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CENTRAL AMERICA INITIATIVE

HONDURAS:
TRENDS IN HEALTH AND NUTRITION INDICATORS IN THE 1980s

by

Kevin Wayne
Barton Burkhalter
Elizabeth Burleigh
Roy Miller

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HONDURAS

TRENDS IN HEALTH AND NUTRITION INDICATORS IN THE 1980s

1. INTRODUCTION

In the context of the Central America Initiative program, USAID's Bureau for Latin America and the Caribbean designated a series of health and nutrition indicators for use in monitoring program progress. Data used to form the various indicators are collected and processed by a number of organizations and institutions, both in the countries themselves and in the international donor community. In order to gather the available data and to develop a better understanding of the underlying causes for discrepancies in reported indicators, the LAC Bureau commissioned a study, including visits to several Central American countries, to collect and analyze existing information on each of the designated indicators. This report presents the findings of that study for Honduras.

The field component of the study was completed during Fall 1988. Data were sought in each country for the eight-year period, 1980 through 1987. Sources of data explored in Honduras included USAID, the Ministry of Health (MOH), the Pan American Health Association (PAHO) and the regional office of UNICEF. Through these sources, published and non-published studies containing primary data were identified, including various national demographic and health surveys. Additionally, other documents containing more recent data (1988-1989) were reviewed in Washington, D.C. during the preparation of the report and these additional data were incorporated into the analysis.

In 1981, a series of large national surveys to be conducted at three- to four-year intervals was begun in Honduras. To date, three surveys have been completed and analyzed; a fourth survey is currently being planned for 1991, and a fifth for 1994. To their credit, a relatively consistent team of organizations have been involved in the planning and analysis of the surveys, including the Honduras MOH, Asociacion Hondurena de Planificacion Familiar (ASHONPLANFA), Family Health International and Management Sciences for Health. Such consistency should assist in increasing the longitudinal reliability of the survey data, thereby adding measurable veracity to trend analyses, helping to distinguish "real" change from artifacts caused by differing survey and analysis techniques.

The most poignant finding of the study is the diversity or range of values reported by different sources for many of the key indicators designated to monitor the Central America Initiative. Due to the historical nature of the data gathered, it was not always possible to determine the underlying origins of reported data. At times, the "numbers" were available but the procedures

used to generate them were lost or forgotten. In this report, the emphasis is as much on the diversity of reported statistics and the reasons for that diversity as on the selection of the "best" statistic from among those available.

2. TRENDS IN INFANT MORTALITY

Measuring Infant Mortality. The Infant Mortality Rate (IMR) in a specified geographical area is defined as the number of deaths occurring in infants under age one in that area for every 1,000 live births. This definition can also be expressed in terms of probability: the IMR is the probability of a newborn infant dying prior to his/her first birthday. In practice, the IMR is calculated for a specific time period; this period may be as short as a year but, more often, a period of three, or even five years, is used.

In the ideal situation where all births and deaths are registered routinely and there is no migration, one can determine the IMR for any given period by recording the number of births in that period and, one year following the last birth recorded, counting the number of those children registered who died before their first birthday. Because the vital events registration systems in the developing world do not yet approach the ideal and because there is migration, a variety of estimation procedures are used to determine IMRs.

In general, there are two methods of estimating an IMR: a direct method in which births and deaths in a given time period are counted and a ratio formed of deaths per 1,000 live births, and an indirect method in which knowledge about births and deaths plus additional demographic information is factored into a mathematical model to generate an estimate. Most models generate estimates in the form of a time trend, not single estimates for individual points in time. The data needed to apply either method -- direct or indirect estimation -- can come from two basic sources -- vital events registries and comprehensive surveys (or censuses).

IMRs in Honduras. In Honduras, a number of different types of organizations provide estimates of trends in mortality: The Ministry of Health furnishes an estimate on behalf of the government; two international organizations working in the health arena in Honduras -- UNICEF and PAHO -- publish estimates; USAID itself makes (or selects from other sources) its own estimates; and a number of other institutions publish estimates -- the World Bank, the United Nations and the U.S. Bureau of the Census. In an attempt to clarify the situation, the Latin American Demographic Center (CELADE) added to the plethora of numbers with a study of its own, reviewing other sources and developing its own estimates.

The various estimates of IMR encountered during the field visit to Honduras used the direct and the indirect methods and relied on either (or both) types of data sources -- vital events registries and surveys. Instances exist where estimates are published where neither the method nor the data source are documented. As one might expect, the range of IMR values is large enough to make it difficult to render a definitive estimate for a particular point in time without a thorough review of available estimates and their source and derivation.

The variation in published estimates reflects the technical issues mentioned above:

a) the method of estimation -- direct or indirect;

b) within indirect methods, the model used and the analyses of the available empirical information; and

c) the time period of the estimate -- one year, three years, five years or some other period.

Although not clearly the case in Honduras, it is possible that the situation is further complicated by poor reporting by different organizations of what is essentially the same data. In particular, once an event such as a survey or a census takes place generating new, primary data, the results of that event trickle into different organizations at varying rates and, moreover, may be erroneously attributed to the time the organization receives the data rather than the time the data were actually collected. The most egregious instance of this phenomenon is citing a rate as of the year of its publication rather than the year in which the data were collected. Another common error is the attribution of a period estimate to a single year.

Finally, because the IMR is used in a political context as well as a technical environment, certain estimates are distorted to emphasize political rather than technical issues. Overestimates may be generated for the donor community as a means of stimulating additional technical and/or financial assistance. Often, underestimates are generated for public consumption at home to convey the image to the populace that conditions are improving.

Few of the IMR estimates for Honduras seem to be based on vital statistics, as survey data have been available throughout the study period (1980-1988), beginning with the 1981 Encuesta Nacional de Prevalencia del Uso de Metodos Anticonceptivos (ENPA 1981). In fact, the only estimates cited to be derived from government statistics are those published by PAHO 1986. These extremely low, optimistic estimates, beginning at only 24.9/1,000 in 1979 and ending with an enviable 17.4/1,000 in 1983, are

probably based on national censuses and/or vital statistics, known to have a high rate of underregistration. No other published estimates (even those found from the Honduras Ministry of Health) reported such low estimates. If nothing else, these PAHO estimates help to underscore the inherent danger of calculating (and using) indicator statistics from incomplete and unadjusted vital registration data.

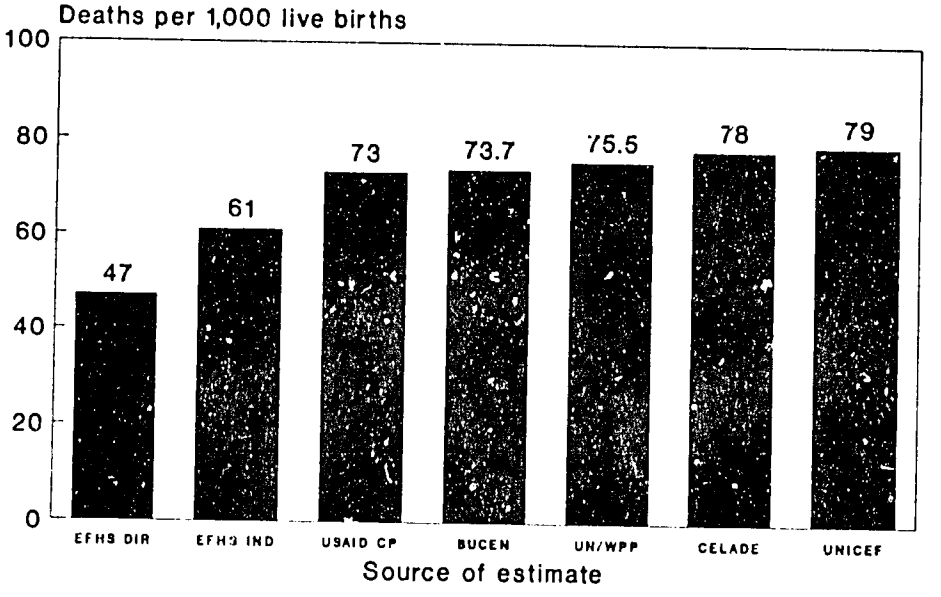
The greatest number of IMR estimates fall in 1985, where a direct estimate of 46.9 deaths per 1,000 live births from the 1987 Epidemiology and Family Health Survey (EFHS 1987) anchors the low end of a range topping off with an estimate of 79/1,000 from the UNICEF Area Office for Central America and Panama (UNICEF CAP)(see Figure 1).

The estimates for 1985 cluster around a mean IMR of 68.2, somewhat higher than the indirect estimate of 61/1,000 from the EFHS 1987 reported by the Ministry of Health. This high mean may be due to the fact that the majority of sources reporting IMRs in 1985 did not yet have access to the EFHS 1987 estimates; many of the IMRs for 1985 more closely reflect the higher, but best survey estimate at that time, of 76.4/1,000 arising out of the 1984 Maternal and Child Health/Family Planning Survey (MCH/FP 1984). Any reports released after 1987 and reporting a 1985 IMR estimate seem to have utilized the findings of the EFHS 1987.

Both direct (EFHS 1987-II) and indirect (MOH EFHS 1987) estimates were published based on the EFHS 1987 data, with the former being considerably lower. Although these estimates seem closely matched in 1981, there is considerable divergence in subsequent years, ending in 1985 with a direct estimate of 46.9/1,000 compared to an indirect estimate of 61.0/1,000. The less conservative indirect estimates seem to be the force behind estimates proffered by other reporting sources, as opposed to the direct estimates generally believed to underestimate mortality levels.

A prospective, follow-up survey was conducted in 1988 (Follow-up 1988) to test the validity of the direct IMR estimates from EFHS 1987. The purpose of the survey was to determine whether retrospective data were adequate to estimate IMRs. The Follow-up 1988 survey interviewed selected pregnant women and/or women with infants identified during EFHS 1987. The estimate of 48/1,000 for 1986-1988 calculated from the prospective data is well-aligned to the 1985-1987 EFHS 1987 rate of 48.1, lending considerable validity to the EFHS 1987 IMR estimate. It is likely that future publications from sources relying on this primary data will shift their estimates downward, reflecting the confirmed validity of the EHFS direct estimate. Additionally, this estimate shows a considerable and encouraging decline in the infant mortality rate in Honduras.

FIGURE 1
THE RANGE OF INFANT MORTALITY RATE ESTIMATES IN HONDURAS IN 1985



NOTES:

1) The United Nations World Population Prospects estimate is based on a linear interpolation between five year estimates for the periods 1980-85 and 1985-1990. The estimate is a mid-year 1985 estimate assuming the five year period estimates refer to 1/1/83 and 1/1/88.

2) The BUCEN estimate was provided by BUCEN as one of a sequence of annual estimates (sequence provided in 1990).

3) EFHS DIR is the direct rate from the 1987 Epidemiology and Family Health Survey; EFHS IND is the indirect rate.

4) The UNICEF estimate is that reported in the UNICEF Area Office for Central America and Panama 1988 Annual Report.

Figure 2 displays the time trends gathered from three sources: BUCEN 1990, United Nations World Population Prospects 1988 (UN/ESA 1988c) and the Ministry of Health. Both BUCEN and the UN rely primarily on indirect estimation to generate time series trends. The trends from these two sources track nearly identical slopes, with the UN estimates being only slightly higher than BUCEN's.

The MOH estimates, (indirect estimates based on EFHS 1987 data), show a similar slope to the UN and BUCEN data, but are considerably lower than those estimates, yielding a more optimistic trend. While BUCEN customarily adjusts its data retrospectively based on recent survey data, the EFHS 1987 findings were not incorporated into the report reviewed in this study.

Although it is difficult to know which single source most accurately portrays the infant mortality in Honduras, the current series of surveys is yielding valuable trend information, adding considerable credibility and understanding to published numbers from other primary sources as well as secondary sources. In the future, the USAID Latin America Bureau should rely primarily on one source. For consistency over time, that source should be one of the organizations with teams of demographers who quickly reanalyze new empirical data and adjust their models accordingly. Additionally, adopting and citing data from sources which clearly define and qualify their methods of estimation, rather than using a number with few clues as to its derivation and that only intuitively seems "correct," should be encouraged.

3. TRENDS IN VACCINATION COVERAGE

Measuring Vaccination Coverage in Children. Worldwide, the effort to develop and implement methodologies for estimating vaccination coverage rates[1] on an annual basis has been greater than the effort to estimate any of the other indicators discussed in this paper. One reason for this is the potential for rapid change of a vaccination coverage rate. Every year, a completely new cohort of infants must be vaccinated. As the success in vaccinating each cohort is dependent on a number of short-term factors, coverage rates can, and do, fluctuate dramatically from year to year; therefore, a new rate must be estimated each year. In general, two methods of estimating vaccination coverage rates have been refined over the years -- routine reporting (generating what are known as administrative estimates) and surveys.

