

Missing the Millennium Development Goal targets for water and sanitation in urban areas

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ABSTRACT This paper reviews progress towards the Millennium Development Goals (MDGs) for water and sanitation in urban areas. Drawing on UN data, it shows the disastrous performance of many low- and middle-income nations in relation to the goal of halving the proportion without drinking water sources piped on premises and improved sanitation between 1990 and 2015. It also describes how even such a poor performance is actually understating the problem because of deficiencies in the data available. For water, there are no data sources with global coverage on who has “sustainable access to safe drinking water” (what the MDGs specify). UN statistics record whether households have drinking water sources piped on premises, but this does not necessarily mean the water is safe to drink or that there is a regular, reliable supply (what is implied by sustainable access). For what is termed “improved” or “basic” sanitation, the bar is set too low in the quality of provision needed in urban areas, so large numbers of urban dwellers said to have improved or basic sanitation still lack sanitation that greatly reduces health risks. The paper emphasizes that assessments of provision for water and sanitation need to make allowances for different contexts; what can work well in rural contexts does not do so in large and dense urban agglomerations. The paper ends with a discussion of what the experience with the MDGs for water and sanitation implies for the Sustainable Development Goals.

KEYWORDS data / MDGS / sanitation / SDGs / water

I. INTRODUCTION

This paper reviews progress between 1990 and 2015 for provision for water and for sanitation in urban areas in relation to the Millennium Development Goal (MDG) targets. But there are no data sources with global coverage on what the MDG target for water demands – halving between 1990 and 2015 the proportion without sustainable access to safe drinking water. There are UN data on who uses drinking water sources piped on premises,⁽¹⁾ but, as discussed in detail in Section II, the UN is clear that this is not necessarily safe to drink or with regular, reliable supplies (what is implied by “sustainable access”). According to UN figures for who has use of drinking water sources piped on premises, close to half of all low- and middle-income nations for which data are available did not halve the proportion lacking such provision in urban areas between 1990 and 2015. In more than 30 of these nations, a lower percentage of the urban population lacked water piped on premises in 2015 than in 1990.

1. Unless otherwise stated, all statistics on provision for water and sanitation are drawn from UNICEF and WHO (2015), *Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment*, Geneva, 80 pages. Classifications of countries by their per capita incomes come from <http://>

Many more would lack provision if there were data on the proportion without sustainable access to safe drinking water. More than half of all low- and middle-income nations for which data are available also missed the MDG target for “basic” sanitation for their urban populations (using UN figures for “improved” sanitation). Aggregate figures for low- and middle-income countries and for the least developed countries show that they were nowhere near halving the proportion without water piped on premises or improved sanitation between 1990 and 2015; this is also the case for sub-Saharan Africa and Southern and South-eastern Asia.⁽²⁾

It is important to understand the different definitions in use for water and sanitation provision as they have large implications for how many people are considered to have benefitted and, as discussed in Section V, how many people live in “slums”. The only statistics with global coverage on provision for water and sanitation come from the Joint Monitoring Programme (JMP) of the United Nations Children’s Fund (UNICEF) and the World Health Organization (WHO). This has data for most nations on who has use of drinking water sources from “improved” sources and, as a subset of this, who has this piped on premises. The JMP also has data on who has use of “improved” sanitation facilities.

The JMP’s definition of “improved” drinking water sources includes “piped water on premises” (i.e. a household water connection located inside the user’s dwelling, plot or yard), public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection. Regardless of the water source, however, the definition does not specify whether the water is of drinking quality or whether access is sustainable. Clearly, these different water sources imply a very large spectrum in terms of quality of provision – public taps (which may be shared by hundreds of people and be several hundred metres from the home) are classified in the same category as water piped into each home.

The very large spectrum in terms of quality of provision is also evident for sanitation. What the JMP defines as “improved” sanitation facilities includes provision that is very good and provision that is still very inadequate. Improved sanitation includes flush/pour flush to a piped sewer system, septic tank or pit latrine, and three types of latrines – ventilated improved pit latrines, pit latrines with slabs, and composting toilets. The definition lacks sufficient detail to assess the adequacy of provision and it fails to consider whether there is provision for the safe disposal of excreta.

Progress in provision for water and for sanitation is reported separately for rural and for urban populations, yet the same definitions of “improved provision” are applied to rural and urban areas. One of the reasons that urban provision for water and sanitation appears to be so much better than rural provision is that what might be appropriate criteria for rural water and sanitation (for instance a protected dug well and a pit latrine with a slab) are applied to urban areas where they are often not appropriate.

Pit latrines in each household can work well where there are low densities, small population concentrations and sufficiently large plot sizes. But urban areas typically have large and dense concentrations of people, many of whom have small house plots with little or no space for pit latrines. These households need different sanitation solutions from those in the less dense concentrations found in most rural areas, where space for pit latrines in the home, plot or close by is less of a problem.

data.worldbank.org/about/
country-and-lending-groups.

2. This draws on a background paper prepared for the World Economic and Social Survey 2015: Satterthwaite, David (2015), “MDG experience regarding improved drinking water, sanitation and slums and the lessons for implementation of the post 2015 agenda”, available at <https://wess.un.org/wp-content/uploads/2014/11/DevEnv2015-Satterthwaite.pdf>.

3. Satterthwaite, David, Diana Mitlin and Sheridan Bartlett (2015), "Is it possible to reach low-income urban dwellers with good-quality sanitation?", *Environment and Urbanization* Vol 27, No 1, pages 3–18.

4. Banana, Evans, Patrick Chikoti, Chisomo Harawa, Gordon McGranahan, Diana Mitlin, Stella Ntalishwa, Noah Schermbrucker, Farirai Shumba and Anna Walnycki (2015), "Sharing reflections on inclusive sanitation", *Environment and Urbanization* Vol 27, No 1, pages 19–34.

5. UN (2013), *The Millennium Development Goals Report 2013*, New York, page 3.

6. See reference 1.

7. See WHO and UNICEF (2014), *Progress on Drinking-Water and Sanitation: 2014 Update*, Joint Monitoring Programme, Geneva, page 2.

8. UN (2015), *The Millennium Development Goals Report 2015*, New York, page 58.

9. See reference 1, Foreword.

Multi-storey housing, which is far more common in urban areas (and increasingly common in informal settlements) also requires different sanitation solutions to single-storey housing, especially where there are different households in each storey. Where pit latrines are relied on, they need to be easily emptied, and this is particularly difficult in dense informal settlements, especially those that lack roads. Large pits or a second latrine, which reduce the frequency with which they need to be emptied, are also difficult in high-density settlements. In many urban contexts, sewerage systems are the most effective systems for greatly reducing human contact with faecal matter.⁽³⁾

Of course there are exceptions – urban areas or settlements that are low-density and have large plot sizes, or rural settlements that have high densities. But it makes no sense to stress the inequality between rural and urban areas in relation to connection to sewers when, in general, these are so much more essential in most urban contexts than in most rural contexts.

