

# 1. The Global Water Supply and Sanitation Assessment 2000

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*This chapter presents the main findings of the Global Water Supply and Sanitation Assessment 2000. It also outlines the background, methodology and limitations of the Assessment.*

**A**ccess to water supply and sanitation is a fundamental need and a human right. It is vital for the dignity and health of all people.

The health and economic benefits of water supply and sanitation to households and individuals (and especially to children) are well documented. Of special importance to the poor are the time-saving, convenience and dignity that improved water supply and sanitation represent. Those without access are the poorest and least powerful. Access for the poor is a key factor in improving health and economic productivity and is therefore an essential component of any effort to alleviate poverty.

## 1.1 Main findings

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The percentage of people served with some form of improved water supply rose from 79% (4.1 billion) in 1990 to 82% (4.9 billion) in 2000. Over the same period the proportion of the world's population with access to excreta disposal facilities increased from 55% (2.9 billion people served) to 60% (3.6 billion). At the beginning of 2000 one-sixth (1.1 billion people) of the world's population was without access to improved water supply (Figure 2.1) and two-fifths (2.4 billion people) lacked access to improved sanitation (Figure 2.2). The majority of these people live in Asia and Africa, where fewer than one-half of all Asians have access to improved sanitation and two out of five Africans lack improved water supply. Moreover, rural services still lag far behind urban services. Sanitation coverage in rural areas, for example, is less than half that in urban settings, even though 80% of those lacking adequate sanitation (2 billion people) live in rural areas – some 1.3 billion in China and India alone. These figures are all the more shocking because they reflect the results of at least twenty years of concerted effort and publicity to improve coverage.

One positive finding of the Assessment 2000 is that sanitation coverage appears to be higher than would be expected from the findings of earlier assessments. This is because the consumer-based survey data in the Assessment 2000 account for households that provided their own sanitation facilities, especially in Asia and Africa. These facilities were not covered by the provider-based data used in previous assessments.

Although an enormous number of additional people gained access to services between 1990 and 2000, with approximately 816 million additional people gaining access to water supplies and 747 million additional people gaining access to sanitation facilities, the percentage increases in coverage appear modest because of global population growth

during that time. Unlike urban and rural sanitation and rural water supply, for which the percentage coverage has increased, the percentage coverage for urban water supply appears to have decreased over the 1990s. Furthermore, the numbers of people who lack access to water supply and sanitation services remained practically the same throughout the decade.

The water supply and sanitation sector will face enormous challenges over the coming decades. The urban populations of Africa, Asia, and Latin America and the Caribbean are expected to increase dramatically. The African urban population is expected to more than double over the next 25 years, while that of Asia will almost double. The urban population of Latin America and the Caribbean is expected to increase by almost 50% over the same period.

Although the greatest increase in population will be in urban areas, the worst levels of coverage at present are in rural areas. In Africa, Asia, and Latin America and the Caribbean, rural coverage for sanitation is less than one-half that of urban areas. In those three regions alone, just under 2 billion people in rural areas are without access to improved sanitation, and just under 1 billion are without access to improved water supply.

This report uses international development targets to highlight the challenges faced by the sector in reducing the coverage gap (see Box 1.1).

To achieve the 2015 target in Africa, Asia and Latin America and the Caribbean alone, an additional 2.2 billion people will need access to sanitation and 1.5 billion will need access to water supply by that date. In effect, this means providing water supply services to 280 000 people and sanitation facilities to 384 000 people every day for the next 15 years.

Projected urban population growth, especially in Africa and Asia, suggests that urban services will face great challenges over the coming decades to meet fast-growing needs. At the same time, rural areas also face the daunting task of meeting the existing large service gap. To reach universal coverage by the year 2025, almost 3 billion people will need to be served with water supply and more than 4 billion with sanitation.

Poor water supply and sanitation have a high health toll (Boxes 1.2 and 1.3), whereas improving water and sanitation brings valuable benefits to both social and economic development (Box 1.4). The simple act of washing hands with soap and water can reduce diarrhoeal disease transmission by one-third. Hygiene promotion, therefore, is an important priority.