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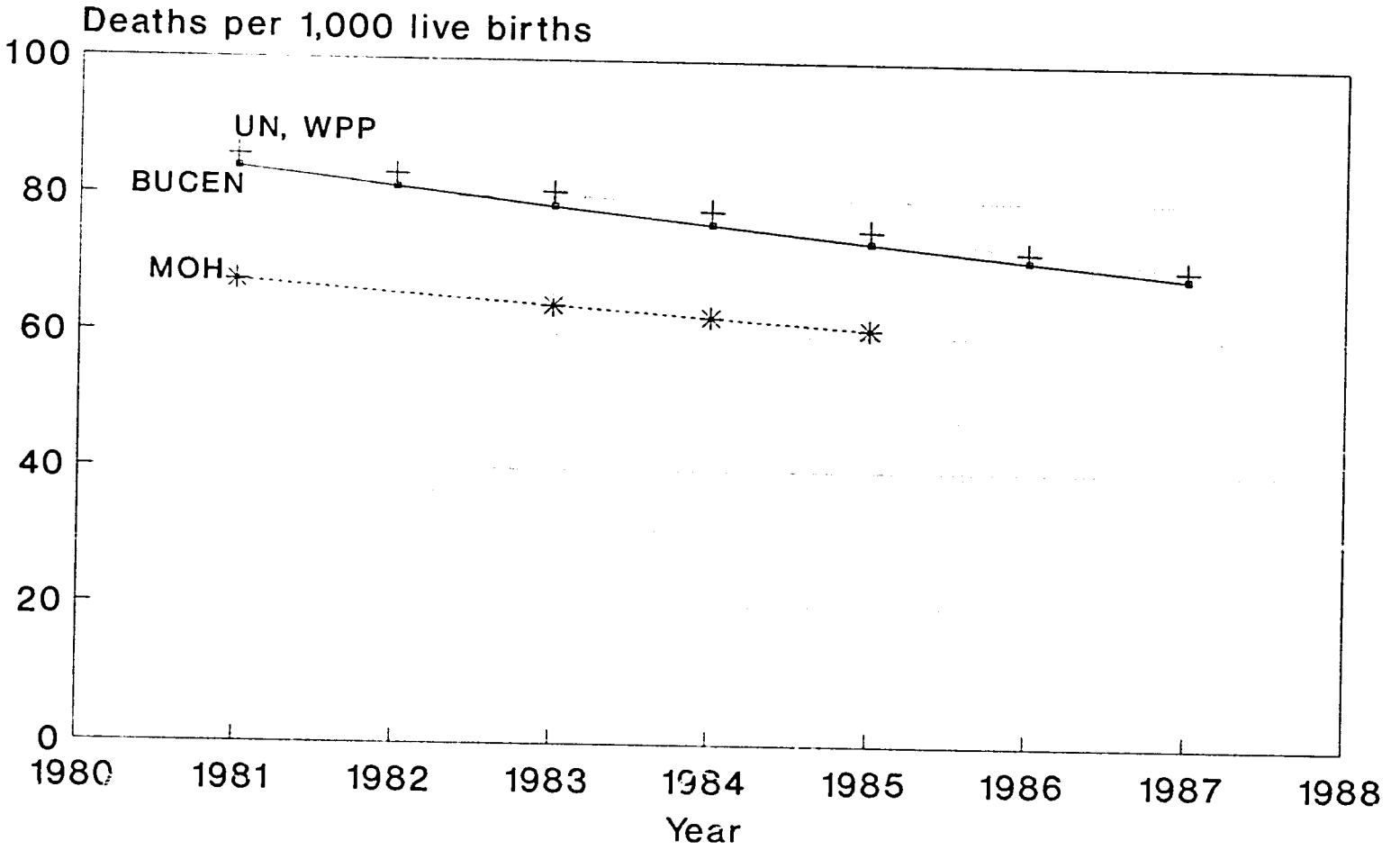
[1]A vaccination coverage rate is not synonymous with a rate of immunization. Vaccination does not guarantee protection. Not all vaccinations result in the sero-conversion necessary to assure immunization, especially in situations where frequent breakdowns in the cold-chain render vaccines ineffective.

FIGURE 2
TRENDS IN INFANT MORTALITY RATES IN HONDURAS FROM THREE DISTINCT SOURCES



In Central America, where reporting systems are relatively well developed, the emphasis has been on improving the quality of routine reporting. However, special surveys have been carried out periodically providing an alternative view of coverage levels from the perspective of the beneficiary. Normally, Ministries of Health report administrative estimates and, in turn, these are reported by the international organizations -- PAHO, WHO and UNICEF. In Honduras, several national demographic and health surveys were completed in the 1980s, each providing alternative estimates to those provided by the administrative system.

Administrative estimates are calculated by forming a ratio between the number of doses of a vaccine given to the children in an age group in a particular time period and the total number of children in that age group during that time period. Standard practice calls for generating annual administrative estimates of vaccination coverage from a count of vaccines administered to children <u>under one year of age</u> throughout a year and an estimate of the size of the cohort of children which should be vaccinated during that year (most often, a mid-year estimate of the size of the 0 through 11.9 month population[2]). Typically, the health sector keeps a count of the vaccines administered. Estimates of the number of children in the designated age group are usually taken from census projections (which may, themselves, be outdated or otherwise inaccurate) or, in cases where vital registration systems are functioning, from counts of the number of live births in the given time period. An administrative estimate is a <u>period</u> estimate; that is, it is the coverage rate achieved over a relatively long period of time, usually a year.

The most frequent error made in calculating administrative estimates of vaccination coverage is:

> the inclusion of vaccines given to children <u>outside</u> of the age group in question in the numerator (the count of vaccines given); for example, including vaccines given to 18 month old children in a calculation of the coverage achieved

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[2]Much confusion enters into the reporting of age-specific rates as a result of differing conventions regarding the definitions of age groups. In demographic circles, 12 to 23 months is used to denote children from the moment of their first birthday until the moment just preceding their second birthday. In the nutrition community, 12 to 23 months is frequently used as the title for children ranging in age from 11.5 months through 23.5 months -- a difference of 15 days on each end point of the category. Other groups erroneously apply the title 12 to 24 months of age for children in their second year of life. In this paper, we will use a decimal point to indicate the end points of age categories more clearly and employ the word "through" to emphasize inclusion of the end point in the category.

in children under age one.

Discrepancies in reported administrative estimates occur (even in the absence of gross error) due to:

a) the use of alternative demographic estimates of the size of the target population; and

b) delays in the reporting of data from the periphery (frequently, an estimate published six months or even a year after the close of a period is updated upon receipt of raw data from peripheral stations which had not, for whatever reason, submitted timely reports to the central information system).

In contrast to the period estimates generated from routine reporting systems, survey estimates are point estimates; that is, they are estimates of the coverage in a cohort of children at the moment of the survey. A vaccination coverage rate is calculated from survey data by dividing the number of children in the age group in question vaccinated at the time of the survey by the total number of children surveyed in that age group.

Under the direction of the World Health Organization, a standard sampling methodology (the two-stage cluster sampling technique) has evolved for estimating vaccination coverage. In the case of Honduras, it is not clear if the surveys conducted used the two-stage cluster sampling technique. However, extensive and comprehensive surveys have been completed and published in Honduras that include estimates of vaccination coverage.

Errors associated with sampling, in general, are also relevant in regard to vaccination coverage surveys:

a) samples may not be truly representative (in part, because of incomplete knowledge of the sample frame and, in part, because limited resources frequently restrict the movement of survey teams to remote places); and

b) the phenomenon surveyed may be seasonal (in the case of vaccination programs, coverage rates generated at a point in time may reflect recent campaigns and/or temporary breakdowns in the cold-chain or even the irregular pace of vaccination programs caused by rainy seasons or natural disasters).

In addition to these "familiar" errors linked to sampling, a number of issues peculiar to vaccination coverage cause discrepancies in the reporting of rates from surveys. These include:

a) the inclusion or exclusion from the numerator (the count of children vaccinated) of undocumented vaccinations supported by mother's recall but no vaccination card; and

b) the degree to which strict application of the procedure to limit the count of children vaccinated to children vaccinated prior to their first birthday.

When surveys are done by teams who do not fully understand the nuances of this last issue -- the dictum to measure rates of vaccination prior to the first birthday -- serious errors in calculating and/or reporting survey results may be made. The emphasis on "prior to the first birthday" often results in persons sampling or reporting on children under one year of age. However, the recommended survey methodology for estimating vaccination coverage rates "prior to the first birthday" is to survey children 12 through 23.9 months of age (who have already celebrated their first birthday) and recording the vaccination status of those children at the time of that birthday. Rates of children vaccinated prior to their first birthday cannot be computed from a sample of children under one year of age unless adjustments are made to correct for the fact that members of the sample have not yet reached the prescribed age for completing their vaccination series.

Vaccination Coverage in Honduras. Reported vaccination coverage rates for Honduras come from two sources: administrative estimates and survey estimates. For either method, some sources may focus on vaccination before the first birthday, while others may not. Administrative estimates vary in regard to the time differential between the report and the end of the reporting period, to the selection of the population estimate (the denominator) applied to calculate the rate and to the degree of rigor applied to limiting the numerator to children vaccinated prior to their first birthday.

Rates determined from surveys may be for children 0 through 11.9 months of age (adjusted), 12 through 23.9 months of age or, in some cases, the less commonly used age group of 0 through 59.9 months. Some surveys accept mother's recall as a valid source of information; others depend solely on health card records. The MCH/FP 1984 estimates reported here are derived from both health cards and mother's recall; the EFHS 1987 survey reports estimates based solely on cards. Some survey results, such as those from the ENN 1987, report a mixed bag of techniques -- while estimates for polio, measles and DPT were based on cards, the treatment of the card/recall issue is not well defined for BCG. ENN 1987 reports a rate for children receiving one or more BCG injections (adequate coverage) without defining how this information was obtained, as well as a BCG coverage rate based on the presence of a scar on the child at the site of the vaccination. Finally, surveys may also differ as to sampling frame and/or sampling

methodology. For instance, coverage rates from the MCH/FP 1984 were based on all children under age five, whereas the rates from the ENPA 1981 were based only on the vaccination status of the last live birth under age five.

Annexes 2 through 5 display the full range of vaccination coverage rates discovered during the field investigation of this report. A key at the bottom of each table displays the time sequence and age group on which the estimate is based.

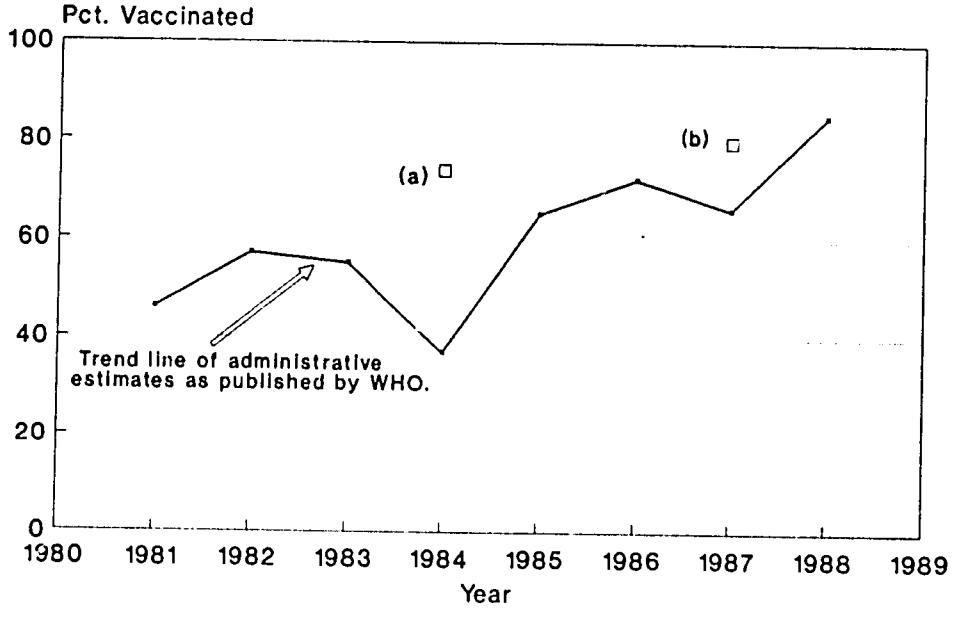
Figures 3.1, 3.2, 3.3 and 3.4 display selected vaccination coverage rates. The sequence published by WHO serves as the heart of the table because these numbers are derived from information provided by the Ministry of Health via PAHO and are used, in most cases, by other reporting agencies such as UNICEF. Except for the 1981 measles coverage rate reported by PAHO, the rates reported in the Honduras MOH 1988 report are identical to those reported by PAHO, illustrating the initial movement of these numbers from the field to the UN agencies. However, many of the WHO/EPI estimates differ from the PAHO 1986 rates, as well as the Honduras MOH 1988 rates reported for 1985-1988. This is likely due in part to the use of different denominators by WHO when calculating coverage rates. The rates for children 12-23 months of age from the MCH/FP 1984 and EFHS 1987 surveys for each of the childhood antigens are included in the figures as a "litmus" test of the official figures published by WHO. Additionally, survey coverage rates for children 0-11 months of age are also provided.

With the exception of BCG, the coverage rates reported by the surveys for children 12-23 months of age show little increase from 1984 to 1987; for polio, coverage apparently declined during this period. This decline is somewhat discouraging, given the multidonor push for eradicating polio in the Americas. However, because the decline is small (85.7 percent in 1984 vs. 76.7 percent in 1987) it may simply reflect an artifact of the different survey methodologies or simply a temporary, and expected aberration in coverage. Nevertheless, coverage levels in Honduras for all major antigens are within the real limits of the 80 percent coverage goals set by USAID.

One possible explanation for the stagnation in coverage levels between 1984 and 1987 is the difficulty inherent in trying to increase coverage above 80 percent. Immunization experience suggests that it is easier to increase coverage from 20 to 60 percent than it is to move from 60 percent to 80 percent or higher. The leap to higher coverage levels often means reaching those children and families that are the least accessible to health care.

The administrative data from WHO paint a more conservative estimate of coverage than the survey data. Except for polio, the

FIGURE 3.1
BCG VACCINATION COVERAGE RATES
ADMINISTRATIVE + SURVEY BASED ESTIMATES

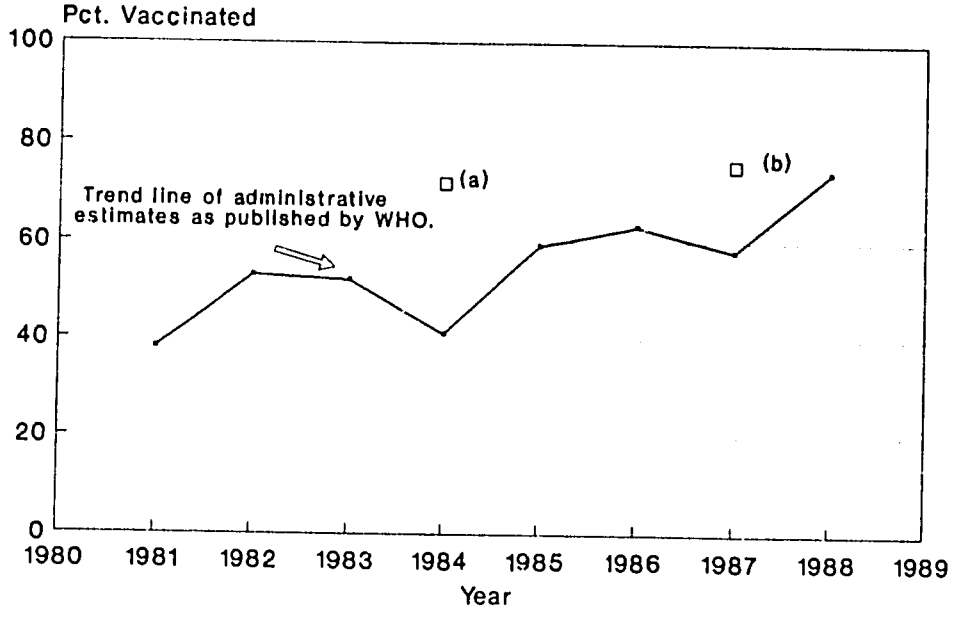


NOTES:

1) The administrative estimates are the ratios of vaccines given to children under 1 year of age to estimates of the mid-year populations for the years shown.

