

Demographic and health surveys (DHS): contributions and limitations

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Introduction

A variety of data sources can be employed to generate data relevant to health planning, and the implementation, monitoring and evaluation of health programmes in developing countries. The routine health information system, based on health facility data, and population-based surveys are the most important sources of data. The focus is on a selected set of health indicators, such as those proposed in the context of primary health care (1,2) or child survival initiatives (3).

In general, surveys can provide information on health indicators for the whole population. National surveys conducted in the context of the Demographic and Health Surveys (DHS) programme constitute an important source of information on family health indicators.

In this article, we first provide some background information on the DHS programme, including a brief overview of the health information collected in DHS surveys. Subsequently, the contribution of DHS surveys to our knowledge of family health issues in developing countries is discussed, followed by an assessment of the limitations of DHS surveys. The article concludes with a summary of the role of DHS-type surveys in family health measurement during the remainder of the 20th century.

DHS

The DHS programme, funded by the United States Agency for International Development, started in 1984 as a successor to the World Fertility Survey (WFS) (4). The WFS had mainly focused on collecting information on fertility, child mortality and family planning, but DHS expanded this to include information on health and nutrition. DHS surveys are based on nationally-representative samples. The respondents are women of childbearing age. An increasing number of surveys include a men's questionnaire as well, focusing on family planning and AIDS-related issues.

DHS surveys are implemented by national organizations: usually the Bureau of Statistics, Ministry

of Planning or Ministry of Health, often in collaboration. DHS staff provide technical assistance to the implementing organization in the areas of general survey design, questionnaire development, sampling, data processing and editing, data analysis, report writing, dissemination of results and further analysis. The DHS model or core questionnaire is adapted in each country, as are other survey documents such as interviewers' manuals and tabulation plans. An integrated software package (ISSA: integrated system for survey analysis) has been developed specifically for DHS surveys.

Table 1 lists countries with completed DHS surveys as of September 1993 with year of survey and sample size. Several countries have now conducted two DHS surveys.

Health indicators in DHS

The model DHS questionnaire includes questions to collect information on the following health indicators:

Fertility and mortality

Estimates of fertility and child mortality, as well as information on ages of children, are based upon a full birth history from women 15-49 at the time of the survey. The respondent is asked to provide information on all her children born alive, starting with the most recent birth. This information includes the child's sex, birth date, and survival status. If a child died, the age at death is recorded.

The birth history data can be used to obtain estimates of current fertility levels and trends, and levels and trends in neonatal, infant, early childhood and under-5 mortality for the 15 years prior to the survey. Mortality estimates are mostly made for 5-year periods. Several countries have included maternal mortality modules with questions on adult mortality for both sexes which can also be used to estimate male and female adult mortality (5).

Anthropometry

Initially, data on weight and height were only collected for children under 3 or under 5 years, but more recently maternal anthropometry has also been included in DHS surveys. Levels of wasting, stunting and underweight at the time of the survey are estimated.

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Table 1

Countries with DHS surveys, year of survey and number of respondents (mostly women 15-49 years).

Tableau 1

Pays participant au programme "Enquête démographique et de santé", et nombre de répondants (surtout des femmes, âgées de 15 à 49 ans)

Region/Country Région/Pays	Year of survey Année de l'enquête	Number of respondents Nombre de répondants
<i>Sub-Saharan Africa — Afrique subsaharienne</i>		
Botswana	1988	4 368
Burkina Faso	1992/93	6 000
Burundi	1987	3 970
Cameroon – Cameroun	1991	3 871
Ghana	1988	4 488
Kenya	1988/89	7 150
Kenya	1993	8 000
Liberia – Libéria	1986	5 239
Madagascar	1992	6 260
Malawi	1992	4 850
Mali	1987	3 200
Namibia – Namibie	1992	5 421
Niger	1992	6 503
Nigeria – Nigéria	1990	8 781
Nigeria – Nigéria (Ondo State – état d'Ondo)	1986/87	4 213
Rwanda	1992	6 551
Senegal – Sénégal	1986	4 415
Senegal – Sénégal	1992/93	6 500
Sudan – Soudan	1989/90	5 860
Togo	1988	3 360
United Republic of Tanzania – Rép.-Unie de Tanzanie	1991/92	7 650
Uganda – Ouganda	1988/89	4 730
Zambia – Zambie	1992	7 060
Zimbabwe	1988/89	4 201
<i>North Africa and Asia – Afrique du Nord et Asie</i>		
Egypt – Egypte	1988/89	8 911
Egypt – Egypte	1992	9 864
Indonesia – Indonésie	1987	11 884
Indonesia – Indonésie	1991	22 909
Jordan – Jordanie	1990	6 462
Morocco – Maroc	1987	5 982
Morocco – Maroc	1992	9 256
Nepal — Népal (KAP – CAP/gap) ^a	1987	1 623
Pakistan	1990/91	6 611
Philippines	1993	15 000
Sri Lanka	1987	5 865
Thailand – Thaïlande	1987	6 775
Tunisia – Tunisie	1988	4 184
Turkey – Turquie	1993	7 500
Yemen	1991/92	5 687
<i>Latin America and Caribbean – Amérique latine et Caraïbes</i>		
Bolivia – Bolivie	1989	7 923
Brazil — Brésil	1986	5 892
Northeast Brazil – Nord-Est Brésil	1991	6 222
Colombia – Colombie	1986	5 329
Colombia – Colombie	1990	8 644
Dominican Republic – République dominicaine	1986	7 649
Dominican Republic (experimental) ^b – République dominicaine (expérimental) ^b	1986	3 885
Dominican Republic – République dominicaine	1991	7 320
Ecuador – Equateur	1987	4 713
El Salvador	1985	5 207