Any sanitation intervention that is not connecting toilets to sewers needs to take account of the collection, disposal and treatment of the faecal matter. If toilet wastes are going to a septic tank, is this actually working? Many simply push their untreated liquid wastes into local and often open drains. For pit latrines of various kinds, can they be emptied easily? And is there a local treatment plant that can treat the wastes? Usually not. Conventional pit-emptying trucks are often of no use in informal settlements because there is no road access or roads are too steep or muddy. Cheap yet effective systems for disposing of waste are difficult in urban contexts. The journey time between latrines or septic tanks and the treatment plant has to be short, and often it is not. This raises costs. Another concern is that toilet wastes in pit latrines may well be contaminating groundwater sources. In many urban contexts, toilets are shared by two or three adjoining households. Community-managed public toilets and washing facilities are often the most appropriate solutions that can be practically implemented,⁽⁴⁾ yet these are considered "unimproved" by the JMP.

II. ASSESSING PROGRESS TOWARDS TARGETS FOR WATER AND SANITATION

UN reports on progress towards MDG targets insist that the MDG drinking water target has already been surpassed.⁽⁵⁾ This is confirmed in the latest (2015) report of the WHO/UNICEF Joint Monitoring Programme.⁽⁶⁾ But as noted above, we do not know the proportion of the world's population that has safe water and sustainable access (what the MDGs specify). The 2014 report of the WHO/UNICEF Joint Monitoring Programme states, "*The MDG drinking water target, to halve the proportion of the population without sustainable access to safe drinking water (an increase in coverage from 76% to 88%) between 1990 and 2015, was met in 2010.*"⁽⁷⁾ The UN 2015 report on the MDGs claims that the "*global MDG target for drinking water has been met five years ahead of schedule*".⁽⁸⁾ In the 2015 JMP report, Jan Eliasson, the UN Deputy Secretary-General, claims that "*the target for safe drinking water was met in 2010, well ahead of the MDG deadline of 2015*".⁽⁹⁾

But these claims are not true because the UN statistics these are using do not measure who has safe water and sustainable access. They measure who has water from "improved" sources, and many "improved" water

sources are not safe – or regular or easily accessed. However, generally, the JMP and (usually) the MDG reports are careful not to equate “improved drinking water provision” with safe water. These reports admit that a significant proportion of the population said to have their MDG water needs met are using drinking water sources that are faecally contaminated,⁽¹⁰⁾ and that if attention was given to water quality and easy access, the number of people without access to safe drinking water might be found to be two to three times higher than official estimates.⁽¹¹⁾ The very same documents that report that the drinking water targets have been met also highlight that these are not valid measures of who has safe or sustainable water supplies.

The UN 2013 report on MDG progress notes: *“Furthermore, concerns about the quality and safety of many improved drinking water sources persist. As a result, the number of people without access to safe drinking water may be two to three times higher than official estimates.”*⁽¹²⁾ But if this is the case, then the MDG for water has not been met. This report also notes that 2.4 billion people worldwide with “improved provision” *“...do not enjoy the convenience and associated health and economic benefits of piped drinking water at home. Instead, they spend valuable time and energy queuing up at public water points and carrying heavy loads of water home, often meeting only minimal drinking water needs. The most affected are the poorest and most marginalized people in society— many of whom, especially in urban areas, pay high prices for small amounts of often poor quality water.”*⁽¹³⁾

If progress towards the MDG target for safe water in urban areas is assessed on the basis of who has use of drinking water sources piped on premises rather than on the broader terms of “improved” provision, it shows much less progress (and for many nations no progress). To give but one example, 81 per cent of Nigeria’s urban population and 57 per cent of its rural population had improved provision for water in 2015 – but only 3 per cent of the urban population and 1 per cent of the rural population had water piped on premises. Between 1990 and 2015, in what the JMP terms “developing countries”, the proportion of urban dwellers with “improved” provision went from 93 per cent to 95 per cent, while the proportion of urban dwellers with water piped on premises went from 68 to 72 per cent. If it is accepted that for urban areas, water piped on premises is a far more valid indicator for assessing MDG progress on sustainable access to safe drinking water than access to an improved source, this completely changes the extent of provision and the extent of progress in regard to MDG targets.

For sanitation, the definition of what constitutes improved provision includes forms of provision that are not adequate for good health. Improved sanitation facilities are those that are *“...likely to ensure hygienic separation of human excreta from human contact”*,⁽¹⁴⁾ but as discussed in Section I, in many urban contexts, pit latrines with slabs are not likely to do this. There is also the fact that the quality of provision for sanitation cannot be assessed only on the basis of household facilities; it has to be assessed at a neighbourhood or village level to ascertain whether faecal matter is being managed and disposed of adequately. But this is not being measured. Even if a majority of households in a settlement have good-quality toilets, these households are still at risk from faecal contamination if the minority are defecating or disposing of their toilet wastes in the open.

Even though the JMP statistics do not show who has safe drinking water sources and who has regular supplies, it is worth considering

10. See references 1 and 7.

11. See reference 5, page 47.

12. See reference 5, page 47.

13. See reference 5, pages 47–48.

14. See reference 7, page 40.

what the statistics show in regard to how provision for water to urban populations changed between 1990 and 2015, in who has drinking water sources piped on premises.

Progress in sanitation between 1990 and 2015 is also considered in what the JMP terms use of sanitation facilities that are “improved” (which is assumed to be the same as the “basic” sanitation specified in the MDGs). The JMP statistics do not have any disaggregation of “improved” sanitation facilities – for instance to show who has a toilet connected to a sewer.

III. PROVISION FOR WATER IN URBAN AREAS

The JMP’s 2015 report states that 95 per cent of the urban population in “developing countries” have drinking water from an improved source. So even if the target of halving the proportion without improved sources was not met for urban populations, if only 5 per cent lack provision, this does not seem such a pressing problem.

But if we take water piped on premises as a better indicator (even if it is not specified who has sustainable access to safe drinking water), a very different picture emerges. For instance, among “developing countries”, more than a quarter of the urban population lacked this in 2015. For the least developed countries, only 32 per cent of the urban population had water piped on premises in 2015; for the deficit to be halved between 1990 and 2015 the number would have to be 64.5 per cent.

What is of interest here is the many nations that still had low levels of provision in 2015, the nations and regions that failed to meet the target of halving the proportion without provision, and the countries that actually had a lower proportion of their population with water piped on premises in 2015 than in 1990.

For the first of these, Figure 1 shows countries that still had half or more of their urban population without water piped on premises in 2015. More than three-quarters of the countries in Figure 1 are in sub-Saharan Africa. It is likely that this list would be much longer if there were data on such provision for all countries. Note the heavy concentration in Figure 1 of low-income countries among those with the lowest proportion of their urban population with water piped on premises; for the 20 countries with the lowest provision, 14 are low-income; the others are lower-middle income (Nigeria, Myanmar, Cameroon and Bangladesh) or upper-middle income (Angola and the Marshall Islands).

