

Urban Water and Sanitation in Tanzania

Remaining Challenges to Providing Safe,
Reliable, and Affordable Services for All

BRIEF

Background—Country Context

Although still largely rural, Tanzania has one of the highest urbanization rates in Sub-Saharan Africa, growing at a rate of 5.4 percent (WDI 2015). Approximately 54 percent of the population is expected to be living in cities by 2030. Dar es Salaam, home to 40 percent of the country's population, is expected to have 10 million inhabitants by then (World Bank 2017), a large bulk of whom will be living in low-income and slum settlements. Water supply and sanitation (WSS) services in growing urban centers in African cities are important for both economic and human development outcomes. Nonetheless, thus far, providers of WSS services in urban Tanzania, and in particular Dar es Salaam, have struggled to keep pace with the demand for improved services due to economic and population growth. This has had consequences for both rich and poor households, but those in marginalized low-income settlements are of course hit the hardest.

About the WASH Poverty Diagnostics

This brief draws from the Tanzania WASH Poverty Diagnostic (TWPD) report (World Bank, forthcoming), an initiative of the World Bank Water Global Practice (GP), which brings together analytics from across sectors to identify practical, operationally relevant findings on the linkages between water supply, sanitation, and hygiene (WASH) and poverty. The diagnostic identifies the B40 of the wealth distribution and focuses on the disparities they face in WASH access. It also identifies how these disparities and challenges affect other human development outcomes in sectors such as health and nutrition. Finally, it puts forward recommendations for how to address these deficits within the existing institutional context.

In this brief, we cover the current state of WSS services in urban areas of Tanzania and trends over time, primarily focusing on Dar es Salaam, using available data from sources across different years. In accordance with the TWPD's objectives, the analysis enables comparison between the T60 and the B40 of wealth distribution. First we look at overall coverage rates for both water supply and sanitation and their progress since 2005 according to the MDGs. Second, we reexamine these coverage rates according to SDG criteria. This means critically reanalyzing what we mean by "improved" to also include additional dimensions of safe WSS access, well beyond technology alone. We find that urban water coverage, though at first sight seeming more comprehensive and equal, is often unsafe, unreliable, and, for some, unaffordable. For sanitation, we find that improved coverage has gone up but still remains very low and in particular unsafe for a large percentage of the B40 poor population.

HIGHLIGHTS

The urban population of Tanzania is rapidly expanding, with quadrupled figures since 1990. Dar es Salaam has the highest concentration, home to 40 percent of the urban population and on course to be a megacity by 2030.

Millennium Development Goal (MDG) coverage rates for improved water in urban areas are high compared to other countries in the continent and have seen improvement over recent years, reaching 87 percent in 2016 (DHS).

While urban sanitation coverage has increased, improved and unshared facilities still only cover 43 percent of the urban population. Improved facilities are largely onsite with only 2 percent sewer coverage. Wastewater treatment and fecal sludge management need significantly more attention.

Although the gap between the top 60 percent (T60) and bottom 40 percent (B40) access to MDG improved water service has been gradually shrinking, the same cannot be said for sanitation, which remains very unequal with a widening gap between nonpoor and poor households.

Measurement by Sustainable Development Goal (SDG) standards reveals concerns over affordability, reliability, and quality of the water provided. The inability of the utility to cater for the whole population and the resulting proliferation of unregulated informal providers means that poor populations in Dar es Salaam are increasingly affected by high cost water.

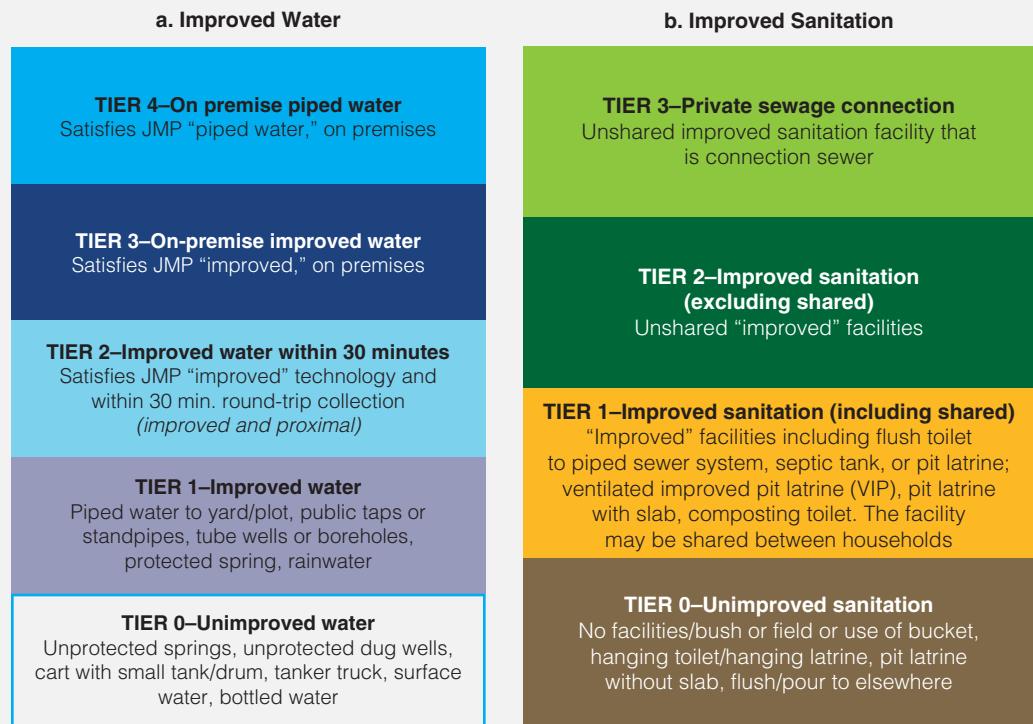
In the wake of frequent cholera outbreaks, the emphasis of the SDG sanitation targets on improving safe disposal of fecal sludge is particularly relevant in urban Tanzania.



