
Chapter 58

THE WORLD HEALTH SURVEYS

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The World Health Surveys (WHS) are an initiative launched by the World Health Organization to strengthen national capacity to monitor critical health outputs and outcomes through the fielding of a valid, reliable, and comparable household survey instrument. To provide the context for the WHS, we first discuss the role of household surveys in national health information systems. The remainder of the chapter gives an overview of the objectives of the WHS, the development and rationale for the WHS modules, the current status of implementation of the WHS, and the WHS methods. Some reflections on the relevance of the WHS to policy formulation are provided at the end.

ROLE OF HOUSEHOLD SURVEYS IN HEALTH INFORMATION SYSTEMS

Health information systems (HIS) are the set of data collection instruments, actors, resources, and institutions whose primary purpose is to inform strategic decision-making, support programme management, monitor progress towards agreed targets, and provide the basis for the evaluation of what works and what does not in health systems. National health information systems need to give information on a wide range of topics including levels, causes and patterns of health, use and effectiveness of health interventions, client experience of health services, financial, physical and human resource inputs, and a range of other health system activities.

A key aspect of health information systems is the mode through which needed information is collected for a range of purposes, topics, and levels of aggregation. Figure 58.1 illustrates the seven main modes of information gathering that should be part of any national health information system.

Vital registration systems, which capture events such as birth and death, and attribute deaths based on the International Classification of Diseases, are the backbone of most national health information systems. Irrespective of whether a Ministry of Health manages vital registration, it is an integral component of a functioning health information system.

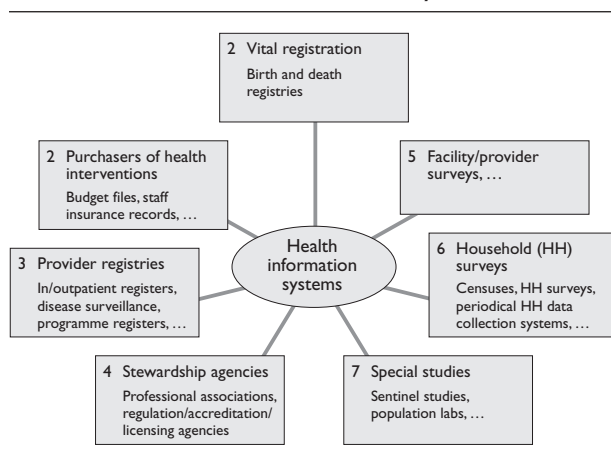
The second main mode is information collected from purchasers of health interventions, including Ministries of Health, which allocate budgets to their own hospitals and clinics. Purchaser information comprises budgets, expenditure accounts, staff lists, and the more richly detailed information purchasers in some high- and middle-income countries on specific health system transactions through, for example, insurance records.

In many countries, HIS investments are focused on the third mode of data collection: provider registries and case reporting. This information, collected at the point of service by health providers, includes case notifications meeting specified criteria as well as registries of specific interventions such as DTP3. Providers can be categorized into Ministry of Health, other public sector, and private sector. In the vast majority of countries, provider registry information is often received only from Ministry of Health providers, giving an incomplete picture of morbidity and intervention delivery.

Fourthly, health information systems also collect information from a number of actors and institutions whose primary role is stewardship. Examples of information collected from stewards of the health system include nurse or physician licensing, hospital accreditation, or occupational safety inspections.

The fifth mode is collecting information directly from households through national censuses, or more commonly through household surveys. Household sur-

Figure 58.1 Different information collection modes for health information systems



vey data may be collected as part of a broader national survey or may be focused only on health topics. A well-designed household survey can address many of the selection bias problems that plague both vital registration and provider registries in many countries. Similarly, information on quality, resourcing, and efficiency can be collected through facility surveys, which can be considered a separate mode of data collection.

Household surveys have an important role to play in national health information systems. They represent a low-cost method of addressing the selection bias inherent in provider registries in nearly all countries; effective coverage of health interventions delivered by private providers is a good example of this. Collecting information directly from households also provides a practical strategy for dealing with the poor coverage of vital registration data in many low-income countries. Household surveys are the only method of obtaining some important types of information, such as household out-of-pocket payments to providers or patient experience of the full spectrum of health system providers. With increasing policy concern in health and health system outcomes in the poor and other disadvantaged groups, household surveys are the most practical and low-cost approach to measuring key outcomes for different socio-demographic subgroups including the poor.

Household surveys are currently used in nearly all health information systems, but their full potential is often unrealized. Well-established health information systems in high-income countries use household surveys routinely to provide essential information. For example, the National Health Interview Survey in the United States has been implemented annually since

1957 (1). In low- and middle-income countries, a large number of household surveys focusing on health topics are undertaken every year. This major investment by nearly all countries includes a wide range of narrow surveys on particular topics such as nutritional status, oral health, chronic disease risk factors, adolescent health, or integrated management of childhood illness. The opportunity presented through each contact with a household in existing surveys could be better used if valid and reliable standardized instruments were available for a wide range of topics.