There are 215 “countries, areas or territories” included in the JMP 2015 data tables, but for 65 of these, progress could not be assessed for water piped on premises in urban areas as the JMP did not have data for 1990, 2015 or both. A further 29 were high-income Organisation for Economic Co-operation and Development (OECD) nations with universal or very close to universal provision. Of the remaining 121 countries, 76 did not meet the target. For four of these, 96 per cent or more of their urban population had water piped on premises in 2015, so the deficits in provision are less serious here, even if they did not meet the target; 59 countries missed the target by 5 or more percentage points.

It is discouraging to recall that most governments were making commitments to universal provision for water and sanitation 40 years ago – at Habitat I, the first UN Conference on Human Settlements in

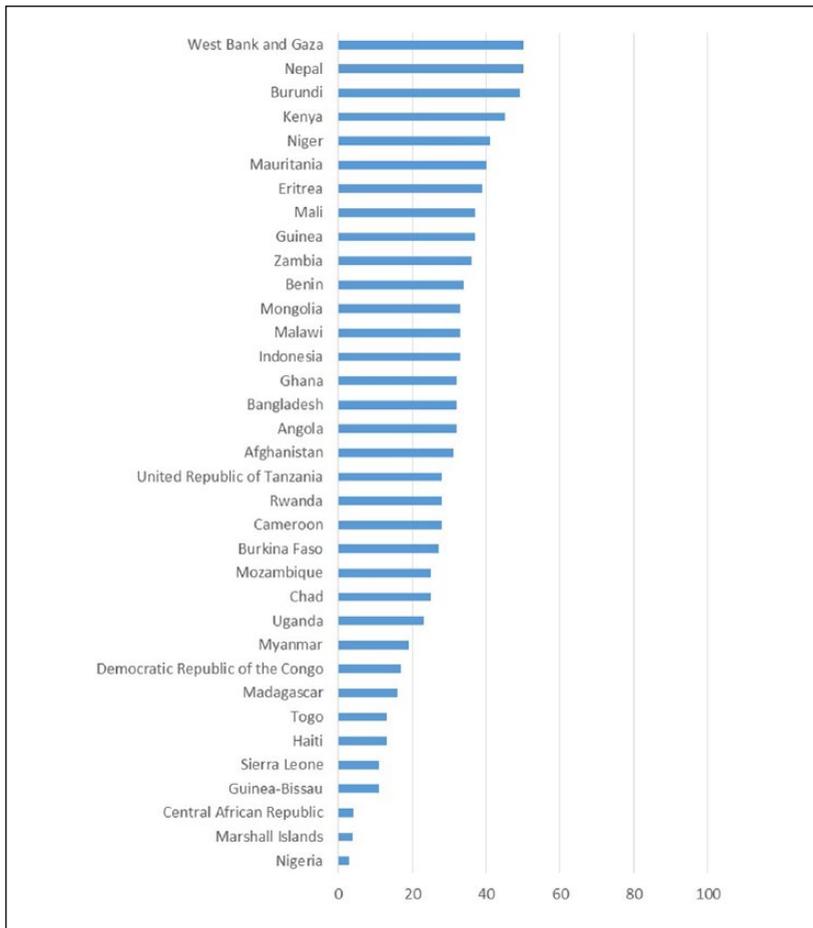


FIGURE 1
Countries with the lowest proportion of their urban population with use of drinking water sources piped on premises, 2015 (per cent)

SOURCE: JMP data tables at the back of UNICEF and WHO (2015), *Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment*, Geneva. JMP data accessed directly at <http://www.wssinfo.org/data-estimates/> may be more recent than in the 2015 report, but for consistency, I have drawn on the data in the 2015 report for this and for Figures 2–6.

1976 – and with the 1980s designated as the International Drinking Water Supply and Sanitation Decade to help ensure universal provision by 1990. Sub-Saharan Africa has an urban population of around 400 million today and the JMP figures suggest that two-thirds lacked water piped on premises in 2015.

Figure 2 shows that 21 per cent of the world’s urban population lacked water piped on premises in 2015. In low- and middle-income countries, it was 28 per cent. For the least developed countries, as noted earlier, it was 68 per cent.

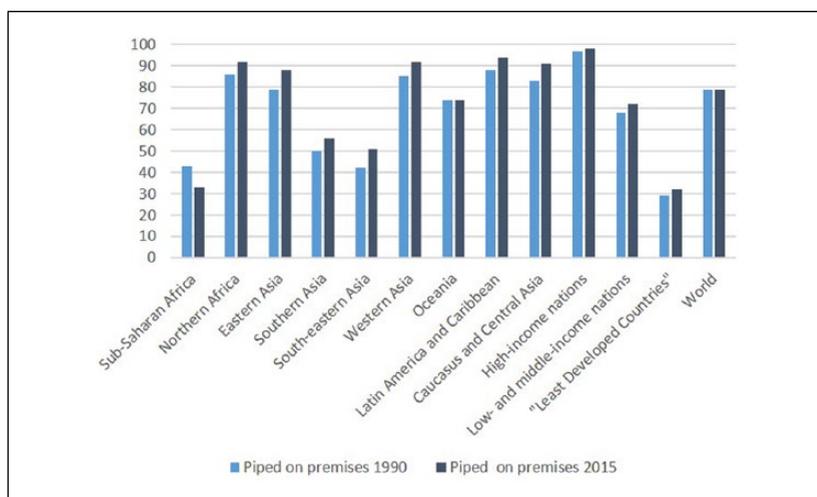


FIGURE 2
The proportion of the urban population with water piped on premises by region, 1990 and 2015 (per cent)

SOURCE: JMP data tables at the back of UNICEF and WHO (2015), *Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment*, Geneva.

The second issue is how little coverage has increased. Globally, there was no increase in the proportion of the urban population with water piped on premises between 1990 and 2015; for low- and middle-income nations and for the “least developed countries” there was a small increase. Figure 2 shows the changes by region, comparing 1990 to 2015. None of these regions came close to halving the proportion of their urban population without water piped on premises between 1990 and 2015, although the problem is less serious in some regions that had achieved relatively high coverage by 1990. Sub-Saharan Africa went backwards – as it had only 33 per cent of its urban population with water piped on premises in 2015 compared to 43 per cent in 1990.

Table S1 (see this paper’s supplementary material online) shows the many countries that failed to meet the MDG target for water piped on premises for their urban population by 2015. It also highlights the scale of this failure in so many nations in the gap between the target and what was actually achieved. For Nigeria, 66 per cent of its urban population needed to have water piped on premises by 2015, if the deficit in this was to be halved between 1990 and 2015 – but in 2015 this figure was just 3 per cent. For the Democratic Republic of the Congo, meeting this target needed 74 per cent of its urban population to have water piped on premises by 2015 – yet it had only 17 per cent. In 36 nations, the proportion of the urban population with water piped on premises was 20 or more percentage points lower than it should have been to meet the target. Most of the countries, territories and areas that have more than halved the urban population without water piped on premises are upper-middle and high-income nations. Most of the countries with the

largest gaps between this target and what they achieved are low-income or lower-middle income.