Comparing the MDG and SDG Definitions of “Improved”

The SDGs differ from the MDGs in their scope and conceptual appreciation of what having “improved” coverage means. For water, SDG 6 is to “achieve universal and equitable access to safe and affordable drinking water for all” by 2030.^a This new framework means consideration of aspects of service such as **accessibility**, **reliability** of service, **affordability**, and **quality**. For sanitation, this means focusing on improved and **unshared facilities** and an appreciation of **safe disposal** and **treatment** of waste and wastewater. The WPD has used a conceptual framework of “Tiers” to at least partially demonstrate how this can be displayed in a hierarchy, as in figure 1, panels a and b.

Figure 1: World Bank Tiers of SDG-Improved Water Supply and Sanitation



Note: JMP = Joint Monitoring Programme.

a. For more information, see the UN’s website, <https://sustainabledevelopment.un.org/sdg6>.

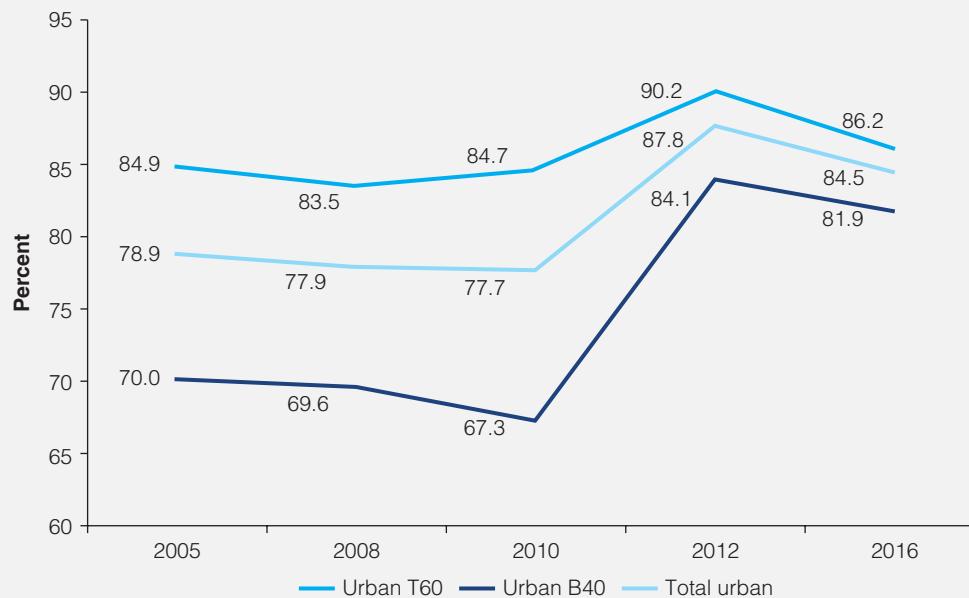
Reducing Inequality in Water Coverage and a Widening Gap in Sanitation

Overall, MDG improved water coverage in urban areas of Tanzania currently stands at **84.5 percent** (DHS 2016), far above the national average at 59.6 percent and higher than many other countries in the region (van den Berg and Danilenko 2017)¹.

Examining differential access between rich and poor, our analysis of DHS coverage rates since 2005 shows this gap narrowing between the T60 and B40 of the

1. A recent comparative study by WSP of cities across Africa finds that Dar es Salaam is one of 17 cities that has achieved relatively good coverage rates in improved water service for the poor (Van den Berg and Danilenko 2017)

Figure 2: Trends in Improved Water Coverage in Urban Areas in Tanzania, T60 and B40, 2005–16



Source: World Bank calculations using DHS 2005–16.

Note: B40 = bottom 40 percent of the population; T60 = top 60 percent of the population.

wealth distribution. The latest figures putting their coverage rates only 5 percentage points apart, and both over 80 percent (see figure 2).

Meanwhile, while sanitation rates have improved greatly since 2005, improved and unshared facilities still covered only 43 percent of the urban population in 2016. Furthermore, in contrast to water coverage, the gap between T60 and B40 for urban improved sanitation has remained consistently wide between 2005 and 2016 and seems to be on the rise with a 40 percentage point gap in 2016 (see figure 3).