The Demographic and Health Surveys (DHS) have been an important effort to create and implement standardized modules for measuring child and maternal health, and household characteristics including assets, environmental risk factors, nutritional status, reproductive behaviour, children's health, status of women, AIDS, and other sexually transmitted infections (2). The implementation of the DHS in over 50 countries over the last 20 years has added substantially to global knowledge on child mortality and fertility. Standardized modules built on multi-country implementation, however, are not available for a range of important topics such as multidimensional health status, patient experience, household health expenditures, coverage of interventions for non-communicable conditions or some risk factors that can be captured through household surveys in a cost-effective manner. In some cases, existing standardized modules in use in various survey programmes have not undergone extensive psychometric evaluation.

When household survey instruments are designed to enhance comparability of responses across individuals within a population and across different cultural groups, the utility of the information can be greatly increased. Valid, reliable and comparable information can be used to bench-mark important health or health system outcomes, inputs and processes. When information is valid, reliable and comparable, data collected for monitoring and evaluation purposes can also contribute to the global evidence base on what works and what does not. Comparability can often be obtained in household surveys at relatively low cost through the appropriate design of the instrument and the inclusion of specific testing in development of the comparability of results. The World Health Survey is the first major survey programme to explicitly recognize the importance of comparability in the development of the instrument, in addition to the important concerns about validity and reliability.

OBJECTIVES OF THE WHS

Recognizing both the central role of regular household surveys in an effective national health information system and the under-utilized potential of existing household surveys in most countries, the World Health Organization launched the World Health Survey (WHS) in August of 2001. The programme of work in support of the WHS has the following specific objectives:

- To develop valid, reliable, and comparable household survey modules for a wide range of priority topics that can be used by countries as an integral part of their health information systems in a cost-effective manner.
- To define a set of quality assurance protocols and reporting strategies, including visits by technical advisers, in order to ensure satisfactory survey design and implementation.
- To formulate a strategy for building national capacity and expertise to conduct surveys and develop long-term sustainable platforms to share this information in public.
- To encourage the formation of links with international and regional networks to build national and regional research capacity.
- To provide a dynamic data collection platform that can be continuously developed with a transparent audit trail and availability of data in the public domain as an international public good.
- To facilitate the use of information collected through the WHS in appropriate strategic planning, programme management, monitoring, and evaluation. Particular emphasis is placed on policy use of the monitoring of the Millennium Development Goal indicators and on the critical outcomes concerning the poor.

MODULAR DESIGN

In order to enhance the utility of the World Health Survey, its development, testing and implementation have been formulated on a modular basis. The intention is that each module may be used as a stand-alone product in a variety of household survey contexts. New modules will be added to the initial set of modules incorporated into the first round of the WHS. Participating countries can choose from these modules in any combination according to their policy

needs. They can add their own modules if they wish, or add WHS modules to existing survey platforms in their countries.

The existing set of modules included in the WHS is listed in Table 58.1. The current WHS modules address different aspects of health and health systems, and are organized in two sections, the household questionnaire and the individual questionnaire.

INSTRUMENT DEVELOPMENT

In this section, we briefly review the origin, testing, and revision of the WHS modules. Special emphasis is given in this discussion to the health state description and the health system responsiveness modules, since these are relatively innovative and underwent a longer process of development and testing. An important aspect of the development of the WHS has been the use of the anchoring vignette strategy to enhance the comparability of self-responses for health state descriptions, responsiveness, and social capital. Instrument development should be seen as a continuous process. Each wave of empiricism has to be used to revise and improve the instrument for subsequent waves. The focus of this section, therefore, is on the development of the WHS instrument used in the first wave of surveys fielded in 2002 and 2003.

INSTRUMENT DEVELOPMENT PROCESS

The health state description and responsiveness modules began with an extensive review of the available items in common use in health and patient experience

Table 58.1 Modules of the WHS instrument in 2002–2003

<i>The Household Questionnaire</i>	Roster of all the individuals in the household Household health intervention coverage Health insurance Health expenditure Indicators of permanent income Health occupations
<i>The Individual Questionnaire</i>	Socio-demographics Health state description Health state valuation Risk factors Mortality Coverage of health interventions Health system responsiveness Health system goals and social capital Interviewer observations

instruments. The review of existing health instruments was facilitated by the ongoing work on developing the *International Classification of Functioning, Disability and Health* (ICF) (3). The ICF provides a coherent framework and terminology for the multiple domains of health. Based on this systematic review and consultations with experts in the field, a pilot instrument was tested in household surveys in Tanzania, the Philippines, and Colombia in 1999. Following analysis of the preliminary data and consultations in expert meetings, the instrument was thoroughly revised. The major development was the inclusion in the instrument of panels of anchoring vignettes (see Chapters 30 and 31 in this book for details (4;5)). Anchoring vignettes are meant to help understand how respondents in diverse socioeconomic, demographic, and cultural settings may use response categories in different ways. The information collected through anchoring vignettes can be used non-parametrically or with appropriate statistical models such as CHO-PIT, to enhance response comparability (6).