Figure 3 lists the countries, territories and areas that went backwards – i.e. that had a lower proportion of the urban population with water piped on premises in 2015 than in 1990. Again, if there were data for all nations and territories, this list would likely be much longer. For some of these, there are obvious contributing factors such as conflict or, for Haiti, the catastrophic 2010 earthquake. But there are also nations listed here that have had stability and considerable growth in their economies during these 25 years.

IV. IMPROVED SANITATION IN URBAN AREAS

There are no data with global coverage on sanitation for anything other than what the JMP calls “improved sanitation”; the inadequacy in this measure for urban contexts was described above. But even with this definition, which sets the bar far too low, the target of halving the proportion of the urban population without improved sanitation (or what the MDGs term basic sanitation) between 1990 and 2015 was not met for the world, for all low- and middle-income nations, or for the least developed countries.

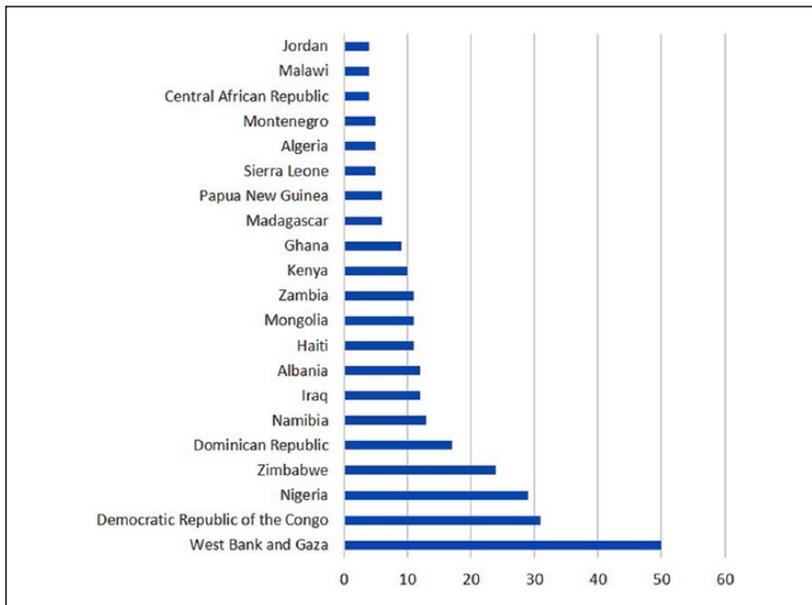


FIGURE 3

Countries with a decline in the proportion of their urban population with water piped on premises (the fall in the per cent with such provision between 1990 and 2015)

SOURCE: JMP data tables at the back of UNICEF and WHO (2015), *Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment*, Geneva.

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Figure 4 shows countries with the lowest proportion of their urban population with improved sanitation. Given how basic provision for sanitation can be for it to be included as “improved”, the deficits in provision are astonishing. In Figure 4, all but Haiti are in sub-Saharan Africa.

Figure 5 shows how provision for improved sanitation in urban areas has changed by region. Globally, the proportion of the urban population with improved sanitation increased from 79 to 82 per cent between 1990 and 2015; for low- and middle-income nations, it went from 69 to 77 per cent, and for the least developed countries, from 37 to 47 per cent. None of these achieves a halving of the deficit. Among the world’s regions, the only one to meet this target for the urban population was Eastern Asia, although some regions (high-income nations, Caucasus and Central Asia, Western Asia) had 94 per cent or more of their urban population with improved sanitation in 1990, so the deficits in provision affected a smaller proportion of their urban population. Figure 5 highlights in particular that 60 per cent of the urban population in sub-Saharan Africa still lack improved sanitation and that there was almost no increase in the proportion of the urban population with improved sanitation from 1990 to 2015.

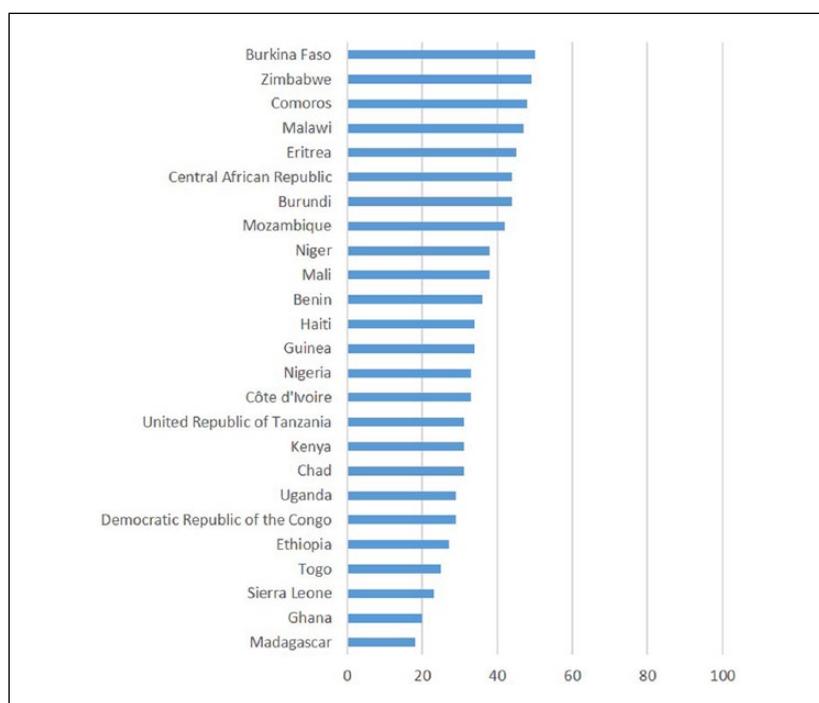


FIGURE 4
Countries with the lowest proportion of their urban population with “basic sanitation” (per cent)

SOURCE: JMP data tables at the back of UNICEF and WHO (2015), *Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment*, Geneva.

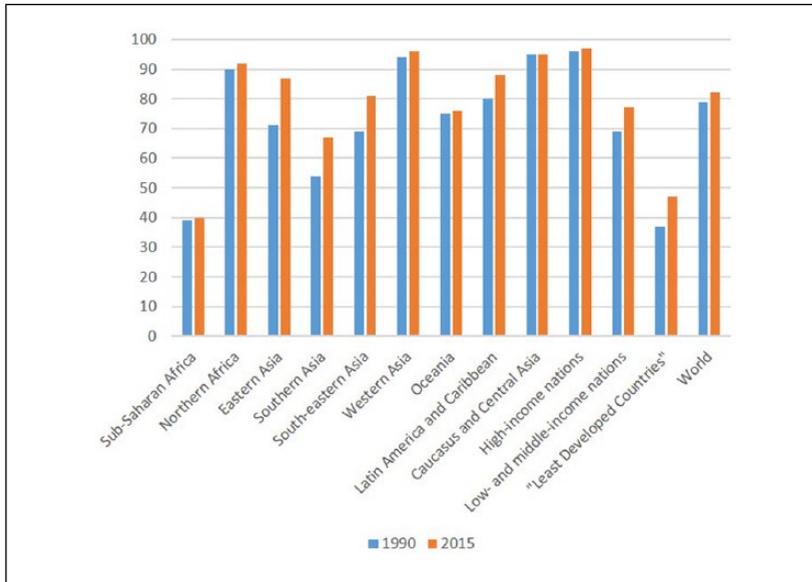


FIGURE 5

The proportion of the urban population with “basic sanitation”, by region, for 1990 and 2015 (per cent)

SOURCE: JMP data tables at the back of UNICEF and WHO (2015), *Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment*, Geneva.