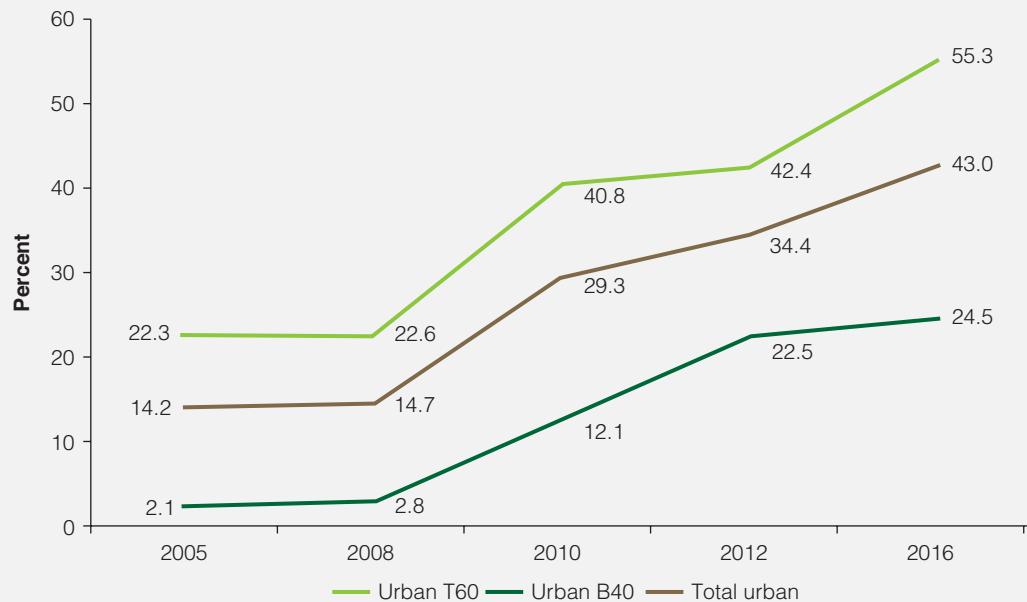
Thus, these figures seem to tell a far more positive story for water than for sanitation, but as the following analysis shall reveal, these initial figures can mask issues when considering the SDG dimensions of service in water such as accessibility, reliability, affordability and water quality.

Sources of Water for Urban Households

The most dominant source of drinking water for Tanzanians in urban areas is piped water (26.3 percent). Those who cannot get water piped to their premises may next rely on a neighbor's connection (23.3 percent), protected well (14.3 percent) or public tap or standpipe (11.8 percent). A relatively small percentage relies on other sources, both improved (e.g., boreholes or tube wells, 5 percent); and unimproved (e.g., tanker trucks or small carts, 4.9 percent; unprotected wells, 4.4 percent; among others) (see figure 4).

Disaggregating water access by different population groups reveals that coverage of piped water to premises is more than three times higher for the T60 (36.7 percent) than for the B40 (10.8 percent). About 28 percent of the B40 instead rely on piped services to a neighbor, and a larger share of poor households rely on public standpipes and protected and unprotected wells.

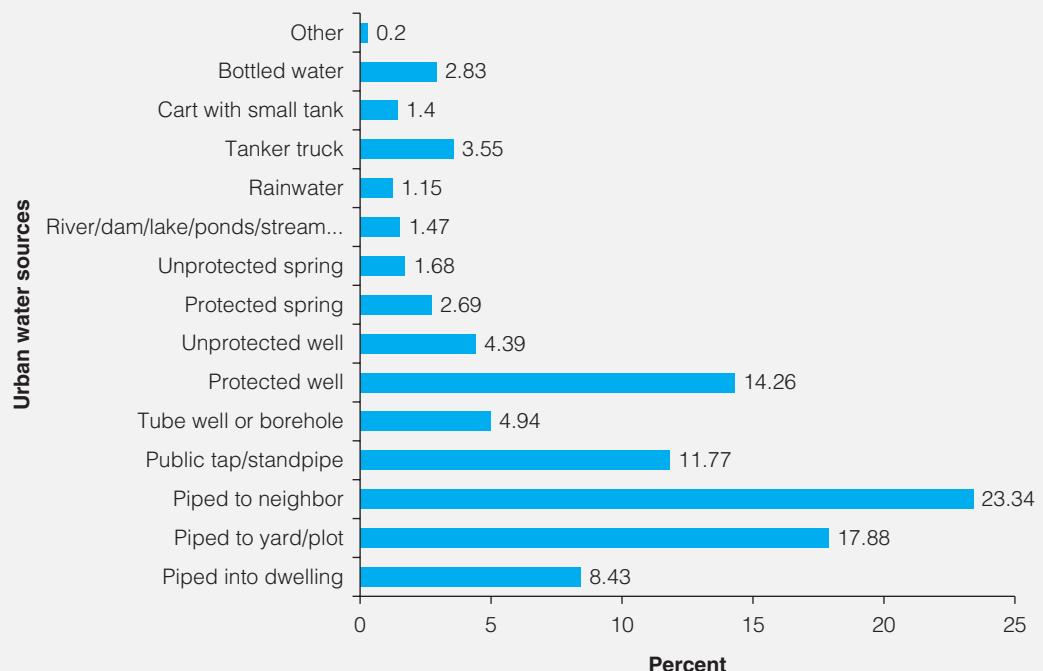
Figure 3: Trends in Improved and Unshared Sanitation Coverage in Urban Areas in Tanzania, T60 and B40, 2005–16



Source: World Bank calculations using DHS 2005–16.