2) All survey estimates are for the age group 12 through 23.9 months of age.
   a) MCH/FP 1984: Age adjusted rates based on cards and recall.
   b) EFHS 1987: based on cards only.

FIGURE 3.2
DPT III VACCINATION COVERAGE RATES
ADMINISTRATIVE + SURVEY BASED ESTIMATES

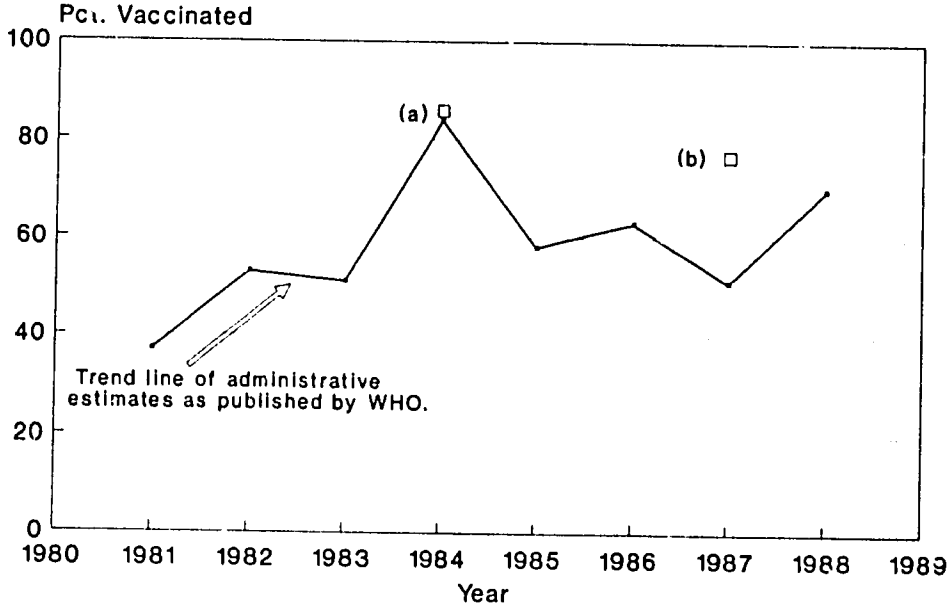


NOTES:

1) The administrative estimates are the ratios of vaccines given to children under 1 year of age to estimates of the mid-year populations for the years shown.

2) All survey estimates are for the age group 12 through 23.9 months of age.
   a) MCH/FP 1984: Age adjusted rates based on cards and recall.
   b) EFHS 1987: based on cards only.

FIGURE 3.3
POLIO VACCINATION COVERAGE RATES
ADMINISTRATIVE + SURVEY BASED ESTIMATES

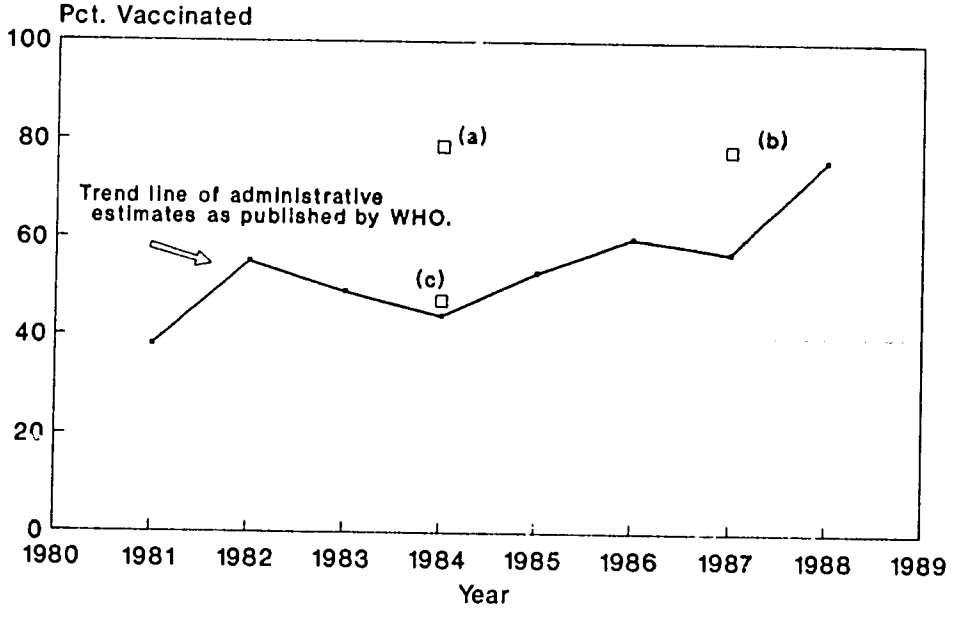


NOTES:

1) The administrative estimates are the ratios of vaccines given to children under 1 year of age to estimates of the mid-year populations for the years shown.

2) All survey estimates are for the age group 12 through 23.9 months of age.
   a) MCH/FP 1984: Age adjusted rates based on cards and recall.
   b) EFHS 1987: based on cards only.

FIGURE 3.4
MEASLES VACCINATION COVERAGE RATES
ADMINISTRATIVE + SURVEY BASED ESTIMATES



NOTES:

1) The administrative estimates are the ratios of vaccines given to children under 1 year of age to estimates of the mid-year populations for the years shown.

2) Survey estimates for (a) and (b) are for the age group 12 through 23.9 months of age. Estimate for (c) is for age group 0-11.9 months of age.
   a) MCH/FP 1984: Age adjusted rates based on cards and recall.
   b) EFHS 1987: based on cards only.
   c) MCH/FP 1984: Age adjusted rates based on cards and recall.

trend line for all the antigens dips in 1984 and then steadily climbs to 1987 where coverage spikes between 16 and 19 percent above the 1987 level. For polio, coverage accelerated some 33 percent between 1983 and 1984, and then subsequently declined by 26 percent. Following a further decline in coverage between 1986 and 1987, coverage increased nearly 20 percent in 1988. The spike in polio coverage in 1984 may have been the result of a one-time accelerated polio campaign. This rapid increase in coverage was also picked up by the MCH/FP 1984 survey.

The administrative trend line for measles was developed from coverage estimates calculated from distinctly different age groups than the survey data. From 1981-1984, the WHO estimates reflect coverage of children 0-11 months of age, while for 1985-1988 the rate is based on the percentage of children vaccinated at or later than 12 months of age and up to 60 months. While it is intriguing that the administrative estimate for 1988 of 76 percent closely agrees with the 1987 survey estimate of 77.9 percent, in the absence of more information about the age distribution of the WHO denominator it is inadvisable to make inferences about the relationship between the two estimates. The MCH/FP 1984 estimate for children 0-11.9 months of age (labeled (b) on Figure 3.4) is supplied as a comparison to the 1984 administrative estimate also for children 0-11.9 months of age.

Measuring Tetanus Toxoid Coverage. The detection of trends in tetanus toxoid coverage in women or mothers from historical data is particularly challenging due, in part, to changing definitions of the coverage indicator over time and, to the cumulative protective effect of tetanus toxoid vaccination during the course of a lifetime. These two issues are closely related.

Properly spaced, five doses of tetanus toxoid protect a woman from tetanus and all of her newborns from neonatal tetanus throughout her childbearing years. In populations where little or no effort has been made to vaccinate women against tetanus, the strategy adopted by health professionals has been to give two shots during the latter stages of a single pregnancy in order to protect the newborn. The indicator to monitor program progress was defined accordingly -- the proportion of pregnant women receiving two doses during a pregnancy prior to delivery.

However, as the number of women receiving subsequent doses of the vaccine through repeated pregnancies increases and younger women, vaccinated as children as part of the diphtheria-pertussis-tetanus vaccination series, enter childbearing age, the proportion of newborns protected increases, even among mothers who may not have received the prescribed two shots during any single pregnancy. Thus, the indicator used historically has ceased to measure the underlying phenomenon which one wishes to assess -- the proportion of newborns protected against neonatal tetanus. Worldwide efforts are underway to modify the indicator

to one which measures long-term tetanus protection. However, as the rate of adaptation of this new indicator varies, one cannot always discriminate which definition was applied to determine a particular published rate. The new indicator is the proportion of newborns whose mothers had received sufficient tetanus toxoid vaccinations, properly spaced, to guarantee the newborn's protection against neonatal tetanus.

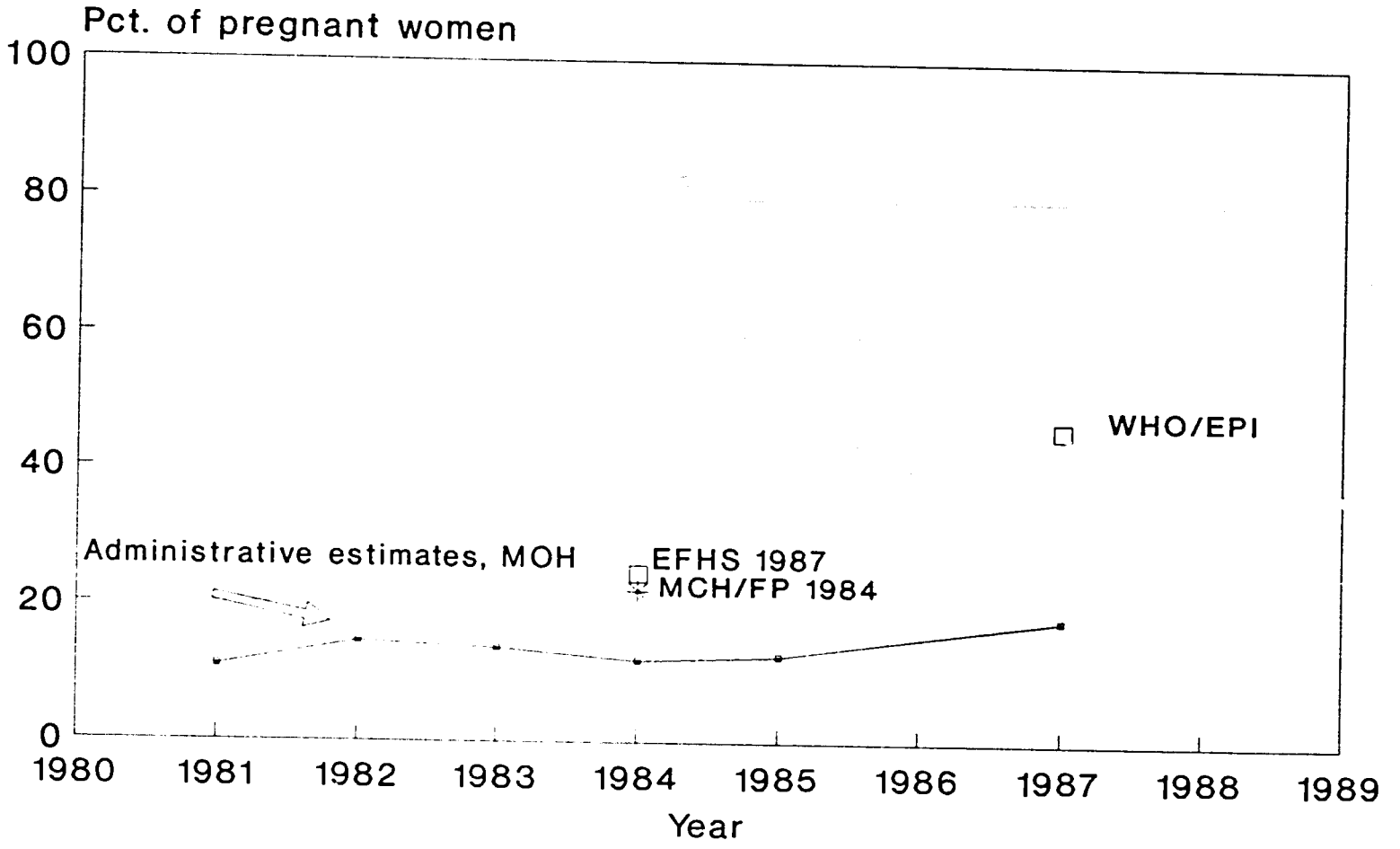
As with the vaccinations against the childhood diseases, estimates of coverage are available from both non-survey and survey sources. The quality of estimates is determined by many of the same issues which determine the quality of estimates of coverage among children. Administrative estimates are only as good as the ability of the routine reporting system to capture the number of doses given and the accuracy of the estimate of the number of pregnancies in a given time period. Survey estimates are also limited by the ability of a mother to recall her vaccination history. Frequently, where children have vaccination cards, mothers do not, and therefore, mothers' recall is more important to assess tetanus toxoid coverage. Moreover, surveys are frequently incomparable due to the diverse manner in which vaccination histories are sought and/or recorded.

Tetanus Toxoid Coverage in Honduras. Figure 4 displays various reported rates of coverage with tetanus toxoid. The estimates for MCH/FP 1984 and EFHS 1987 are based on the percentage of women whose last live birth occurred during the five years before the survey (the period 1979-84 for MCH/FP and 1982-87 for EFHS) who reported receiving two or more doses of tetanus toxoid vaccination. The sequence of rates through 1987 were furnished by the Ministry of Health. These are based on counts of the number of second doses given to pregnant women in the time period indicated. The denominator was calculated based on the percent of pregnant women in Honduras (estimated as five percent from available estimates of live births and fetal deaths).

The Ministry of Health rates are quite low throughout the reporting period. After a slow but steady rise from 7.9 percent in 1980 to 14.5 percent in 1982, the reported coverage fell to 11.8 in 1984. The last available Ministry estimate found during this study (17.9% in 1987) indicates that coverage is again on the rise; however, this estimate falls shy of the MCH/FP 1984 survey estimate of 21.8 percent. While the fluctuations in the Ministry estimates may be real, there is a strong possibility that they are little more than an artifact of the method of computation applied in producing the estimates.

