

## OVERVIEW

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More of life is generally regarded as better than less of life. And the overriding justification for studying mortality is to find ways in which it can be reduced and survival can be extended. Mortality risks vary among populations over both time and place. Crude death rates vary between and within countries by as much as a factor of five; and some mortality measures, such as the infant mortality rate, vary even more widely. Mortality measures have, for many countries, declined by at least comparable amounts since the beginning of the twentieth century, although the declines have been far from uniform. These and other trends and differentials in mortality are of importance because of their relevance to devising and implementing mortality-reducing strategies. Mortality levels are also important because mortality, with fertility and migration, is one of the three components of population change, a key variable in much economic and social planning.

Reliable mortality analysis depends upon reliable mortality data. The Meeting of the United Nations/World Health Organization Working Group on Data Bases for Measurement of Levels, Trends and Differentials in Mortality was a significant step towards finding means to deal with this question. Part one of the present publication reports briefly on the background of the Meeting and includes the recommendations of the Working Group.

The papers in the present volume are concerned with the measurement of mortality levels, trends and differentials; they cover approaches to data collection, evaluation and analysis. The papers in part two discuss the various uses to which mortality data are put and the implications of their uses for the available methods of data collection and analysis. Part three consists of an overview of current data-collection methods and of their strengths and weaknesses. The papers in part four are concerned with the use of vital registration systems for the collection of mortality data and with the evaluation of such data. Part five contains discussions of sample survey approaches to mortality measurement at the macrolevel and covers both data collection and analytical procedures. The papers in part six consider survey approaches for more intensive and specialized mortality studies.

The overall focus of this publication is undoubtedly on issues in mortality measurement for statistically

less developed countries. In these countries, which lack a long history of civil registration and censuses, the provision of even the most basic mortality information is hedged with uncertainty and therefore the issue of alternative approaches is most pressing. Most developed countries obtain basic mortality measures of a high degree of reliability from their civil registration systems and censuses, and will continue to do so; the issues that remain concern the ways in which fully to exploit the data available and to conduct specialized surveys in the areas of epidemiological and clinical medical research. In developing countries, on the other hand, the basic collection systems are weaker, if not in absolute coverage then in the quality of the information recorded, or non-existent, and the range of possible approaches is thus wider.

The papers in the present publication are briefly discussed below, in order to guide the reader to this area of interest.

### A. USES OF MORTALITY DATA

The primary consideration in the collection of mortality data is the need for such data; only what is needed should be collected, and all that is collected should be used. Chapter III, by the present author and the United Nations Secretariat, provides an overview of the uses to which mortality information is put. The first category of uses, termed "descriptive" and "demographic", views mortality as one of the three components of population dynamics and centres on population forecasting, an essential element of socio-economic planning, and social description. The second category covers uses in the health sector; examples include the identification of high mortality-risk groups so that health services can be efficiently targeted and the evaluation of health services and projects. The third category covers uses in medical research and investigation. For each type of use the characteristics of the information required, such as accuracy, detail and timing, are discussed.

Chapter IV, by Ewbank, specifically concentrates on the use of mortality information for assessing the health impact of health and general development programmes in developing countries and on the shortcomings of the existing collection and analysis procedures for meeting such needs. Although the general tone of the paper is one of caution—that is, in some cases there may be no affordable way for assessing health impacts—the issues and approaches are clearly laid

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out and should assist in the selection of an appropriate assessment strategy.

#### B. OVERVIEW OF APPROACHES FOR COLLECTION OF MORTALITY DATA

The chapter prepared by the United Nations Secretariat, which constitutes part three of the present volume, provides a summary description of the characteristics, advantages and disadvantages of the various approaches used in the collection of mortality information. The approaches are divided into three categories: those whereby deaths are continuously recorded, such as civil registration systems; those where deaths are retrospectively reported for a past period, which may or may not be specifically bounded, such as survey questions on deaths in the preceding 12 months or on children dead among those ever born; and those which infer numbers of deaths or rates of death from numbers of living, again either specifically time-bounded, such as intercensal survival methods, or unbounded, such as stable or quasi-stable population methods. The basic conclusions are that measurement approaches must be selected with reference to the needs and conditions of the country and that the three collection vehicles—civil registration, census and survey—must be viewed as complementary rather than competitive, each having its place in a fully developed system.

#### C. COLLECTION OF MORTALITY DATA THROUGH VITAL REGISTRATION SYSTEMS

The most important source of information about mortality levels, trends and differentials has been historically and remains currently the continuous recording of deaths and their characteristics by civil registration. The primary purpose of such systems has generally been administrative, although the statistical by-product has become increasingly valuable with the recognition that provision of health services is a legitimate concern of national Governments. Moriyama, in chapter VI, provides a useful summary of experience with civil registration, beginning with a brief description of the historical development of the use of such information for mortality estimation; and then describing common features of existing systems, illustrating the uses to which the information is put, discussing the advantages (mainly richness of data) and disadvantages (mainly coverage limitations in developing countries) of such systems, and suggesting approaches to the upgrading of defective registration systems.

Chapter VII, by Padmanabha, discusses the experience of India with a sample civil registration system introduced in the mid-1960s. He first describes the context, in terms of alternative sources of information, then turns to a detailed description of the organization of the system, basically a dual-based survey combining continuous death registration with survey interviewing every six months, and then presents an evaluation of the results obtained using internal and

external consistency checks. The strengths and shortcomings of the system are objectively examined.