Note: B40 = bottom 40 percent of the population; T60 = top 60 percent of the population.

Figure 4: Disaggregation of Coverage by Water Source in Urban Areas in Tanzania, 2016



Source: World Bank calculations using DHS 2016.

Reliability and Affordability Issues with Water Supply Services

During the MDG era, next steps for service delivery in water would be to expand the piped network coverage to the final 15 percent of the urban population who currently lack improved access. However, whilst expansion of piped water coverage is still very necessary, expansion without consideration of the need to improve service *quality*, particularly in terms of regularity and affordability, would not necessarily provide a better service for all. This is particularly the case in Dar es Salaam, where according to a Policy and Satisfaction Survey by Research on Poverty Alleviation (REPOA), households are more dissatisfied with aspects of their water supply than in the rest of the country—even when considering rural areas (WaterAid 2008:3).

Field research has shown that those receiving piped services, particularly in Dar es Salaam, have been **plagued by poor continuity** of service leading them to rely often on multiple sources. While some in low-income urban areas are digging wells unofficially to deal with the lack of continuous supply, another recourse is tanker trucks or carts with small tanks (Smiley 2016). Interestingly, reliability in urban areas for piped supply seems to be even lower than that of rural areas. In rural areas 56 percent of households with piped access reported interrupted service when compared to 66 percent in urban areas in the previous two weeks (DHS 2016).

Tanker trucks or carts with small tanks still constitute a small percentage of the reported primary drinking water sources in overall urban areas (around 5 percent, according to DHS 2016). However, such mobile vendors are highly prevalent in Dar es Salaam, with the B40 overtaking the T60 in terms of their reliance on this source in recent years. In 2016, 18 percent of the B40 and 12 percent of the T60 reported relying on tanker trucks or carts with small tanks for drinking water (DHS) (see figure 5). There are multiple reasons for why Dar, in particular, has seen this increase. Firstly, this is a result of a legacy of “hydraulic exclusion” in water provision (Slater and Jingu 2016). This is where piped connections have historically been limited to a heavily subsidized service in richer areas. Meanwhile, poorer populations and incoming migrant populations on the outskirts of the city have had to resort to point sources or mobile vendors. Some such mobile vendors may be official trucked water provided by Dar es Salaam Water & Sewerage Corporation² (DAWASCO),³ but reports that have studied informal provision (Pauschert et al. 2012) provide evidence that DAWASCO’s supply is not meeting the increasing demand of these new populations. Even for those who have piped supply, the lack of reliable service means a higher dependence on mobile vendors as a secondary option.

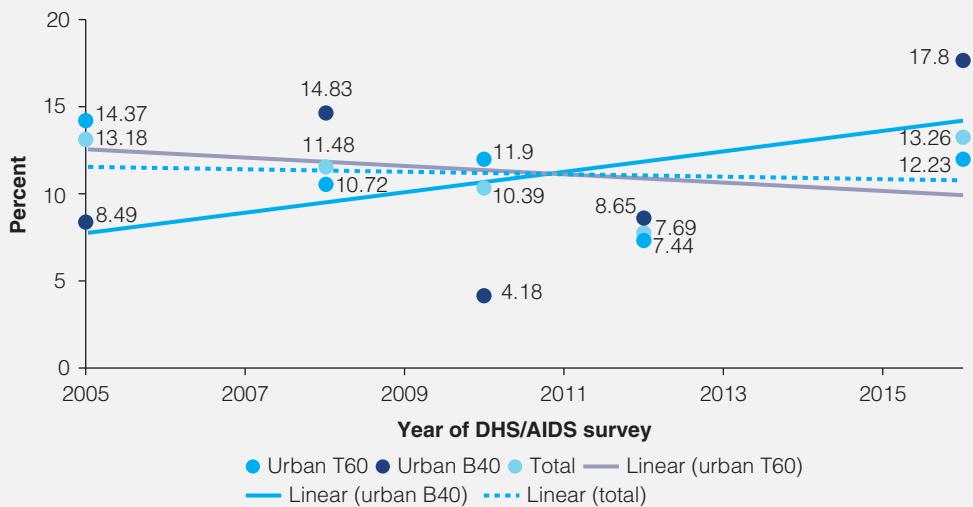
Map 1 shows the spectrum of DAWASCO’s provision of continuous service in Dar es Salaam. Field research shows that even in areas that are supposed to have 24-hour coverage, such a service is not consistently provided. There are also reports of customers having to get up in the middle of the night to fill buckets with water when the service cuts in (Smiley 2016, 10). DHS (2016) finds that 75 percent of those responsible for collecting water in urban areas are women; so having to perform this kind of chore disproportionately affects them.