Estimates from UNICEF State 1987-1990 are rather erratic, beginning with 25 percent for 1984-85, dropping to 18 percent for the period 1985-86, rising again to 25 percent for 1986-87 and falling to 16 percent for the period 1987-1988. The rates of 25

FIGURE 4
TETANUS II+ VACCINATION COVERAGE RATES
ADMINISTRATIVE + SURVEY BASED ESTIMATES



percent, cited as coming from the UNICEF field office, seem to reflect the EFHS 1987 estimate of 24.6 percent reported for the period 1982-87. An optimistic and enviable rate of 46 percent for 1987 was reported by WHO/EPI. While the source cited by WHO was the Ministry of Health via PAHO, this number is considerably higher than the Ministry's administrative estimate for 1987 of 17.9 percent.

4. TRENDS IN DEATHS DUE TO DIARRHEA AND USE OF ORT

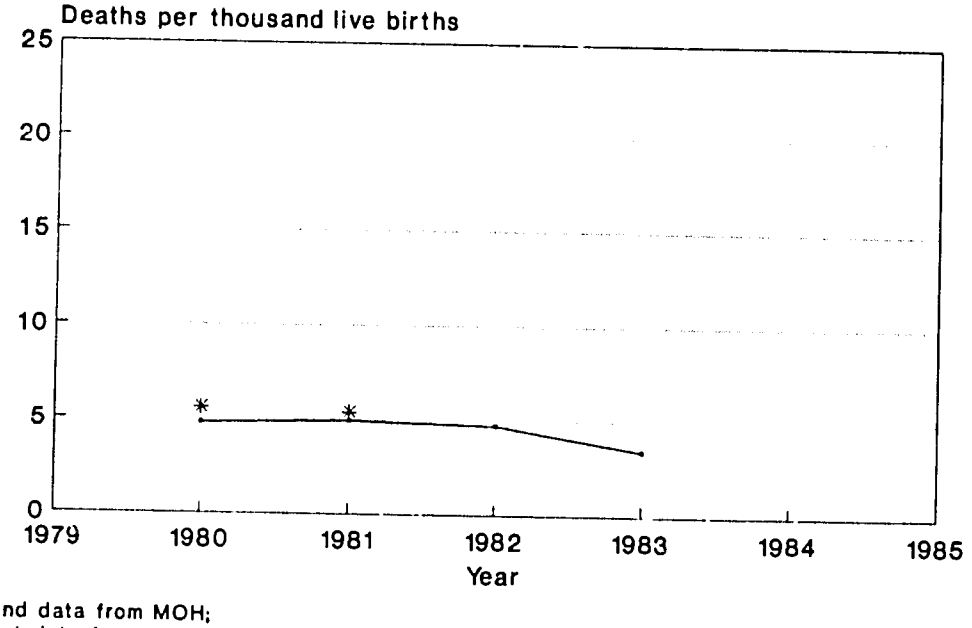
Measuring Trends in Deaths Due to Diarrhea. Among children 0 through 11.9 months, disease-related mortality is generally expressed in terms of deaths per thousand live births. In other age groups, mortality rates are expressed as the ratio of deaths to 10,000 or 100,000 population.

The difficulties in collecting reliable disease-specific mortality in situations where many deaths occur unattended by medical practitioners and where, in fact, many deaths go unreported are enormous. In Honduras, data were predominately available from the routine reporting system through either the Ministry of Health or PAHO, although limited survey data were available from the EFHS 1987 and ENN 1987. For the routine data, the authors of this report do not know whether the numbers of deaths reported are themselves estimates for the country as a whole based on partial reporting or whether the numbers correspond to actual deaths reported by the system. In general, routine reporting systems capture only a portion of the actual number of deaths, due to incomplete coverage of the health care delivery system. Furthermore, the diagnostic capability of peripheral health workers without proper laboratory equipment and training is often limited.

It is important to note that the EFHS 1987 and ENN 1987 survey rates are not based on deaths per 1,000 live births or per 100,000 population. Rather, they are estimates of the percentages of children reported deceased at the time of the survey determined to have died from a diarrheal disease. In the case of the EFHS 1987, physicians reviewed the information collected from the survey's infant mortality module and made a determination as to the cause of death. For the ENN 1987, the exact procedure for determining cause of death was not clear.

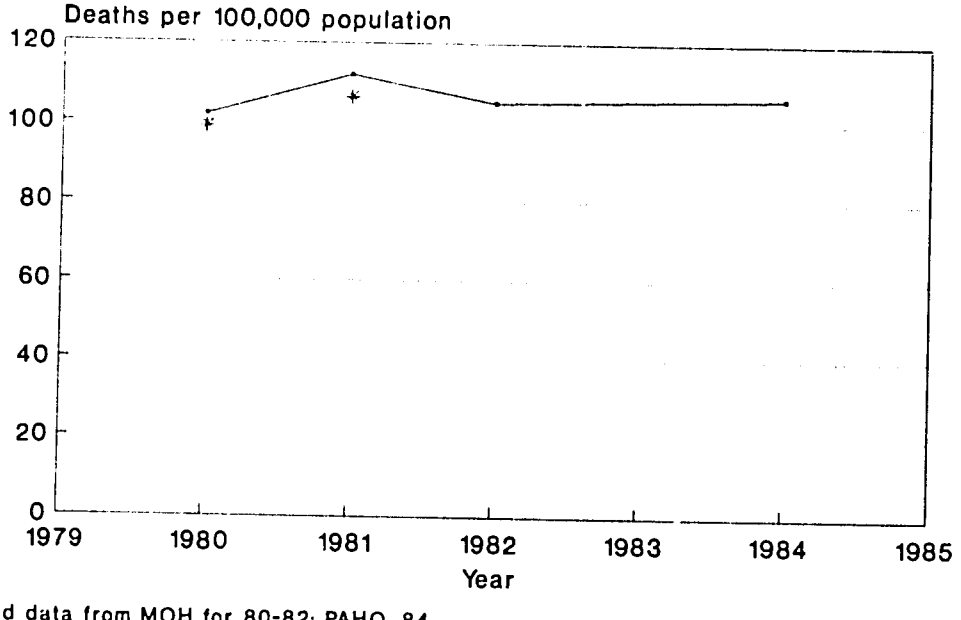
Diarrheal Deaths in Honduras. Figures 5.1 and 5.2 display the trend in deaths in infants and in children 12 through 59.9 months of age. The limited number of data points, coupled with an absence of contextual knowledge regarding completeness of reporting for the years in which data are available, makes interpretation of the trends inappropriate.

FIGURE 5.1
DIARRHEA ASSOCIATED MORTALITY
INFANTS AGED 0 THROUGH 11.9 MONTHS



Trend data from MOH;
Point data for 1980-81 from PAHO

FIGURE 5.2
DIARRHEA ASSOCIATED MORTALITY
CHILDREN AGED 12 THROUGH 59.9 MONTHS



Trned data from MOH for 80-82; PAHO, 84
Point data for 1980-81 from PAHO

Measuring Trends in ORT Use Rates. The appropriate technology for treating watery diarrhea is the administration of pre-packaged oral rehydration salts (ORS) or home-made sugar-salt solutions (SSS). During the course of the Child Survival Initiative of the late eighties, a distinction developed between the ORS Use Rate and the Oral Rehydration Therapy (ORT) Use Rate. The former is limited to the use of pre-packaged ORS. According to the USAID Child Survival Program definition, the latter involves three aspects of diarrhea case management -- the administration of either ORS or SSS; continued appropriate feeding during diarrhea; and the referral of severe cases to proper medical treatment facilities. Frequently, in citing primary sources of data, individuals and institutions are sloppy in their efforts to distinguish ORS Use Rates from ORS+SSS Use Rates. Similarly, ORS+SSS Use Rates are often confused or substituted for ORT Use Rates.

Both ORS and ORS+SSS Use Rates are best determined by surveys. The recommended method for inquiring about rehydration practice is to ask mothers whose children (aged 0 through 59.9 months) have had diarrhea in the two weeks prior to the survey what treatment was administered to the children. Variations in the manner in which this question is posed limit the comparability of survey results. Additionally, large sample sizes must be employed to guarantee that enough mothers are found whose children have had diarrhea in the two weeks preceding the survey. Errors and/or inconsistencies arise in survey rates due to:

a) sample composition differences arising from seasonal variation in the distribution of diarrhea cases;

b) inaccurate responses from mothers who have learned how to answer the questions to please the authorities but have not changed the way they treat episodes of diarrhea; and

c) loose handling of the distinctions between packets, proper home solutions and other home solutions in determining use rates.

WHO has developed procedures to estimate ORS and ORS+SSS usage from data on the number of packets available in a country during a year. First, an estimate in the number of episodes of diarrhea must be made, often from old surveys and, where surveys do not exist, from regional averages in the number of cases per child per year derived from existing surveys. An algebraic algorithm is then applied to estimate how many of those cases might have been treated given what is known about ORS packet availability. In the absence of other empirical data, these estimates are reasonable; however, issues such as the existence of backlogs of packet supplies and/or non-usage following distribution do not enter into the estimation procedure.

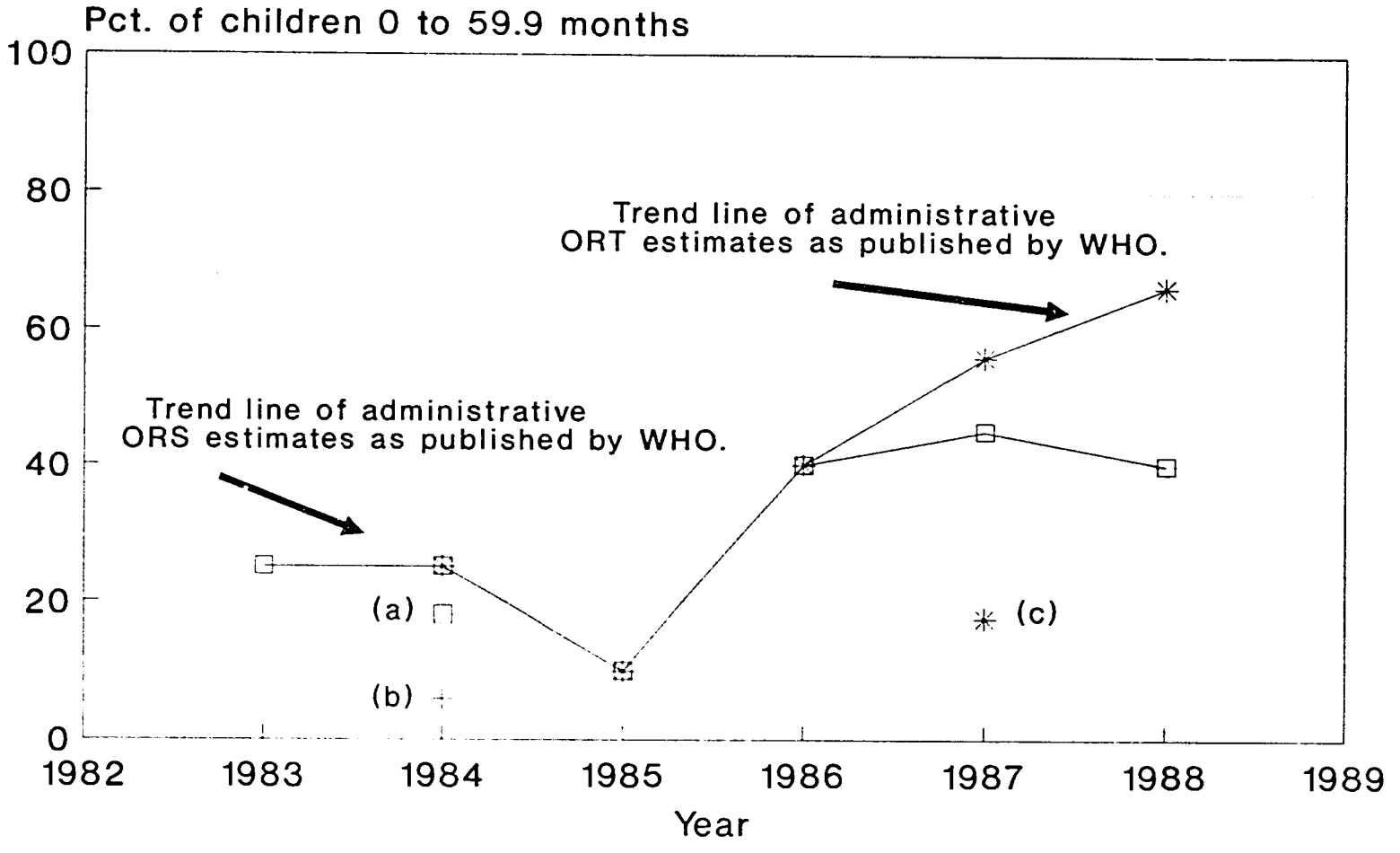
As the use of some form of rehydration as a treatment for diarrhea has grown, increasing attention has been given to the proper or correct application of the technology. Studies have shown that, all too often, mothers use packets but mix the solution incorrectly or fail to give adequate amounts to their children. Similarly, mothers do not always mix home solutions in proper proportions and, again, they do not always give adequate quantities to their children. In years to come, indicators of ORS and ORT Use may well be changed to distinguish proper administration of the treatment from faulty applications.

ORT Use Rates in Honduras. In Honduras, data are available regarding ORS and ORS+SSS Use Rates from two sources -- surveys and the routine reporting system as published by WHO/PAHO. The WHO/PAHO reports distinguish between the use rate of ORS packets and the use rate of both packets and home solutions. The use of both packets and home solutions is referred to as the ORT Use Rate in WHO/PAHO reports. WHO/PAHO does not attempt to measure the proportion of diarrheal cases for which the three steps comprising ORT as defined by the USAID Child Survival Program, above, are carried out. Similarly, questionnaires generally seek from each mother what treatment was given to her child during his/her child's most recent bout of diarrhea (sometimes limited to bouts within the two-week period prior to the survey) but do not explore the complete application of the three actions required according to the USAID ORT definition. The full course of case management suggested by the concept of ORT is so difficult to quantify in either surveys or routine reporting systems that data regarding its application is virtually non-existent. (One can be reasonably confident in a mother's ability to report on what special treatment was given to a child with diarrhea -- it is less reasonable to determine the quantity and types of food eaten by the child and virtually impossible to determine retrospectively whether referral was indicated).