Reviewing all 215 countries, areas and territories included in the data tables of the JMP 2015, in 57, progress in meeting the target for halving the proportion lacking improved sanitation in urban areas could not be assessed as they did not have data for 1990, 2015 or both. Twenty-nine were high-income OECD nations with universal or close to universal provision. Of the remaining 129 countries for which data were available, over 100 did not meet the target, although 26 of these had 96 or more per cent of their urban population with improved sanitation in 2015, so the deficits in provision were less serious here. Fifty-nine (nearly half of the 129 countries) missed their target by 5 or more percentage points.

Figure 6 shows the countries, territories and areas that had low proportions of their urban population with improved sanitation in 1990 and then had even lower proportions in 2015, i.e. in terms of the target they went backwards. These include Rwanda, Zimbabwe, Zambia, Nigeria, Papua New Guinea, Namibia and Eritrea.

Table S2 (please see this paper’s supplementary material online) shows the countries that were furthest from halving the proportion of their urban population without use of improved sanitation facilities. It also shows the scale of the failure in many countries; in 29 countries, the proportion of the population with improved sanitation in urban areas was 20 or more percentage points lower than it should have been to halve the deficit.

This paper has focused on countries with the largest deficits in provision for water and sanitation in their urban areas and the largest

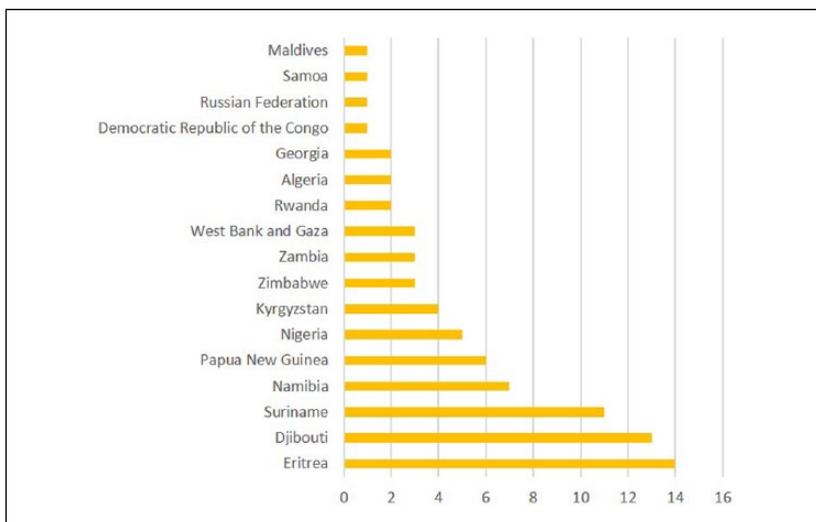


FIGURE 6
Countries with a decline in the proportion of their urban population with “basic” or improved sanitation (the fall in the per cent with such provision between 1990 and 2015)

SOURCE: JMP data tables at the back of UNICEF and WHO (2015), *Progress on Sanitation and Drinking Water: 2015 Update and MDG Assessment*, Geneva.

deficits in relation to halving those without provision. There are at least 30 countries that halved or more than halved the proportion of their urban population without improved sanitation (not including those that already had at least 99 per cent coverage in 1990); nine are in Latin America and most are upper-middle or high-income countries.

The JMP does not report on the proportion of individuals or households with toilets connected to piped sewers, although this would be a more useful indicator of good-quality sanitation in urban areas (even if we accept that there are other forms of provision that can keep down health risks in most urban contexts). If it did, the figures for sanitation coverage in urban areas would be much lower. For instance, for Nigeria, in 2013, 42.7 per cent of its urban population had improved sanitation but only 6.1 per cent had toilets connected to a piped sewer system.¹⁵ This is not to claim that toilets connected to sewers are the only form of sanitation that delivers adequate provision, but it does show how much the figures on coverage can change as definitions change.

An even better indicator of good-quality sanitation would be households that have toilets in their home connected to sewers with water piped on premises and available 24 hours a day. If this was used to assess who had “improved sanitation” in urban areas, the figures would be much lower. The lack of detail in the JMP assessments also masks the achievements in many middle-income nations in extending much better than improved sanitation to a large section of their urban population.¹⁶

15. National Population Commission and ICF International (2014), *Nigeria Demographic and Health Survey 2013*, Abuja, Nigeria and Rockville, USA, 538 pages.

16. United Cities and Local Governments (2014), *Basic Services for All in an Urbanizing World*, Third Global Report on Local Democracy and Decentralization, Routledge, London.

V. COMMENT ON "SLUM" POPULATIONS

When the Millennium Development Goals included a goal on "slums", the need arose to measure and monitor progress towards it. The goal was "By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers". The wording is important. It is not to reduce or eliminate slums (which can worsen conditions for low-income groups), but to significantly improve the lives of slum dwellers. The numbers are a bit of a mystery – why 2020 instead of 2015 (used in other MDGs)? And why only 100 million, which represents a small proportion of slum dwellers in need of significant improvements in their lives?

Within the United Nations, responsibility for monitoring slum populations falls to the UN Human Settlements Programme (UN-Habitat). This agency defines a slum household as one or a group of individuals living under the same roof in an urban area, lacking one or more of the following five amenities:

- Durable housing (a permanent structure providing protection from extreme climatic conditions);
- Sufficient living area (no more than three people sharing a room);
- Access to improved water (water that is sufficient and affordable, and that can be obtained without extreme effort);
- Access to improved sanitation facilities (a private toilet, or a public one shared with a reasonable number of people); and
- Secure tenure (de facto or de jure secure tenure status and protection against forced eviction).⁽¹⁷⁾

Since information on secure tenure is not available for most countries, this was dropped from the definition. The definitions given for water and sanitation above do not match those of the JMP, but came to be more closely aligned with the JMP definitions for improved provision and the JMP statistics used in the calculations of slum populations.⁽¹⁸⁾