The health state description and responsiveness modules including panels of anchoring vignettes, along with modules on mortality, socio-demographics, health system goals, and mental health, were included in the WHO Multi-country Survey Study on Health and Responsiveness 2000–2001 (MCSS). Seventy-one surveys were completed in 61 countries using face-to-face, postal, and telephone interviewing modes (see Chapter 57 (7)). A 90-minute long version of the interview and a shorter 30-minute version were used. The purpose of this study was to develop a valid, reliable, and comparable instrument to describe individual health and responsiveness, and to test the effects that the interviewing mode may have on data quality and self-report. The study was also intended to develop a comprehensive methodology for WHO to gather data on important indicators of interest and to assist countries with the fielding of household surveys. The survey was designed to be implemented with careful quality control, appropriate sampling, and data management strategies. Another major goal was to build capacity in countries to analyse data from complex surveys. The MCSS provides the first comprehensive data set that allows the adjustment of self-reports based on shifts in cut-points using the anchoring vignettes methodology. The MCSS collected 188 307 cases and 10 309 retest cases who were given the same questionnaire twice within a week. Such retest data provides a much richer basis for formal psychometric evaluation of instrument properties.

Analysis of the MCSS provided an extensive empirical basis for modifying items and reducing the number of domains and/or items per domain for the health state description, health state valuation, health system goals, and responsiveness modules. Kappas and intra-class correlation coefficients allowed identification of items with particularly low test-retest reliability. Data on item missingness also provided insights into the psychometric properties of items or groups of items. Formal item and domain reduction methods were used on the MCSS data to suggest ways to decrease substantially the overall length of these modules.

With the public announcement of the WHS and reporting of the results of the WHO Multi-country Survey Study, the discussion platform was widened to include multiple inputs to improve the content and style of the WHS. Demands for information that could be used in national health policy debates and monitoring exercises from national decision-makers led to the development of new draft modules to more systematically collect information from households. These new modules included expanded information on health insurance, household members working in the health sector (health occupations), indicators of permanent income, risk factors, and coverage of health interventions. Items in these modules were taken from existing surveys such as the DHS, or developed by working groups of WHO technical staff from a range of departments.

Between February and April 2002, revised modules for health state description, health state valuation, responsiveness, and health system goals, along with new draft items for modules on health expenditures, health insurance, health occupations, indicators of permanent income, risk factors, and health intervention coverage, were fielded in a 12-country WHS pilot study. Because of the length of some of the draft modules, not all modules were fielded in all sites. Health state description, risk factors, and mortality, along with all the modules at the household level, were fielded in China (467 respondents), Myanmar (599 respondents), Pakistan (549 respondents), Sri Lanka (594 respondents), Turkey (600 respondents), and the United Arab Emirates (595 respondents). Responsiveness, coverage, and all other modules excluding health state description, risk factors, and mortality, were fielded in Cote d'Ivoire (598 respondents), India (649 respondents), Malaysia (602 respondents), Mexico (604 respondents), South Africa (585 respondents), and Spain (592 respondents). As these were pilot studies to allow formal psychometric evaluation of the modules, they were not random sample surveys. In

all, 7 043 respondents were surveyed and 1 200 were retested within two weeks.

Based on careful analysis of the WHS pilot data, working groups for each module proposed a draft final instrument. These proposals were timed and an overall steering group for the WHS made further reductions in the instrument length, so that all modules could be fielded in an average of 90 minutes. In addition, a 30-minute version was developed for use in countries where costs of a 90-minute interview would be prohibitive. The final WHS wave I instrument was available in August 2002. This instrument has been translated into multiple languages following a standardized protocol including back translation (8).

CURRENT WHS MODULES AND RATIONALE FOR THEIR CONTENT

In this part of the chapter, we review each module of the WHS and give a brief explanation of its content.

The first section, the *Household Questionnaire*, takes a roster of all individuals in the household and examines common features of the household. This section of the WHS provides important information on household composition and characteristics. In detail, it includes the following modules:

- Household roster. The informant gives information on members of the household, their relationship to the informant, age, education, marital status, and whether they have worked in a health occupation. The adult member of the household who will be interviewed as the primary respondent for the individual questionnaire, is selected using a Kish table.
- Household health intervention coverage. In this module, selected health interventions that are household interventions by nature are explored. These include, for example, use of insecticide-impregnated bednets for children and pregnant women in the household. Household members who are institutionalized for health reasons are also recorded.
- Health insurance. For each household member, the informant is asked whether he or she is covered by a health insurance plan and what are the various characteristics of this health insurance, including premiums. In selected countries, this module is extended to collect detailed information on participation in community health insurance schemes.