The lack of reliability of service affects health services, too. Time spent collecting water can take time away from treating patients. Lack of availability of water also

2. In Dar es Salaam (and in two peri-urban districts of the adjoining Pwani region), the responsibility for water supply and sanitation is split between an asset holding company that is responsible for capital investments (the Dar es Salaam Water and Sewerage Authority [DAWASA]) and an operating company that runs the water and sewer system on a daily basis and bills the customers (DAWASCO). Dar es Salaam is an exceptional case in terms of its WSS service delivery structure.

3. From the data available, it is not possible to distinguish how many of these are also private vendors.

Figure 5: Share of Increases of Dar es Salaam Population Reliant on Tanker Truck Services, T60 and B40, 2005–16



Source: DHS 2005–16.

Note: B40 = bottom 40 percent of the population; T60 = top 60 percent of the population.

makes it difficult to perform essential tasks including surgery, equipment sterilization, washing soiled linens, flushing toilets and bathing patients (Social Impact 2014). These factors have the potential to be particularly detrimental in environments such as these, where it is most necessary to control disease transmission.

Regarding affordability, vendors have been known to mark up the price of the water that they sell by up to five times (Smiley 2016: 12). This corroborates with a recent study by the Joint Monitoring Programme (JMP), which indicates that 10 percent of the population were paying over 5 percent of their total expenditures on water in 2012 (WHO/UNICEF 2017). This is higher than all ten other countries included in the JMP's analysis. In fact, about 32 percent of those who access water from tanker trucks or vendor in Tanzania were those paying over 5 percent of their expenditures on water.

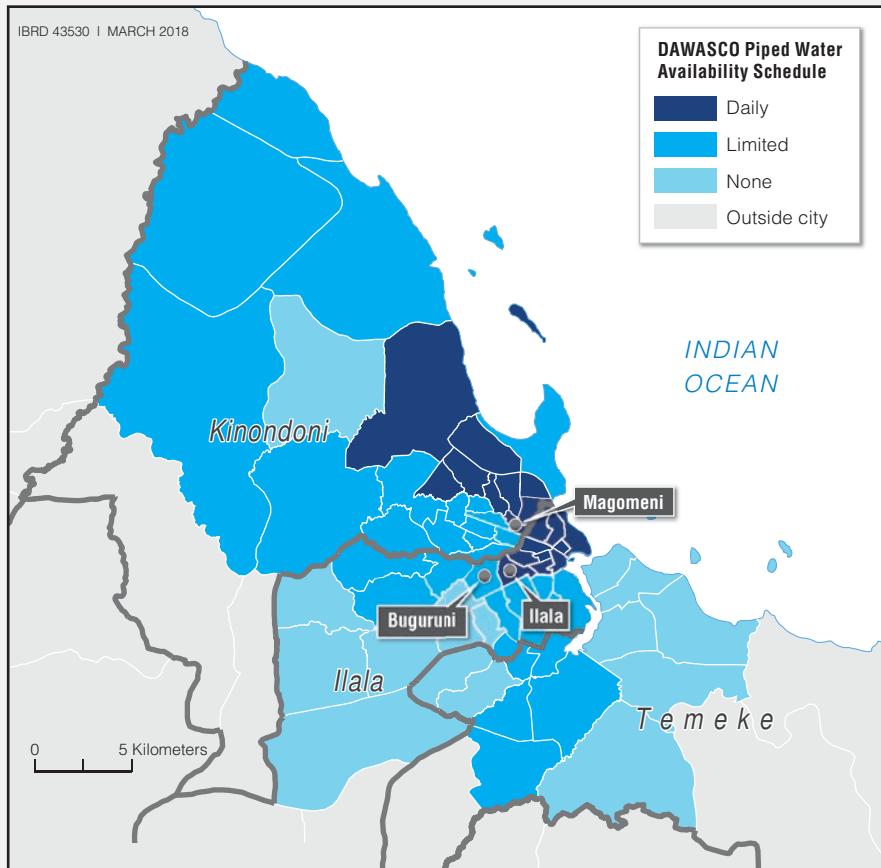
The growing reliance of the B40 on informal services in urban areas of Tanzania is thus more concerning given various reports of high prices.

Unsafe Water

Although no comprehensive water quality data have been collected across Tanzania's urban centers, some small studies have shown worrying results for water quality in Dar es Salaam. A recent study by Social Impact finds *E. coli* contamination in one in four household water samples in Dar es Salaam, which went up to one in three for community and shared tap sources (Social Impact 2014). One might assume this could be due to free chlorine being lost along pipes in need of repair on their way to their consumption points. Nonetheless, the same study finds that in one of the two main treatment plants (Lower Ruvu), only one in four samples met the minimum dosage of free chlorine, meaning that inadequate treatment was at the source point as well.