The rates published by WHO/PAHO are computed by a variety of means depending on the data available. Ordinarily, some explanation of the method of computation is given. In the case of ORS Use Rates, the most frequent method involves a computational algorithm estimating the number of cases of diarrhea which one would expect in the target age group, while considering the amount of ORS available in country to treat those cases. When surveys are done, WHO/PAHO frequently reports the survey results.

Figure 6 presents most of the data available regarding ORS and ORS+SSS use (Annex 8 contains the data itself). The overall trend in ORS+SSS (ORT) use plotted by the WHO/PAHO data is encouraging, with an acceleration in use rates from 1985 to 1988 following a substantial decline from 1984 to 1985. A second trend line based on WHO/PAHO data plots ORS (Litrosal) use rates

FIGURE 6
ORT AND ORS USE RATES
ADMINISTRATIVE AND SURVEY ESTIMATES



only, and seems to indicate a leveling off after 1985. Because the ORS use rates are calculated based on access to ORS packets, this plateau could reflect a stagnation in expanding access to the packets; the optimistic ORT use rates may illustrate the overall importance of SSS in increasing the use of appropriate treatment for dehydrating diarrhea. The divergence of the two trend lines after 1986 serves to exemplify the need to exhibit caution in comparing numbers unless the definitions and procedures used to derive the numbers are known to be the same.

Survey data from the MCH/FP 1984 and EFHS 1987 are for Litrosal use only, and are considerably lower than the administrative estimates. The actual ORS use rate estimated from the MCH/FP 1984 is probably closer to the 5.9 percent reported in the survey's final report than the higher estimate of 18 percent reported from an earlier analysis of the survey data.

5. TRENDS IN UNDERNUTRITION

Measuring Undernutrition. The nutritional status of the children of a community or country is generally considered to be one of the best indicators of the overall well-being of that community or country. It is measured using anthropometry, as the growth of children tends to reflect their nutritional condition. Specifically, a child of a given age is considered to be malnourished if his/her weight is more than two standard deviations below the standard weight for children of that given age. The ratio of the child's weight to the standard is often referred to as his/her weight-for-age score. Although a number of standards have been used during the last decade, in recent years the standard set by the United States National Center For Health Statistics (NCHS) has been adopted by most scientists and field practitioners.

Occasionally, alternative anthropometric measurements are used to quantify malnutrition. A comparison of a child's height to a standard height for children of the same age as the child in question (height-for-age) measures chronic malnutrition as manifested by stunting. Similarly, a comparison of a child's weight to the standard weight for children of the same height as the child in question (weight-for-height) measures acute malnutrition in the form of wasting. The weight-for-age measure presented in this report is a composite of the two measures -- a child can be deficient in weight-for-age due to either chronic or acute malnutrition, or both. It is the indicator of choice for infants and very young children as stunting manifests itself only after prolonged nutritional deprivation while wasting is, typically, a transitory phenomenon. Also, until children can stand tall, the measurement of height is highly inaccurate. Finally, weight-for-age is collected most frequently and, therefore, is the most available indicator of nutritional status.

Whereas individual projects may establish procedures to estimate the nutritional status of a population in a limited geographic area on a routine basis, national estimates are usually derived through surveys.

Comparisons among surveys are often inappropriate for a number of reasons, including:

a) measurements are taken among children of different age groups in different surveys;

b) different standards are used to determine the normal weight or height for a child of a given age (or height); and

c) the degree of deficiency (determined by a point in the distribution of the anthropometric measurement in question) required to classify a child as malnourished varies across surveys.

Regarding nutritional status measurement, the issue of age groups (issue "a" above), requires special attention. In most child populations, the prevalence of malnutrition at a point in time in various age groups is invariably different. Typically, in Latin America, the prevalence is highest in children late in the second year of life. Therefore, comparisons over time must be made on population groups with similar if not identical age distributions. Otherwise, differences in prevalence may be nothing more than an artifact of the different age distributions of the groups under scrutiny. It is not acceptable to compare children 0 to 35.9 months of age to children 0 to 59.9 months of age.

Undernutrition in Honduras. Annex 9 displays the nutritional status data for Honduras found during this study. Each of the issues raised above regarding comparability of surveys applies to these data, especially issue (b), the use of different standards. For that reason, it is not prudent to plot trends from the data.

6. TRENDS IN THE NUMBER OF CASES OF MALARIA REPORTED

Measuring Malaria Cases. In Honduras, as in the balance of Central America, the only data on malaria is that reported routinely by the Ministry of Health on the number of cases registered annually. Because it is extremely difficult to distinguish fever due to malaria from other fevers in a retrospective survey, there is no survey-based data on malaria. Moreover, many peripheral health units lack the equipment and/or know-how to test whether a fever is due to malaria. Health workers in such peripheral units are advised to treat all fevers as if they are malaria and, therefore, the routine reporting system may overestimate the number of actual cases.

Malaria in Honduras. Annex 10 lists the number of cases of malaria reported by the Ministry of Health for the period 1980 through 1988. Figure 7 shows an overall downward trend in reported cases after 1981. Increases in registered cases in 1985 and 1987 are probably due to artifacts of the comprehensiveness of the information system, and may not reflect a true increase in the occurrence of the disease.

7. TRENDS IN THE ADEQUACY OF WATER AND SANITATION SERVICES

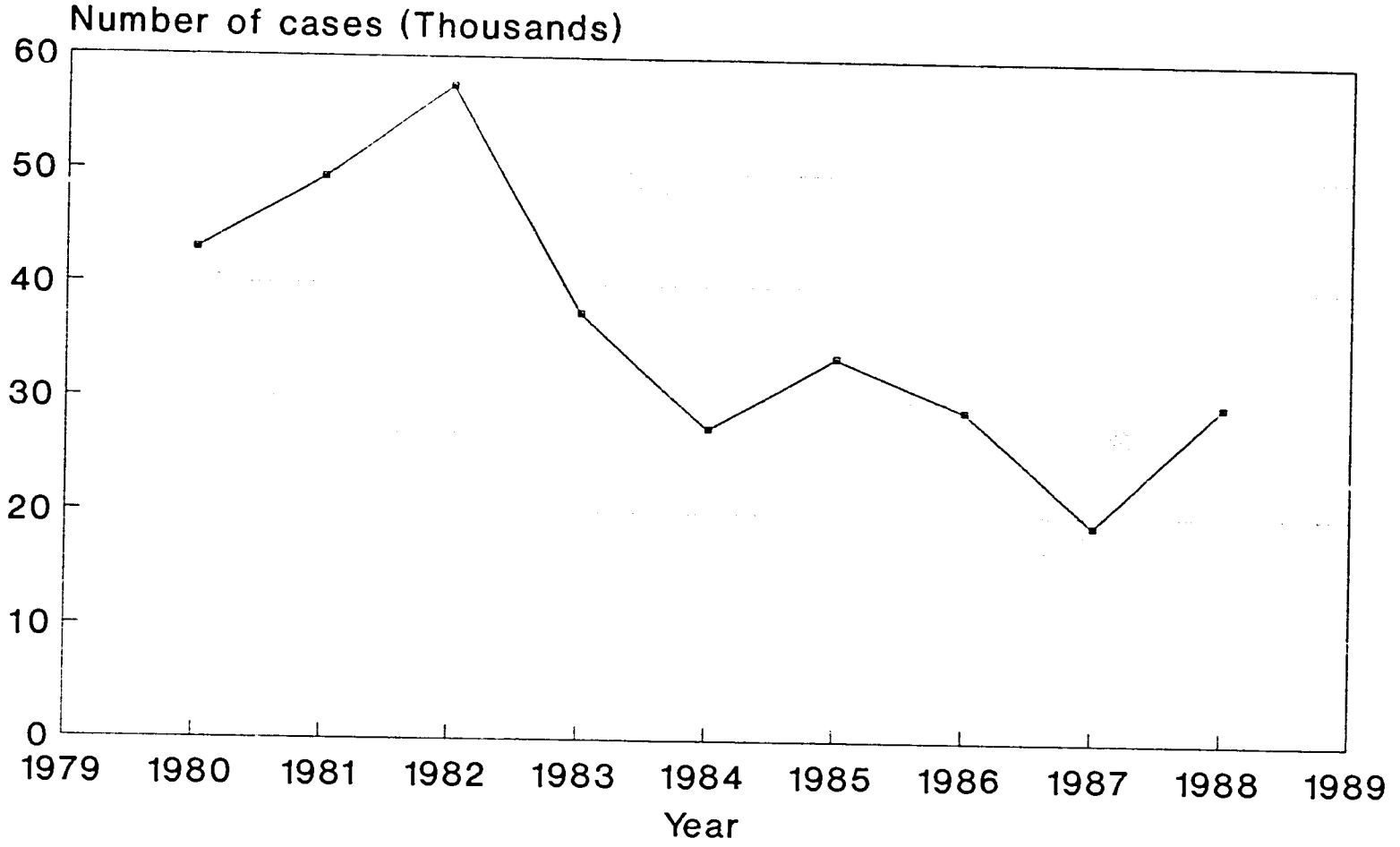
Measuring Water and Sanitation. As with many of the other health indicators, estimates of access to water and sanitation services may be made from survey data or from administrative record keeping systems at the national level. Access to water supply and sanitation in urban areas is often defined differently from that in rural areas. Consequently, comparisons between rural and urban access are not strictly valid. For example, in Central America, the WASH project uses the following definitions:

> Urban Water Supply Coverage is defined as service provided through either a direct connection to a residence or a residence within 200 meters of a public standpipe or fountain.
>
> Rural Water Supply Coverage is defined as service provided either through direct connection to a residence or from a water supply source at a distance from the home which would not cause family members to spend a disproportionate amount of time fetching water.
>
> Urban Sanitation Coverage is defined as service provided through sewer systems or in-house or in-compound facilities (latrines, septic tanks, etc.).
>
> Rural Sanitation Coverage is defined as service provided through in-house or in-compound excreta disposal facilities (latrines).

Furthermore, the definition of the key terms "access", "urban", and "quality of coverage" (potable water or adequate sanitation) are not universally established. WASH defines an urban area to be a population center of over 2,000 persons, with all other areas designated as rural. Thus, in different surveys, varying interpretations of the meaning of these terms are possible. Regarding administrative records, it is common to find countries which do not update the operating status of older water and sanitation systems. Once in place, all systems are typically assumed to be operable.

Annexes 11 and 12 present data primarily from two sources: PAHO and WASH. The WASH figures were calculated by dividing an

FIGURE 7
NUMBER OF CASES OF MALARIA REGISTERED BY THE MINISTRY OF HEALTH



estimate of persons with access (obtained from International Drinking Water Supply and Sanitation Decade progress reports augmented by reports from specific projects and USAID Mission estimates) by the urban and rural populations (obtained from the Demographic and Health Survey project). Judging from the similarity of the estimates from different sources, it would appear that a single estimate of access is shared by organizations reporting this type of information.

Access to Water and Sanitation in Honduras. Figures 8 and 9 present the trend data as reported by the WASH project. After a decline and stagnation in access to potable water in urban areas (probably due to increased urban growth between 1980 and 1986) 1988 saw a considerable increase in access, with 97 percent (1.6 million persons) of urban dwellers with access to a good water supply. In rural areas growth has been slow, and seems to be holding steady at about 50 percent, up from only 40 percent in 1980. Some 1.4 million rural inhabitants have access to potable water, up from 950,000 in 1980.

Honduras seems to be keeping pace with growing urban needs for adequate sanitation, increasing coverage some 44 percent between 1980 and 1988. The urban population served has more than doubled over this period, from 670,000 in 1980 to over 1.5 million in 1988, with a concomitant rise in coverage from 49 percent to 93 percent. As with access to water, there was stagnation in expansion of services between 1984 and 1986. Service coverage in rural areas has increased 30 percent since 1980, with the population served more than doubling by 1988. Some 1.5 million rural dwellers now have access to adequate sanitation, compared with only 670,000 in 1980.

8. CONCLUSION

While this report makes no specific recommendations for utilizing one reported number over another, readers are encouraged to use the general discussions about each of the indicators as guidelines when considering using and interpreting data from any source.

Bringing together like data from multiple sources provides an intriguing perspective on the range of data collected and its subsequent reporting. While many data sources adequately describe and define their data collection and analysis techniques, a considerable number do not and merely report a number with few, if any, qualifications. And, because there are only a few sources of primary data, the problem is heightened by some secondary reporting sources passing on the unqualified primary data, or even worse, subjecting this unspecified data to a definition that "seems" correct, is appropriate for filling out a trend analysis or provides the right political curve for a report.