- Health expenditure. Information on total expenditure broken down into food, housing, education, health care, and all other expenditures is collected in this module. Health expenditure is further divided into a range of categories.
- Indicators of permanent income. Robust estimates of household permanent income can be obtained with information on the ownership of selected assets such as radios, televisions, cars, or chairs, as well as access to household services such as electricity, running water, and sewerage (9;10). This module uses a standard set of dichotomous questions about household assets and services. The exact set of items is adjusted to national levels of income per capita. Permanent income estimates provide important information for the measurement of health of the poor and the analysis of inequalities in health, coverage, and responsiveness.
- Health occupations. For any household member identified in the household roster as having worked in a health related occupation, a series of items on the type of employment and employer, educational experience, and compensation mechanism is collected. This module is meant to provide information on a cross-section of health workers in a country including public and private sectors.

The second section, the *Individual Questionnaire*, covers the following aspects:

- Socio-demographics. This module collects information on age, sex, education, employment status, and ethnicity.
- Health state description. Self-assessed health levels are elicited for each of the eight domains of health—mobility, self-care, pain and discomfort, cognition, interpersonal activities, vision, sleep, and energy and affect. For each domain, two items are included to reduce measurement error and improve the efficiency of statistical models used to analyse these data. In addition, respondents provide answers to five vignettes relating to two of the eight domains. Respondents are randomized to answer vignettes for one of four combinations of two domains.
- Health state valuation. Respondents rank a series of hypothetical health states and provide associated detailed descriptions of those hypothetical states. This can be used to understand how individuals combine information on levels of different domains of health into an overall assessment of health.

- Risk factors. Items in this module cover tobacco use, alcohol consumption, fruit and vegetable intake, physical activity, water and sanitation, and indoor air pollution. These risks have been selected taking into account the risk factors that are the largest worldwide and for which self-report is a reasonable method of data collection. Responses can be used as inputs to comparative risk assessment exercises.
- Mortality. Primarily intended for use in countries with incomplete vital registration systems, this module includes a complete birth history, sibling survivorship history, and a brief verbal autopsy designed to identify selected leading causes of death. Measurements of adult mortality are particularly weak in many low-income countries; the sibling survival items may provide an important input to demographic assessments of adult mortality in these settings.
- Coverage of health interventions. This module is intended to collect information that can be used to assess the coverage or effective coverage of certain key health interventions. Coverage is the probability that an individual who needs an intervention will receive it. For interventions that an entire target population is meant to receive, such as immunization, assessment of coverage requires information on who received the immunization. For interventions directed at particular diseases, the coverage module collects information on the prevalence or incidence of a condition and whether the respondent received treatment. The module includes items on immunization, treatment of childhood illnesses, safe motherhood interventions, DOTS for tuberculosis, STD and HIV/AIDS prevention, and treatment of angina, asthma, arthritis, depression, road traffic injuries, and others.
- Health system responsiveness. The responsiveness module gathers basic information on health care utilization for inpatient and outpatient services. For health system contacts, two items are collected on the eight domains of responsiveness—autonomy, dignity, communication, confidentiality, basic amenities, prompt attention, choice, and social support. For two of the eight domains, each respondent also answers these items for five vignettes (11).
- Health system goals and social capital. Because many health systems performance assessment schemes have a composite measure combining different aspects of health systems such as health of

the population, responsiveness, and financing of the system (12;13), it is useful to obtain the preferences of the respondents on these components. WHS modules ask about the relative importance of the key goals of a health system: level and distribution of health, level and distribution of responsiveness and fairness in financial contribution. In addition, given the importance of interdependencies between social capital and health, this module includes a range of questions on social capital, e.g. relating to stress, security, and participation in community, plus corresponding anchoring vignettes to enhance the cross-population comparability of these data.

- The WHS interview schedule ends with a section to record interviewer observations regarding the interview context and quality of responses.

The short version of the interview is nested within (i.e. includes a subset of questions from) the long version, which enables a direct comparison of data collected using the different versions. The short version takes about 30 minutes to complete and is administered to a single respondent in its entirety. It excludes questions on insurance, valuation of health, risk factors, mortality, and social capital, and has abbreviated coverage and responsiveness sections.

ONGOING INSTRUMENT DEVELOPMENT AND MODIFICATION

The WHS instrument is envisaged as an evolving product. As country needs arise, new WHS modules will be developed following the same principles of rigorous psychometric testing and piloting on a large scale. As lessons are learned, items and vignettes will be modified. Individual items will be changed, added, or dropped depending on the way they have performed psychometrically and based on the information they provide. Systematic testing (see Chapter 30 in this book (4)) will detect items that perform particularly poorly across populations or in selected situations, and these items will be modified or replaced. Vignettes will continue to be improved in order to achieve the goal of comparability. Every new module that is developed will have to pass the same stringent tests before being implemented on a wide scale. It will be carefully developed on the same principles as the core of the WHS instrument, and will be extensively pre-tested in several languages and regions.

