# Chapter V

# DATA USEFUL FOR ESTIMATES OF FERTILITY AND MORTALITY

The importance of measuring current fertility and mortality has led to a number of experimental attempts to obtain current figures by sample registration, by special surveys, and by a combination of registration and interviews.[1] The design of such sample registration and surveys has been excluded from the discussion in this *Manual*; the methods outlined here are confined to data that might be obtained in a census, or large-scale sample demographic survey. The purpose of this short final chapter of part one. is to specify explicitly what kinds of questions should be included in censuses or broad purpose surveys to make reliable estimation of birth and death rates possible.

The same questions would also be a valuable part of the design of intensive repeated surveys instituted for the specific purpose of estimating vital statitics: for example, Brass-style estimates of infant and child mortality would be a useful check on mortality information obtained in a sample register, or from frequent interviews.

## A. DATA ON AGE

Information about age is an essential part of every form of estimation presented in this *Manual*. Moreover, the existence of similar patterns of distortion in age distributions in surveys or censuses makes even rough age distributions the basis of useful estimation. A question on chronological age should be part of every census or demographic survey, and when the respondent is unable to supply an acceptable figure, the interviewer should be instructed to make an estimate.

Tables should be published showing the distribution by the standard five-year age intervals for each sex in each geographical unit, and by single years for whole populations covered by the survey. The single-year distribution makes useful analysis of age–misreporting possible.

## B. DATA ON CHILDREN EVER BORN

In the absence of vital statistics, data on the number of children born in the lifetime of each woman and the number of these surviving provide a very useful basis for determining fertility and mortality. The following suggestions are intended to supply the maximum material for constructing estimates, and simultaneously to make it possible both to detect and to minimize biases in the responses.

1. Questions on fertility histories should ask for the number of children born alive who are still living in the household, the number born alive who have left the household, and the number who have died. The question about those who have died is the foundation of estimates of infant and child mortality, and the separate questions about those still at home and those who have left minimize a source of omission, especially for older women with grown children.

2. Women should be asked the sex of each child reported, and males and females should be tabulated separately. This procedure makes possible the estimation of male and female child mortality separately. It also provides material for a number of tests of consistency—for example, omissions of children ever born are likely to be sex selective, and such a tendency is revealed by a trend in the sex ratio of the reported children ever born as the age of woman increases. Another significant form of probable omission is to leave out higher proportions of dead than of surviving children, especially on the part of older women. This form of omission may also be sex selective, resulting in an implausible contrast in estimated child mortality by age for the two sexes.

3. Questions about children ever born and children surviving should be asked of and tabulated preferably for *all* women, not merely married women. If, for some reason, non-married women must be excluded, the questions should be asked of and tabulated for all married women, not merely "mothers". Interviewers should be instructed to make an unambiguous entry for every respondent, especially to enter a zero for women

[1] See notably, C. Chandrasekaran and W.E. Deming, "On a Method of Estimating Birth and Death Rates and the Extent of Registration", *Journal of the American Statistical Association*, vol. 44, March 1949, pages 101-115; Ansley J. Coale, "The Design of an Experimental Procedure for Obtaining Accurate Vital Statistics", in International Union for the Scientific Study of Publications, *International Population Conference, New York, 1961* (London, 1963), Vol. II, pages 372-376; *Guanabara Demographic Pilot Survey*, A joint project of the United Nations and the Government of Brazil (United Nations publication, Sales No.: 64.XIII.3). Karol J. Krotki, "First Report on the Population Growth Experiment", in International Union for the Scientific Study of Population, *International Population Conference, Ottawa, 1963* (Liège, 1964) pages 159-173; Carmen, Arretx G. and Jorge L. Somoza, "Survey Methods, Based on Periodically Repeated Interviews, Aimed at Determining Demographic Rates," *Demography* (Chicago, 1965), vol. II, pages 289-301; cf. also William Brass, "Methods of Obtaining Demographic Measures where Census and Vital Statistics Registration Systems are Lacking or Defective", background paper presented at the Second World Population Conference (Belgrade, 1965), No. 409.

with no children, rather than leaving a blank, which indicates "no response", rather than "no children".

4. The parity distribution in each five-year age interval should be tabulated—i.e., the number of women with no children, with one child, two children etc.—rather than just the mean parity or number of children ever born. This tabulation makes possible additional tests of consistency, and additional valuable inferences, such as differential mortality in families with different numbers of children.

## C. DATA ON THE AGE STRUCTURE OF FERTILITY

In chapter II a method of estimating fertility is described that is based on accepting as accurate the number of children ever born reported by younger women as an indication of the level of fertility, and judging the age pattern of fertility from births-by-age reported for the preceding year. This technique is especially promising in populations in which knowledge of approximate age is widespread, so that the comparison of cumulated fertility with reported average parity is not excessively distorted by misreporting of age.

The question that should be asked to reveal the age pattern of fertility is whether each woman bore a child in the year before the survey. Answers should be tabulated by age, and also by parity—information that is collected in the same survey if the technique is to be employed. This additional detail creates additional possibilities for determining the presumed error in the perception of the "reference period" (one year) that causes mistakes in reporting recent births. For example, the cumulation of age specific fertility of zero parity women to the age interval 30-34 should equal the proportion of women at age 30-34 having at least one child, and a correction can be applied to the births reported for the preceding year to insure such equality. If this correction factor is about the same as the one described in chapter II—the correction needed to equate cumulative fertility (all parities) with average parity at age 20-24—the credibility of the adjustment is greatly strengthened.

Another possibility for ascertaining the age structure of fertility is to ask every woman whether she is currently pregnant. Not all pregnancies result in live births; some women may not recognize pregnancy in its early stages; and in some populations there may be a tendency for women to deny they are pregnant. None of these differences between reported pregnancy and fertility are likely to be age selective, except in ways that can be estimated; and this question is a promising supplement (or substitute) for a question on births last year. Of course the age of the woman at the birth of the child would be about four months greater than the mean age during a reported pregnancy, and an allowance for this difference must be made in forming a schedule of fertility.