Health information systems in Africa: descriptive analysis of data sources, information products and health statistics

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Abstract

Objective: To identify key data sources of health information and describe their availability in countries of the World Health Organization (WHO) African Region.
Methods: An analytical review on the availability and quality of health information data sources in countries; from experience, observations, literature and contributions from countries.
Setting: Forty-six Member States of the WHO African Region.
Participants: No participants.
Main outcome measures: The state of data sources, including censuses, surveys, vital registration and health care facility-based sources.
Results: In almost all countries of the Region, there is a heavy reliance on household surveys for most indicators, with more than 121 household surveys having been conducted in the Region since 2000. Few countries have civil registration systems that permit adequate and regular tracking of mortality and causes of death. Demographic surveillance sites function in several countries, but the data generated are not integrated into the national health information system because of concerns about representativeness. Health management information systems generate considerable data, but the information is rarely used because of concerns about bias, quality and timeliness. To date, 43 countries in the Region have initiated Integrated Disease Surveillance and Response.
Conclusions: A multitude of data sources are used to track progress towards health-related goals in the Region, with heavy reliance on household surveys for most indicators. Countries need to develop comprehensive national plans for health information that address the full range of data needs and data sources and that include provision for building national capacities for data generation, analysis, dissemination and use.

Keywords

health information in Africa, health information system, data sources, information products, health statistics

Introduction

Policy-makers, planners and health system managers need actionable data to improve the performance of the health system and track progress towards health-related goals, including the prevention of premature mortality. However, health information systems in many countries are currently weak and fragmented, and unable to supply sound data in a timely way.

Much of the information required by the health system is generated outside the health sector. Population censuses, civil registration systems and household surveys are essential for the measurement of mortality, but these data sources are generally organised and managed by the ministry of the interior, the census bureau or the national statistical office. Some of the administrative and resource records that generate information relevant to the health system, such as data about the health workforce and financial resources for health, are generated outside the health sector. This is also the case for data on key determinants of health such as socioeconomic status, education, nutrition and food security. Administrative statistics from sectors such as justice, police and labour may be of particular relevance to the health information system; for example, information about road traffic accidents, injuries and violence, or occupational health.

A fully functional health information system must identify not only the types of data needed for specific purposes but also the data sources that are available and appropriate for generating the required data elements. In this paper, we identify key sources of health information and describe their availability in the 46 Member States[a] of the World Health Organization (WHO) African Region. We discuss the use of different data sources for understanding health issues and examine the data sources required for monitoring health inequity and progress towards the health-related Millennium Development Goals.

This review details the state of data sources in the African Region, including census, vital events monitoring, health facilities statistics, public health surveillance, population-based surveys and resource-tracking. These key sources of health information system data were analysed using two methods: first, a self-assessment by country stakeholders in the ministries of health, national statistics offices, health programmes, donors and technical agencies was completed in 14 countries[b] using a tool developed by the WHO and the Health Metrics Network;[1,2] second, a literature review on the availability and quality of health information data sources in countries, from experience, observations, literature and contributions from the 46 countries of the Region. The WHO/Health Metric Network tool helped to identify important gaps and issues as seen from the viewpoint of country stakeholders involved in the health information system, and the review completed the results from the tool with existing knowledge, evidence and consultations.

Following data sources, the description of information products deals with accurate and reliable data available for health status, health systems and determinants of health.

Key sources of health information in Africa

Civil registration systems

Civil registration is the continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events (live births, deaths, fetal deaths, marriages and divorces) and other civil status events pertaining to the population as provided by decree or regulation, in accordance with the legal requirements in each country.[3]

Although the primary purpose of civil registration is the establishment of legal documents as required by law, the system generates continuous national and regional data on births and deaths for a whole country, including districts and subdistricts.[4] In addition to crucial information on vital events (births, deaths), the civil registration system may also be able to supply additional data on birth weight; place of delivery (home, maternity centre and hospital); medical assistance during childbirth; maternal age and parity; and medical attention received prior to death.[5] When civil registration of deaths is coupled with medical certification of cause of death using the principles and standards set out in the *International Statistical Classification of Diseases and Related Health Problems* (ICD),[6] it is possible to generate accurate and timely data on causes of death in the population. Such information permits the

study of mortality differentials by age, sex and other stratifiers and provides the key input for constructing life tables and estimation probabilities of death at various ages. Information on the number of live births over time, classified by maternal characteristics, is essential for analysing reproduction dynamics.

The vital statistics generated through the civil registration system enable regular updating of population size and structure, the denominator data needed to calculate population indicators.

In Algeria, Cabo Verde, Mauritius, Seychelles and South Africa, coverage of birth registration is 90% or higher (Figure 1). An additional 11 countries (Burkina Faso, Burundi, Comoros, Congo, Madagascar, Mali, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Togo) have birth registration coverage rates of 75–89%; though it is not ideal, it is sufficient for some statistical purposes. Less than 20% of births are registered in Chad, Ethiopia, Liberia, United Republic of Tanzania and Zambia. It should be noted that for the majority of the countries in the Region, the reported rate of coverage of birth registration was calculated on the basis of mothers' responses to questions in household surveys about their most recent births; it is likely that true coverage for the general population is much lower than reported here.

With regard to mortality data, of the 46 countries of the Region, only four (Algeria, Mauritius, Seychelles and South Africa) have coverage rates of 75% or higher (Figure 2).[7–9]

Operating and maintaining a civil registration system requires accurate and continuous registration of vital events, recorded when they occur and in accordance with standards described by the United Nations.[3] In the absence of functional civil registration systems, data on births and deaths can be generated through alternative strategies, including household surveys (for births and child deaths), censuses or demographic surveillance.[10] However, the civil registration system has a number of advantages over other methods of obtaining vital statistics.

