

statistical annex
explanatory
notes

ANNEX TABLE 1

All estimates of population size and structure for 2004 are based on the demographic assessments prepared by the United Nations Population Division (1). These estimates refer to the de facto population, and not the de jure population in each Member State.

The annual growth rate, the dependency ratio, the percentage of population aged 60 years and more, and the total fertility rate are obtained from the same United Nations Population Division database.

To assess overall levels of health achievement, it is crucial to develop the best possible assessment of the life table for each country. Life tables have been developed for all 192 Member States for 2004 starting with a systematic review of all available evidence on levels and trends in under-five and adult mortality rates. It is worth noting the efforts of WHO regional offices in collecting vital registration data from Member States (2). International agencies such as the United Nations Children's Fund (UNICEF) also maintain historical databases on under-five mortality rates, which have been generously shared and incorporated in these analyses. Other sources of information include data from national censuses or household surveys such as the Demographic and Health Survey (DHS) undertaken by ORC Macro, the World Bank Living Standards Measurement Study, and the Multiple Indicator Cluster Survey (MICS) conducted by UNICEF. Finally, national statistical documents such as statistical yearbooks, reports from specialized agencies and periodical paper findings were also incorporated into the database.

This review of data sources benefited greatly from a collaborative assessment of under-five mortality levels for 2004 by UNICEF, WHO, the World Bank and the United Nations Population Division responsible for monitoring child mortality trends.

The four agencies have established the Child Mortality Coordination Group including an independent group of academics which aims to conduct a critical review of current procedures used in each institution for compiling data and arriving at point estimates (3).

WHO uses a standard method to estimate and project life tables for all Member States using comparable data. This may lead to minor differences compared with official life tables prepared by Member States.

Life expectancy at birth, the probability of dying before five years of age (under-five mortality rate) and the probability of dying between 15 and 60 years of age (adult mortality rate) derive from life tables that WHO has estimated for each Member State.

Procedures used to estimate the 2004 life table differed for Member States depending on the data available to assess child and adult mortality. Because of increasing heterogeneity of patterns of adult and child mortality, WHO has developed a model life table system of two-parameter logit life tables, and with additional age-specific parameters to correct for systematic biases in the application of a two-parameter system (4). This system of model life tables has been used extensively in the development of life tables for those Member States without adequate vital registration and in projecting life tables to 2004 when the most recent data available are from earlier years. Estimates for 2004 have been revised to take into account new data received since publication of *The world health report 2005* for many Member States and may not be entirely comparable with those published in previous reports. The methods used to construct life tables are summarized below and a full detailed overview has been published (4, 5).

For Member States with vital registration and sample vital registration systems, demographic techniques (Preston–Coale method, Brass Growth–Balance method, Generalized Growth–Balance method and Bennett–Horiuchi method) were first applied to assess the level of completeness of recorded mortality data in the population above five years of age and then those mortality rates were adjusted accordingly (6). Where vital registration data for 2004 were available, these were used directly to construct the life table. For other countries where the system provided a time series of annual life tables, the parameters (I_{5+} , I_{60+}) were projected using a weighted regression model giving more weight to recent years (using an exponential weighting scheme such that the weight for each year t was 25% less than that for year $t+1$). For countries with a total population of less than 750 000 or where the root mean square error from the regression was greater than or equal to 0.011, a shorter-term trend was estimated by applying a weighting factor with 50% annual exponential decay. Projected values of the two life table parameters were then applied to a modified logit life table model, using the most recent national data as the standard, which allows the capture of the most recent age pattern, to predict the full life table for 2004.

For all Member States, other data available for child mortality, such as surveys and censuses, were assessed and adjusted to estimate the probable trend over the past few decades in order to predict the child mortality in 2004. A standard approach to predicting child mortality was employed to obtain the estimates for 2004 (7).

Those estimates are, on the one hand, used to replace the under-five mortality rate in life tables of the countries that have a vital registration or sample vital registration system, but with incomplete registration of numbers of deaths under the age of five years; on the other hand, for countries without exploitable vital registration systems, which are mainly those with high mortality, the predicted under-five mortality

rates are used as one of the inputs to the modified logit system. Adult mortality rates were derived from either surveys or censuses where available; otherwise the most likely corresponding level of adult mortality was estimated based on regression models of child versus adult mortality as observed in the set of approximately 1800 life tables. These estimated child and adult mortality rates were then applied to a global standard, defined as the average of all the life tables, using the modified logit model to derive the estimates for 2004.