Even if the water is not contaminated at the source, the reliance on storage in the household due to poor continuity leads to increased risk of contamination. While 80 percent of those

Map 1: DAWASCO's Reported Piped Water Coverage by Continuity of Service, Dar es Salaam, 2016



Source: Adapted from Smiley 2016.

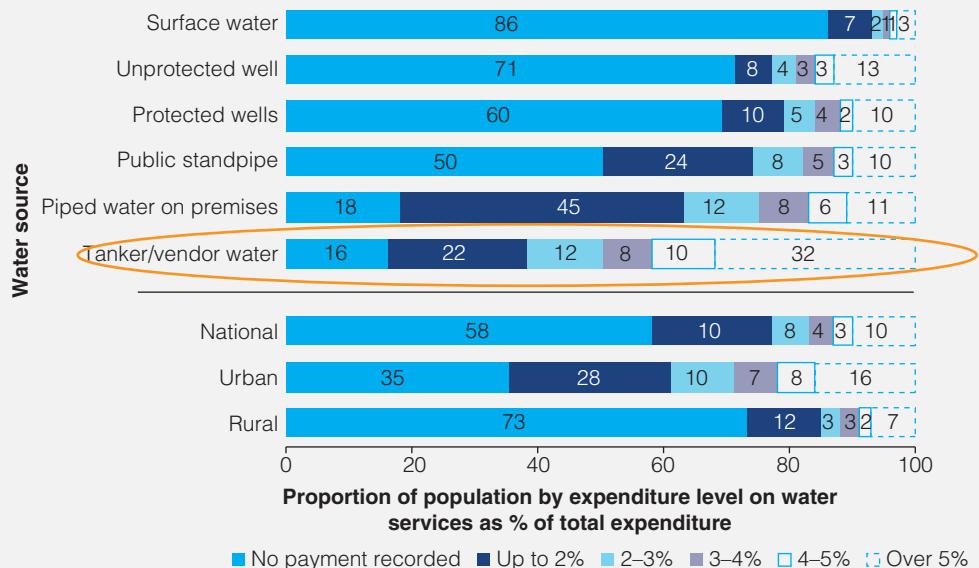
Note: DAWASCO = Dar es Salaam Water & Sewerage Corporation.

who receive water from their own tap treat their water for drinking, this drops to 50 percent for those who receive from a public standpipe. Given that the study finds shared tap sources to be more contaminated, this makes these customers even more at risk.

In comparison, the quality of water provided by Informal Service Providers (ISPs) is perhaps of even greater concern given the lack of a regulator's oversight. ISPs may include mobile vendors, water tankers, private boreholes, and neighborhood resellers among others. They may get their water either from the utility itself, with or without providing payment, or from open water sources such as rivers or streams. In Dar es Salaam it has been reported that vendors mix brackish water from wells with utility water to neutralize the taste (Social Impact 2014). In some towns, such as Moshi, Tanga and Iringa, 100% of ISPs claim to sell water from the public utility. In others such as Kigoma, only 9% reported to take water from the public utility for resale (Pauschert 2012:19⁴). Due to these concerns, a recent study by the Center for Disease Control (CDC) is now looking at encouraging the bulk chlorination by ISPs themselves before distribution to reduce the need for behavioral change in water treatment at the household level (Rajasingham, Hardy, Kamwaga, et al. 2017)

4. This information is taken from a study by GIZ which surveyed over 32,000 households and 2,315 ISPs in low income areas of the 20 biggest urban centers in Tanzania in 2012.

Figure 6: Proportion of Population in Tanzania by Level of Expenditure on Water Services as Percentage of Total Expenditure, 2011



Source: WHO/UNICEF 2017.

Note: Data show that in Tanzania, households using tanker or vendor water are most likely to spend over 5 percent of their annual budget on water.

Photograph 1: Water from Community Source in Morogoro



Source: Social Impact 2014.

Gap in Urban Sanitation

An underlying reason for poor water quality could potentially derive from poor sanitation and hygiene coverage, due to contamination of the water supply with untreated fecal matter. Such contamination can come about with particularly hazardous repercussions in urban areas where population density is high. This is an area in which practitioners and policy makers should be placed on high alert.