Table 1 (continued)

Countries with DHS surveys, year of survey and number of respondents (mostly women 15-49 years).

Tableau 1 (suite)

Pays participant au programme «Enquête démographique et de santé», et nombre de répondants (surtout des femmes, âgées de 15 à 49 ans)

Region/Country Région/Pays	Year of survey Année de l'enquête	Number of respondents Nombre de répondants
Guatemala	1987	5 160
Mexico – Mexique	1987	9 310
Paraguay	1990	5 827
Peru – Pérou	1986	4 999
Peru (experimental) ^b – Pérou (expérimental) ^b	1986	2 534
Peru – Pérou	1991/92	15 882
Trinidad and Tobago – Trinité-et-Tobago	1987	3 806

^aThis survey explored the discrepancies ("gap") between fertility preferences, and knowledge, attitudes and practices (KAP) of family planning. - Cette enquête examinait les écarts ("gap") entre les préférences en matière de fécondité et les connaissances, attitudes et pratiques (CAP) dans le domaine de la planification familiale.

^bMethodological issues. - Aspects méthodologiques.

Family planning

Detailed information is collected on current and past use of family planning methods, and knowledge of contraceptive methods. Several questions are asked to assess (met and unmet) needs for family planning and availability of family planning services.

Maternity care

Questions are asked on antenatal care (attendant, number of visits, timing of first visit), tetanus toxoid vaccination (number of doses received during each pregnancy), and delivery care (place and attendant). In addition, data are collected on birth weight, both recalled birth weight and subjective size of the baby as reported by the mother. Recently, a question on complications during delivery has been added.

Child feeding

DHS surveys provide data on breastfeeding and supplementary feeding patterns.

Vaccination

Coverage estimates are made using information from child health cards and mother's recall of vaccinations for all children under 5 years.

Child morbidity

Questions on the prevalence of diarrhoea, fever and cough, with or without rapid breathing, are used to assess curative health services utilization and treatment patterns.

AIDS

Questions about knowledge of HIV/AIDS have recently been added to the model questionnaire, and

an AIDS module includes questions about sexual behaviour and condom use.

Contributions made by DHS

DHS surveys have made a significant contribution to family health programmes. They provide a global, comparable, high-quality data base on a wide range of health indicators.

Firstly, DHS surveys are alleviating the paucity of data on health status in developing countries. Very few sources of data on fertility and child mortality are available, and child (and maternal) anthropometry data from DHS surveys also make an increasingly important contribution. Extensive use is made of DHS surveys in many health studies by national and international organizations and researchers. Long-term trends in fertility and mortality and MCH (maternal and child health) indicators can be assessed and used to challenge or support current opinion about priority health interventions. Comparative studies using DHS data are powerful tools to ascertain commonalities or exceptional patterns, and to compare countries or regions (6-10).

Secondly, DHS surveys provide population-based coverage data of key health services indicators. These indicators can be disaggregated and differentials can be assessed by geographic, biodemographic (sex of child, birth interval, etc.) and socioeconomic characteristics (mother's education, rural-urban residence, attributes of the household, etc.). Previously, rather limited data were available on health status and health care utilization differentials.

Continuous evaluation of data quality (11,12) and inputs from international experts are used to create the best possible health interview instruments. Health interview surveys are a complicated and relatively under-developed field (13), and im-

improvements in the health section of the DHS questionnaire are made continuously. Extensive training and supervision during field work, almost concurrent data entry and editing, and use of data-quality tables with feedback during field work are methods which ensure data quality.

A particular strength of DHS surveys is the quickness of publication of results after the end of field work. Through standard approaches in questionnaire design and contents, data processing and tabulation programmes, most tabulations are available within 2 or 3 months after the end of field work.