Population censuses

The United Nations criteria to recognise a modern census are 'individual enumeration, universality within a defined territory, simultaneity and defined periodicity'.[11]

Although a census is in effect a snapshot of a population at a given time, in many developing countries, including those in Africa, the population census is a key source of data on fertility, mortality and population dynamics. For instance, comparison of

Figure 1. Births registration coverage (%), WHO African Region, 2005–2011. Source: *Atlas of Health Statistics of the African Region 2014*. Brazzaville: World Health Organization Regional Office for Africa, 2014.
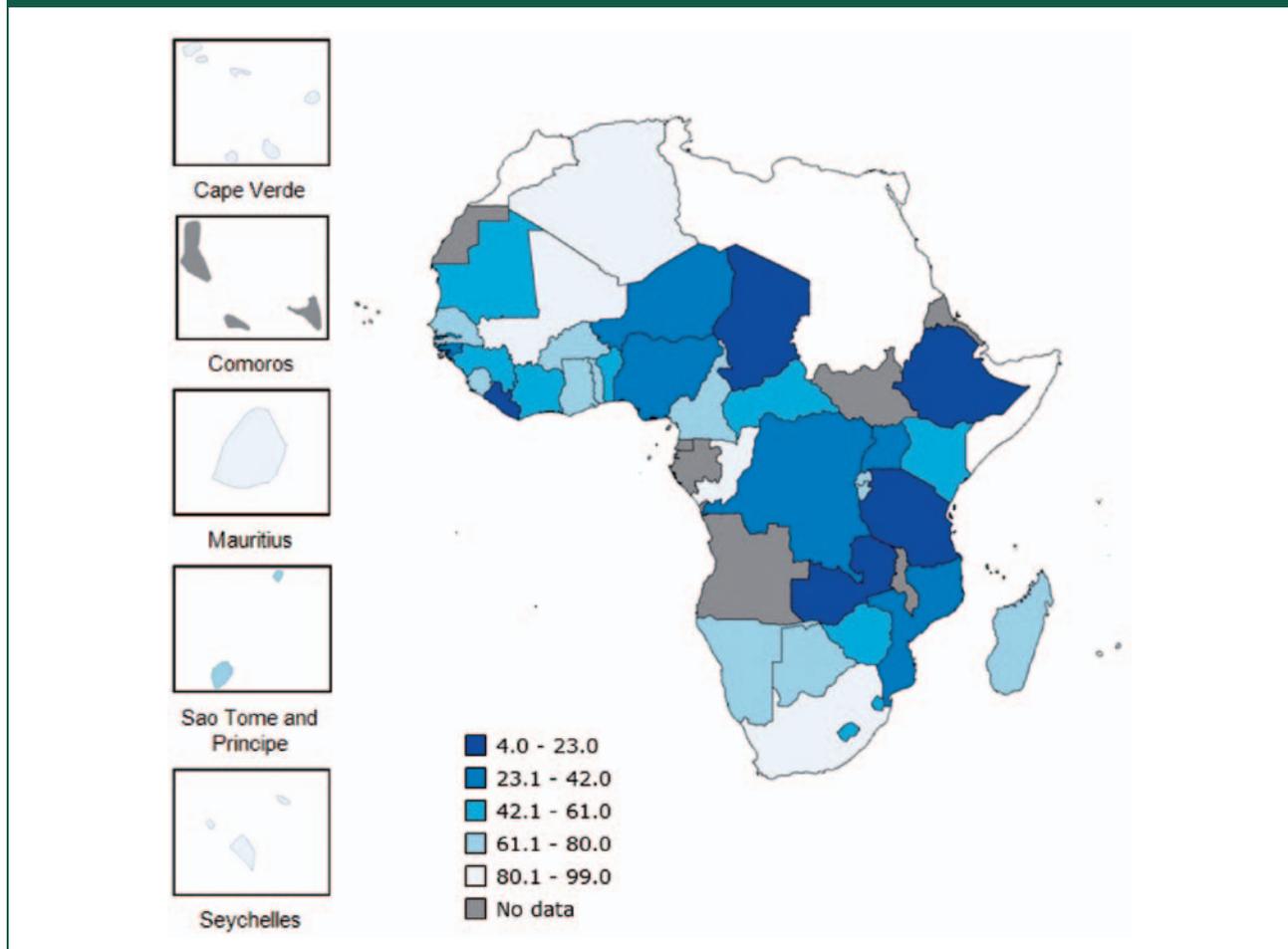
censuses taken at different time periods provides information about the growth or decline of the population, while the counts themselves serve as denominators for a variety of health indicators. Although the census is usually only conducted every 10 years, extrapolation is used to generate population data for the intercensal years.

The census also collects information that permits estimates of mortality. Infant and child mortality can be calculated by asking mothers about the survival of their children. Adult mortality can be estimated indirectly by asking people about the survival of their parents, siblings or spouses. Some censuses also collect information on number of deaths and the age and sex of those who died within 12 or 24 months prior to the census. Together with data on the enumerated population, the information can be used to produce estimates on adult mortality as long as the completeness of the reporting of deaths is the same for all ages.

Figures 3 and 4 give information on population censuses in the Region. Available data show that Angola and Eritrea have not conducted a national census in the past 20 years, census is ongoing in four countries (Benin, Democratic Republic of Congo, Gabon and Senegal) and three countries (Lesotho, Seychelles, South Africa) have conducted the census every five years. Most countries have a decennial census programme.

Ideally, data from the census and a comprehensive civil registration system are used together to generate an accurate picture of population change in a country. For example, census fertility questions generate data for calculating lifetime and cohort fertility that are not easily available from civil registers. Other advantages of the census include the ability to tabulate data for small geographical areas and to draw up the sampling frame for health and social welfare surveys.