The United Nations claims: "Between 2000 and 2010, over 200 million slum dwellers benefitted from improved water sources, sanitation facilities, durable housing or sufficient living space, thereby exceeding the 100 million MDG target."⁽¹⁹⁾ This report also states: "The proportion of urban slum dwellers declined significantly."⁽²⁰⁾ Many countries are reported to have had a very large decline in the proportion of their urban population living in "slums". For instance, UN-Habitat claims that this proportion in India dropped from 54.9 per cent in 1990 to 41.5 per cent in 2000 and 29.4 per cent in 2009. For Bangladesh it dropped from 87.3 per cent in 1990 to 77.8 per cent in 2000 and 61.6 per cent in 2009. For Egypt it dropped from 50.2 per cent in 1990 to 28.1 per cent in 2000 and 17.1 per cent in 2009.⁽²¹⁾ Among other nations reported to have had large declines in the proportion of their urban population living in slums are Mali, Indonesia, Ghana and Nigeria. But this apparent progress is hard to reconcile with the many papers that have highlighted the growth of informal settlements in these and many other nations and the lack of success in increasing good provision for water and sanitation. If UN-Habitat used the JMP statistics on who uses drinking water sources piped on premises rather than who has "improved" provision, it is likely that slum populations would be substantially larger in many nations. The same would be true if the bar for "improved" sanitation provision was not set so low and with types of

17. UN-Habitat (2010a), *State of the World's Cities 2010/11 - Cities for All: Bridging the Urban Divide*, Earthscan Publications, London, page 33.

18. UN-Habitat reported that it had revised the definition of slums in 2008, so it was using lack of access to improved water and to improved sanitation facilities (rather than the previous definition, which was for inadequate provision). It seems that it chose to use the JMP figures for water and sanitation, but its definition still differs from the JMP definition as it includes within improved provision an excreta disposal system that is shared by a "reasonable number" of households – see UN-Habitat (2010b), "Chapter 1: Development Context and the Millennium Agenda", Revised and updated version (April 2010) of Chapter 1 in UN-Habitat (2003), *The Challenge of Slums: Global Report on Human Settlements 2003*, Earthscan Publications, London, available at <http://unhabitat.org/wp-content/uploads/2003/07/>

GRHS_2003_Chapter_01_ Revised_2010.pdf.

19. See reference 5, page 4.

20. See reference 5, page 3.

21. See reference 17.

22. See reference 18.

23. Mitlin, Diana (2015), "Will urban sanitation 'leave no one behind'?", *Environment and Urbanization*, Vol 27, No 2, pages 365–370.

24. WHO (2014), *Preventing diarrhoea through better water, sanitation and hygiene: exposures and impacts in low- and middle-income countries*, available at <http://www.who>.

provision that are inappropriate to most urban contexts. It may be that the dramatic drop in the proportion of urban dwellers living in slums is linked not to on-the-ground changes but to the changes in the definition; the revision of the slum definition in 2008 meant that pit latrines with slabs were included in the list of sanitation options that were "improved", whereas the original slum definition had considered these inadequate. In addition, the original UN-Habitat definition of slums had used the proportion of households with two or more persons per room as one of the indicators of overcrowding, but the 2008 revision has this as three or more persons per room.⁽²²⁾

VI. WHAT IS PROVISION FOR WATER AND SANITATION TRYING TO ACHIEVE?

The JMP recognizes the large gap between many of the drinking water sources and forms of sanitation considered "improved" (with all their health risks) and provision that has very low health risks and is the standard solution in high-income nations (water piped into the home that is of drinking water quality and available 24 hours a day, along with a flush toilet in the home connected to sewers or septic tanks that work). In effect, there is a "ladder" of different options for water and for sanitation that progressively lower health risks, increase convenience and reduce time (for instance from walking to and from and/or having to queue for community standpipes or toilets). Higher steps on the ladder may also reduce costs – for instance for households that previously had to rely on pay-to-use toilets and washing facilities.

It is likely that almost all households would prefer the solution with the lowest risks and greatest convenience unless these come with a cost burden that households find unaffordable,⁽²³⁾ or in cases where indoor space is so constrained (several people living in a single small room) that there is no room for a toilet. Of course, flush toilets will not be a preferred solution unless there is a regular and affordable water supply to flush them.

Figure 7 comes from WHO and draws on a range of studies. It makes evident the very large difference in the risks to health from diarrhoeal disease between unimproved sources of drinking water and piped water that is systematically managed. The same is true for the difference between unimproved sanitation facilities and community sanitation or sewer connections. The figure is also a reminder of the importance of good practice in water treatment and storage in the home (although those with regular piped water supplies can dispense with storage in the home). But this figure includes the following note: "*Estimates of risk reductions associated with transitions to higher levels of service are based on limited evidence and should therefore be considered as preliminary. They are not used in estimating deaths attributable to poor water and sanitation, but suggest that additional health gains could be achieved by transitions to higher levels of service.*"⁽²⁴⁾

Figure 8 provides more "rungs" on the ladder of health risks within urban contexts than Figure 7 does, but it lacks the specific estimates for diarrhoeal disease risk reduction. Figure 8 also highlights how provision for water and sanitation are linked and that deficits

int/water_sanitation_health/
gbd_poor_water/en/.

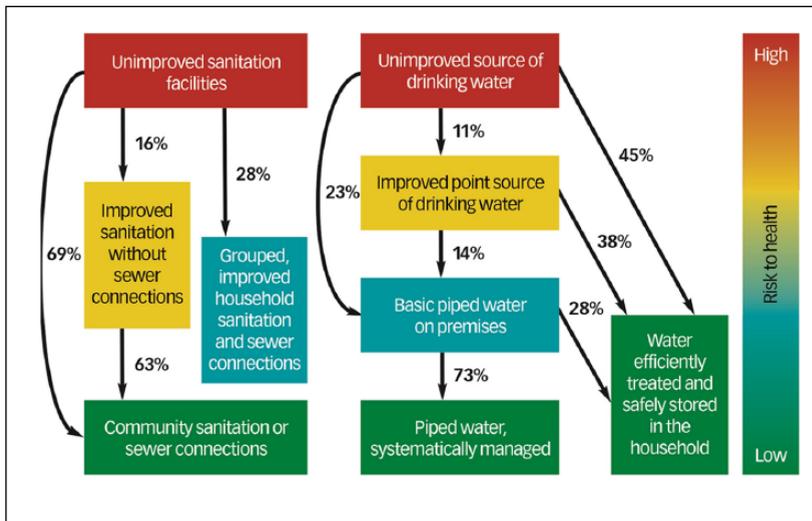


FIGURE 7

Diarrhoeal disease risk reductions associated with transitions in sanitation and drinking water

SOURCE: Adapted from WHO (2014), *Preventing diarrhoea through better water, sanitation and hygiene: exposures and impacts in low- and middle-income countries*, available at http://www.who.int/water_sanitation_health/gbd_poor_water/en/. Also see the papers in *Tropical Medicine & International Health* (2014), Vol 19, No 8, especially Bain, R, R Cronk, R Hossain, S Bonjour, K Onda, J Wright, H Yang, T Slaymaker, P Hunter, A Prüss-Ustün and J Bartram (2014), "Global assessment of exposure to faecal contamination through drinking water based on a systematic review", *Tropical Medicine and International Health* Vol 19, No 8, pages 917–927.

in sanitation become more critical if reliable sources of safe water are not also present.⁽²⁵⁾ Table 1 is a useful supplement to these two figures as it shows the very significant proportion of the population with "improved" provision who still lack safe water or water of drinking quality. This even includes a significant proportion of those with piped water.

