Research Issues in Child Health and Child Care

Proceedings of a workshop held in Accra, Ghana, 22–26 September 1986
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Abstract

This workshop brought together West African health scientists and social scientists to discuss methodological and conceptual issues in the study of infant and child health and mortality, and to identify new research needs. Health and social scientists from the Gambia, Ghana, Nigeria, and Sierra Leone attended the workshop. Emphasis was placed on evaluation of research design and procedures for analyzing the determinants of child health rather than on the presentation of findings. Discussions and papers focused on four central themes: conceptual frameworks more appropriate to local contexts, questions of scale and measurement, the search for indicators of child health, and directions for future interdisciplinary research. This publication is intended to serve as a record of the proceedings of the workshop and to promote further communication and interaction among researchers working in the area of infant and child mortality and health.

Résumé

Cet atelier réunissait des spécialistes de la santé et des sciences sociales de l'Afrique occidentale qui ont discuté de problèmes méthodologiques et conceptuels liés à l'étude de la santé et de la mortalité du nouveau-né et de l'enfant, et qui ont cerné de nouveaux besoins en matière de recherche. Des spécialistes des sciences de la santé et des sciences sociales de la Gambie, du Ghana, du Nigéria et de la Sierra Leone y participaient. On a mis l'accent sur l'évaluation de la conception de la recherche et sur les procédures d'analyse des déterminants de la santé des enfants, plutôt que sur la présentation des conclusions de travaux de recherche. Les discussions et les communications ont porté sur quatre grands thèmes : paramètres conceptuels mieux adaptés au contexte local, questions d'envergure, la recherche d'indicateurs de la santé des enfants et les orientations futures de la recherche interdisciplinaire. Cette publication a pour objet de faire le compte rendu des délibérations et en même temps de promouvoir la communication et les interactions entre les chercheurs dans le domaine de la mortalité et de la santé des nouveau-nés et des enfants.

Resumen

Este taller reunió a científicos del campo de la salud y las ciencias sociales para discutir cuestiones conceptuales y metodológicas en el estudio de la salud y mortalidad infantiles y para identificar nuevas necesidades investigativas. Asistieron al taller científicos de la salud y las ciencias sociales de Gambie, Ghana, Nigeria y Sierra Leona. Se hizo más énfasis en la evaluación del diseño y los procedimientos investigativos para analizar los determinantes de la salud infantil que en la presentación de los resultados. Las discusiones y documentos se centraron en cuatro temas: marcos de trabajo conceptuales más apropiados para los entornos locales, cuestiones de escala y medición, búsqueda de indicadores de salud infantil y pautas para la investigación interdisciplinaria futura. El propósito de esta publicación es el de registrar las sesiones del taller y promover una mayor comunicación e interacción entre los investigadores que trabajan en el campo de la salud y mortalidad infantiles.
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METHODOLOGICAL AND OPERATIONAL PROBLEMS IN THE COLLECTION OF DATA ON INFANT AND CHILD MORTALITY

Rebecca Appiah

Introduction

This paper attempts to examine some of the problems encountered in the field in collecting accurate data for the estimation of infant (under 1 year in age) and child (ages 1 to 5 years) mortality. It will deal mainly with direct techniques although references will be made to indirect methods such as those of Brass et al. (1968). It will also examine some of the limitations in the data collection procedures relating to infant and child mortality, in particular the validity of some concepts used and some cultural factors that affect the collection of accurate data on mortality differentials. The paper draws mainly on the concepts and questions used in surveys conducted by the Ghana Statistical Service, i.e., the Post-Enumeration Survey of 1960, the 1971 Supplementary Enquiry, the Ghana Fertility Survey (1979-1980), and the Danfa Project.

The rapid decline of mortality in developing countries after World War II has been attributed mainly to the introduction of immunization and modern medicines (mostly vaccines and antibiotics). The single largest group that benefited from this technology transfer has been children because most vaccines protect children against major child-killer diseases such as measles, small-pox, whooping cough, diphtheria, tetanus, polio, and tuberculosis. Quite recently, oral rehydration therapy has also contributed significantly to lowering infant deaths from diarrheal diseases. Increasing public health education on maternal and child health has contributed highly to the decrease in infant and child deaths. Since the 1970s, however, the previously rapid decline of infant mortality has slowed down in Africa. This has been partly attributed to the economic recession with its attendant nutritional inadequacies and deteriorating sanitary conditions, and partly to the fact that mass disease eradication efforts have not had their maximum impact. In connection with the latter, the World Health Organization in 1974 established the Expanded Programme on Immunisation. UNICEF is now taking a leading role in this program and, together with WHO, hopes to cover areas that have hitherto not benefited from such programs.