FIGURE 8
ACCESS TO POTABLE WATER
URBAN AND RURAL POPULATIONS

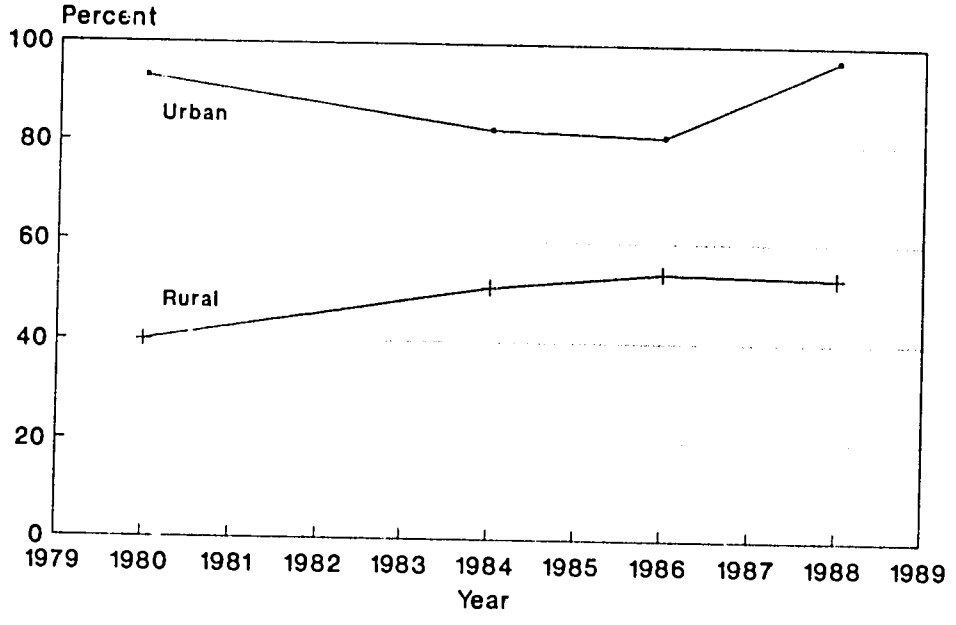
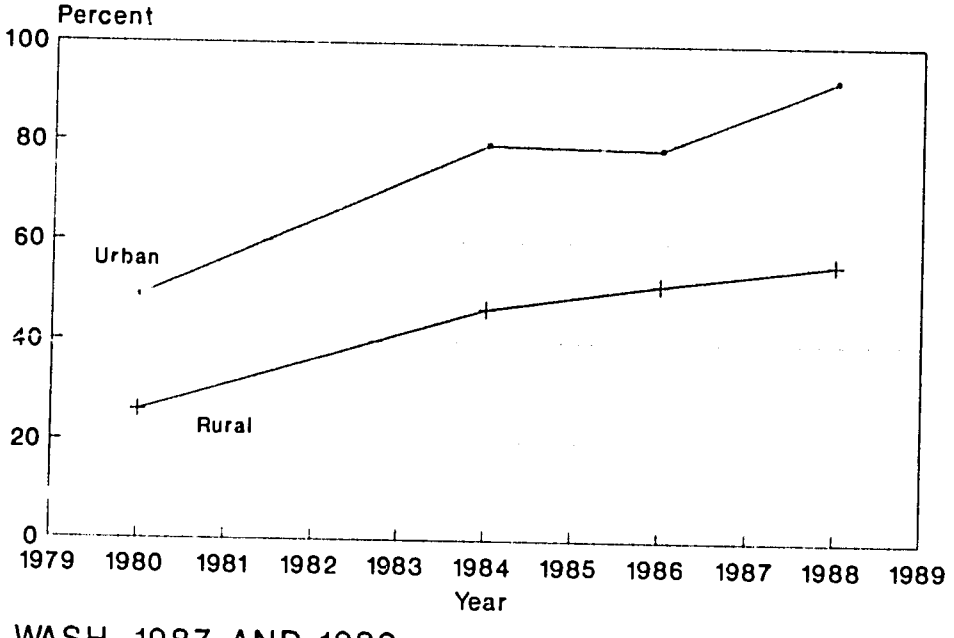


FIGURE 9
ACCESS TO ADEQUATE SANITATION
URBAN AND RURAL POPULATIONS



SOURCE: WASH, 1987 AND 1989

More positively, this gathering of data helps to identify relevant and reliable sources of information and allows a simple study of the flow of primary data to the various reporting sources. Additionally, this report aids in recognizing the complexities inherent in data collection, analysis and reporting, as well as the importance of understanding the derivation of indicator statistics.

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10/17/90

10/17/90

ANNEX 1

Infant Mortality Rates in Honduras Reported by Various Sources

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. BUCEN 1990	103 [1974]	86.8	84.1	81.3	78.6	76.1	73.7	71.4	69.0	66.7	
2. BUCEN 1989											64
3. CELADE 1988		84.0					78.0				
4. ENPA 1981	--90--	64.2									
5. EDENH-II 1983	--85--		82.6	83.3							
6. MCH/FP 1984		72.6	71 68	68.9	76.4						
7. EFHS 1987											
8. " "							61				
9. " "	--59.1--			--53.8--			47				
10. " "	-64.7(r)-			-58.1(r)-							
11. " "								--48.1--			
12. EFHS 1987-II (Direct)	54.9	49.3	66.4	56.0	45.4	51.3	46.9				
13. MOH EFHS 1987 (Indirect)	79.2		67.5		64.2	62.6	61.0				
14. Follow-up 1988									--48--		
15. Honduras MOH 85					85.0						
16. Honduras MOH 88					78.6						
17. Honduras MOH 89							62				
18. PAHO 1986	--95.0--			--82.0--							
19. " "	24.9	23.1	23.0	22.0	17.4				--69.0--		--57.0--
20. " "		98.5			78.6						
21. UNICEF State 1986					80						
22. " " 1987							76				
23. " " 1988								71			
24. " " 1989									70		
25. " " 1990										68	
26. UNICEF 1987		88					76				
27. UNICEF CAP 86/88		83.5 90				80	79.0				
28. UN/ESA 1988a	--95--			--82--					--69--		--57--
29. " 1988b	--127--										
30. " 1988c	--95--			--82--					--69--		--57--
31. USAID CP			118	95	78	76	73	72	69	66	64
32. USAID/Hon(a)		78				63	61	60	60	60	
33. USAID/Hon(b)						63	62	61	60		
34. USAID/Hon(d)						78	70	70			
35. World Bank 1988									--53.3--		--46.0--

ANNEX 1

Notes for Infant Mortality Rates in Honduras Reported by Various Sources

1. 1974 and 1983 are "benchmark" years; 1974 based on vital registration data and 1983 based on survey data.

2. Table 8, page 60; estimate is for 1989.

3. Unverified field reporting of data.

4. IMR of 90 for period 76-78; copied from EFHS 1987, Table IV C1, p 67 and from Follow-up 1988, Table III 1, page 25. Indirect method. 64.2 copied from Table 1, p 12, "Mortalidad Infantil" report derived from EDENH II 1983 survey data, indirect method.

5. IMR of 85 for period 76-78; copied from EFHS 1987, Table IV C1, p 67 and from Follow-up 1988, Table III 1, page 25. Indirect method. 82.6 and 83.3 copied from Table 1, p 12, "Mortalidad Infantil" report derived from EDENH II 1983 survey data, indirect method.

6. IMR of 71 copied from EFHS 1987, Table IV C1, p 67 and from Follow-up 1988, Table III 1, page 25. Indirect method using West variant. Except for 68 in 1981, other estimates copied from Table 1, p 12, "Mortalidad Infantil" report derived from EDENH II 1983 survey data. Estimate of 68 reported by Family Health International, MCH/FP 1984 Final Report, Table II 8. Based on West variant.

7. Table IV C1, page 67; indirect method, Trussell model, west variant (see p 62), using complete birth histories.
8. Table IV C1, page 67; direct method using life tables and complete birth histories.
9. Table IV C3, page 69. Estimates for periods 75-79, 80-84, respectively. Derived from direct estimates.
10. Table IV C3, page 69. Estimates for periods 75-79, 80-84, respectively. Rural only.
11. EFHS rate for 1985-87 reported in Follow-up 1988, p 18.

12. Data reported by Family Health International. Direct estimates. 54.9 for 1979.

13. Data reported by Family Health International, co-investigators in EFHS 1987, from unpublished MOH document. Indirect estimates using West variant. 79.2 is for 1978.

14. Table III 1, page 25. For period 1987-88, prospective study. (See also chart on page 16.)

15. Page 2, Indicadores de Salud. Data from EDENH II 1983.
16. Page 1. Data from EDENH II 1983.
17. Page 7. Data from EFHS 1987.

18. V I, Annex III-9, p 392; From UN/ESA 1988c, med. var.; figures for 5 year periods: 75-80,80-85,85-90,90-95.
19. V I, Annex III 10b, p 394; from official gov't statistics (p 177); first figure (24.9) is for 1979.
20. V II, p 144.

21. Table 5, page 140.
22. Table 1, page 90.
23. Table 1, page 64.
24. Table 1, page 94.
25. Table 1, page 76.

26. Honduras table, no page. Source: UN Population Division.

27. Unverified field reporting of data. Estimates of 90 and 80 from 1986 report; others from 1988 report.

28. Table A.2, pp 38-39; figures are for 5 year periods: 75-80,80-85,85-90,90-95.
29. Table 50, page 122; figure (127) for 1973-75. Based on census and vital reg. adjusted for underregistration.
30. Table 16, pages 121-122; med. var. Figures for 5 year periods: 75-80,80-85,85-90,90-95.

31. Each annual CP reports an IMR in the second preceding year, eg, 1980 data in FY82 CP.

32. Tables 1 and 2, p. 5-6. Source of data not cited.
33. Page 65. Source of data not cited.
34. Page 44. Source of data not cited.

35. Page 120; figures are for 5 year periods: 85-90,90-95.

ANNEX 2

Polio 3 Vaccination Coverage Rates in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EDENH-II 1983			45.5/p			70.0/p					
2. EFHS 1987†									53.2/o 76.7/f		
3. EFHS 1987†									70.4(u)/p 74.1(r)/p 73.0/p		
4. ENN 1987									87.6/p		
5. ENPA 1981			52.7(u)/p 38.3(r)/p 45.5/p								
6. Honduras MOH 1985							57.8/k 13.8/l				
7. Honduras MOH 1988									73.2/a 87.6/p		
8. Honduras MOH 1988			36/k	47/k	51/k	73/k	58/k	77.3/k	74.3/k	73.2/k	
9. Honduras MOH 1989										82.4/h	
10. IRD/West							58/e				
11. MCH/FP 1984 (ENSMI)						81.9/p 72.8/a 85.7/f					
12. MCH/FP 1984 (ENSMI)						76.0(u)/p 74.5(r)/p 75.0/p					
13. PAHO 1986			36/q	47/q	51/q	73/q					
14. UNICEF State 1986				--68--/e							
15. " " 1987		--32--/e				--75--/e					
16. " " 1988			37/e				--62--/e				
17. " " 1989								--61--/e			
18. " " 1990									--70--/e		
19. UNICEF 1987			31/e			73/e	58/e				
20. UNICEF CAP 86					68/k	85/k					
21. UNICEF CAP 88							59/k	63/k	61/k		
22. USAID CP							58/e	63/e		70/e	
23. USAID/Hon(b)						83/h	88/h	88/h	88/h	85.3/p	
24. USAID/Hon(c)						83/h	88/h	88/h 82/h	88/h	85.3/h	
25. WHO/EPI			37/q	53/q	51/q	84/q	58/q	63/q	51/q	70/q	

KEY: a = percentage of infants aged 0-11.9 months who were vaccinated by the time of the survey.
e = percentage of children aged 12-23.9 months who were vaccinated by their first birthday.
f = percentage of children aged 12-23.9 months who were vaccinated by the time of the survey.
h = percentage of children aged 0-59.9 months who were vaccinated, timing uncertain.
k = percentage of children aged 0-11.9 months who were vaccinated, timing uncertain.
l = percentage of children aged 12-23.9 months who were vaccinated, timing uncertain.
o = percentage of children aged 2-11.9 months who were vaccinated by the time of the survey.
p = percentage of children aged 0-59.9 months who were vaccinated by the time of the survey.
q = percentage of children vaccinated throughout the year while still less than age one.

ANNEX 2

Notes for Polio 3 Coverage Rates in Honduras Reported by Various Sources

1. Table 20, p 54. Source: Ministry of Health and ASHOPLANFA 1986, table III.C.7.

2. Table V C3, p 135; based on cards only.

3. Table V C5, p 137; based on cards only.

4. Table 29, p 46. Based on cards only.

5. Table V C5, p 137 of EFHS report. Rates based on last live birth younger than five years and not adjusted for age.
Note: Coverage reported in ENPA 1981 has been adjusted to the age distribution of children under age five in the MCH/FP 1984 survey, which is virtually identical to the EFHS 1987 survey age distribution.

6. Page 30. Percentage based on doses of vaccine applied according to age group.

7. Page 3. Source: Encuesta Nacional de Nutricion 1987 (ENN 1987).

8. Page 36. Source: Division of Epidemiology, MOH.

9. Page 10. Source: El Programa Ampliado de Immunizaciones.

10. Table 7, p 89. Source: WHO 1/20/86.

11. Table III.C.1 and III.C.3. Age adjusted rates based on cards and recall.

12. Table III.C.7 and Table V C5, p 137 of EFHS report. Rates not adjusted for age.

13. Vol. I; 36%, 47%, 51%, 73% from Annexes IV-6 p 407, IV-7 p 408, IV-8 p 409, IV-9 p 410, respectively.

14. Table 3, p 136; for period 1981-1983.
15. Table 3, p 94; 32 for period 1980-1981; 75 for period 1984-1985 (UNICEF field office source).
16. Table 3, p 68; 37 for 1981; 62 for period 1985-1986 (UNICEF field office source).
17. Table 3, p 98; for period 1986-1987.
18. Table 3, p 80; 70 for period 1987-1988.
19. Honduras table, no page. Source: World Health Organization.

20. Unverified field reporting of data.
21. Unverified field reporting of data.

22. CP reports data from CIHI vaccination coverage database, compiled from WHO/EPI reports.

23. Page 65-66. For 1988 source is early report of EFHS 1987.
24. Page 40. 82% from page 48, and defined as percentage of children 0-59.9 months immunized against polio under AID-supported programs.

25. WHO published figures from MOH via PAHO, as reported in WHO/EPI/CEIS 90.1, January 1990.

†When the mother reported there was no card or could not find it, the child was assumed to be inappropriately immunized and no further questions were asked. Thus, the proportions of children considered to be appropriately vaccinated are underestimated (p 130).

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ANNEX 3
Measles Vaccination Coverage Rates in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EDENH-II 1983			60.4/p			69.3/p					
2. EFHS 1987†									47.3/b 77.9/f		
3. EFHS 1987†									69.6(u)/p 77.7(r)/p 75.2/p		
4. ENN 1987									91.2/p		
5. ENPA 1981			67.3(u)/p 56.6(r)/p 60.4/p								
6. Honduras MOH 1985							52.6/k 34.9/l				
7. Honduras MOH 1988									62.5/a 91.2/p		
8. Honduras MOH 1988			34/k	48/k	49/k	44/k	53/k	73.2/k	69.2/k	62.5/k	
9. Honduras MOH 1989										71.7/h	
10. IRD/West							53/e				
11. MCH/FP 1984 (ENSMI)						81.5/p 47.1/a 78.6/f					
12. MCH/FP 1984 (ENSMI)						67.4(u)/p 70.4(r)/p 69.3/p					
13. PAHO 1986			66/e	48/q	49/q	44/q					
14. UNICEF State 1986				--68--/e							
15. " " 1987		--33--/j				--49--/e					
16. " " 1988			38/j				--55--/e				
17. " " 1989								--57--/e			
18. " " 1990									--76--/e		
19. UNICEF 1987			34/j			44/j	53/e				
20. UNICEF CAP 86			35/k		66/k	52/k					
21. UNICEF CAP 88								60/k	57/k		
22. USAID CP							53/e	60/e		76/e	
23. USAID/Hon(b)						75/h	84/h	84/h 80/h	91/h	89.1/h	
24. USAID/Hon(c)						75/h	84/h	84/h 80/h	91/h		
25. WHO/EPI			38/r	55/r	49/r	44/r	53/q	60/q	57/q	76/q	

KEY: a = percentage of infants aged 0-11.9 months who were vaccinated by the time of the survey.
b = percentage of children aged 9-11.9 months who were vaccinated by the time of the survey.
e = percentage of children aged 12-23.9 months who were vaccinated by their first birthday.
f = percentage of children aged 12-23.9 months who were vaccinated by the time of the survey.
h = percentage of children aged 0-59.9 months who were vaccinated, timing uncertain.
j = percentage of children aged 12-59.9 months who were vaccinated, timing uncertain.
k = percentage of children aged 0-11.9 months who were vaccinated, timing uncertain.
l = percentage of children aged 12-23.9 months who were vaccinated, timing uncertain.
p = percentage of children aged 0-59.9 months who were vaccinated by the time of the survey.
q = percentage of children vaccinated throughout the year while still less than age one.
r = percentage of children vaccinated at or later than 12 months and up to 60 months.