NATIONAL PARTICIPATION IN THE WHS

WHO recognizes that the WHS must lead to the building of collaborations and partnerships that will strengthen survey capacity and improve data quality in Member States. With this goal in mind, participation in the WHS is based on the desire of Ministries of Health to use the survey for national needs. Ministries of Health that expressed an interest in participating in the WHS have worked with WHO to identify partners to implement the WHS in their countries. Given the needs of the complex survey infrastructure, it is essential to involve multiple parties such as the National Statistical Offices, Census Bureaus and Survey Institutions, to collaborate and implement the various steps of the survey.

The World Health Survey Programme will continue to be developed in individual countries through consultation with policy-makers, particularly those involved in planning the scaling-up of health activities in response to the prospective increase in available resources. It will also be undertaken in collaboration with the people involved in routine health information systems. It will be complementary to their efforts to ensure periodic data input in a cost-effective way so that important gaps in health information are covered.

It will also establish a baseline for efforts to scale-up health activities.

The WHS will be implemented within a comprehensive programme with a long-term view on the development of national health information systems. Appropriate use of household surveys as a key form of data collection in an overall national health information system requires national capacity building and sustaining continued survey programmes.

Currently, World Health Surveys are being conducted in different modes of in-household 90-minute interviews in 55 countries (including a computerized personal interview in one country); 30-minute long brief face-to-face interviews (BFTF) in 13 countries; and computer assisted telephone interviews (CATI) in four countries. Table 58.2 lists the countries that are participating in the WHS in different WHO regions, and Figure 58.2 shows their geographical distribution.

WORLD HEALTH SURVEY METHODS

MODE

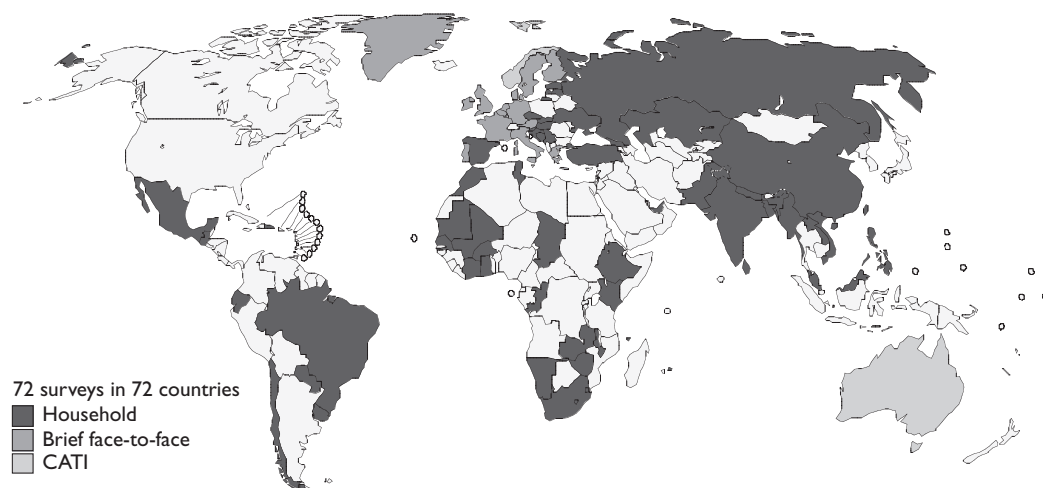
Given the importance of health issues, complex information requirements, and the length of the WHS interview, the basic survey mode is in-person interview. There is a choice of survey modes available for the

Table 58.2 Countries participating in the WHS 2002–2003

<i>EURO</i>						
<i>AFRO</i>	<i>AMRO</i>	<i>Common survey platform for short form</i>	<i>Other EURO countries</i>	<i>EMRO</i>	<i>SEARO</i>	<i>WPRO</i>
Burkina Faso	Brazil	Austria	Bosnia	Morocco	Bangladesh	Australia*
Chad	Chile	Belgium	Croatia	Pakistan	India	China
Comoros	Dominican Rep.	Denmark	Czech Rep.	Tunisia	Myanmar	Lao (PDR)
Congo	Ecuador	Finland	Estonia	United Arab Emirates	Nepal	Malaysia
Côte d'Ivoire	Guatemala	France	Georgia		Sri Lanka	Philippines
Ethiopia	Mexico	Germany	Hungary			Viet Nam
Ghana	Paraguay	Greece	Israel*			
Kenya	Uruguay	Ireland	Kazakhstan			
Malawi		Italy	Latvia			
Mali		Luxembourg*	Norway*			
Mauritania		Netherlands	Russian Fed.			
Mauritius		Portugal	Slovakia			
Namibia		Sweden	Slovenia			
Senegal		United Kingdom	Spain			
South Africa			Turkey			
Swaziland			Ukraine			
Zambia			Yugoslavia			
Zimbabwe						
18	8	14	17	4	5	6

Total number of countries: 72

*Australia, Israel, Luxembourg, and Norway are implementing the WHS short form through CATI (Computerized Telephone Interviews).