The census is also an important source of data on social and living conditions of disabled persons[11] or distribution of healthcare workers. In practice, the census can fill up the gap created by a weak civil

Figure 2. Death registration coverage (%), WHO African Region, 2000–2009. Source: *Atlas of Health Statistics of the African Region 2014.* Brazzaville: World Health Organization Regional Office for Africa, 2014.
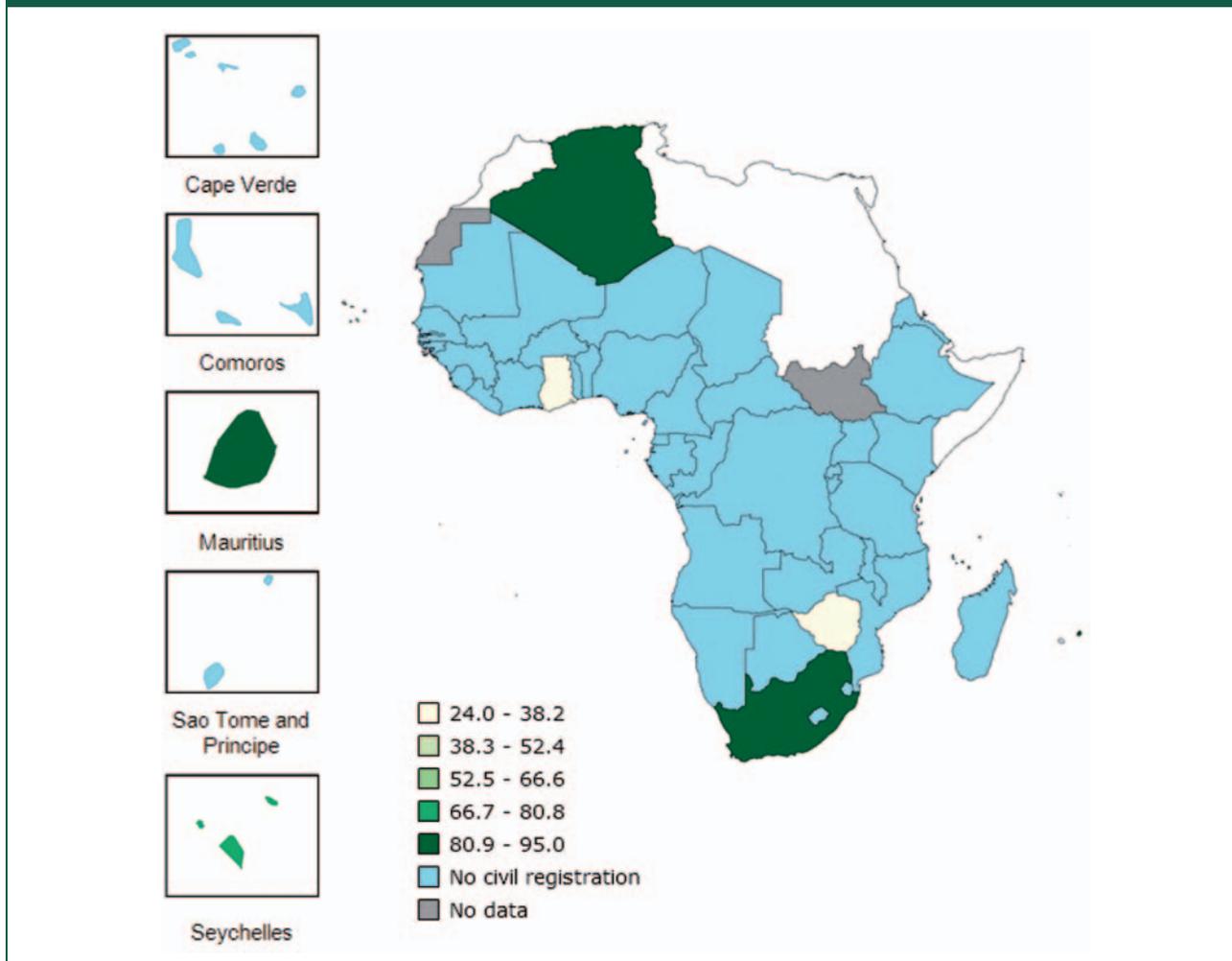

Table 1. Relationship between health information domains and key data sources.

Health information domain	Health system				
	Determinants of health	Inputs and outputs	Outcomes	Service availability and utilisation	Health outcomes (status)
Population census	x	x			x
Civil registration	x				x
Household surveys	x	x	x	x	x
Patient records and service statistics	x	x	x	x	x
Administrative records		x			
Facility assessments		x	x	x	
Surveillance statistics	x			x	x

Source: World Health Organization Regional Office for Africa, 2009.