## BOX 1.1 INTERNATIONAL DEVELOPMENT TARGETS FOR WATER SUPPLY AND SANITATION COVERAGE

Indicative targets for water supply and sanitation coverage were developed by the Water Supply and Sanitation Collaborative Council (WSSCC) as part of the process leading up to the Second World Water Forum, The Hague, 17–22 March 2000. The targets were presented in the report *VISION 21: A shared vision for hygiene, sanitation and water supply and a framework for action (1)*. The targets to be achieved are:

- **By 2015 to reduce by one-half the proportion of people without access to hygienic sanitation facilities, which was endorsed by the Second World Water Forum, The Hague, March 2000.**
- **By 2015 to reduce by one-half the proportion of people without sustainable access to adequate quantities of affordable and safe water, which was endorsed by the Second World Water Forum and in the United Nations Millennium Declaration.**
- **By 2025 to provide water, sanitation, and hygiene for all.**

The VISION 21 report stresses the indicative nature of these targets and the need to consider them in local context. Such targets are nevertheless helpful in assessing the magnitude of the task ahead in meeting the water and sanitation needs of the poor. These targets build upon the target of universal coverage established for the International Drinking Water Supply and Sanitation Decade 1981–1990, which was readopted as the target for the year 2000 at the World Summit for Children in 1990.

Coverage targets themselves have been criticized as failing to focus on the changes that contribute progressively to health and development and as being too simplistic, dividing the world into those who “have” and those who “have not.” The Assessment 2000 report represents a first step in moving towards a breakdown according to means of provision, in addition to overall coverage estimation.

## BOX 1.2 HEALTH HAZARDS OF POOR WATER SUPPLY AND SANITATION

- **Approximately 4 billion cases of diarrhoea each year (2) cause 2.2 million deaths**, mostly among children under the age of five (3). This is equivalent to one child dying every 15 seconds, or 20 jumbo jets crashing every day. These deaths represent approximately 15% of all child deaths under the age of five in developing countries. Water, sanitation, and hygiene interventions reduce diarrhoeal disease on average by between one-quarter and one-third (4).
- **Intestinal worms infect about 10% of the population of the developing world (2)**. These can be controlled through better sanitation, hygiene and water supply (5). Intestinal parasitic infections can lead to malnutrition, anaemia and retarded growth, depending upon the severity of the infection.
- **It is estimated that 6 million people are blind from trachoma** and the population at risk from this disease is approximately 500 million. Considering the more rigorous epidemiological studies linking water

to trachoma, Esrey et al. (4) found that providing adequate quantities of water reduced the median infection rate by 25%.

- **200 million people in the world are infected with schistosomiasis**, of whom 20 million suffer severe consequences. The disease is still found in 74 countries of the world. Esrey et al. (4), in reviewing epidemiological studies, found a median 77% reduction from well-designed water and sanitation interventions.
- **Arsenic in drinking water is a major public health threat**. According to data from about 25 000 tests on wells in Bangladesh, 20% have high levels of arsenic (above 0.05 mg/l). These wells were not, however, selected at random and may not reflect the true percentage (6). Many people are working hard in Bangladesh, West Bengal and other affected areas to understand the problem and identify the solution.

### BOX 1.3 CHOLERA EPIDEMICS

Cholera is a worldwide problem that can be prevented by ensuring that everyone has access to safe drinking-water, adequate excreta disposal systems and good hygiene behaviours.

Major health risks arise where there are large concentrations of people and hygiene is poor. These conditions often occur in refugee camps, and special vigilance is needed to avoid outbreaks of disease.

Most of the 58 057 cases of cholera reported in Zaire

in 1994 occurred in refugee camps near the Rwandan border. A decrease to 553 cases in Zaire in 1995 reflected the stabilization of refugee movement.

A cholera epidemic that began in Peru in 1990 spread to 16 other countries in Latin America. A total of 378 488 cases were reported in Latin America in 1991. Ten years later, cholera remains endemic following its absence from the continent for nearly a century

Source: (7)

### BOX 1.4 HEALTH BENEFITS OF IMPROVED WATER SUPPLY AND SANITATION

#### Water supply and health

Lack of improved domestic water supply leads to disease through two principal transmission routes (8):