Considerable attention has been paid to reducing infant and child mortality in developing countries recently because this is an indicator of the quality of life. Not only is the information required for the country as a whole but, for proper planning of health programs and control of communicable and other diseases that affect infants and children, such data must be available at the lowest level of administration. In Ghana, this will be the district; in Nigeria, it will be
the local government; and in Sierra Leone, the chiefdom. Moreover, in recent times, attention has been focused on the relationship between infant deaths and fertility in developing countries. It is argued that fertility levels will decrease only when there is a substantial decline in the level of infant mortality. Data on infant and child mortality in addition to that of fertility will enable us to test this hypothesis.

Ghana has also benefited from the world-wide decline of infant deaths. Infant mortality rates using Brass and Trussel mortality estimation techniques were 150 and 121 per 1000 births in 1960 and 1971, respectively (Ghana Fertility Survey 1983). The levels estimated directly from the 1960 and 1971 surveys were 126 and 87, respectively. Estimates for 5-year periods from the Ghana Fertility Survey range from 111 in the early 1950s to 70 for the 1974-1978 period. Although the data presented above vary, the results reveal that infant mortality has decreased considerably.

The study of infant deaths is desirable in itself because reducing deaths is a priority of most governments (especially infant and child deaths). The level of infant mortality in a country indicates the level of health conditions; therefore its decline directly reflects the improvement of health conditions. Because infant mortality levels differ according to region, educational and occupational group, age of mother, parity, and rural or urban residence, however, the study of mortality differentials becomes as important as the study of its levels. The differentials make it possible to identify the underprivileged sections of society that experience higher infant mortality levels and thereby formulate appropriate strategies to improve their living conditions and improve their survival chances. The study of infant and child mortality differentials also increases the understanding of the determinants of mortality and their interrelationships. This also enables policymakers to enact appropriate policy measures for reducing mortality, especially in the light of the Alma Ata declaration of Health for All by the year 2000.

Data Requirements

To measure infant and child mortality levels, data on children (by sex and date of birth) born alive to female respondents (of a specified age range, usually 15-45 or 15-49 years) during the 12-month period preceding the survey or census and deaths by sex and date of death of children born during the 12-month reference period are required. Data on the number of children ever born alive, classified by 5-year age groups of mother in addition to the total number of women in the 5-year age group, are also required. These data should be available for either one survey or census, or for two censuses or surveys taken 5 or 10 years apart.

To interpret differentials of infant and child mortality, information relating to the socioeconomic characteristics of the parents is also required (in addition to the data required in determining infant and child mortality). Usually the following information is collected: age of mother, ethnicity of mother/father, religion of mother/father, childhood rural/urban residence of mother/father, current rural/urban residence of mother/father, education of
mother/father, occupation of mother, and marital status and duration of marriage of mother.

Source of Data

Data used in the measurement of infant and child mortality are usually obtained from vital registration (of births and deaths), censuses, and surveys. In Ghana, the current registration form for decedents contains information on name, sex, age, date of death, nationality, name of mother (if decedent is less than 15 years), place of death, and usual place of residence (of decedent). For births, name, sex, date of birth, type of birth, place of delivery, nationality, usual residence, and name of mother, and name and nationality of father are obtained. Examining the items for which information is collected suggests that the data obtained is inadequate to measure differentials. This deficiency is characteristic of most vital registration systems in developing countries. Another deficiency of vital registration is its failure to record all events when they occur. Usually most births are either not recorded (especially of infants who die young), or are recorded later, in many cases when the children are grown. The registration of deaths is even worse for infants who die very young. Coverage of both births and deaths in Ghana is currently estimated at 40-45% for regional capitals and about 20% for towns with populations of 5000 and over.

When surveys and censuses are used to provide information on infant and child mortality, retrospective questions are asked. First, births to female respondents (within a specified age range, usually 15-45 or 15-49 years) during the 12 months preceding the survey or census are determined, then deaths of children born alive during the same period. In both cases, data on their sex and date of birth and death are also collected. This method was used in both the 1960 Post Enumeration Survey and the 1971 Supplementary Enquiry. To counteract misplacement of dates of birth and death of infants, some surveys ask information on births and deaths during the 24 months preceding the survey, and then detailed questions are asked on each birth and death within that period. In this way, births and deaths that do not belong to the specified 12-month period are eliminated. However, the advantage of the 24-month reference period over the 12-month period is yet to be proved.