Figure 3. Availability of census data, WHO African Region, 2005–2014. Source: *Atlas of Health Statistics of the African Region 2014*. Brazzaville: World Health Organization Regional Office for Africa, 2014.
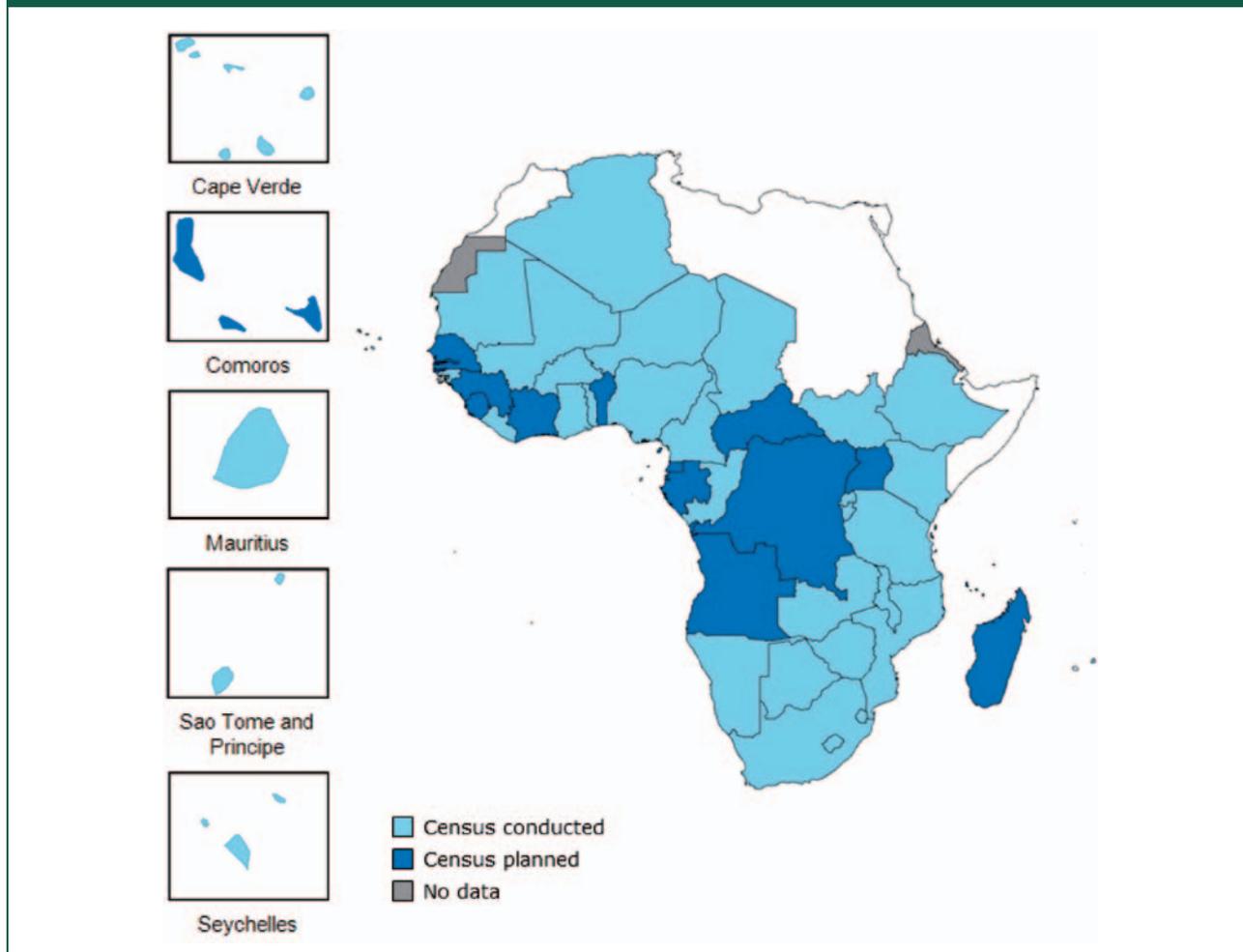
register system and is particularly valuable in countries such as those in Africa where birth or death registration is incomplete. However, data should not be viewed as a substitute for reliable birth and death statistics from civil registers.

Household surveys

Practically, every country in the Region has conducted at least one population census. However, the census is, by design, conducted rarely – perhaps only once a decade – and can only provide relatively limited amounts of information due to the magnitude of the operation involved. Given the ongoing weakness of civil registration in the Region, population-based surveys are the single most important source of population health information.

In addition to direct health indicators, surveys are the preferred source of information on individual behavioural risk factors such as unsafe sex, smoking, substance abuse and poor nutritional status. More recently, household surveys have also been the vehicle for clinical data; the inclusion of clinical measurement and biomarkers generates more accurate and reliable information on health status than self-reports.

A significant number of surveys include questions on the characteristics and socioeconomic condition of respondents, such as living standards, education or employment. By linking such information with data on healthcare use and health status, it is possible to generate important information on the links between health and its socioeconomic determinants.

Although routine household surveys are effective instruments to generate data on levels of child mortality, either through detailed questions to mothers about birth histories or through indirect methods (children ever born, children still alive), they are less