ANNEX 3

Notes for Measles Coverage Rates in Honduras Reported by Various Sources

1. Table 20, p 54. Source: Ministry of Health and ASHOPLANFA 1986, table III.C.7.
2. Table V C3, p 135; based on cards only.

3. Table V C5, p 137; based on cards only.

4. Table 33, p 50. Based on cards only.
5. Table V C5, p 137 of EFHS report. Rates based on last live birth younger than five years and not adjusted for age.
Note: Coverage reported in ENPA 1981 has been adjusted to the age distribution of children under age five in the MCH/FP 1984 survey, which is virtually identical to the EFHS 1987 survey age distribution.

6. Page 30. Percentage based on doses of vaccine applied according to age groups.

7. Page 3. Source: Encuesta Nacional de Nutricion 1987 (ENN 1987).

8. Page 36. Source: Division of Epidemiology, MOH.

9. Page 10. Source: El Programa Ampliado de Immunizaciones.
10. Table 7, p 89. Source: WHO 1/20/86.

11. Table III.C.1 and III.C.5. Age adjusted rates based on cards and recall.

12. Table III.C.7 and Table V C5, p 137 of EFHS report. Rates not adjusted for age.

13. Vol. I; 34%, 48%, 49%, 44% from Annexes IV-6 p 407, IV-7 p 408, IV-8 p 409, IV-9 p 410, respectively.

14. Table 3, p 136; for period 1981-1983.
15. Table 3, p 94; 33 for period 1980-1981; 49 for period 1984-1985 (UNICEF field office source).
16. Table 3, p 68; 38 for 1981; 55 for period 1985-1986 (UNICEF field office source).
17. Table 3, p 98; for period 1986-1987.
18. Table 3, p 80; 70 for period 1987-1988.
19. Honduras table, no page. Source: World Health Organization.

20. Unverified field reporting of data.
21. Unverified field reporting of data.

22. CP reports data from CIHI vaccination coverage database, compiled from WHO/EPI reports.

23. Page 65-66. For 1988 source is early report of EFHS 1987.

24. Page 40. 80% from page 48, defined as percentage of children 0-59.9 months immunized against measles under AID-supported programs.

25. WHO published figures from MOH via PAHO, as reported in WHO/EPI/CEIS 90.1, January 1990.

†When the mother reported there was no card or could not find it, the child was assumed to be inappropriately immunized and no further questions were asked. Thus, the proportions of children considered to be appropriately vaccinated are underestimated (p 130).

ANNEX 4
DPT 3 Vaccination Coverage Rates in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EDENH-II 1983			42.3/p			62.4/p					
2. EFHS 1987†									50.6/e 75.2/f		
3. EFHS 1987†									68.9(u)/p 72.4(r)/p 71.3/p		
4. ENN 1987									85.9/p		
5. ENPA 1981			49.9(u)/p 39.5(r)/p 42.3/p								
6. Honduras MOH 1985							58.5/k 24.1/l				
7. Honduras MOH 1988									59.7/a 85.9/p		
8. Honduras MOH 1988			34/k	46/k	52/k	41/k	58/k	76.5/k	71.6/k	59.7/k	
9. Honduras MOH 1989										73.3/h	
10. IRD/West							59/e				
11. MCH/FP 1984 (ENSMI)						66.7/p 34.1/a 71.5/f					
12. MCH/FP 1984 (ENSMI)						60.2(u)/p 63.7(r)/p 62.4/p					
13. PAHO 1986			34/q	46/q	52/q	41/q					
14. UNICEF State 1986				--70--/e							
15. " " 1987		--30/e									
16. " " 1988			38/e			--49--/e					
17. " " 1989							--62--/e				
18. " " 1990								--61--/e			
19. UNICEF 1987			34/e			41/e	59/e		--74--/e		
20. UNICEF CAP 86			36/k		70/k	48/k					
21. UNICEF CAP 88							58/k	62/k	59/k		
22. USAID CP							59/e	63/e		74/e	
23. USAID/Hon(b)						64/h	75/h	74/h	87/h	83.4/p	
24. USAID/Hon(c)						64/h	75/h	75/h 74/h	87/h		
25. WHO/EPI			38/q	53/q	52/q	41/q	59/q	63/q	58/q	74/q	

KEY: a = percentage of infants aged 0-11.9 months who were vaccinated by the time of the survey.
e = percentage of children aged 12-23.9 months who were vaccinated by their first birthday.
f = percentage of children aged 12-23.9 months who were vaccinated by the time of the survey.
h = percentage of children aged 0-59.9 months who were vaccinated, timing uncertain.
k = percentage of children aged 0-11.9 months who were vaccinated, timing uncertain.
l = percentage of children aged 12-23.9 months who were vaccinated, timing uncertain.
o = percentage of children aged 2-11.9 months who were vaccinated by the time of the survey.
p = percentage of children aged 0-59.9 months who were vaccinated by the time of the survey.
q = percentage of children vaccinated throughout the year while still less than age one.

ANNEX 4

Notes for DPT 3 Coverage Rates in Honduras Reported by Various Sources

1. Table 20, p 54. Source: Ministry of Health and ASHOPLANFA 1986, table III.C.7.

2. Table V C3, p 135; based on cards only.

3. Table V C5, p 137; based on cards only.

4. Table 31, p 48. Based on cards only.

5. Table V C5, p 137 of EFHS report. Rates based on last live birth younger than five years and not adjusted for age.
Note: Coverage reported in ENPA 1981 has been adjusted to the age distribution of children under age five in the MCH/FP 1984 survey, which is virtually identical to the EFHS 1987 survey age distribution.

6. Page 30. Percentage based on doses of vaccine applied according to age groups.

7. Page 3. Source: Encuesta Nacional de Nutricion 1987 (ENN 1987).

8. Page 36. Source: Division of Epidemiology, MOH.

9. Page 10. Source: El Programa Ampliado de Immunizaciones.

10. Table 7, p 89. Source: WHO 1/20/86.

11. Table III.C.1 and III.C.4. Age adjusted rates based on cards and recall.

12. Table III.C.7 and Table V C5, p 137 of EFHS report. Rates not adjusted for age.

13. Vol. I; 34%, 46%, 52%, 41% from Annexes IV-6 p 407, IV-7 p 408, IV-8 p 409, IV-9 p 410, respectively.

14. Table 3, p 136; for period 1981-1983.
15. Table 3, p 94; 30 for period 1980-1981; 49 for period 1984-1985 (UNICEF field office source).
16. Table 3, p 68; 38 for 1981; 62 for period 1985-1986 (UNICEF field office source).
17. Table 3, p 98; for period 1986-1987.
18. Table 3, p 80; for period 1987-1988.
19. Honduras table, no page. Source: World Health Organization.

20. Unverified field reporting of data.
21. Unverified field reporting of data.

22. CP reports data from CIHI vaccination coverage database, compiled from WHO/EPI reports.

23. Page 65-66. For 1988 source is early report of EFHS 1987.
24. Page 40. 74% from page 48, defined as percentage of children 0-59.9 months immunized against DPT under AID-supported programs.

25. WHO published figures from MOH via PAHO, as reported in WHO/EPI/CEIS 90.1, January 1990.

†When the mother reported there was no card or could not find it, the child was assumed to be inappropriately immunized and no further questions were asked. Thus, the proportions of children considered to be appropriately vaccinated are underestimated (p 130).

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ANNEX 5

BCG Vaccination Coverage Rates in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EDENH-II 1983			50.3/p			69.3/p					
2. EFHS 1987†									59.9/a 79.7/f		
3. EFHS 1987†									68.1(u)/p 75.0(r)/p 72.9/p		
4. ENN 1987									85.7/p		
5. ENPA 1981			60.0(u)/p 44.9(r)/p 50.3/p								
6. Honduras MOH 1985							65.0/k 20.5/l				
7. Honduras MOH 1988										67.4/a 85.7/p	
8. Honduras MOH 1988			41/k	50/k	55/k	41/k	65/k	88.7/k	81.3/k	67.4/k	
9. Honduras MOH 1989										79.6/h	
10. IRD/West							65/e				
11. MCH/FP 1984 (ENSMI)						69.3/p 35.0/a 73.7/f					
12. MCH/FP 1984 (ENSMI)						69.8(u)/p 69.1(r)/p 69.3/p					
13. PAHO 1986			41/q	50/q	55/q	41/q					
14. UNICEF State 1986				--74--/e							
15. " " 1987		--26--/e				--41--/e					
16. " " 1988			46/e				--67--/e				
17. " " 1989								--66--/e			
18. " " 1990									--85--/e		
19. UNICEF 1987			41/e			41/e	65/e				
20. UNICEF CAP 86			42/k		74/k	48/k					
21. UNICEF CAP 88								74/k	66/k		
22. USAID CP							65/e	72/e		84/e	
23. USAID/Hon(b)							75/h	80/h	86/h	84/p	
24. USAID/Hon(c)							74/h	80/h	86/h		
25. WHO/EPI			46/q	57/q	55/q	37/q	65/q	72/q	66/q	85/q	

KEY: a = percentage of infants aged 0-11.9 months who were vaccinated by the time of the survey.
e = percentage of children aged 12-23.9 months who were vaccinated by their first birthday.
f = percentage of children aged 12-23.9 months who were vaccinated by the time of the survey.
h = percentage of children aged 0-59.9 months who were vaccinated, timing uncertain.
k = percentage of children aged 0-11.9 months who were vaccinated, timing uncertain.
l = percentage of children aged 12-23.9 months who were vaccinated, timing uncertain.
p = percentage of children aged 0-59.9 months who were vaccinated by the time of the survey.
q = percentage of children vaccinated throughout the year while still less than age one.

ANNEX 5

Notes for BCG Coverage Rates in Honduras Reported by Various Sources

1. Table 20, p 54. Source: Ministry of Health and ASHOPLANFA 1986, table III.C.7.

2. Table V C3, p 135; based on cards only.

3. Table V C5, p 137; based on cards only.

4. Page 52. Treatment of card/recall issue unclear.

5. Table V C5, p 137 of EFHS report. Rates based on last live birth younger than five years and not adjusted for age.
Note: Coverage reported in ENPA 1981 has been adjusted to the age distribution of children under age five in the MCH/FP 1984 survey, which is virtually identical to the EFHS 1987 survey age distribution.

6. Page 30. Percentage based on doses of vaccine applied according to age group.

7. Page 3. Source: Encuesta Nacional de Nutricion 1987 (ENN 1987).

8. Page 36. Source: Division of Epidemiology, MOH.

9. Page 10. Source: El Programa Ampliado de Immunizaciones.

10. Table 7, p 89. Source: WHO 1/20/86.

11. Table III.C.1 and III.C.6. Age adjusted rates based on cards and recall.

12. Table III.C.7 and Table V C5, p 137 of EFHS report. Rates not adjusted for age.

13. Vol. I; 41%, 50%, 55%, 41% from Annexes IV-6 p 407, IV-7 p 408, IV-8 p 409, IV-9 p 410, respectively.

14. Table 3, p 136; for period 1981-1983.
15. Table 3, p 94; 36 for period 1980-1981; 41 for period 1984-1985 (UNICEF field office source).
16. Table 3, p 68; 46 for 1981; 67 for period 1985-1986 (UNICEF field office source).
17. Table 3, p 98; for period 1986-1987.
18. Table 3, p 80; for period 1987-1988.
19. Honduras table, no page. Source: World Health Organization.

20. Unverified field reporting of data.
21. Unverified field reporting of data.

22. CP reports data from CIHI vaccination coverage database, compiled from WHO/EPI reports.

23. Page 65-66. For 1988 source is early report from EFHS1987 and should read 84.9.
24. Page 48. Note: defined as percentage of children 0-59.9 months immunized against BCG under AID-supported programs.

25. WHO published figures from MOH via PAHO, as reported in WHO/EPI/CEIS 90.1, January 1990.

†When the mother reported there was no card or could not find it, the child was assumed to be inappropriately immunized and no further questions were asked. Thus, the proportions of children considered to be appropriately vaccinated are underestimated (p 130).

ANNEX 6

Tetanus Vaccination Coverage Rates in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EFHS 1987						--24.6--					
2. MCH/FP 1984 (ENSMI)						21.8					
3. Honduras MOH		7.9	10.9	14.5	13.6	11.8	12.5		17.9		
4. IRD/West							11				
5. UNICEF State 1986				--11--							
6. " " 1987		--8--				--25--					
7. " " 1988			11				--18--				
8. " " 1989								--25--			
9. " " 1990									--16--		
10. UNICEF 1987			11			25	25				
11. UNICEF CAP 88									23.0		
12. WHO/EPI									46		

Notes for Tetanus Coverage Rates in Honduras Reported by Various Sources

1. Page 85. Coverage of women whose last live birth occurred between 1982-1987 who reported receiving two or more doses of TT. Note: Women who received no immunization during their last pregancy may have received vaccinations as children, during other medical visits or during a prior pregnancy, rendering them fully protected if they are within the 10-year protective interval. Therefore, the estimate of 24.6 may be conservative; a higher percentage is probably fully protected.

2. Page 33 and Table III.A.3. Coverage of women whose last delivery occurred between 1979-1984 who reported receiving two or more doses of TT. Rate of 22% appears on page 2 of MOH ENSMI report dated June 1986.