It should be noted that the logit model life table system using the global standard does not capture high HIV/AIDS epidemic patterns, because the observed underlying life tables do not come from countries with the epidemic. Similarly, war deaths are not captured because vital registration systems often break down in periods of war (8). For these reasons, for affected countries, mortality without deaths attributable to HIV/AIDS and war was estimated and separate estimates of deaths caused by HIV/AIDS and war in 2004 were added.

The main results in Annex Table 1 are reported with uncertainty intervals in order to communicate to the user the plausible range of estimates for each country on each measure. For the countries with vital registration data projected using time series regression models on the parameters of the logit life table system, uncertainty around the regression coefficients has been accounted for by taking 1000 draws of the parameters using the regression estimates and variance covariance matrix of the estimators. For each of the draws, a new life table was calculated. In cases where additional sources of information provided plausible ranges around under-five and adult mortality rates the 1000 draws were constrained such that each life table produced estimates within these specified ranges. The range of 1000 life tables produced by these multiple draws reflects some of the uncertainty around the projected trends in mortality, notably the imprecise quantification of systematic changes in the logit parameters over the time period captured in available vital registration data.

For Member States where complete death registrations were available for the year 2004 and projections were not used, the life table uncertainty reflects the event count uncertainty, approximated by the Poisson distribution, in the estimated age-specific death rates arising from the observation of a finite number of deaths in a fixed time interval of one year.

For countries that did not have time series data on mortality by age and sex, the following steps were taken. First, point estimates and ranges around under-five and adult mortality rates for males and females were developed on a country-by-country basis (5). In the modified logit life table system described (4), values on these two parameters may be used to identify a range of different life tables in relation to a global standard life table. Using the Monte Carlo simulation methods, 1000 random life tables were generated by drawing samples from normal distributions around these inputs with variances defined according to ranges of uncertainty. In countries where uncertainty around under-five and adult mortality rates was considerable because of a paucity of survey or surveillance information, wide distributions were sampled but the results were constrained based on estimates of the maximum and minimum plausible values for the point estimates.

For 55 countries, mainly in sub-Saharan Africa, estimates of life tables were made by constructing counterfactual life tables excluding the mortality impact of the HIV/AIDS epidemic and then combining these life tables with exogenous estimates of the excess mortality rates attributable to HIV/AIDS. The estimates were based on back-calculation models developed as part of collaborative efforts between WHO and

the Joint United Nations Programme on HIV/AIDS (UNAIDS) to derive country-level epidemiological estimates for HIV/AIDS. In countries with substantial numbers of war deaths, estimates of their uncertainty range were also incorporated into the life table uncertainty analysis.

ANNEX TABLE 2

Annex Table 2 (Annex Table 5 in last year's report) provides a set of policy-relevant indicators on major health expenditure aggregates. The indicators include the total expenditure on health, broken down into public/general government expenditure on health and private health expenditure. Selected components are presented of public health expenditures (social security expenditure on health) and private health expenditures (health insurance and prepaid schemes and out-of-pocket expenditure). General government expenditure on health is also presented as a ratio to total general government expenditure (GGE). Data on external resources, which are flows earmarked for health originating outside the country and treated as a financing source, are also available. External resources represent all outside funds that finance the above-mentioned general government health expenditure and private health expenditure.

The data include the best figures that were accessible to WHO until the end of 2005 for its 192 Member States. Subsequent updates, additional years and detailed information are available on the WHO National Health Accounts (NHA) web site at <http://www.who.int/nha/en/>.

During the past half decade, an increasing number of countries have been releasing more comprehensive data on health spending: about 100 countries produced full national health accounts (for one year or more) or report expenditure on health to the Organisation for Economic Co-operation and Development (OECD), released as *OECD health data*. WHO publishes data collated from national and international sources and reports. Data are consolidated, triangulated and harmonized in the NHA framework, using international classifications and standard national accounts procedures. Standard accounting estimation and extrapolation techniques have been used to provide time series. As in previous years, a draft template of the estimates was sent to ministers of health seeking their comments and assistance in obtaining additional information. Their responses and those of other government agencies, such as statistical offices, provided valuable feedback that has improved the estimates for the health expenditure indicators reported here. WHO staff at headquarters and in regional and country offices facilitate this process. Years of regular consultation and discussion have established extensive communication channels with ministries of health and other agencies, domestic and international experts and networks and have also helped in developing national capacity.