- **Waterborne disease transmission occurs by drinking contaminated water.** This has taken place in many dramatic outbreaks of faecal–oral diseases such as cholera and typhoid. Outbreaks of waterborne disease continue to occur across the developed and developing world. Evidence suggests that waterborne disease contributes to background rates of disease not detected as outbreaks. The waterborne diseases include those transmitted by the faecal–oral route (including diarrhoea, typhoid, viral hepatitis A, cholera, dysentery) and dracunculiasis. International efforts focus on the permanent eradication of dracunculiasis (guinea worm disease).
- **Water-washed disease occurs when there is a lack of sufficient quantities of water for washing and personal hygiene.** When there is not enough water, people cannot keep their hands, bodies and domestic environments clean and hygienic. Without enough water, skin and eye infections (including trachoma) are easily spread, as are the faecal–oral diseases.
- **Diarrhoea is the most important public health problem affected by water and sanitation and can be both waterborne and water-washed.**

Adequate quantities of safe water for consumption and its use to promote hygiene are complementary measures for protecting health. The quantity of water people use depends upon their ease of access to it. If water is available through a house or yard connection people will use large quantities for hygiene, but consumption drops significantly when water must be carried for more than a few minutes from a source to the household (9).

#### Sanitation and health

Sanitation facilities interrupt the transmission of much faecal–oral disease at its most important source by preventing human faecal contamination of water and soil. Epidemiological evidence suggests that sanitation is at least as effective in preventing disease as improved water supply. Often, however, it involves major behavioural changes and significant household cost. Sanitation is likely to be particularly effective in controlling worm infections. Adults often think of sanitation in adult terms, but the safe disposal of children's faeces is of critical importance. Children are the main victims of diarrhoea and other faecal–oral disease, and also the most likely source of infection. Child-friendly toilets, and the development of effective school sanitation programmes, are important and popular strategies for promoting the demand for sanitation facilities and enhancing their impact.

Adequate quantities of safe water and good sanitation facilities are necessary conditions for healthy living, but their impact will depend upon how they are used. Three key hygiene behaviours are of greatest likely benefit:

- Hand washing with soap (or ash or other aid).
- Safe disposal of children's faeces.
- Safe water handling and storage.

## 1.2 Background and methods

The Assessment 2000, carried out through the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP), differs from the previous JMP exercises in three important ways:

- **The Assessment 2000 covers the whole world through presentation of data from six regions: Africa, Asia, Europe, Latin America and the Caribbean, Northern America and Oceania as defined by the United Nations, Department of Economic and Social Affairs, Population Division (10). Previous assessments were limited to the developing countries.**
- **Household survey data have been used extensively to estimate coverage figures.**
- **The report provides a more comprehensive overview of the sector by presenting a broader range of information than simply coverage.**

The change in methodology between this and earlier assessments makes it difficult to compare the present results with those obtained in previous years. To assess trends, coverage estimates were largely based on survey data, and were made only for those countries where such data were reasonably consistent, and were available over a sufficient period of time for a trend to be discerned. Fortunately, the countries for which this was the case included well over two-thirds of the total population, enabling meaningful statements to be made about global and regional trends over the 1990s. Where survey data were not available, the estimates provided through the questionnaire for the Assessment 2000 were used.

A detailed explanation of the methods used for the collection and analysis of coverage data is given in Annex A.

In the past, the monitoring of the population with access to adequate water supply and sanitation facilities has proved problematic because the level of detail of such data as estimated by service providers is often limited. The Assessment 2000 instead turned also to consumer-based

information in the form of household survey data. This has allowed for a far more detailed picture of the water and sanitation technologies being used. It also captures information related to usage and breakdown of self-built facilities, of which service providers may be unaware.

Data collection for the Assessment 2000 had two main sources: questionnaires and household surveys. Electronic files were compiled that presented the information from both sources and are accessible through the WHO and UNICEF web sites. The web sites will be regularly updated on the basis of reports received.

The definition of coverage used in the Assessment 2000 and in this report is based on technology type. In past assessments, the coverage figures referred to “safe” water supply and “adequate” sanitation. One of the findings of the current assessment is that there is a lack of information on the safety of the water served to the population and on the adequacy of sanitation facilities. Population-based surveys do not provide specific information on the quality of the drinking-water, or precise information on the adequacy of sanitation facilities. Therefore, this assessment assumed that certain types of technology are safer or more adequate than others and that some of them could not be considered as “coverage.” The terms “safe” and “adequate” were replaced with “improved” to accommodate these limitations. The population with access to “improved” water supply and sanitation is considered to be covered. Types of facilities that are considered as improved water sources and improved sanitation facilities are given in Box 1.5. Essentially, technology is used as an indicator of improved water and sanitation. Like all indicators, it can allow only an approximate description of water and sanitation coverage. The coverage figures produced by technology indicators do not provide information about the quality of the water provided or about its use. Furthermore, factors such as intermittence or disinfection could not be taken into account in the coverage figures.

