69.9 | 72.4 | 82.0 | 75.4 |

Note: Information on dwelling facilities is not available for Venezuela, and for sewerage is also missing for Colombia.

the adequacy of health as they are for diet, so that defining physically-suppliable needs, where it can be done at all, is only the beginning of the problem. Apart from services related quite directly to health, it is in any case hard to define necessities in housing; nearly all measurable characteristics vary continuously as income and comfort vary.

The household data used here do not report the state of health, but only medical spending. The only other need which seems feasible to study is for primary schooling (assuring literacy), which clearly is a "need" with no physiological component at all, being defined socially. Expenditure per person on education varies enormously with the age composition of the household, and is sensitive to price differences among school levels and across countries, particularly as the availability of public schooling may vary. As a measure of household *effort* to provide schooling for children, Table 15 therefore shows the budget share on this category. However, since the likely downward bias in food expenditure imparts an upward bias to all other budget shares, the table also shows an adjusted share, defined by the assumption that actual food expenditure equals the norm, in the two poorest groups. That is, the share for education is estimated as:

$$C_E / (C - C_f + C_f^*)$$

where C_E is educational spending, C is total expenditure, and C_f and C_f^* are respectively reported and normative food spending. This adjustment, which may understate the education share, reduces the budget percentage sharply but still shows something like one percent of total spending going to schooling even among the poorest households, and a much higher share in Colombia. Moreover, the share does not rise very much as income rises, never doubling, for example. Education is even less basic a need than housing, but it seems not to be excluded from the budget even when food spending may be inadequate.

TABLE 15
 PERCENTAGE OF TOTAL EXPENDITURE ON EDUCATION (REPORTED AND ADJUSTED),
 AND PERCENTAGE OF PRIMARY SCHOOL NORM COMPLETED BY CHILDREN
 AGED 7-12, BY CITY AND RELATIVE FOOD EXPENDITURE

| City and Concept | Food Expenditure as a Percentage of Norm | | | | All Families |
|----------------------------|--|-------|---------|---------|--------------|
| | 0-64 | 65-99 | 100-149 | 150-499 | |
| Bogota: | | | | | |
| Education share | 8.0 | 6.0 | 6.4 | 6.1 | 6.0 |
| (Adjusted) | 5.5 | 5.5 | — | — | — |
| Primary school completion | 52 | 61 | 67 | 75 | 64 |
| Barranquilla: | | | | | |
| Education share | 5.4 | 4.4 | 3.4 | 5.6 | 4.9 |
| (Adjusted) | 3.5 | 3.9 | — | — | — |
| Primary school completion | 24 | 34 | 51 | 73 | 53 |
| Cali: | | | | | |
| Education share | 2.9 | 3.0 | 3.7 | 3.5 | 3.3 |
| (Adjusted) | 1.8 | 2.7 | — | — | — |
| Primary school completion | 28 | 52 | 80 | 83 | 61 |
| Medellin: | | | | | |
| Education share | 5.1 | 3.8 | 4.6 | 4.7 | 4.4 |
| (Adjusted) | 3.3 | 3.3 | — | — | — |
| Primary school completion | 37 | 48 | 53 | 77 | 49 |
| Santiago: | | | | | |
| Education share | 0.7 | 0.8 | 0.9 | 1.4 | 1.2 |
| (Adjusted) | 0.4 | 0.7 | — | — | — |
| Primary school completion | 84 | 83 | 83 | 86 | 84 |
| Quito: | | | | | |
| Education share | 1.5 | 1.9 | 2.2 | 1.7 | 1.8 |
| (Adjusted) | 0.9 | 1.7 | — | — | — |
| Primary school completion* | 89 | 88 | 80 | 100 | 89 |
| Guayaquil: | | | | | |
| Education share | 1.8 | 2.8 | 2.5 | 2.1 | 2.3 |
| (Adjusted) | 1.1 | 2.5 | — | — | — |
| Primary school completion* | 85 | 89 | 84 | 92 | 87 |
| Lima: | | | | | |
| Education share | 1.6 | 1.8 | 2.0 | 2.5 | 2.2 |
| (Adjusted) | 1.0 | 1.6 | — | — | — |
| Primary school completion | 37 | 61 | 70 | 79 | 70 |
| Caracas: | | | | | |
| Education share | 4.1 | 4.0 | 4.8 | 4.6 | 4.4 |
| (Adjusted) | 3.0 | 3.7 | — | — | — |
| Primary school completion | 60 | 69 | 85 | 93 | 80 |
| Maracaibo: | | | | | |
| Education share | 2.5 | 1.9 | 1.9 | 2.5 | 2.2 |
| (Adjusted) | 1.8 | 1.7 | — | — | — |
| Primary school completion* | 81 | 87 | 94 | 99 | 92 |