Measurement of expenditure on health

Health accounting (HA) is a synthesis of the financing and spending flows recorded in the operation of a health system. It offers the potential to monitor all transactions from funding sources to the distribution of benefits according to geographical, demographic, socioeconomic and epidemiological characteristics. NHA are further related to the macroeconomic and macrosocial accounts whose methodological approach they borrow.

An important methodological contribution to the construction of HA is the *Guide to producing national health accounts with special applications for low-income and*

middle-income countries (9), itself grounded on the OECD *System of health accounts (10)* principles. This methodology rests on the foundations of the United Nations *System of national accounts* (commonly referred to as SNA93) (11).

WHO has been publishing a moving five-year series on NHA indicators since 2002, and updates the figures every year with the best estimates accessible. Each five-year series exhibits internal consistency among the included years. Because HA is a discipline in development – not only regarding methods but also regarding implementation by countries – several Member States have modified previous estimates in order to improve measurement. Some of the reasons for improved estimates can be categorized into five groups: 1) new NHA reports, where countries make their first ever NHA report; 2) improved NHA reports, where an additional report offers improved estimates over preliminary NHA work; 3) new data sources, where there is access to new data such as social security data or new households expenditure survey results released; 4) improved data sources, where governments provide better data or instances of double counting were identified; and 5) macro data updated. Caution is required when comparing newly published estimates with previously published series or when trying to construct a series longer than the currently available multiyear series (please refer to the web site for longer reconciled series).

Definitions

Total health expenditure (THE) has been defined as the sum of general government expenditure on health (commonly called public expenditure on health), and private expenditure on health. General government health expenditure (GGHE) is estimated as the sum of outlays by government entities to purchase health care services and goods: notably by ministries of health and social security agencies. Private health expenditure (PvtHE) includes total outlays on health by private entities: notably commercial insurance, non-profit institutions, households acting as complementary funders to the previously cited institutions or disbursing unilaterally on health commodities. The revenue base of these entities may comprise multiple sources, including external funds. This necessitates taking into account essential attributes of health accounting such as comprehensiveness, consistency, standardization and timeliness when building estimates. Figures are originally estimated in million national currency units (million NCU) and in current prices.

GGHE comprises the outlays earmarked for health maintenance, restoration or enhancement of the health status of the population, paid for in cash or in kind by the following financing agents:

- central/federal (ministry of health or other ministries), state/provincial/regional, and local/municipal authorities;
- extrabudgetary agencies, principally social security schemes;
- direct expenditure on health care by parastatals and public firms (which operate as though they were private sector firms but are controlled by the government).

All three can be financed through domestic funds or through external resources (mainly as grants passing through the government or loans channelled through the national budget).

GGHE includes both recurrent and investment expenditures (including capital transfers) made during the year. The classification of the functions of government (COFOG) promoted by the United Nations, the International Monetary Fund (IMF), OECD and other institutions sets the boundaries for public outlays. In many instances,

the data contained in the publications accessed are limited to those supplied by ministries of health. Expenditure on health, however, should include all expenditure when the primary intent is to improve health, regardless of the implementing entity. An effort has been made to obtain data on health expenditure by other ministries, the armed forces, prisons, schools, universities and others, to ensure that all resources accounting for health expenditures are included. Furthermore, all expenditures on health include final consumption, subsidies to producers, and transfers to households (chiefly reimbursements for medical and pharmaceutical bills).

The figures for social security expenditure on health include purchases of health goods and services by schemes that are mandatory and controlled by government. A major hurdle faced by accountants is the need to avoid double counting and exclude cash benefits for periods of sickness or loss of employment, which are classified as income maintenance expenditure. Government-controlled and mandatory social security schemes that apply only to a selected group of the population, such as public sector employees only, are also included here.