Another variant of this method is the multiround survey. A baseline survey is carried out to obtain basic characteristics of households. Subsequently, periodic visits at intervals of 3, 6, or 12 months are made to record changes in those households. The Danfa Project, for example used 12-month periodic surveys. The multiround survey, it is argued, is better able to capture all births and deaths occurring in households that would otherwise be missed or not reported in a single-round survey. There are also variations of this approach that use both retrospective and registration approaches. A refinement of this method is the use of the dual-record system to match information from the survey and the registration, and to apply the Chandra-Sekaran-Deming formula to estimate the number of events that actually occurred during the period.

In another type of questionnaire, birth or pregnancy histories or both are used to collect information on birth and death of infants. In
In this case, detailed questions on each birth or pregnancy are asked. The objective of this method is to eliminate the omission of some births and deaths. The birth histories procedure was used extensively in the World Fertility Survey in conjunction with pregnancy histories, but the latter was only used to collect information on pregnancies that did not end in live births. The main objective was to capture situations where death followed soon after a live birth, and may be regarded by the respondents as nonlive births.

Pregnancy histories can also be used on their own to obtain data on all pregnancies whatever their outcome. Even though both birth and pregnancy histories are designed to eliminate omission of births and pregnancies, the likelihood that some respondents may deliberately not mention some births or pregnancies cannot be overlooked. This is likely to occur where respondents might have resorted to abortion to terminate unwanted pregnancies and also when respondents may want to conceal, from their current husbands, live births that did not survive, or births that occurred when they were much younger.

In both methods (i.e., retrospective questions and birth-pregnancy histories), data on the number of children ever born to female respondents (within a specified age range) and the number dead are also collected through direct questions. To eliminate omission of some children, especially those who are not living with respondents and those who died soon after birth, the following series of questions are usually used instead of just one or two questions.

How many of your own children...
   a. live in this house?
   b. live elsewhere in this town/village?
   c. live in another town/village in Ghana?
   d. live outside Ghana?
   e. are dead?

The sum of the responses gives the number of children ever born. The above questions were used in both the 1960 Post Enumeration Survey and the 1971 Supplementary Enquiry. In the Ghana Fertility Survey, another variant was used. The questions were asked separately for male and female children to further reduce the omission of some children.

The deficiencies outlined in both the vital registration system and surveys and censuses render any data obtained from these far from accurate and, therefore, inadequate to estimate plausible levels of infant and child mortality. For example, as mentioned earlier, direct estimates of infant mortality were 120 and 87 per 1000 live births for 1960 and 1971, respectively, but indirect estimation techniques yielded 150 and 121, respectively, for the same two dates. Because of such discrepancies (a result of omission of events), indirect techniques are used to estimate such rates.

**Conceptual Problems**

To obtain data on infant mortality differentials, data on the socioeconomic characteristics of parents are collected in addition to data on the infant and child deaths. The data usually relate to rural/urban residence of parents, ethnicity, religion, education, and occupation. But how are these concepts operationally implemented?
Education of parents is usually measured in terms of completed years or type of education or both. During analysis, data are tabulated either by years of schooling thereby disregarding the level, or by level disregarding the years of schooling. Equating levels of schooling with years of schooling, however, causes problems. Twelve years of schooling for one respondent may mean completed secondary and for another completed middle and vocational training. Is it reasonable to equate these two? In the same way, occupations are usually classified in such broad categories that important differences within categories are masked. For example, professionals and their technicians are usually grouped together in one major occupational group as "professional, technical, and related workers." In this category, chemists, medical officers, and engineers are grouped with their assistants. Wide differences exist, however, both in terms of level of education and salaries - variables that have been proven to have considerable effect on levels of infant mortality.

Furthermore, socioeconomic characteristics of parents are measured at the time of survey and are often interpreted as affecting the child's survival chances. But these characteristics might have been different at the time of birth and death of the children. Parents might have changed occupations or educational status. Usually, the analysis is based on the assumption that these characteristics remain the same. Moreover, in some analyses, the educational and occupational status of the "father" is used to determine the status of the household and these characteristics pertain to that of the current husband of the mother. Most surveys do not inquire whether these are the biological fathers or stepfathers of the children being studied.

Field Problems

There are interviewing dimensions to the problems of misdating and recall lapse. In Ghana, attempts have been made to aid respondents in remembering the dates of events through the use of national, regional, and local lists of historical events. Unfortunately, in many cases, this has introduced new sources of error such as the heaping of events. If the heaping occurs within the actual range, no problem exists, but if it occurs outside the range, it poses problems for data collection and analysis. For example, if the intention is to find out the ages of children who died in the last 12 months and the reference event is the expulsion of Ghanaians from Nigeria in January 1983, respondents tend to put children born outside the range within the range. If the person was born in February 1983 and died in March 1984, they tend to compress the timetable around the expulsion date so that this becomes the date of the infant's death.