25. Wankhade, Kavita (2015), "Urban sanitation in India: key shifts in the national policy frame", *Environment and Urbanization* Vol 27, No 2, pages 555–572.

VII. CONCLUSIONS

This paper has described the inadequacies in the statistical base for measuring and monitoring progress on the MDG targets for water and sanitation in urban areas. But even if we accept these inadequacies, a review of the statistics on changes to coverage from 1990 to 2015 for water piped on premises and improved sanitation shows targets not being met for urban populations in many nations. The paper has also highlighted that there would be much less progress in meeting targets for water and sanitation if the bar was not set so low.

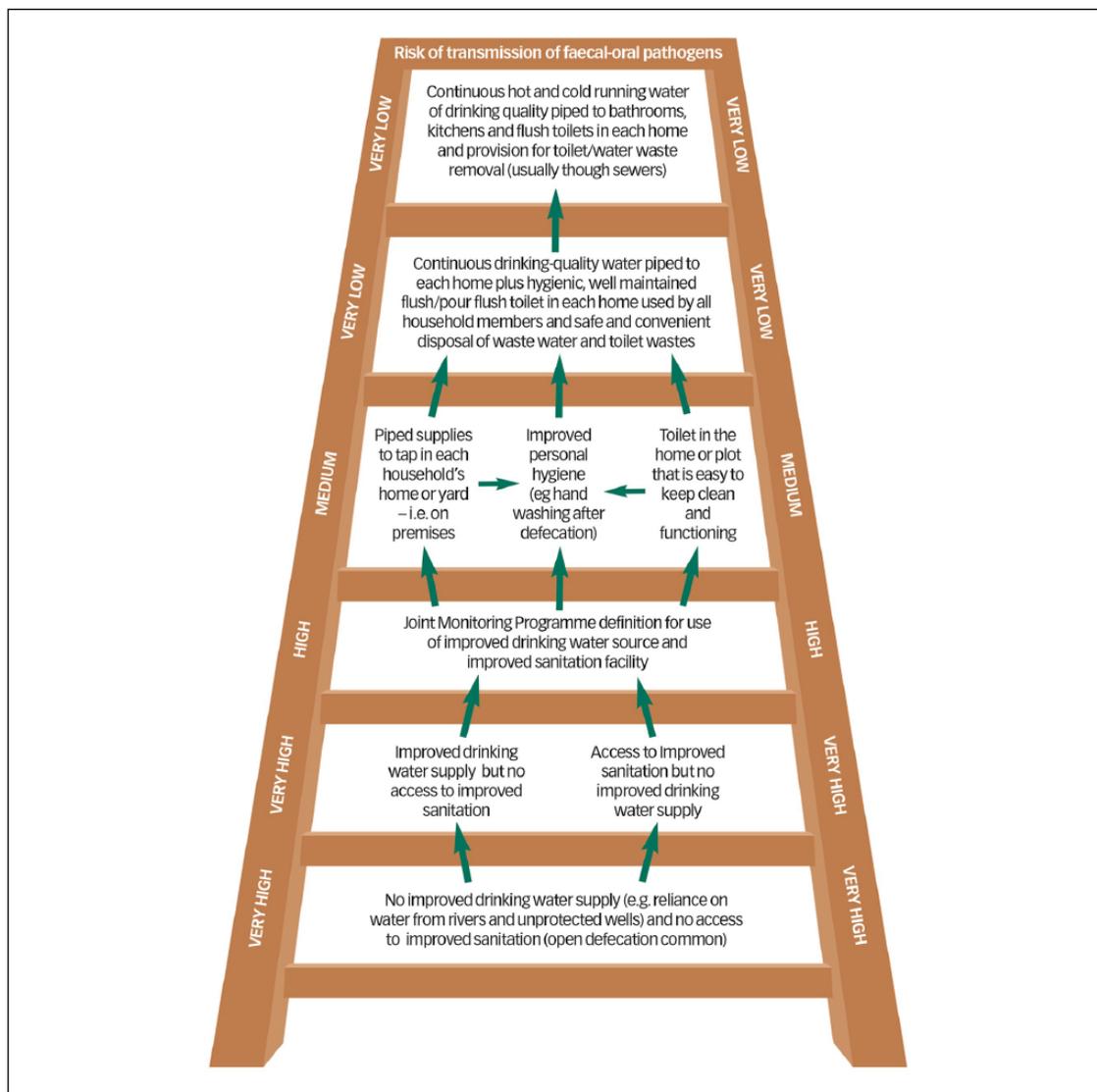


FIGURE 8
Different standards of provision in urban areas mean different risk levels.

NOTES AND SOURCES: The idea of constructing a ladder that highlighted improvements as the ladder was climbed go back to the classic paper by Sherry Arnstein: Arnstein, S R (1969), "Eight rungs on the ladder of citizen participation", *Journal of the American Institute of Planners* Vol 35, No 4, pages 216–224. Work on household energy also developed an energy ladder to show how rising incomes generally mean a shift in fuel use towards cleaner fuels and electricity. The use of a ladder to illustrate different levels of provision for water and sanitation has been discussed in some UN and JMP reports – see for instance Figure 1.1 in UN-Habitat (2003), *Water and Sanitation in the World's Cities: Local Action for Global Goals*, Earthscan Publications, London, which in turn drew on Prüss, Annette, David Kay, Lorna Fewtrell and Jamie Bartram (2002), "Estimating the burden of disease from water, sanitation and hygiene at a global level", *Environmental Health Perspectives* Vol 110, No 5, pages 537–542.

TABLE 1
The proportion of the population with faecally contaminated water

Region	% of population with faecally contaminated water			Total
	Piped water	Other improved	Other unimproved	
Sub-Saharan Africa	6	11	30	47
Oceania	7	10	42	59
Southern Asia	5	10	5	20
South-eastern Asia	4	18	9	31
Caucasus & Central Asia	14	7	12	33
Eastern Asia	5	3	6	14
Northern Africa	15	1	6	22
Western Asia	13	2	7	22
Latin America & Caribbean	12	2	5	19

SOURCES: Drawn from Figure 34 of WHO and UNICEF (2014), *Progress on Drinking-Water and Sanitation: 2014 Update*, Joint Monitoring Programme, Geneva, 80 pages, which drew on Bain, R, R Cronk, R Hossain, S Bonjour, K Onda, J Wright, H Yang, T Slaymaker, P Hunter, A Prüss-Ustün and J Bartram (2014), "Global assessment of exposure to faecal contamination through drinking water based on a systematic review", *Tropical Medicine and International Health* Vol 19, No 8, pages 917–927.