Figure 58.2 The WHS 2002–2003 geographical distribution of participating countries

The boundaries and names shown on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities; or concerning the delimitation of its frontiers or boundaries.

Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

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WHS implementation in a country. All modes have been pre-tested in the WHO Multi-country Survey Study as well as other pilot work for the WHS. All modes involve random selection of respondents on a nationally representative sampling frame. The choice will depend on the most practical and cost-effective mode in different settings.

- Household face-to-face surveys. In most countries, randomly selected households are contacted and a single person from each household is interviewed. This mode can be either 90 minutes or a 30-minute, brief version.
- Telephone surveys. When there is good coverage of a telephone network, surveys can be conducted via phone, using computerized systems. Telephone surveys use the same instrument as the 30-minute face-to-face surveys.

SAMPLE SIZE

To be useful for policy, responses should be representative of the population under consideration. It is recommended that samples be drawn by scientific principles of random selection to avoid any bias, and that quality assurance procedures be conducted during survey implementation to ensure that accurate and reliable data are obtained. Depending on the information needs and the amount of detail required, sample size

may vary between 1 000 and 10 000 for each country survey. This first wave of the WHS covers adult populations (i.e. older than 18 years). All samples were selected from nationally representative frames with a known probability in order to obtain estimates based on general population parameters. The sample sizes drawn for the longer household questionnaires ranged between 5 000 and 10 000, based on feasibility and survey costs. Brief face-to-face and CATI interviews generally had between 1 000 and 1 500 respondents (except in Luxembourg, which included a sample of 600). Details of country samples are documented on the WHS web site (8).

QUALITY ASSURANCE

To implement the WHS with high quality, intensive consultations with survey countries were undertaken to understand and improve survey implementation. A large-scale exercise was built with participation of countries, international survey experts, and regional advisors on *WHS Quality Assurance Standards & Guidelines*. This exercise has led to the examination of country needs and survey procedures to ensure appropriate sampling, efficient survey implementation, high quality data management, and analysis strategies.

The *WHS Quality Assurance Standards & Guidelines* identify explicitly the operational criteria as quality standards (14). The best practices to achieve

these standards are also defined, together with assessment strategies for monitoring and evaluation procedures. These guidelines will be implemented locally by national institutions and monitored by external peer review. Figure 58.3 depicts the different stages of quality assurance procedures.

Each step of the survey production process involves a certification of quality. The instrument design requires careful consideration to ensure that the questions are easily understood, the concepts are transferable across languages, and the measurement properties are stable across populations and over time. Attention needs to be paid to the design and implementation of the survey with adequate supervision and training of interviewers. Troubleshooting on-site with actual observations of the implementation is a prerequisite. In large multi-country surveys, uniform procedures for data entry, cleaning, and archiving are necessary. Ongoing monitoring of this process during the data collection phase, with a regular feedback loop from the site to the central monitoring centre and back, ensures that all analytical strategies can be executed with minimal error. All methodologies to analyse the data should be clearly documented and reviewed for appropriateness. Audit trails must be established to ensure transparency in the final analysis since these data will often have important policy implications and potentially far-reaching impacts in public health.

As an example of monitoring the end result of survey data, the following standard indicators are currently being used to monitor the survey data quality:

- Sample Population Deviation Index (SDI) shows the proportion of age and sex strata in the sample in comparison to the general population, here taken from the UN population database. It indicates the quality of the sample in terms of its representativeness. A ratio of one shows that the survey sample matches the characteristics of the general population, whereas deviations from one indicate over- or under-sampling from that age or sex group. The expected value of one (i.e. ideal representativeness) is rarely observed in surveys because of sampling errors. Figure 58.4 shows the SDI for one of the postal surveys indicating under-representation at younger ages and over-representation at older ages, particularly for older men.
- Response rate shows the completion rate of interviews in the selected sample—the number of completed interviews among eligibles. This indicator illustrates how well the survey has covered its defined sampling frame.
- Rate of missing data is defined as the proportion of missing items in a respondent's interview. We measured the number of people failing to complete a selected acceptable range of items to indicate the