PvtHE has been defined as the sum of expenditures by the following entities:

- Prepaid plans and risk-pooling arrangements: the outlays of private insurance schemes and private social insurance schemes (with no government control over payment rates and participating providers but with broad guidelines from government), commercial and non-profit (mutual) insurance schemes, health maintenance organizations, and other agents managing prepaid medical and paramedical benefits (including the operating costs of these schemes).
- Firms' expenditure on health: the outlays by private enterprises for medical care and health-enhancing benefits other than payment to social security or other pre-paid schemes.
- Non-profit institutions serving mainly households: the resources used to purchase health goods and services by entities whose status does not permit them to be a source of income, profit or other financial gain for the units that establish, control or finance them. This includes funding from internal and external sources.
- Household out-of-pocket spending: the direct outlays of households, including gratuities and in-kind payments made to health practitioners and to suppliers of pharmaceuticals, therapeutic appliances and other goods and services, whose primary intent is to contribute to the restoration or the enhancement of the health status of individuals or population groups. This includes household payments to public services, non-profit institutions or nongovernmental organizations and non-reimbursable cost sharing, deductibles, copayments and fees for services. It excludes payments made by enterprises which deliver medical and paramedical benefits, mandated by law or not, to their employees and payments for overseas treatment. It also excludes transport and food costs (except those paid officially to the providers) and contributions to pre-paid pooling schemes.

The external resources appearing in Annex Table 2 are those entering the system as a financing source, i.e. all external resources (grants and loans) whether passing through governments or private entities are included. The other institutions and entities reported are public or private expenditures on health acting as financing agents. Financing agents are entities that pool health resources collected from different financing sources (such as households, government, external agencies, firms and nongovernmental organizations) and pay directly for or purchase health care.

Gross domestic product (GDP) is the value of all goods and services provided in a country by residents and non-residents without regard to their allocation among domestic and foreign claims. This (with small adjustments) corresponds to the total sum of expenditure (consumption and investment) of the private and government agents of the economy during the reference year.

General government expenditure (GGE) includes consolidated direct outlays and indirect outlays (for example, subsidies to producers, transfers to households), including capital, of all levels of government (central/federal, provincial/regional/state/district, and local/municipal authorities), social security institutions, autonomous bodies, and other extrabudgetary funds.

Data sources

Annex Table 2 provides both updated and revised figures for 1999–2003. Estimates for additional years along with sources and methodology are available at <http://www.who.int/nha>. National sources include: national health accounts reports, public expenditure reports, statistical yearbooks and other periodicals, budgetary documents, national accounts reports, central bank reports, nongovernmental organization reports, academic studies, and reports and data provided by central statistical offices, ministries of health, ministries of finance and economic development, planning offices, and professional and trade associations, statistical data on official web sites, and household surveys.

Specific health accounts or comprehensive health financing documents and studies (including both private and public sectors) are available in the following countries presented by WHO regional groupings:

- African Region: Algeria, Burkina Faso, Cameroon, Ethiopia, Guinea, Kenya, Malawi, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.
- Region of the Americas: Argentina, Bahamas, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, United States of America, Uruguay.
- South-East Asia Region: Bangladesh, India, Indonesia, Sri Lanka, Thailand.
- European Region: Albania, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Cyprus, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Tajikistan, Turkey, United Kingdom.
- Eastern Mediterranean Region: Bahrain, Djibouti, Egypt, the Islamic Republic of Iran, Jordan, Lebanon, Morocco, Oman, Tunisia, Yemen.
- Western Pacific Region: Australia, China, Japan, Malaysia, Mongolia, New Zealand, Papua New Guinea, Philippines, Republic of Korea, Samoa, Tonga, Viet Nam.

OECD health data series supply GGHE and PvtHE entries for OECD's 30 Member countries. For GGHE, a larger number of reports on expenditure on health from non-OECD countries has been made available in the recent years. This has allowed a more complete estimation than in previous World Health Reports. The IMF *Government finance statistics* now reports central government expenditure on health for over 120 countries, as well as regional and local government outlays on health

for a third of these countries. Government finance data, together with statistical yearbooks, public finance reports, reports from social security agencies, and status reports on the implementation of health policies, facilitate the estimation of GGHE for Member States which do not yet release this information.