Figure 4. Distribution of censuses carried out in the last three census rounds (1985–1994, 1995–2004, 2005–2014) in the WHO African Region. Source: *Atlas of Health Statistics of the African Region 2014.* Brazzaville: World Health Organization Regional Office for Africa, 2014.
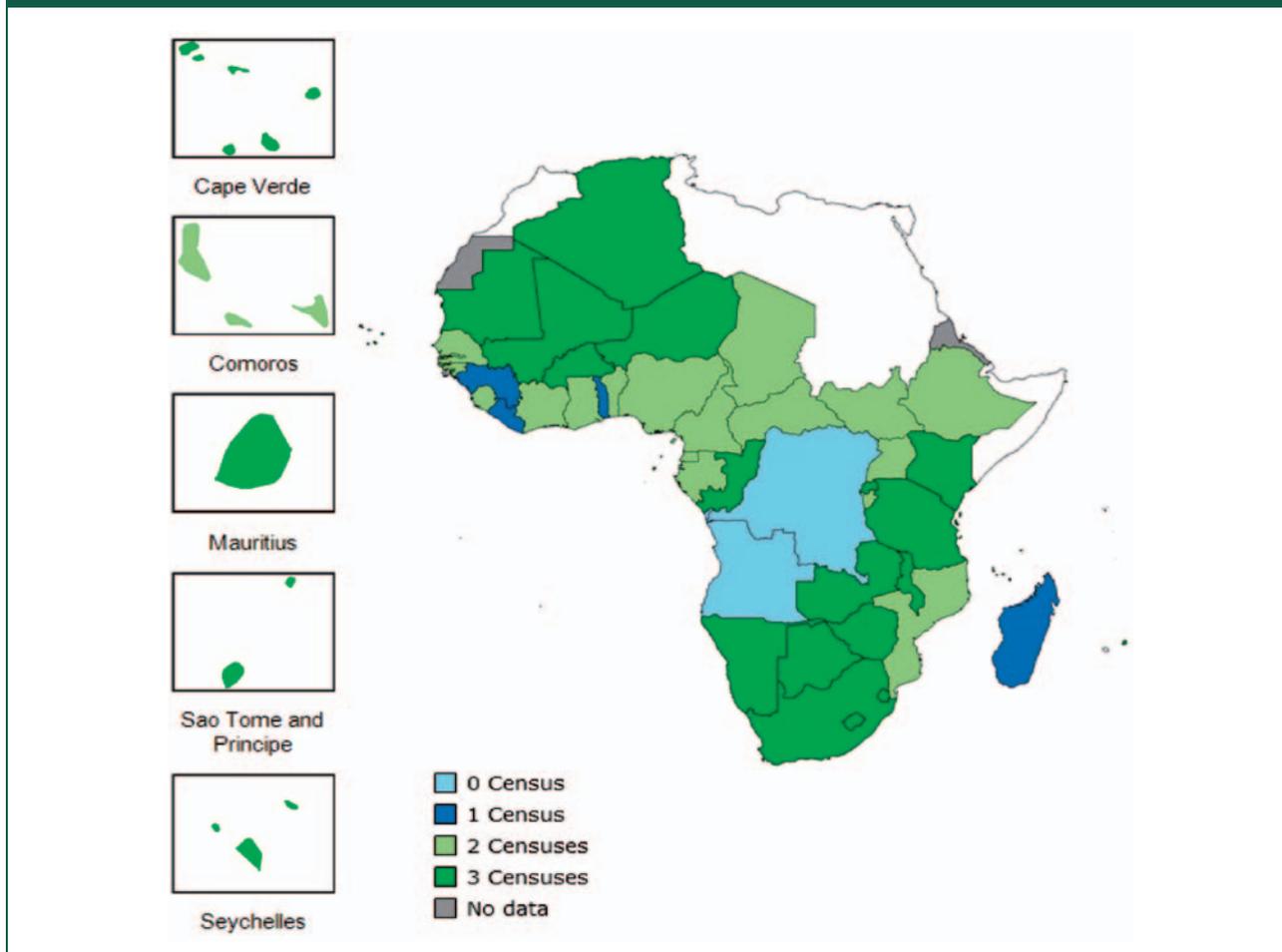
effective when it comes to the measurement of adult mortality or cause-specific mortality in general because of the limitations of sample size.

Household surveys are of multiple types and vary in complexity and emphasis. The gold standard is a well-integrated, demand-driven household survey programme that is part of a national health information and statistical system and that generates essential high-quality information on population health and socioeconomic status on a regular basis.

Between 1985 and 2007, a total of 211 household surveys were conducted in the African Region, of which 121 were conducted after 2000 (Figure 5). The cumulated number of surveys has increased over the years, reaching a peak of around 50 during 1999–2001 alone. Given that 17 of the 23 health-related Millennium Development Goal indicators can be generated through household surveys, the increase in the number of surveys is not surprising. However,

concerns have been expressed by country statistics offices that the increasing frequency of surveys is burdensome given limited country capacity, especially for data analysis. In addition, there is insufficient coordination across the different surveys, almost all of which are externally supported and many of which are driven by disease-specific programme interests.[12]

In terms of frequency, 43 countries have conducted at least one survey since 2000. In both Ghana and Malawi, there have been six surveys since 2000. In Côte d'Ivoire, Ghana and Kenya, 10 or more surveys have been conducted over the past 20 years. During the same period, Cabo Verde and Mauritius each conducted only one survey while Equatorial Guinea and Seychelles did not conduct any.

The number of surveys per country has accelerated in recent years in all three WHO African Region's subregions from less than one survey during 1985–1991 to two or more surveys in the first half