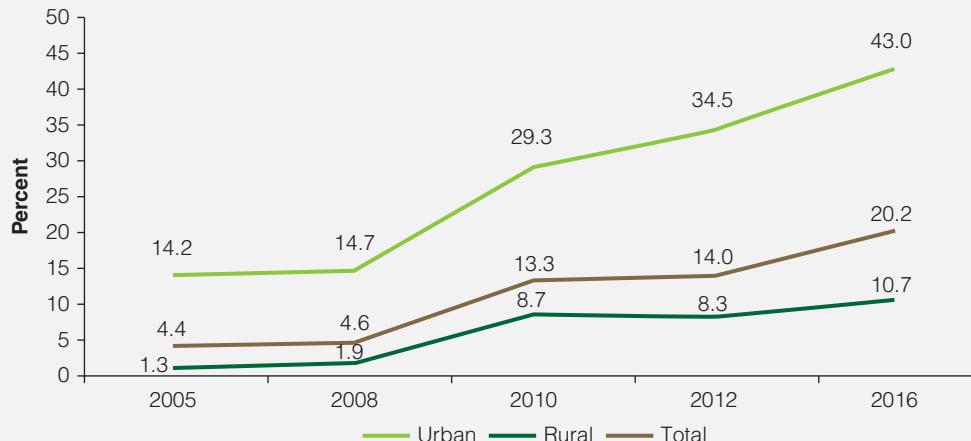
Improved sanitation rates do seem to have increased substantially over recent years as we can see from figures 7 and 8. The almost 30 percentage point increase in improved and unshared sanitation coverage since 2005 is certainly good news and levels of improved sanitation in urban areas are now over double the national average.

However, there is certainly not cause to celebrate prematurely: 43 percent coverage for improved sanitation, while certainly better than the mere 11 percent in rural areas, still means that less than half of the population have coverage in areas in which the population is far more densely packed, and thus unsanitary conditions can have far-reaching health implications. When we disaggregate by B40 and T60 populations, the inequalities for sanitation are much starker than those of urban water in DHS data.

If we break the data down by types of toilet, disregarding the shared criteria we still find high figures of unimproved facilities among the B40. As shown in figure 9, 45.4 percent of the B40 are using some form of unimproved pit latrine, and as many as 6 percent are openly defecating. Only 16 percent of the B40 have a flush to pit latrine option, while this is 44.7 percent for the T60.

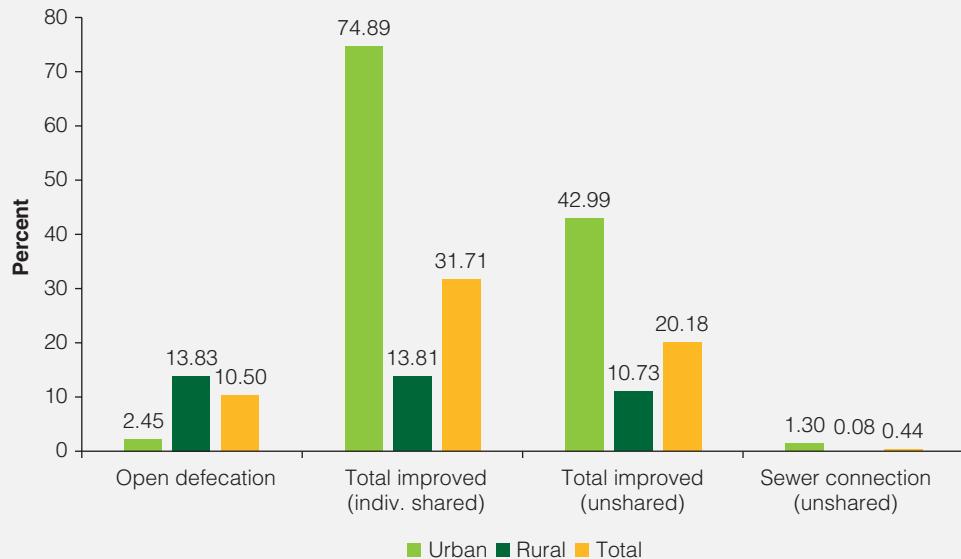
Moreover, figure 8 shows substantially higher coverage rates for improved and shared facilities (75 percent) according to the latest DHS analysis. Nonetheless, shared facilities are categorized as unimproved by the JMP. High rates of unimproved coverage are a source of concern, particularly during the rainy season when flooding can destabilize an already risk-filled environment for potential cholera outbreaks due to drinking water's proximity to waste water and poorly maintained pipes with regular interruptions to service. Furthermore, sewerage connections still constitute under 2 percent coverage in urban areas, thus leaving another channel for untreated