*Probable under-estimate of the norm for primary schooling; the completion index equals or exceeds 100 percent in the richest class (food expenditure five times the food norm, or more).

As a measure of the *satisfaction* of educational needs, Table 15 shows an estimate of the degree to which children aged 7-12 have completed the amounts of primary school appropriate to their ages. Except in Quito, Guayaquil and Maracaibo, where the calculation appears to understate the norm for primary schooling and thus overstate compliance with it, the results show the share rising

with relative food spending; but they also show that even among the poor a substantial part of the schooling norm has been achieved.

7. SOME CONCLUSIONS AND SUGGESTIONS

Traditional household budget data can answer only certain questions about absolute poverty, and then only with errors that may be substantial. They contain reporting errors and transitory components, they do not concentrate attention on the poor, they usually measure spending rather than actual consumption, and so on. Nonetheless they can and should be used, if only because the theory of poverty-level behavior is incomplete and even limited knowledge is valuable. The empirical analysis just presented appears to support a few conclusions, and it points to ways in which gathering and analyzing data could be improved.

First, it does not seem that food expenditure relative to a biologically-derived norm is a bad measure of poverty. It is subject to the same errors and biases as measures based on other variables, but does not necessarily suffer them any more. Families identified as poor by this measure have generally the same characteristics as those found to be poor by other criteria, except of course for the way they distribute their expenditures. Rural households, it should be noted, sometimes satisfy their food needs better than urban families at the same low income (World Bank, 1979).

Second, the association between poverty and large families with many dependents is strongly confirmed. Adjusting food norms to reflect a family's age and sex composition may make it look less poor than it would be on a simple per capita measure, but the gain is slight. Also, families with many children are at the greatest risk of malnutrition.

Third, absolute poverty is associated with low education and low incomes per worker, not just with many dependents per worker. However, it is not systematically associated, for the most part, with particular occupations or sectors of employment. The strongest tendency noted is for unemployment to be high among poverty families, at least for members other than the head.

Fourth, even families who do not appear to be eating adequately devote appreciable effort to meeting other needs, for housing, education and so on. Even such "needs" as durable goods sometimes become important well before a proper diet is assured. (World Bank, 1979).

The limitations of standard budget data suggest at least three lines for improvement in data collecting and for research, both empirical and theoretical. The first is to get measures of actual food intake, so that relative food consumption can be accurately measured and mis-classification avoided. Usually this involves a much more complicated survey, having interviewers weigh food before (and even after) meals, which is expensive and time-consuming (see for example FIBGE, 1977-78). In traditional household budget surveys, it would also be valuable to estimate the transitory components of different kinds of spending, and try to obtain better estimates even of expenditures. The second improvement is to link household data to more detailed and complete information about employment, partly through larger samples concentrated on the poor and partly by following respondents from home to workplace or vice versa. The third is to

study the relative urgency of different needs, to see how families near a poverty line actually behave and, where possible, to infer norms for nonfood spending from that behavior. Attention needs to be turned from setting poverty lines—usually with respect to some assumptions about behavior—to finding out how families actually behave when their resources are at best barely adequate to meet their most urgent needs.

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