Figure 5. Household health surveys in the WHO African Region, 1985–2007. Source: World Health Organization Regional Office for Africa, 2008 (unpublished).
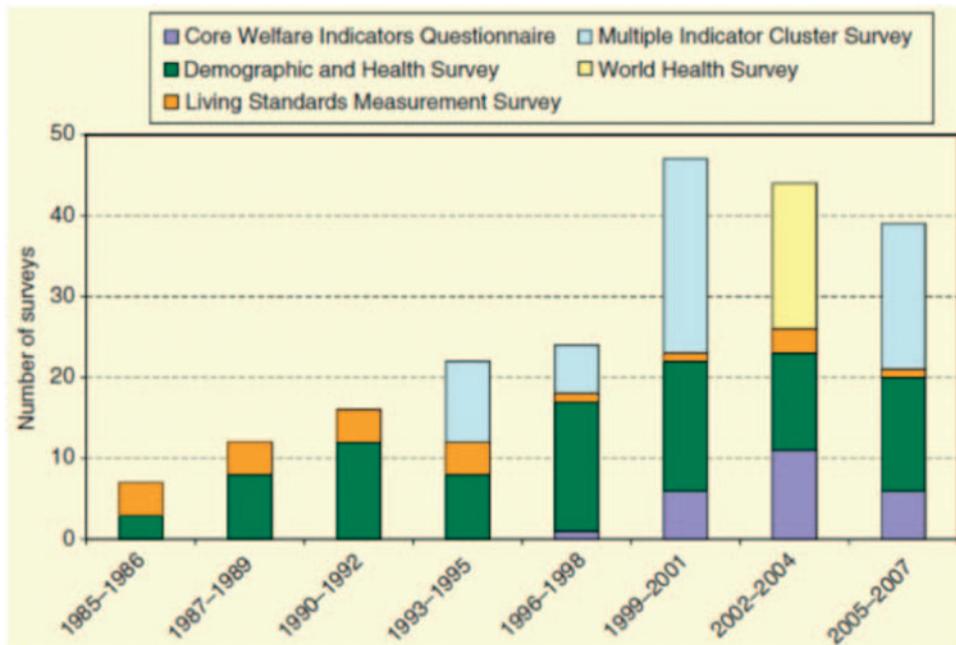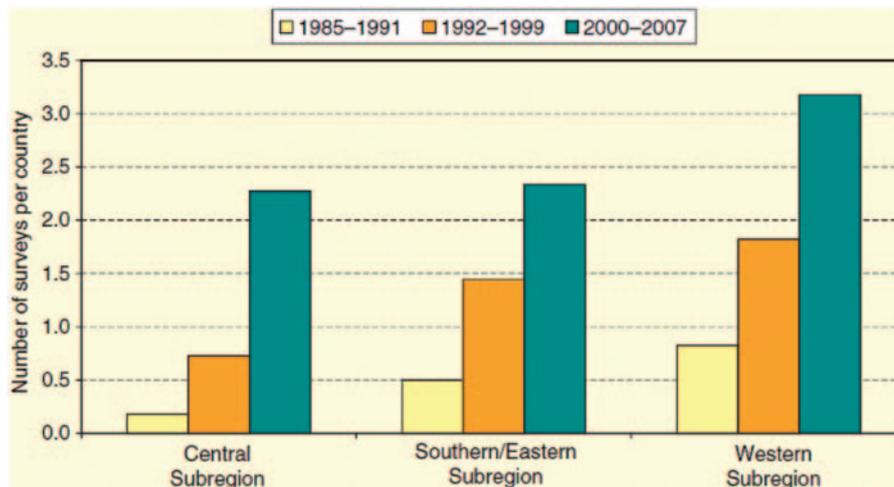
Figure 6. Household health surveys in the WHO African Region, 1985–2007. Source: World Health Organization Regional Office for Africa, 2008 (unpublished).

of 2000 in the Central and South/East subregions, and to three or more in the Western subregion (Figure 6). The number of surveys per country is highest in the Western subregion followed by the South/East subregions, with the Central subregion having the smallest number.

The most commonly applied survey instrument in the Region is the United States Agency for International Development (USAID)-supported Demographic and Health Survey. Since 1985, 98 Demographic and Health Surveys have been conducted and 37 of the 46 countries of the Region

conducted at least one between 1985 and 2007, 29 of which were carried out after 2000.

The second most common survey instrument is the United Nations Children's Fund (UNICEF)-supported Multiple Indicator Cluster Survey. A total of 58 such surveys have been carried out since 1995. In recent years, a number of disease-focused surveys (such as the Malaria or AIDS Indicator Surveys) have been undertaken. In addition to these internationally sponsored surveys, many countries conduct their own surveys, but these are not included in this review due to lack of data.

Despite the heavy reliance on household surveys for many health indicators, the method has a number of disadvantages. Foremost among these is that surveys do not generate recent data. For example, for calculating child mortality, the methods rely heavily on the responses of mothers to questions about the survival of their children and thus relate to a period some time in the past, on average around three years prior to the survey. Similarly, questions about the use of maternal healthcare relate to most recent births (generally live births only) and so are similarly retrospective in nature. These methodological considerations, coupled with the inevitable fact that surveys cannot be conducted annually, mean that much of the information used to report on the Millennium Development Goals is several years out of date. In addition, all household surveys generate data that have margins of uncertainty associated with both sampling and non-sampling errors.

Lastly, the vast majority of household surveys are funded and supported by external agencies. Inevitably, this means that country planners are not the main decision-makers when it comes to determining when and where a survey will be carried out. The increasing number and frequency of single-disease focused surveys increases the risks of overlap, duplication and overloading of country capacity. Despite the fact that considerable efforts have been made to use the externally supported surveys to build national capacities in data generation and analysis, the fact remains that in the absence of external technical and financial support, few countries in the Region would be able to maintain household survey programmes at the current level.

Health service statistics

All countries routinely collect data from health facilities, and assemble and report them in annual (or biannual or five-yearly) health statistical abstracts or reports. Such information is often described as the health management information system. The information generally derives from reports from health facilities on:

- Health status (leading causes of death in hospitals, admissions and discharges by diagnosis, institutional maternal deaths, case fatality rates, outpatient morbidity, deliveries and complications)
- Service provision, including type and utilisation of services
- Statistics on supplies and financial and human resources available for the provision of services

In general, only the operations of public facilities are included in the health management information system.

Despite the volume and variety of data generated through the routine health management information system, the information is systematically under-analysed and under-utilised for planning and programme reviews. Completeness, timeliness and quality of reporting are often described as problematic, and the data are inevitably biased because they relate only to the populations using public health services. Investments in the information system are often minimal, and there are major lacunae in the availability and statistical capabilities of those charged with collecting, compiling and analysing the statistics. As a result, data generated through the routine system are rarely assessed for their quality and used to support decision-making.

Few, if any, countries compare and contrast their routine health service statistics with survey data or other relevant sources. However, the fact that routine statistics are a by-product of an administrative process makes them relatively inexpensive. Therefore, once due adjustments are made for possible biases, it should be possible to use these data for policy guidance and programme reviews.