The problems associated with retrospective surveys as outlined in the previous sections are compounded by cultural factors. Among some ethnic groups in Ghana, mothers who lose children in infancy are encouraged to forget that those children were born. It is generally believed that too much mourning over such children may result in the mothers not having other children. On the other hand, there is a popular belief among the rural uneducated segments of such ethnic groups that if such unfortunate births are ignored, the deceased children may return soon. In addition, people generally do not want to be reminded of their dead children. Respondents, therefore, may not report the birth and death of such children.
However, the cultural practice of some ethnic groups of using a set of names for children may help to reduce omission of events from such surveys. Among the Ga, for example, one cannot have a male child called Kwatei (i.e., second male child) without having a male child before him called Kwatelai (i.e., first male child). Similarly, among the Akans, the name Tawiah is usually used for the male or female child born directly after a set of twins. In the same way, Mansa is always the name given to the third girl in a row. The male equivalent is Mensah. In most cases, the interviewer can obtain complete information on children by asking for the missing names from a set.

Retrospective surveys are also plagued by a high incidence of nonresponse to questions that are considered sensitive. Usually, interviewers are trained not to use culturally unacceptable modes of asking such questions. For example, we do not ask a female respondent "How many of your children are dead?" We usually use the expression that translates approximately in English to mean "How many of your children have passed away?" When interviewers do not ask such questions in culturally acceptable ways, there may be a high level of nonresponse.

Translation of questions is also a problem. In the Ghana Fertility Survey, translated questionnaires were used to elicit accurate information. This was a major departure from the usual practice of the Census Office (Ghana Statistical Service) where translations of the questions are put in the Enumerators Manual. It has not been proven beyond reasonable doubt that one approach is better than the other, although the use of translated questionnaires may pose logistical problems.

Another issue is the type of interviewer to use in surveys on infant and child mortality. Because information on children ever born is best collected from the respondent herself, female interviewers may be better at eliciting more accurate information than their male counterparts. This hypothesis has not been adequately tested in Ghana. It should be noted, however, that in some countries or parts of countries, the issue is not whether women are superior to men as interviewers, it is that women are the only acceptable interviewers. In Northern Nigeria, for example, no male interviewer would be allowed access to women in purdah. A related issue is whether, in surveys involving the collection of data on infant and child mortality, paramedical personnel are preferred to lay interviewers. This hypothesis has also not been adequately tested in Ghana. Even if the null hypothesis is upheld, however, it is doubtful whether enough paramedical personnel can be spared for such surveys. In addition, self-selection of respondents by interviewers may also make the findings unrepresentative. This, however, can partly be remedied by prior listing and selection of households (with names of household heads) to be interviewed.

Conclusions

From the foregoing, it can be seen that even though surveys and censuses are the most common sources of fairly reliable information for estimating levels, trends, and differentials of infant and child mortality in most developing countries, the methodology needs to be refined to provide more accurate, valid, and representative data. In
this connection, samples should be large enough to enable further breakdown of broad educational and occupational groups to provide more meaningful interpretations of infant and child mortality differentials.

Developing vital registration systems to achieve more complete coverage should be assiduously pursued as this is the only way to obtain current and (if well developed) accurate information on infant and child mortality. In the short run, however, the vital registration system should aim to fully cover vital events in compulsory registration areas as well as extending the system to encompass countrywide sample areas so that direct estimates of vital events can be obtained on a continuous basis. When the registration system is well developed, more information on the characteristics of parents can be collected and problems of the adequacy of data on socioeconomic characteristics of parents relevant to the interpretation of levels, trends, and differentials in infant and child mortality would be solved.

In the meantime, various techniques can be adopted to improve the estimates from censuses and surveys. The dual-record method can be applied periodically to crosscheck rates from these sources, provided the limitations of the method, such as matching problems and the statistical independence of the two sources of data used for matching purposes, can be taken into account.

The multiround survey, which is like a longitudinal survey, can provide reliable information, but the attrition rate of respondents (i.e., respondents who move out of the sample) can be very high as shown by the Danfa Project. Unfortunately, in this type of survey, households dropping out cannot be easily replaced by new households because the main purpose of the survey is measuring changes over a specified period.

Awareness is increasing that demographic surveys that inquire into infant and child mortality may not be the best way to obtain useful and relevant information. A combination of demographic and health surveys in which questions on births and deaths are linked to those on morbidity, nutritional status of mother, causes of deaths, breastfeeding, and so on may be a better approach. The Demographic and Health Survey being carried out by Westinghouse in a number of countries in the world may therefore be the type of survey that can provide a comprehensive data set for the study of infant and child mortality.

References