Figure 7: Trends in Improved and Unshared Sanitation in Tanzania, 2005–16



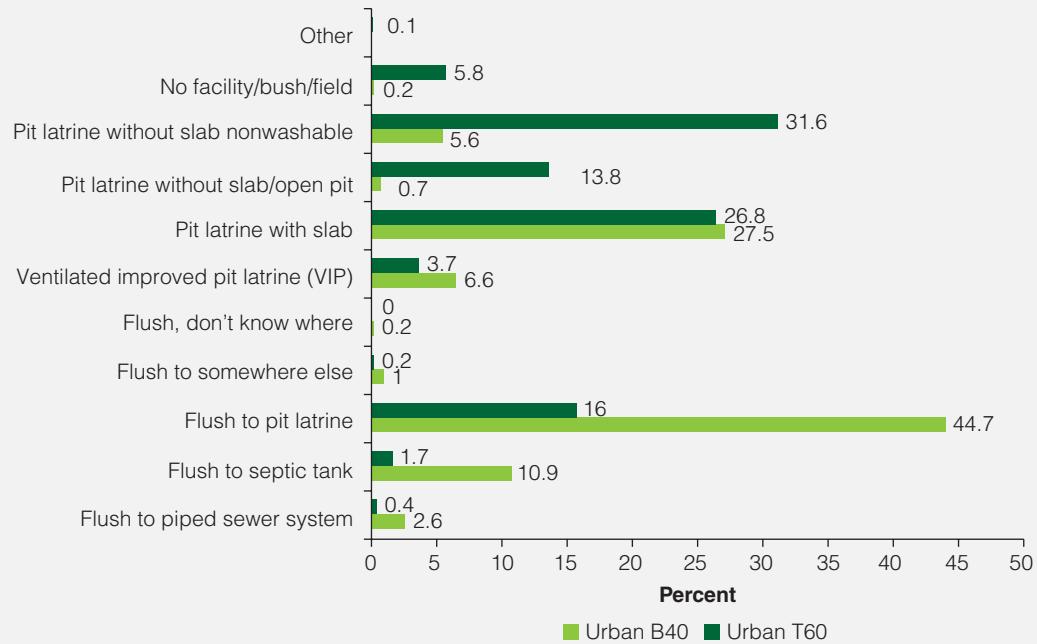
Source: DHS 2005–16.

Figure 8: Urban, Rural, and National Distributions of Sanitation Coverage in Tanzania, 2016



Source: DHS 2016.

Figure 9: Sanitation in Urban Areas, B40 and T60: Toilet Facilities, Tanzania, 2016



Source: DHS 2016.

Note: B40 = bottom 40 percent of the population; T60 = top 60 percent of the population.

wastewater to make its way into the environment. Even if the facility is improved, thus removing risk of direct *E. coli* contamination at the household level, if wastewater treatment is not properly managed this can lead to seepage/leakage of wastewater into the environment, again risking contamination of drinking water in particular. Despite overall declines in the number of cholera cases in Tanzania in recent years, outbreaks continue to occur. In 2017 some 4,985 cases including 99 deaths were reported in Tanzania Mainland and Zanzibar (WHO 2018).

Conclusions

As Tanzania's urban areas, in particular Dar es Salaam, see increasing levels of growth in recent years, the expansion of networks need to be designed with quality and safety of service in mind for water and sanitation, respectively. While Tanzania's urban providers have made certain progress in narrowing the gap between rich and poor populations in terms of their access to MDG-improved water coverage, the same cannot be said for sanitation, in which the B40 have been left behind for many years.

For water, an expansion of the network on its own will not be sufficient for Tanzania to reach its SDG and national targets. Research highlighted in this brief has shown that presently, some customers are paying up to five times more for their water than the price that the utility could be providing it to them for directly. We notice that in Dar es Salaam the dependence of the B40 on tanker trucks has even surpassed the dependence of the T60 in recent years. In this sense, the current arrangement benefits neither the customers nor the utility itself, and seems at risk of backsliding on its progress for the poor.

In this brief the SDG framework is harnessed to emphasize coverage of several other considerations. This means rethinking efforts to focus not just on the infrastructure but also on the institutions providing the service. Now that progress in water coverage has been made, providers are encouraged to take a step back and reconsider investment in water treatment, network maintenance, and water production. This includes prioritizing their ability to enforce stronger regulation of water treatment, acknowledging and working with informal providers; building mechanisms to ensure greater continuity of supply; and improved capacity to operate and maintain the existing network. With a solid foundation, further network expansion can then continue with lower risk of repeating the same reliability, affordability, and safety concerns. Furthermore, it can reduce dependence on informal providers in the process.

For sanitation, a greater focus should be placed on narrowing the gap in unequal service to poor households. It is clear from this report that unimproved sanitation is the most predominant option among the urban B40, and that, proportionally, their coverage has been consistently 20 percentage points or more lower than that of the T60 since 2005. Cholera outbreaks continue to be a problem in Dar es Salaam (Kihupi et al. 2016). The added risks from heavy rainfall, as the city has seen recently, could combine with low levels of safe sanitation to put its inhabitants at a greater health risk. A policy recommendation would be to drive forward efforts for a transition from unimproved to improved-and-safe sanitation. This seems not to have been given the attention it deserves in recent years, and addressing this deficiency could contribute to improved health outcomes for the urban population as a whole.

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About the WASH Poverty Diagnostic Initiative

The WASH Poverty Diagnostic is a global initiative that aims to have local impact by understanding the extent to which the social contract for delivering WASH services is working for all—particularly the poor and vulnerable—and if it not, who is not benefiting and why? The initiative ultimately aims to better understand binding constraints in service delivery and search for solutions that are both technically and politically feasible to overcome them. Results from this initiative are intended to be public goods to inform country-level policy dialogue and programming as well as the methods and frameworks for broader consumption by a variety of specialists. The initiative is led by the World Bank's Water and Poverty Global Practices in close collaboration with the Governance and Health, Nutrition, and Population Global Practices. This initiative also collaborated closely with the UNICEF/WHO Joint Monitoring Programme (JMP).

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