Some examples of best practices in Africa include comprehensive clinical analysis in Burkina Faso; annual updates of the new results for a select set of indicators in Ghana; the set of indicators reported in Uganda that are published in a newspaper; and a district health information system that revolves around a minimum set of indicators with much emphasis on quality control in South Africa.

In September 1998, the WHO Regional Committee for Africa adopted the Regional Strategy on Integrated Disease Surveillance with the aim of strengthening national surveillance of the main threatening diseases and response capacities. To date, 43 out of the 46 countries in the Region have initiated Integrated Disease Surveillance and Response and launched training of district health staff, of which 33 have attained the objective of

training at least 60% of their districts by 2007. Integrated Disease Surveillance and Response is a multidisease approach for conducting surveillance across all levels of the health system, with a strong emphasis on linking surveillance with public health response.

Health facility assessments

Population-based data sources such as censuses, civil registration and household surveys are not providing information on health system resources or on the type, nature and range of services available to the population. Health facility assessments can provide data on availability and quality of health services and the health system resources that are required for their success. Facility assessments are a unique source of statistics on service availability, generating data on facility infrastructure, infection control, services offered, staffing, laboratory facilities, treatments, guidelines and supplies. Indicators can be calculated to track the percentage of health facilities in a given country or region that offer a specific, measurable treatment or service. For example, infection-control indicators include the presence or absence of disposable syringes, sharps containers and other equipment, while laboratory indicators measure whether or not a facility can test for HIV, syphilis, tuberculosis and other diseases. Additional aspects of facility assessment are the ability to associate each service delivery point with specific geo-coordinates, which enables comparison with geographical, population and epidemiological profiles.

Five kinds of health facility assessments have been applied in the Region:

1. *Facility censuses*: this involves a visit to all public and private health facilities in an area to collect detailed information about the physical assets of all the public and semi-public health facilities in a region or nation. The aim is to identify health facilities that do not meet criteria on the availability and condition of physical infrastructure and equipment; the availability of services and location of health service delivery points; and headcounts of health workers.

By identifying facilities that lack these resources or abilities, the facility census provides a baseline assessment for deciding how to invest resources into an area. In the Region, facility censuses have so far been conducted in Malawi and Zambia. Nevertheless, there are some limitations to this data source: a facility census, as currently undertaken, typically does not collect information on quality of care practices, patient satisfaction and details of available human resources, such as educational background and training experiences.

2. *Facility surveys*: instead of conducting a census of all facilities, a sample of facilities is selected and detailed data are collected through an inventory and through interviewing health workers in the facilities. Facility surveys fill the gap on service quality that is often missing in facility censuses by collecting information on staff qualifications, training and supervision; examining adherence to standards in practice; or assessing adequacy of available infrastructure and resources for providing a given service.

The recommended frequency of implementation is once every three to five years. An example of a facility survey is the USAID-supported Service Provision Assessment conducted in several countries, including Ghana (2002), Kenya (1999, 2004), Rwanda (2001) and Zambia (2005).

3. *Service provision assessments:* these are designed for system-wide national-level monitoring; however, when the interest is on specific intervention(s) or a project, or on a specific district, more focused measurement tools such as the Prevention Service Availability Mapping and Facility Audit of Service Quality have been used. These are low-cost tools that provide district planners, project managers and other stakeholders with information on what is available and where. This information can be used to monitor scale-up and assess equitable and appropriate distribution of services and resources. Such surveys have been conducted in Botswana (2002), Kenya (2001–2002) and the United Republic of Tanzania (2005).

4. *District key informant surveys*: this rapid assessment method is used to assess service availability, human resources, supplies and coverage of national programmes through interviews with the district medical officer and the district health management team. Such surveys are more comprehensive if they can build on existing databases of facilities and human resources. Countries that have conducted such assessments (called Service Availability Mapping) include Botswana, Ethiopia, Ghana, Kenya (2005), Nigeria, Rwanda (2005), Uganda (2004), United Republic of Tanzania (2006) and Zambia (2005). Service Availability Mapping has now evolved to Service Availability and Readiness Assessment.

5. *Operational research studies*: these are conducted in a small number of facilities to assess

the quality of care, for example waiting time or patient flow.

Facility assessments are one of the few sources of health statistics for which the health sector has primary responsibility. In addition to these health-sector specific assessments, many countries also conduct establishment censuses and censuses of buildings, which can be used to assess the status of health facilities. However, the potential for these studies is yet to be seen. The success of this technique will also very much depend on the extent to which the health sector will closely work with the national statistical agencies that are mandated to conduct such censuses.

Demographic surveillance sites

Health information collected from health facilities alone provides neither a complete picture of the health sector nor of the health status of the population. For instance, not all population groups have geographic or economic access to health facilities, which means that, despite being timely, data on health status derived from facilities are inherently biased and fragmentary. To meet the need for unbiased, timely and continuous information on vital events, demographic surveillance is proposed as a possible interim solution.

Demographic surveillance sites have the functions of providing health information that accurately reflects the prevailing disease burden of the population; assisting in monitoring and tracking new health threats and alerting stakeholders for an appropriate response; and serving as a platform for testing and evaluating health interventions.[13]

In Africa, there are some 19 such sites scattered across 13 countries, mostly operating as part of a cross-country research network, known as the INDEPTH Network. Enumeration of births and deaths is a key aspect of demographic surveillance, but the data are largely used for research purposes and generally not considered integral to the health information system. However, one useful outcome of these surveillance sites was the publication of a model life table for sub-Saharan Africa, based on mortality data gathered in the sites in the course of 1995–1999.[14]

Health information domains and links to major data sources

In addition to providing data for decision-making at different levels of the healthcare system, the health information system should provide the information needed for planning and management of healthcare services; understanding the determinants and causes of ill-health; public health decision-making; and formulation and assessment of health policy, financing and resource allocation.