### BOX 1.5 WATER SUPPLY AND SANITATION TECHNOLOGIES CONSIDERED TO BE “IMPROVED” AND THOSE CONSIDERED TO BE “NOT IMPROVED”

The following technologies were considered “improved”:

#### **Water supply**

Household connection  
Public standpipe  
Borehole  
Protected dug well  
Protected spring  
Rainwater collection

#### **Sanitation**

Connection to a public sewer  
Connection to septic system  
Pour-flush latrine  
Simple pit latrine  
Ventilated improved pit latrine

The following technologies were considered “not improved”:

#### **Water supply**

Unprotected well  
Unprotected spring  
Vendor-provided water  
Bottled water<sup>1</sup>  
Tanker truck provision of water

#### **Sanitation**

Service or bucket latrines  
(where excreta are manually removed)  
Public latrines  
Open latrine

<sup>1</sup> Not considered “improved” because of limitations concerning the potential quantity of supplied water, not the quality.

Particular care was taken in reviewing the coverage data for the 40 largest developing countries. These countries include 90% of the population of the developing world and as such have a significant effect on regional and global aggregate figures. Detailed information on household connections in developing countries will be presented in the JMP Databook 2000.

Estimates of percentage coverage for a region are based upon country estimates of the absolute numbers of people with and without access to water supply and sanitation. The data were obtained from available household surveys, or from country questionnaires. If country estimates were not available, regional estimates were obtained by extrapolating from countries within the region for which estimates existed. Such extrapolation, however, is used only to compute regional and global statistics. The data for individual countries, areas or territories are drawn from relevant sources.

In addition to collecting coverage data, the questionnaire sought information on other aspects of the sector, including finance and costs, target setting, sector constraints, factors affecting quality of service and information about the largest city in each country. This information will be presented in full, by country, area or territory, in the JMP Databook 2000.

### 1.3 Limitations of the Assessment 2000

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As noted above, access to improved water and sanitation is estimated using technology as an indicator. Definitions of “improved” technologies are thus based on assumptions that certain technologies are better for health than others. These assumptions may not be true in all individual cases. For instance, in some locations an unprotected household well may provide a better supply of water, both in terms of quantity and quality of water, than a household connection which may be subject to intermittence and poor water quality.

In some cases, it is also likely that water supplies from vendors or tanker trucks, or sanitation services by public toilets, may be adequate. However, from a public health perspective, experience suggests that such technologies are typically inferior to “improved” services. The quantities of water distributed through this alternative are likely to be less than 20 litres of water per capita per day.

While household surveys provide the most accurate available data, they suffer from other problems. Definitions of services vary not only between the different types of surveys undertaken, but also over time. It is therefore sometimes difficult to compare surveys undertaken even within the same country. In particular, the Assessment 2000 did not provide standardized definitions of urban and rural, as none could be found that would be consistent with the range of definitions adopted locally. Accordingly, the national classification of urban and rural was accepted.

In many countries, there have been a large number of population-based surveys over the past 10–15 years. In others, except for censuses, such surveys have not been conducted at all. Much uncertainty about coverage remains in many countries, and there is a need to refine and develop the monitoring process. The monitoring of access to water supply and sanitation is generally weak at national level and is likely to be even weaker at local level. Reliable coverage figures for individual countries, regions, cities and districts would contribute significantly to national planning and deployment of resources, through bilateral and multilateral cooperation.

Although most well-designed household surveys provide breakdowns of national data at subnational level (provinces, districts, etc.), this report has used nationally consolidated data for its regional and global sector analysis. Using national consolidated data can often hide important variations within a country. For example, national consolidated data cannot describe disparities between and within urban areas. There is also a danger that national consolidated data do not represent the conditions of the poorest of the poor, who are often hidden in totals or averages.

The present report refers mainly to water supply and sanitation coverage, as that was the remit of the Assessment 2000. But hygiene is also vitally important to health, and the collection and use of hygiene information will be an important component of future work.

These coverage figures represent only those countries, areas and territories reporting in the Assessment 2000 and those for which household survey data were available. Some regions have higher representation than others within the Assessment 2000. The exercise aimed to employ standardized definitions in all countries; inevitably, however, the definitions are not entirely standardized. Some countries used more stringent definitions of improved water supply and sanitation than others.