Limitations

Virtually all information collected in DHS surveys is subject to reporting and recall biases (except weight and height measurements and vaccination data copied from the child health card). Current-status data are used to estimate duration of breastfeeding, postpartum amenorrhoea, etc., since that methodology is least vulnerable to biases. Certain information such as the age of the respondent, birth dates of children, and age at marriage refers to events in the past. This inevitably causes biases, although detailed evaluation of DHS data has shown that these data are reasonably well reported. Omission of births or deaths, the most serious problem of cross-sectional surveys, is generally within limits. Most health information is based on women's reports: for example, concerning child diarrhoea and respiratory symptoms in the past two weeks, or use of maternity care. Misclassification biases are known to occur. The magnitude of the bias is often unknown and correcting for the bias is difficult. As long as the biases are fairly random, the aggregate estimates of indicators will be fairly adequate, but individual-level data will have to be interpreted more carefully, especially when making causal interpretations.

DHS surveys are also limited to health indicators which can be measured with relatively few questions. For instance, malaria, tuberculosis, and AIDS are illnesses for which no satisfactory questions are available. Recall of diets for children is cumbersome and requires multiple questions and considerable expertise from the interviewer. Determination of economic status is limited to a short list of durable goods. Determination of cause of death through verbal autopsy gives a rough idea of the importance of selected causes of death, but is not precise enough for evaluation of the impact of health interventions or assessment of trends in cause-specific mortality.

In addition, DHS data on health services are limited to assessing availability and utilization, and no data on quality of care are collected. There are better methods than cross-sectional surveys to assess the quality of care (14).

The disadvantage of using a standardized questionnaire is that there are limited opportunities to

adapt the questionnaire to be locally relevant. Additions, deletions and changes are made in every DHS survey, but the number of modifications is limited in order to maintain comparability, limit complexity of the survey, and keep the length of the questionnaire within limits.

Disaggregation to district level is desirable, since a district is often the major unit of implementation of health programmes. DHS surveys are generally not designed to yield estimates of health indicators at the district level, since this is too costly. A sample of at least 1 000 to 1 500 women is required in order to obtain valid estimates of fertility and child mortality. Other maternal and child health indicators do not need such a large sample size, but sampling errors are usually large at district level.

Hitherto, the DHS questionnaire has focused mainly on child health indicators, and much less on adolescent and adult health. Although it may be possible to ask questions about adult health, the current length of the questionnaire prohibits considerable expansion. Special modules are, however, being considered.

Nationally representative surveys are costly and require considerable expertise. For most developing countries external assistance is required to cover the local costs of 3-6 months of field work (50-80 staff in the field), and data processing and editing, while the costs of technical assistance may amount to half of the survey expenses.

Discussion

DHS surveys are an important source of data on health of families in developing countries. Both at the national and international level DHS surveys provide much needed data on fertility and family planning, on mortality and nutrition, and on health services utilization.

Adult health and health examination data (e.g., physical examination and laboratory investigations) are likely to receive more attention in DHS surveys later during the decade. For instance, DHS surveys could be used to provide more detailed data on the spread and determinants of the current HIV/AIDS pandemic, if simple diagnostic techniques are used, such as a saliva test or blood-spotted filter paper analysis.

DHS surveys could also be the main source of data for monitoring the health goals of the World Summit for Children. The summit set specific goals for improvements in maternal and child health for the decade 1990-2000. A review of the indicators shows that, although several goals can be monitored with a well-functioning national health information system, more than two-thirds of the health goals require nationally representative sample surveys. Therefore, each country committed to the goals should have a DHS-type survey at the beginning and at the end of the decade. A survey conducted be-

tween 1989 and 1994 could provide baseline data and the data necessary for programme planning. A survey ten years later should be conducted to evaluate achievements during the decade.

Summary

Surveys conducted in the context of the Demographic and Health Surveys (DHS) programme are an important source of data on health of families in developing countries. Both at the national and international level, DHS surveys provide much-needed data on fertility and family planning, on mortality and nutrition, and on health services utilization. The use of uniform survey instruments allows detailed international and subnational comparisons of health status and health care. Limitations of the DHS surveys are also discussed.

Résumé

Enquêtes démographiques et de santé: source d'information sur la santé des familles dans les pays en développement

Les enquêtes conduites dans le cadre du programme «Enquêtes démographiques et de santé» constituent une importante source d'informations sur la santé des familles dans les pays en développement. Sur le plan national comme sur le plan international, elles fournissent des renseignements particulièrement précieux sur la fécondité et la planification familiale, la mortalité et la nutrition ainsi que sur l'utilisation des services de santé. Le recours à une instrumentation uniforme d'enquête permet des comparaisons détaillées de la situation sanitaire et des soins de santé à l'échelle internationale et infranationale. Les limites des enquêtes conduites dans le cadre du programme sont également passées en revue.

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