In chapter VIII, Preston provides a very useful and compact description of the methods available for evaluating the coverage of death registration, and, if necessary, adjusting for omission. The first part of the paper covers indirect methods, which evaluate coverage by appeal to independent information on population age distributions, beginning with those which assume that the population is stable, that is, characterized by constant fertility, mortality and age distribution; and proceeding to the more recent methods, which avoid this assumption by substituting information on population change over time. The second part of the paper discusses direct procedures for evaluation, basically dual-record approaches, and the relative advantages of the indirect and direct procedures.

#### D. COLLECTION OF MORTALITY DATA THROUGH SAMPLE SURVEY APPROACHES

In countries where the study of mortality on the basis of civil registration data is complicated by data deficiencies, such as omission, erroneous or inadequate reporting of associated characteristics, or lack of adequate population denominators, sample surveys have been extensively used to provide macrolevel information on mortality levels, trends and, to some extent, differentials. Blacker (chapter IX) describes, illustrates and evaluates the use of retrospective information about mortality collected by single-round sample surveys, covering the evaluation and adjustment of data on household deaths in a recent, defined reference period, the use of information from mothers on the survival of their children, the use of information on survival of parents and the use of information on survival of first spouses. While not attempting to be a handbook, the paper presents real examples and concludes that although the use of such approaches is not invariably satisfactory, it represents a cost-efficient way of filling a number of basic needs for mortality information where alternative sources are lacking.

In chapter X, Hobcraft describes the use of maternity history data in the estimation of levels, trends and differentials of child mortality, using as his context the World Fertility Survey programme, which has greatly expanded the amount of such information available, particularly for developing countries. Estimates of levels, trends and differentials of child mortality for some 20 countries are presented; and the basic plausibility of the estimates is demonstrated. The use of such data for the study of differentials and trends using proportional hazard models is particularly interesting.

Adlakha and Nizamuddin, in chapter XI, describe the use of multi-purpose household surveys and multi-round demographic surveys in the estimation of mortality. Actual examples, three of multi-purpose surveys and three of multi-round surveys, are used to bring out the main features in terms of survey organization and methodology. The chapter concludes with a discussion of the relative merits of the two

approaches, the decision between the two being seen to depend both upon what is wanted and upon what is feasible.

#### E. DATA COLLECTION FOR INTENSIVE MORTALITY STUDIES

Mortality information has uses other than the study of national mortality levels, trends and differentials, perhaps the most important of which is epidemiological and medical research and programme evaluation. For such purposes, small-scale, intensive surveys are frequently the only suitable data-collection vehicle. The work by Lyngé (chapter XII), which is the only chapter in the volume with a direct focus on data-collection issues for mortality studies in developed countries, describes a number of ways in which the information is used in the study of disease aetiology; it then outlines, with examples, the ways in which the information can be extracted from existing sources, such as record-linkage exercises between census and death registration data, or specially collected through such approaches as small-scale longitudinal surveys. The examples are exclusively drawn from studies of occupational risks, although the methodologies are applicable also to studies of other differentials. In an evaluation of the various approaches, Lyngé draws a conclusion that runs like a continuing thread throughout this entire publication: the appropriate methodology depends upon the context and objectives of the study. She appeals for the use of collection and storage procedures that maximize the possibilities for combining information from different sources.

Puffer's contribution (chapter XIII) describes experience in the Americas with a somewhat different approach to intensive mortality studies, that of using an existing source of data—in this case, death certificates for young children—as the basis and supplementing the information available by special collection procedures covering improvement of recording procedures; visits by medically trained interviewers to households that have experienced child deaths in order to obtain further background information; and relevant medical or pathological information available from hospitals, health centres and physicians. The

chapter continues by presenting the results of the exercise in terms of child mortality differentials according to a variety of characteristics for different localities. The differentials look, in general, much as one would expect, although the lack of rigorous testing for omission raises questions about the reliability of their magnitude.

The final chapter, by D'Souza, describes the background and history of, and some findings from, the pioneer Cholera Research Laboratory (now the International Centre for Diarrhoeal Disease Research) in Matlab Thana, Bangladesh, as well as from the more recent, and somewhat less intensive, Companiganj Health Project. The Matlab Project, combining intensive registration efforts with periodic censuses for a population of around 200,000, has provided both an abundance of mortality information useful for the study of disease aetiology and a ready-made setting for treatment trials. This chapter brings out the uses to which the mortality information has been put and also describes some of the bottle-necks experienced.

#### F. CONCLUSION

The recommendations of the Working Group, given in the report of the Meeting (see part one), strongly endorse the upgrading of civil registration systems where they are inadequate. The papers themselves, on the other hand, take a more balanced view of the complementarity of the different approaches and of the importance of civil registration as only one element of a thorough system for collecting information on mortality and of the need to improve all the elements in the development of such a system.

The present publication presents accounts of a wide range of approaches to mortality measurement and the results obtained from them, covering the provision of information for all the uses envisioned. It does not, however, present accounts of how to carry out a field exercise or how in detail to analyse a body of data. For such purposes, the reader is referred to the relevant technical manuals published by the United Nations. It is hoped, however, that the papers included here will be helpful in clarifying the issues and options involved in mortality measurement.