3. Unverified field reporting of data. Estimates made based on percent of pregnant women (estimated to be five percent of population).

4. Table 7, p 89. Source: WHO 1/20/86.

5. Table 3, p 136; for period 1981-1983 (UNICEF field office source).
6. Table 3, p 94; 8 for period 1980-1981; 25 for period 1984-1985 (UNICEF field office source).
7. Table 3, p 68; 11 for 1981; 18 for period 1985-1986.
8. Table 3, p 98; for period 1986-1987 (UNICEF field office source).
9. Table 3, p 80; for period 1987-1988.

10. Honduras table, no page. 1981 data: WHO; 1984, 1985 data, UNICEF field office source.

11. Unverified field reporting of data.

12. WHO published figure from MOH via PAHO, as reported in WHO/EPI/CEIS 90.1, January 1990.

10/17/90

ANNEX 7

Diarrhea-Associated Mortality in Honduras

A. Infants Aged 0-11.9 Months

Source	Variable	19xx	1980	1981	1982	1983	1984	1985	1986	1987
1. EFHS 1987	Percentage of children reported deceased at time of survey determined to have died from a diarrheal disease.									19.7
2. Honduras MOH	a. Number of deaths		830	885	875					
	b. Rate based on cases/census population estimates for children 0-12 mos.		4.8	4.9	4.7	3.4				
3. PAHO 1986	a. Number of deaths			872						
	b. Rate per 1,000 live births			5.4		5.4 3.4				
4. PAHO 1990	a. Number of deaths		873							
	b. Rate per 1,000 live births		5.5							

B. Children Aged 12-59.9 Months

Source	Variable	19xx	1980	1981	1982	1983	1984	1985	1986	1987
5. EFHS 1987	Percentage of children reported deceased at time of survey determined to have died from a diarrheal disease.									30.1
6. ENN 1987	Percentage of children under age five that died during the five years prior to the survey.							--31.5--		
7. Honduras MOH	a. Number of deaths		546	621	599					
	b. Rate per 100,000 population		102	112	105.9					
8. PAHO 1986	a. Number of deaths			606						
	b. Rate per 100,000 population			106.3		106.3				
9. PAHO 1990	a. Number of deaths		544							
	b. Rate per 100,000 population		98.9							

Notes for Diarrhea-Associated Mortality in Honduras Reported by Various Sources

1. Table IV C9, p 75. Physicians assigned cause of death by reviewing respondent's answers to all questions in the infant mortality module.

2. Unverified field reporting of data. 1983 data is from 1986 MOH baseline study for national child survival plan.

3. 1981 data - For number of deaths, Vol. I, Annex III 5-a, p 240; for rate, Annex III 5-b, p 241. For 1983, 5.4 from Table 2-7, p 44; For 3.4, Vol. II, table 3, p 145. Death rates based on ICD, 9th Revision, classes 007-009, except for 3.4 which is based only on class 009.

4. Table page 60, Spanish language section.

5. Table IV C9, p 75. Physicians assigned cause of death by reviewing respondent's answers to all questions in the infant mortality module.

6. Table 52, p 71.

7. Unverified field reporting of data.

8. For 1981 data, 606 and 106.3, Volume I, Annex III 5-a, p 240 and Annex III 5-b, p 241; for 1983, Table 2-7, p 44. Death rates based on ICD, 9th Revision, classes 007-009.

9. Table page 60, Spanish language section.

ANNEX 8

ORT Coverage Rates in Honduras Reported by Various Sources
(Children aged 0-59.9 months treated with salts or home-based solution)

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EFHS 1987									23.6 17.5		
3. MCH/FP 1984 (ENSMI)						5.9 11.2 18					
4. UNICEF State 1990								--45.0--			
5. USAID/Hon(b)						10	10	15	15	17.4	
6. USAID/Hon(c)						19	20	20	20		
7. WHO/CDD - ORS Use					25.0 26.0	25.0	10.0	40.0	17.4 45.0		
8. WHO/CDD - ORT Use						25.0	10.0	40.0	56.0		
9. PAHO 1990 - ORS Use							10.0	40.0	45.0	40.0	
10. PAHO 1990-ORT							10.0	40.0	56.0	66.0	

1. Table V D3, p 146. Rate of 23.6 is for children treated for diarrhea that received Litrosal, whose mother consulted a health facility (denominator = 1122). Rate of 17.5% is for all children treated for diarrhea that received Litrosal, whether seen at a health facility or not (denominator = 1515).

2. Table III.D.6. 5.9% is rate for Litrosal alone; 11.2 is rate for Litrosal combined with other treatments. Of those seeking medical care, 10.8% received Litrosal, while the Litrosal use rate for those not seeking care was 4.5%. Rate of 18% is Litrosal use rate for all children under age five with diarrhea and appears on page 4, section G of early MOH survey report dated June 1986.

4. Table 3, p 80, for period 1986-1987. Percentage of all cases of diarrhea in children under age five treated with ORS.

5. Page 66. Explanation and source of data not cited for 1984-1987. Defined as percentage of cases of diarrhea in children under age five treated with ORT (at home or in health centers). Document states that rate of 17.4 for 1987 is data from ENN 87 and that the previous years' figures on ORT use were overestimated.

6. Page 48. Explanation and source of data not cited; defined as percentage of cases of diarrhea in children under age five treated with ORT.

7. 1983, 26.0: Estimated proportion of diarrhea episodes actually treated with ORS; 1984: Nat'l CDD Program Estimate; 1985: Based on household sample surveys; 1986: Reported use rate assumed to apply only to cases with access; 1987, 17.4: Children under age five with diarrhea who were treated with ORS; 45.0: Based on household sample surveys.

8. Same notes as 6, above, except 1987: Based on household sample surveys.

9. Table 7, p 47, English language section. 1986 and 1988 reported use rates assumed to apply only to cases with access to ORS. Figures shown are access rate x use rate/100. Rate for 1987 based on household survey sample.

10. Table 7, p 47, English language section. 1988 rate is national CDD program estimate. 1987 rate is based on household survey sample. As estimates for both ORS and SSS (or recommended home fluid) use rates were available for 1987, the midpoint between the sum and the greater of the two values has been used as the ORT use rate.

ANNEX 9

Percent of Children Weight-for-Age Undernourished in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. ENN 1987									20.6/d		
2. INCAP 1985	28.5/a [1966] 19.7/b [1966]										
3. Honduras MOH			2.6/l 2.7/b	3.4/l 3.5/b	3.2/l 3.3/b	2.6/l 2.7/b	2.4/b		38/j		
4. PAHO 1986	72.5/j 43/e 27.2/f 2.3/c [1976]										
6. UNICEF State 1986			--29--/g --2--/h								
7. " " 1987				--29--/g --2--/h							
8. " " 1988					--29--/g --2--/h						
9. " " 1989					--15--/g --10--/h						
10. " " 1990							--21--/a --4--/i				
11. UNICEF 1987							29/k 2/h				
12. UNICEF CAP 86					-31.0/m-				38.0/b		
13. UNICEF CAP 88								28.5/a 20.6/a			

KEY: a = Children aged 0-59.9 months; WHO definition of 2 std. dev. below median of reference population.
b = Children aged 0-59.9 months; Gomez grades II and III undernourished.
c = Children aged 0-59.9 months; Gomez grade III undernourished.
d = Children aged 0-59.9 months; WHO definition of 2 and 3 std. dev. below median of reference population.
e = Children aged 0-59.9 months; Gomez grade I undernourished.
f = Children aged 0-59.9 months; Gomez grade II undernourished.
g = Children aged 0-59.9 months; between 60% and 80% of the desirable weight-for-age.
h = Children aged 0-59.9 months; under 60% of the desirable weight-for-age.
i = Children aged 0-59.9 months; WHO definition of 3 std. dev. below median of reference population.
j = Children aged 0-59.9 months; Gomez grades I, II and III undernourished.
k = Children aged 0-59.9 months; between 60% and 85% of the desirable weight-for-age.
l = Children 13-60 months; Gomez grade II and III undernourished.
m = Children aged 12-23.9 months; Gomez grade I, II and III undernourished.

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ANNEX 9

Notes for Percent of Children Weight-for-Age Undernourished in Honduras

1. Table 21, p 34.

2. Unverified field reporting of data.

3. Unverified field reporting of data. Percentages based upon number of cases and census-based population estimates.

4. Volume II, Table 2-16, p 60.

6. Table 2, p 134; for period 1975-1983. Source: UNICEF field office.

7. Table 2, p 92; for period 1980-1984. Source: UNICEF field office.

8. Table 2, p 66; for period 1980-1986. Source: UNICEF field office.

9. Table 2, p 96; for period 1980-1986. Source: UNICEF field office.

10. Table 2, p 78; for period 1980-1987.

11. Honduras table, no page. Source: UNICEF field office.

12. Unverified field reporting of data. Rate of 31.0 is for period 1980-1986.

13. Unverified field reporting of data.

ANNEX 10

Number of Registered Cases of Malaria in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. Honduras MOH		43,010	49,377	57,482	37,536	27,322	33,828	29,130	19,095		
2. Honduras MOH 88										29,737	
3. PAHO 1986			49,377	57,482	37,536	27,332 7.0					
4. USAID/Hon(b)						27,000	32,000	30,000	19,000	23,000	
5. USAID/Hon(c)						27,000	32,000	30,000	18,000		

Notes for Number of Registered Cases of Malaria in Honduras Reported by Various Sources

1. Unverified field reporting of data.

2. Page 57.

3. Volume I, Table 2-38, p 96. Rate for 1984 is per 1,000 population, based on 1984 population estimate for malarious areas of 3,867,000.

4. Page 65. Figure for 1988 is preliminary data from MOH Vector Control Division.

5. Page 48.

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ANNEX 11

Percent of Population with Access to Drinking Water in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EDENH-II 1983					86.3(u) 38.5(r)						
2. EFHS 1987									72.2 98.3(u1) 93.6(u2) 56.9(r)		
3. ENN 1987									74.1		
4. IRD/West		--91(u)-- --55(r)--									
5. PAHO 1986		44 50(u) 40(r)			69 91(u) 55(r)						
6. UNICEF State 1986		--44-- --50(u)-- --40(r)--									
7. UNICEF State 1987					69 91(u) 55(r)						
8. UNICEF State 1988						--69-- --91(u)-- --55(r)--					
7. UNICEF State 1989						--69-- --91(u)-- --55(r)--					
8. UNICEF State 1990								--50-- --56(u)-- --45(r)--			
9. UNICEF 1987		44 50(u) 40(r)			69 91(u) 55(r)						
10. UNICEF CAP 86			50(u) 40(r)			50(u) 40(r)					
11. UNICEF CAP 88								72			
12. USAID CP	46 [1976]	44				50				70	
13. USAID/Hon(b)										70 97(u) 53(r)	
14. USAID/Hon(c)						64 94(u) 48(r)	65 95(u) 49(r)	66 95(u) 50(r)	68 97(u) 52(r)		
15. USAID/Hon(d)						91(u) 44(r)	91(u) 46(r)	92(u) 48(r)			
16. WASH 87		59.3 93.0(u) 40.0(r)				63.4 82.6(u) 50.8(r)		65.1 81.4(u) 53.8(r)			
17. WASH 89										70 97(u) 53(r)	

Notes for Access to Drinking Water in Honduras Reported by Various Sources

1. Unverified field reporting of data.

2. Table III C1, p 34. Households considered to have access to drinking water were those with an indoor or outdoor faucet, access to a public faucet, traditional well or well with a pump as well as those that purchased water.
"u1" refers to households in Tegucigalpa and San Pedro Sula; "u2" refers to households in all other urban areas.

3. Unverified field reporting of data.
4. Table 10, p 95; for period 1975-1983. Source: UN Gen. Assembly--Eco. and Social Council, 1985.

5. For 1980, Annex V-1, p 414; for 1983, Annex V-2, p 415.

6. Table 3, p 136; for period 1975-1983. Source: WHO.

7. Table 3, p 94. Source: WHO.

8. Table 3, p 68; for period 1983-1986. Source: WHO.

7. Table 3, p 98; for period 1980-1987.

8. Table 3, p 80;for period 1985-1987. Source: WHO.

9. Honduras table, no page. Source: WHO.

10. Unverified field reporting of data.

11. Unverified field reporting of data.

12. CP data from World Bank Social Indicators Database; 46 for 1976.

13. Page 65.

14. Page 40. Access defined as being within 200 meters of a protected source.
Note: SANAA data rather than survey data (which show lower coverage) and extrapolation of survey data.

15. Page 37.

16. Table C-1, p C-10.

17. Table C-1, p 46.

ANNEX 12

Percent of Population with Access to Adequate Sanitation in Honduras

Source	19xx	1980	1981	1982	1983	1984	1985	1986	1987	1988	19xx
1. EDENH-II 1983					89.8(u) 33.8(r)						
2. EFHS 1987									59.5 92.4(u1) 82.2(u2) 41.8(r)		
3. ENSMI 1984						91.0(u) 43.9(r)					
4. ENN 1987									56.2		
5. IRD/West					50(u) 40(r)						
6. PAHO 1986		35 49(u) 26(r)			44 50(u) 40(r)						
7. USAID/Hon(b)						60 91(u) 44(r)	62 91(u) 46(r)	64 92(u) 48(r)	67 93(u) 56(r)	69 94(u) 56(r)	
8. WASH 87		34.4 49.0(u) 26.0(r)				59.5 79.4(u) 46.6(r)		62.8 78.8(u) 51.6(r)			
9. WASH 89										70 93(u) 56(r)	

ANNEX 12

Notes for Access to Adequate Sanitation in Honduras Reported by Various Sources

1. Unverified field reporting of data.

2. Table III C1, p 34. Households considered to have adequate sanitation were those with a toilet, hydraulic latrine or outhouse. "u1" refers to households in Tegucigalpa and San Pedro Sula; "u2" refers to households in all other urban areas.

3. Unverified field reporting of data.

4. Unverified field reporting of data.

5. Table 10, p 95. Source: UN Gen. Assembly--Eco. and Social Council, 1985.

6. For 1980, Vol. 1, Annex V-1, p 414; for 1983, Vol. 1, Annex V-1, p 415.

7. Page 65.

8. Table C-1, p C-10.

9. Table C-2, p 47.