Most data on private expenditure on health come from NHA reports, statistical yearbooks and other periodicals, statistical data on official web sites, reports of nongovernmental organizations, household expenditure surveys, academic studies, and relevant reports and data provided by central statistical offices, ministries of health, insurance agencies, professional and trade associations and planning councils. Standard extrapolation and estimation techniques are used to obtain the figures for missing years.

Information on external resources is taken from the Development Action Committee of the OECD (DAC/OECD). Where some Member States explicitly monitor the external resources entering their health system, that information has been used to validate or amend the order of magnitude derived from the DAC entries. DAC entries used by WHO relate to disbursements (which reports only bilateral flows from certain countries), wherever available, otherwise commitments are presented.

For macro variables, several international references facilitate the compilation of needed estimates, including the latest estimates from IMF *Government finance statistics yearbook* (12), *International financial statistics yearbook* (13) and *International financial statistics* (14); the Asian Development Bank *Key indicators* (15); *OECD health data* (16); *International development statistics* (17); the United Nations *National accounts statistics: main aggregates and detailed tables* (18); United Nations Statistics Division, the Economic Commission for Europe of the United Nations, and United Nations Economic and Social Commission for Western Asia; The World Bank's *World development indicators*, unpublished data from the IMF research department, the Caribbean Community Secretariat (CARICOM); and national series from ministries of finance or central banks.

The main sources of GDP are latest current year estimates from *OECD national accounts* and *OECD health data* for the OECD countries; for non OECD countries, the United Nations *National accounts statistics* and data from other United Nations agencies are used. When United Nations data are unavailable, other sources as mentioned above are used.

Methodological notes

Variations in the boundaries used in the original sources have been adjusted as far as possible to allow standardized definition. For example, in some countries, GGHE and hence THE may include expenditure on environmental health, education of health personnel and health research activities, whereas other countries treat these expenses as a memorandum item. In the tables reported here, the principles outlined in the *Guide to producing national health accounts with special applications for low-income and middle-income countries* (9) have been followed, which consider these expenditures as health-related and hence have not been included in THE. Inability to exclude these has sometimes led to publication of overestimated ratios of THE to GDP. Availability of new information and subsequent adjustment have then produced lower figures than previously reported.

External resources in these Annex Tables are treated differently from the Rest of the World (ROW) resources under the OECD System of Health Accounts. Under OECD, ROW funds are classified under sources of financing (same as financing agents under

NHA categories) and include only grants passing through the countries. These tables also report expenditure on health by parastatal institutions as public, while others include it as private.

In some cases, expenditures reported under the government finance classification are limited to those of the ministry of health rather than all expenditures on health regardless of source. In such cases, wherever possible, other series have been estimated to supplement that source. GGHE and, therefore, the figures for THE, may sometimes be an underestimate in the cases when it has not been possible to obtain data for local government, nongovernmental organizations, other ministries and insurance expenditures.

The IMF *International financial statistics* provides central government disbursement (CGD) which approximates GGE in many developing countries without autonomous local taxing power. The CGD figures have been complemented whenever possible by data for local/municipal governments as well as some social security payments for health. Several public finance audits, executed budgets, budget plans, statistical yearbooks, web sites, World Bank and Regional Development Bank reports, and academic studies have been consulted to verify GGE.

The entries are not always a continuous time series for all countries, leading to a more thorough search for the relevant national publications to triangulate and complete the information. Also, previous time series have been updated when benchmarking revisions or changes in methodology to estimate particular items, especially out-of-pocket expenditures, for an extensive HA reconstruction are undertaken. Changes in ratios will occur when estimates of GDP are made using the current *System of national accounts* SNA93 instead of the 1968 version (SNA68).

Several quality checks have been used to assess the validity of the data. The data are triangulated with information from different sources and with the macro data available from the country to obtain the best estimates. For example, the aggregate government health expenditure data are compared with total GGE, or out-of-pocket expenditure is compared with total or household private consumption expenditure. Furthermore, estimated expenditure on health is compared against inpatient care expenditure, pharmaceutical expenditure data and other records (including programme administration) to ensure that the outlays for which details have been compiled constitute the bulk of the government and private expenditure on health. The estimates obtained are thus plausible in terms of a system's description.