It comprises information in three major domains: the underlying causes of ill health; the health system responses to healthcare needs and demands; and population health status, including distribution. Health information needs thus comprise indicators on:

- *Determinants of health*: socioeconomic, environmental, behavioural, demographic and genetic determinants or risk factors. Such indicators characterise the contextual environments in which the health system operates. Much of the information is generated through other sectors, such as agriculture, environment and labour.
- *Health system*: inputs to a health system and related processes such as policy, organisation, human resources, financial resources, health infrastructure, equipment and supplies. There are also output indicators such as health service availability and quality, as well as information availability and quality.
- *Health service utilisation*: outcomes of the health system such as service coverage, utilisation and responsiveness to user needs.
- *Health status*: levels of mortality, morbidity, disability and wellbeing. Health status variables depend upon the efficacy and coverage of interventions and determinants of health that may influence health outcomes independently of health service coverage. Health status indicators should be available stratified or disaggregated by variables such as sex, socioeconomic status, ethnic group and geographical location in order to capture the patterns of health in the population.

Though there may be only one gold-standard measurement strategy for a given indicator, more often data for a particular indicator need to be generated from more than one source (Table 1); for example, for maternal or infant or child mortality, both vital statistics and household surveys can be used. Similarly, in population censuses, mortality and morbidity statistics from facilities and surveillance sites also serve for assessing health outcome, but their use for nationwide monitoring depends on the extent to which they are representative of the general population.

Each data source has relative advantages and disadvantages. Service records are available on a continuous basis and provide data for lower administrative levels but are subject to bias because they cover only the populations using health facilities.

Household surveys are free from reporting and representation biases but are time-consuming, expensive and require highly skilled personnel. Generally, household surveys are not suitable for small geographical areas or for providing annual estimates and when such data are available they are subject to high sampling errors.

When statistical values for a given indicator are generated from multiple sources, as is often the case, quality assessment and reconciliation of data are necessary before data are used for programme and policy guidance. A good example of this is the measurement of HIV prevalence among adults in countries with generalised epidemics. Antenatal-clinic based surveillance systems provide annual data on HIV prevalence trends among pregnant women but this is a biased population sample. Through nationally representative household surveys that include HIV testing, unbiased estimates can be generated that cover all regions in a country and include non-pregnant women and men. However, cost considerations preclude annual population-based surveys of HIV prevalence. Antenatal surveillance results are used to monitor progress, and occasional household survey results provide data to calibrate and adjust surveillance findings. The precise combination of different data sources depends on the indicator in question and the methodologies available to generate the data.

Monitoring health inequities

Thus far, we have focused on the challenges of national-level monitoring, but a true understanding of the health situation and trends in a country requires knowledge about the health status and use of services among different population groups. All Millennium Development Goal indicators should be disaggregated by key stratifiers, including socioeconomic status, ethnicity, sex and geographic area.[15] Socioeconomic status can be reflected by household income, expenditure, wealth status, education and occupation. Education and occupation are important indicators of social status in their own right but should not be viewed as proxies for wealth or income. Sex and gender are meaningful equity stratifiers for many, but not all, health measures. For example, low birth weight according to sex of the infant is not meaningful for equity analysis because it is not amenable to social policy, but analysing differences in prevalence rates of malnutrition between boys and girls is meaningful because it indicates discriminatory treatment. Discrimination against ethnic or racial groups can have serious health and social effects. Indicators for characterising ethnicity include

self-identification, social perception of race or ethnicity, religion, language spoken at home, tribal affiliation, or status as an immigrant or native-born citizen. Finally, groups can be advantaged according to the geographical area (e.g. urban versus rural, or provinces or districts) where they live or work. Resources are often allocated on a geographical basis, reflecting both logistic issues such as distance, topography and transport, as well as the tendency for political power to be concentrated in urban areas or particular regions.

Comparing allocations of health measures across different provinces and districts is useful, and such comparisons are easily understood by non-specialists.

Conclusions

As a general rule in the information field, it is wiser to have multiple sources of data and to avoid reliance on single methods. No method is perfect and all have their strengths and weaknesses. The situation in the Region is characterised by a multitude of data sources used to track progress towards health-related goals. However, in almost all countries, there is very heavy reliance on household surveys for most indicators. Few countries in the Region have civil registration systems that permit adequate and regular tracking of mortality and cause of death. Health management information systems generate considerable data, but the information is rarely used because of concerns about bias, quality and timeliness. Demographic surveillance sites function in several countries but tend to be viewed as research efforts, and the data they generate are not integrated into the national health information system because of concerns about representativeness. The great advantage of household surveys, especially those supported by USAID and UNICEF, is the high degree of standardisation, with great attention paid to quality control, training of interviewers and careful data analysis. There is a need for a much greater degree of standardisation and quality control in other sources of information in the Region, in particular with regard to the routine health management information systems.

Countries need to develop comprehensive national plans for health information that address the full range of data needs and data sources and that include provision for building national capacities for data generation, analysis and dissemination.

These national plans should serve as the platform for external funding so that eventually countries will be able to draw on a broad base of reliable, standardised and timely data to support decision-making in health.

Notes:

[a]Subsequent to the research described in this paper, South Sudan joined the WHO African Region by World Health Assembly Resolution WHA66.21, bringing the total number of countries to 47.

[b]Benin, Cameroon, Comoros, Eritrea, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Senegal, Sierra Leone, Swaziland, Uganda and Zambia.

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