Figure 58.3 WHS quality assurance procedures

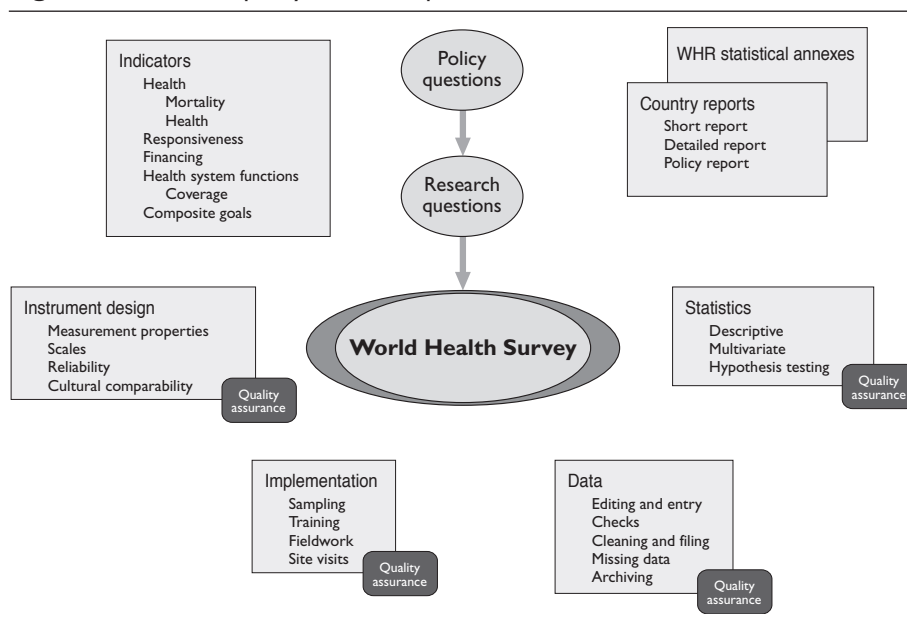
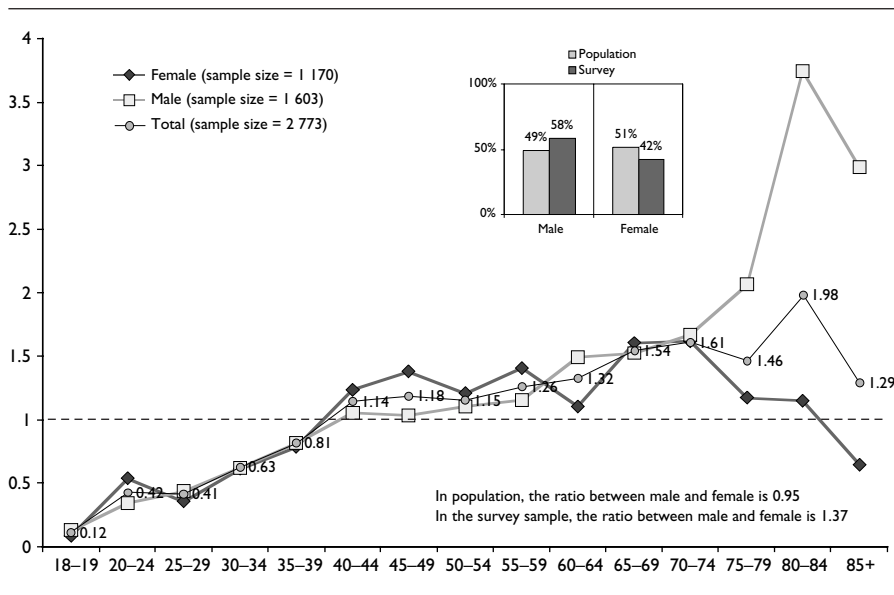


Figure 58.4 Example of a sample population deviation index

quality of the interviews (e.g. 10% in the household face-to-face interviews).

- Reliability coefficients for test-retest interviews demonstrate the standardization and stability of interview administration. These are calculated as chance-corrected concordance rates (i.e. *kappa statistics* for categorical, and *intra-class correlation coefficients* for continuous variables). This indicator refers to the standard application of the interview, i.e. how well a given interview could be repeated yielding the same results. Generally a score greater than 0.4 is acceptable, greater than 0.6 is fair, and higher than 0.8 is excellent (3;12).

In addition, design effect coefficients (DEFF) for the multi-stage cluster samples will be calculated where appropriate. This measure compares the actual sample to an assumed true simple random sample. Since a true simple random sample is not practicable in large-scale surveys due to costs and transportation, it is customary to calculate the variance estimation in comparison to a random sample (15). A DEFF of between 1 and 6 is generally considered acceptable for this sample size.

CAPACITY BUILDING

In order to build capacity in WHO Member States to implement the WHS with high quality and sustainability, intensive consultations with survey countries were undertaken. Training courses for participating country

teams were organized by WHO regions. These courses used standardized training materials. Survey-monitoring tools were also developed and implemented. Collaborating sites worked hard to obtain a representative sample and to ensure participation of selected respondents in the survey. This required substantial organizational skills on the part of the collaborating partners. Ongoing support from WHO was provided through periodic phone conversations, email contacts, and site visits for on-site monitoring, problem solving, and constant quality improvement. The quality of survey implementation at sites has been continuously monitored through electronic data delivery.