ANNEX TABLE 3

Annex Table 3 (Annex Table 6 in last year's report) presents total expenditure on health and general government expenditure on health in per capita terms. The methodology and sources to derive THE and GGHE are those discussed in the notes to Annex Table 2. Ratios are represented in per capita terms by dividing the expenditure figures by population figures. The per capita figures are expressed in US dollars at an average exchange rate (the observed annual average or year end number of units at which a currency is traded in the banking system). The per capita values in local currency units are also presented in international dollar estimates, derived by dividing these by an estimate of their purchasing power parity (PPP) compared with US dollars, i.e. a rate or measure that minimizes the consequences of differences in price levels existing between countries.

OECD health data is the major source for population estimates for the 30 OECD Member countries, just as it is for other health expenditure and macroeconomic vari-

ables. All estimates of population size and structure, other than for OECD countries, are based on demographic assessments prepared by the United Nations Population Division (1). The estimates are of de facto population, and not the de jure population, in each Member State.

The exchange rates have mainly been obtained from the IMF *International financial statistics*. For remaining countries, United Nations, World Bank, and Asian Development Bank reports have been used. While official rates are mostly used, market exchange rates sometimes have also been used. Further, complete change in currency in a particular year have at times led to a revision of the full series.

For OECD Member countries, the OECD PPP has been used to calculate international dollars. For European and central Asian countries that are part of the UNECE but are not members of OECD, the UNECE PPPs are used. For non-European and non-OECD countries, international dollars have been estimated by WHO using methods similar to those used by the World Bank.

ANNEX TABLE 4

Human resources for health are defined as “the stock of all individuals engaged in the promotion, protection or improvement of population health” (19). However, for the purpose of the report, we focus only on paid activities, and divide the health workforce into two main groups: “health service providers” and “health management and support workers” (see Chapter 1).

The indicators needed to describe the characteristics of the health workforce and monitor its development over time are often generated from a multitude of sources and cover many areas (such as profession, training level and industry of employment). The data used in Annex Table 4 were compiled from four major sources: establishment surveys, household and labour force surveys, population and housing censuses and records from professional and administrative sources. The diversity of sources meant that harmonization had to be undertaken to arrive at comparable estimates of the health workforce for each Member State. The harmonization process was based on internationally standardized classification systems, mainly the International Standard Classification of Occupations (ISCO), but also the International Standard Classification of Education (ISCED) and the International Standard Industrial Classification of all Economic Activities (ISIC).

Some difficulties in harmonizing data based on a variety of definitions and classification systems could not be solved through the application of the ISCO. For example, in order to include country-specific types of workers, many ministries of health apply their own national classification system. Community health workers and traditional birth attendants are not captured through the standard ISCO system, but sometimes account for up to a third of the health workforce and form an important part of the infrastructure for service delivery. Therefore, for the purposes of this report, we have kept community health workers and traditional birth attendants as a separate group, whereas most of the country specific cadres were mapped with the common ISCO classification.

The following occupational categories are used in Annex Table 4:

- Physicians – includes generalists and specialists.
- Nurses – includes professional nurses (and midwives), auxiliary nurses and enrolled nurses, and other nurses such as dental nurses or primary care nurses.
- Midwives – includes auxiliary midwives and enrolled midwives. Does not include traditional birth attendants, who are counted as community health workers. While

much effort has been made, caution needs to be exercised in using the data for nurses and midwives; for some countries the available information does not clearly distinguish between the two groups.

- Dentists – includes dentists, dental assistants and dental technicians.
- Pharmacists – includes pharmacists, pharmaceutical assistants and pharmaceutical technicians.
- Lab workers – includes laboratory scientists, laboratory assistants, laboratory technicians and radiographers.
- Environment and public health professionals – includes environmental and public health officers, sanitarians, hygienists, environmental and public health technicians, district health officers, malaria technicians, meat inspectors, public health supervisors and similar professions.
- Community health workers – includes traditional medicine practitioners, faith healers, assistant/community health education workers, community health officers, family health workers, lady health visitors, health extension package workers, community midwives, and traditional birth attendants.
- Other health workers – includes a large number of occupations, such as clinical officers, dieticians and nutritionists, medical assistants, occupational therapists, operators of medical and dentistry equipment, optometrists and opticians, physiotherapists, podiatrists, prosthetic/orthotic engineers, psychologists, respiratory therapists, respiratory therapy technicians, speech pathologists, trainees and interns.
- Health management and support workers – includes general managers, statisticians, teaching professionals, lawyers, accountants, medical secretaries, gardeners, computer technicians, ambulance staff, cleaning staff, building and engineering staff, skilled administrative staff and general support staff.