The significance of this is indicated by Table 1, which shows how much of the population with "piped water" and "other improved" provision still have faecally contaminated water. If more detailed data were available on water and sanitation, and if there was a more appropriate definition of adequate provision (in terms of health risk, access, convenience and cost) and of sustainable provision, the scale of the failure to meet the MDG water and sanitation targets in urban areas would be even greater.

This paper has also questioned the validity of applying the same definition for improved provision for water and sanitation to urban and rural areas – and the lack of regular reporting of the proportion of households with levels of provision that mean very low health risks (and that are the norm in high-income nations). These optimal conditions in most urban contexts are water piped to the home that is drinkable and available 24 hours a day and connection to a sewer. It is odd that sewer systems, which have brought great improvements to health and convenience in urban areas in high-income and many upper-middle income countries, and for which there is close to universal provision there, are not seen as worth reporting on as a separate category. The very large understatement of the deficiencies in provision for water and sanitation also means that the statistics on the extent of slum populations provided by UN-Habitat are too low, because "improved" provision for

water and sanitation are two of the four criteria used to define “slum” households. The estimation of the world’s “slum” population would be much higher if more appropriate standards were set on water and sanitation provision in urban areas.

The application of the same criteria for defining improved provision for water and sanitation in urban and rural areas also contributes to an understatement of the problem in urban areas. The 2013 United Nations MDG Report,⁽²⁶⁾ the GLAAS reports⁽²⁷⁾ and many UN JMP reports, like so many other UN documents, miss few opportunities to emphasize how provision is worse in rural areas. But in large part, this is because no allowance is made for differences in context. Can tube wells, boreholes and protected dug wells (all counted as “improved”) really work in all urban contexts? Do public taps and standpipes really represent improved provision in urban contexts where these are shared among so many households, and often at a distance, with irregular supplies and poor water quality?

It is difficult to know what to recommend in relation to improving data. No low- or middle-income nation has a data gathering system that collects data each year on provision for water and sanitation or on the number of people living in “slums”. It would be very expensive to have a monitoring system that accurately recorded progress on the ground year by year, especially if it had the detail needed to assess the safety and regularity of water supplies or the extent of the health risks associated with different forms of provision for sanitation. It would be even more expensive to greatly expand sample sizes for national sample surveys so that deficiencies in provision could be identified by location. If a (national, provincial/state or local) government is committed to improving provision for water and sanitation, it needs to know who has inadequate provision and where they live, and this requires data for each street and ward. This is the great limitation of national sample surveys; they do not provide the data needed to act (i.e. to show where the deficiencies in provision are). It does not help much to know that a certain proportion of the urban or rural population lack improved sanitation if there is no indication of where this is. A focus on national-level statistics also neglects the extent to which in many countries, it is local governments that need to act on water and sanitation provision and need the data to support their actions, and this calls for a very different data collection process.

There are also very large data gaps in many nations in the basic statistics that should underpin policies and priorities for any intervention that contributes to better health – especially vital registration systems that provide accurate data for each locality on the scale of premature death and the main causes. There seems to be a new enthusiasm for improving such records – but these need to be set up or improved in each urban area.

VIII. MDG LESSONS FOR THE POST-2015 SDGS

The Sustainable Development Goals make a strong commitment to universal provision for many services and to leaving no one behind. Goal 6 is “*Ensure availability and sustainable management of water and sanitation for all*”. It includes a range of sub-goals relevant to water

26. See reference 5.

27. GLAAS: UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (2014), *Investing In Water and Sanitation: Increasing Access, Reducing Inequalities*, World Health Organization.

and sanitation, including by 2030 the achievement of “universal and equitable access to safe and affordable drinking water for all” (6.1) and “access to adequate and equitable sanitation and hygiene for all”, as well as an end to “open defecation, paying special attention to the needs of women and girls and those in vulnerable situations” (6.2). 6.3 is on protecting water quality, and 6.4–6.6 on more efficient and ecologically sustainable freshwater management. 6.b focuses on supporting and strengthening “the participation of local communities for improving water and sanitation management”. SDG 3, “Ensure healthy lives and promote well-being for all at all ages”, includes 3.3: by 2030 ending “the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases” and combatting “hepatitis, water-borne diseases, and other communicable diseases”. Obviously, good provision for water and sanitation will help greatly in addressing the water-borne diseases, and good water and wastewater management can help cut the incidence of malaria.

The indicators for water and sanitation need to change a lot if they are to be used to track progress on these commitments. The current definitions for “improved” provision do not make it possible to measure equitable access as they contain so many different options (a household with a pit latrine and a slab is treated as equal to a household with its own WC with a sewer connection; a household with water piped on premises is treated as equal to one with access to a standpipe). “Improved” provision is not the same as provision that is adequate in terms of risk levels. New questions will need to be included in surveys on water quality (or safety), reliability, access/convenience and cost (to gauge whether a particular water supply option is affordable). A comparable list of questions is needed for sanitation – and with issues of cost too for those who use public or community toilets. Definitions of adequate provision need to separate rural and urban categories because of different contexts. And JMP reports should make more use of Demographic and Health Survey data – for instance reporting separately on the proportion of urban households with flush/pour flush toilets connected to sewers.

There is also a need for more transparency – and honesty – about the limitations in the statistics. Perhaps in tables showing changes in provision by year, the numbers given could be colour coded to highlight which figures are based on data collected from households and which are projections or estimates.

But there is a more fundamental issue – how to generate the data on inadequacies in provision for water and sanitation *for each locality* so they can actually guide policy and investment. The SDGs demand far more attention to water and sanitation. The need for major improvements in data has been stressed. But this calls for a rethink within many governments and international agencies on water and sanitation provision in an urbanizing world. If it is accepted that in most urban contexts, solutions must be locally devised with the full engagement of those who are inadequately served, this also means a rethink of external funding systems. This has to include a capacity among donors to listen to, work with, and support local governments and civil society organizations to develop locally appropriate solutions, including co-production.⁽²⁸⁾ This also has to go beyond supporting a few innovative “community”

28. See reference 4; also Mitlin, Diana (2008), “With and beyond

the state — co-production as a route to political influence, power and transformation for grassroots organizations”, *Environment and Urbanization* Vol 20, No 2, pages 339–360.

29. See the work being done within the many federations that are members of Slum/Shack Dwellers International – <http://www.sdinet.org>.

initiatives to developing the financial and institutional means to support this at scale. This may include the support needed for forms of provision that many funders do not fund at the moment (shared toilets, community toilets) and for organizations they do not fund (especially representative organizations of slum/shack dwellers⁽²⁹⁾). But gathering the data needed to support local action is very different from the current focus on improving national sample surveys.

Of course, even if most new provision for sanitation is for on-site solutions, funding is also needed to put city-wide systems in place, for piped water (and water treatment), for solid waste collection and management, for faecal sludge, and for storm and surface drainage. Such city-wide systems can bring enormous advantages to low-income groups. If done properly they can also provide benefits over many decades.

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