To make a meaningful impact and reach country-relevant conclusions from the World Health Surveys, WHO has established a mechanism to publish national reports based on data analysis in collaboration with countries themselves and international advisors. These reports will translate the findings of the WHS into practical suggestions for policy formulation. There will be different types of WHS reports:

- Country-specific reports. Brief National Reports will summarize the main findings for policy-makers, media, and other stakeholders. A detailed National Report will give richer findings on health system properties, poverty and health, and other country-relevant issues.
- Reports on specific issues. These reports will make comparisons within and across countries either globally or regionally, to facilitate learning from

each other by focusing on similarities and differences in findings.

WHO will assist countries in producing their own national reports and will support local country teams to conduct in-depth analysis of WHS data. In this way, the WHS will be useful for locally relevant policy questions. To support such activities, many tools for training, as well as courses and workshops are planned, focusing on data analysis, production of country reports, and discussion forums for better dissemination and assimilation of results.

ENSURING POLICY RELEVANCE

The WHS provides important information on inputs, coverage of interventions, and critical outputs of health systems. The results can be of immediate policy relevance to countries and could in some cases allow appropriate policy implementation. For this to happen, however, WHO needs to also focus energy on strengthening national capacity to analyse household survey data and to draw policy conclusions. This general need for national capacity to use data for policy purposes is particularly important for two priority areas.

With growing interest in health and poverty, the WHS has the potential to provide cross-country comparable information on health status and access to effective health interventions for the poor versus the non-poor within each country. The inclusion of indicators of permanent income in the WHS strengthens considerably the ability of governments to diagnose the health challenges of the poor and to monitor the efforts of the health system to deliver services to the poor. Detailed information on insurance and geographical, financial, and cultural access, included in the WHS, can be extremely useful in developing pro-poor health policies.

With increasing recognition of the central role of the government as the steward of the health system, information on subnational performance is essential. Such subnational performance assessment frameworks can be particularly important as a policy tool in countries that have undergone considerable decentralization. The WHS, with adjustments for sample size or the adoption of Bayesian methods, can be used as an effective tool for collecting information on subnational performance assessment (16). As a result, a country can make comparisons of key variables such as the levels and distributions of health of the population, responsiveness, coverage, financing, mortality, risk

factors and others accordingly (see Chapter 59 in this book (16)).

A third area of particular policy relevance is the focus of the world's nations on achieving the Millennium Development Goals (MDG) (17). These goals show that health is at the centre of development; three of eight goals for development are health goals. Eighteen of 48 MDG indicators are health indicators. Nearly two-thirds of the health-related MDG indicators can be monitored using the WHS instrument. Robust monitoring of the health-related MDGs is an essential requirement to be able to advocate for continued increases in resources for improving the health of the poor in the poorest countries.

FUTURE OF THE WHS

In developing the WHS, WHO has a vision of a series of valid, reliable, and comparable survey modules covering the full range of relevant health information that can be collected from households. A country considering implementing a household survey, irrespective of funding sources, could draw on this international resource. The instrument is designed to be valid and reliable, and to generate data that allow meaningful comparisons over time, across subgroups within a country and across countries. The library of standardized modules is far from being complete. The WHS instrument currently in use in wave I of the survey represents a first step to fulfil this vision.

Further empirical work will lead to improvements in the instrument. Demands from users of health information will lead to the development of new modules. Implementation of the WHS will, we hope, lead to enhanced country capacity to field high quality household surveys and, ultimately, to effective policy formulation. WHO is committed over the long term to ensuring that the WHS is an effective tool for national health information systems.

NOTES

- 1 Including WHS Collaborators in WHO: Can Çelik, Ajay Tandon, Joshua A. Salomon, Wan Jun Xie, and the following working group members:

Sampling: Somnath Chatterji, Emre Özaltın, Lydia Bendib, Marguerite Schneider, T. Bedirhan Üstün

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Health: Somnath Chatterji, Lydia Bendib, Maria Villanueva, Colin D. Mathers, Joshua A. Salomon, Marguerite Schneider, T. Bedirhan Üstün, Emre Özaltın, Ajay Tandon, Christopher J.L. Murray

Valuation: Joshua A. Salomon, Somnath Chatterji, Emmanuela Gakidou, Christopher J.L. Murray

Mortality: Alan D. Lopez, Colin D. Mathers, Andre L'Hours, Mie Inoue, Emmanuela Gakidou, Margaret C. Hogan, Emre Özaltın, Chalapati Rao, Christopher J.L. Murray

Responsiveness: Nicole B. Valentine, Kei Kawabata, Juan Pablo Ortiz, René Lavallée, Lydia Bendib, Somnath Chatterji, T. Bedirhan Üstün, Ajay Tandon, Christopher J.L. Murray

Risk Factors: Alena Petrakova, Majid Ezzati, Alan D. Lopez, Maria Villanueva, Kathleen L. Strong, Annette Pruess, T. Bedirhan Üstün

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A full list of the WHS Collaborators in WHS Member States (see Table 58.1) can be found on the WHS web site at URL: <http://www.who.int/whs>.

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