Apart from questions concerning the harmonization of health workforce categories, an additional challenge was the triangulation of various data from different sources. Generally, when data were available from more than one source, we opted for the census as a first choice as it provides information on both “health service providers” and “health management and support workers”. However, not many recent censuses with sufficiently detailed ISCO coding were both available and accessible. In the present data set, a total of 12 countries fall into this category: Australia, Bolivia, Brazil, Costa Rica, Honduras, Mexico, Mongolia, New Zealand, Panama, Paraguay, Thailand and Turkmenistan. For a further three, namely Estonia, the United Kingdom and the United States, the data presented in Annex Table 4 were from representative labour force or household surveys: collected in the Luxemburg Income (or Employment) Study (<http://www.lisproject.org/>). These surveys were as detailed as census data in terms of the occupation categories they provide and at the same time were based on ISCO classification system (in the case of Estonia) or we mapped them to corresponding ISCO codes (in the cases of the UK and US surveys).

For all countries in the African Region as well as for a large number of countries in South-East Asia and the Eastern Mediterranean Region, the data presented in Annex Table 4 were obtained through a special survey developed by WHO and executed through its regional and country offices. As much as possible, the survey attempted to obtain information on both “health service providers” and “health management and support workers” and used the ISCO system, while maintaining some country-specific classifications for selected types of occupations (23). The following is a list of countries in which the survey was implemented:

Algeria, Bahrain, Bangladesh, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic People's Republic of Korea, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, India, Indonesia, Iraq, the Islamic Republic of Iran, Jordan, Kenya, Lebanon, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mauritius, Morocco, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Oman, Pakistan, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Seychelles, Sierra Leone, South Africa, Sri Lanka, Sudan, Swaziland, Timor-Leste, Togo, Tunisia, Uganda, United Republic of Tanzania, Yemen, Zambia, Zimbabwe.

For the following countries, data were obtained from miscellaneous sources, namely records of the departments of health, lists maintained by public service commissions or other administrative sources:

Argentina, Belize, Brunei, Cambodia, Chile, China, Colombia, Cook Islands, Cuba, Dominican Republic, Ecuador, El Salvador, Fiji, Finland, Jamaica, Malaysia, Nicaragua, Uruguay, Venezuela, Papua New Guinea, Philippines, Tonga, Tuvalu, Viet Nam.

For the remaining countries, the required data were compiled from the *OECD health data*, the *European health for all database* (<http://data.euro.who.int/hfad/index.php>) or the previous version of WHO's *Global database on the health workforce*. These data were the least detailed of all, containing information on only four to five occupations and almost always containing no information on health management and support workers.

The countries for which data was obtained from these sources are the following:

Afghanistan, Albania, Andorra, Angola, Antigua and Barbuda, Armenia, Austria, Azerbaijan, Bahamas, Barbados, Belarus, Belgium, Bosnia and Herzegovina, Canada, Croatia, Cyprus, Czech Republic, Denmark, Dominica, France, Georgia, Germany, Greece, Grenada, Guatemala, Guyana, Haiti, Hungary, Iceland, Ireland, Israel, Italy, Japan, Kazakhstan, Kiribati, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Latvia, Libya, Lithuania, Luxembourg, Malta, Marshall Islands, Micronesia (Federated States of), Moldova, Monaco, Nauru, Netherlands, Niue, Norway, Palau, Peru, Poland, Portugal, Qatar, Republic of Korea, Romania, Russian Federation, Samoa, San Marino, Serbia and Montenegro, Slovak Republic, Slovenia, Solomon Islands, Somalia, Spain, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, The Former Yugoslav Republic of Macedonia, Trinidad and Tobago, Turkey, Ukraine, United Arab Emirates, Uzbekistan, Vanuatu.

The table provides the best figures that were available to WHO up to January 2006 for each of the 192 Member States. Any subsequent updates will be made available on the WHO *Global atlas for the health workforce* web site (www.who.int/globalatlas/autologin/hrh_login.asp).

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