



Working Paper 432

The SDGs at city level

Mumbai's example

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Cover photo: Evening in Dharavi slum, Mumbai - Adam Cohn CC BY ND NC

Contents

1. Introduction	6
1.1 Why a focus on cities?	6
1.2 Leaving no one behind in cities	6
2. Our approach	8
3. A brief history of Mumbai's slums	11
4. SDG performance at city level: Mumbai's example	12
4.1 Access to water	12
4.2 Access to sanitation	13
4.3 Access to housing	15
5. Conclusion	17

Tables

Table 1: Targets and indicators used in our analysis	9
Table 2: Access to improved water sources and to piped water on premises, 1998 and 2006	13
Table 3: Access to sanitation, 1998 and 2006	14
Table 4: Slum populations in Mumbai – comparing estimates over time from different sources	16

Figures

Figure 1: Projecting progress on 'improved' sanitation in Mumbai settlements – an illustration	15
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Acronyms

DESA	Department of Economics and Social Affairs
DHS	Demographic and Health Survey
IAEG	Inter-Agency Expert Group
IIPS	International Institute for Population Sciences
JMP	Joint Monitoring Programme
MCGM	Municipal Corporation of Greater Mumbai
MDG	Millennium Development Goal
NGO	Non-Governmental Organisation

ODI	Overseas Development Institute
SDG	Sustainable Development Goal
SRA	Slum Rehabilitation Authority
UN	United Nations
UNICEF	UN Children's Fund
UN-Habitat	UN Human Settlements Programme
WHO	World Health Organization

Key messages

- How countries manage urbanisation over the next 15 years will define governments' ability to achieve most of the Sustainable Development Goals.
- Our analysis of performance over time (1998–2006) for three SDG targets in Mumbai (at city and slum settlement levels) suggests the target on access to water will be easier to achieve than the sanitation and housing targets.
- However, data limitations at subnational level make it difficult to reach definite conclusions on trends over time, let alone to project performance through 2030 for these and other targets.
- The SDGs provide an opportunity to set up-to-date credible baselines for cities and slums and to make historical data (where they exist) more accessible, for instance through user-friendly online portals. Having such data would highlight areas where progress needs to be accelerated or trends reversed, motivating city governments and campaigners to act.

1. Introduction

With the Sustainable Development Goals (SDGs) now agreed, the real test of their success lies in their implementation. Compared with the Millennium Development Goals (MDGs), the SDGs have ramped-up levels of ambition. Yet little work has been done to assess how likely it is that the world will achieve these goals by 2030.

Nicolai et al. (2015) offered the first systematic attempt to project progress across the SDG agenda and showed much more effort would be needed to reach the goals. Global projections provide a necessary and useful overall picture of SDG progress, but ultimately, to aid governments in their implementation, more detailed analysis at national and subnational levels is needed. While Nicolai et al. (forthcoming) estimate SDG progress at regional and country levels, this briefing (much narrower in scope, given the many data limitations faced at a subnational level) seeks to complement this work by providing a more localised picture of progress. Using Mumbai as an illustrative example, it examines SDG progress for the city and its slum settlements for three selected targets: access to water, sanitation and decent housing.

1.1 Why a focus on cities?

It is relevant to look at SDG performance at a city level for at least two reasons. First, urban populations are growing fast in many developing countries, particularly in Asia and Africa. The world's urban population is now close to 3.9 billion and is expected to reach 6.3 billion in 2050, with 90% of this growth taking place in urban areas in these two regions (UN DESA, 2014). While cities are often rightly portrayed as drivers of economic growth and opportunity for many developing countries, service provision and job creation in the formal sector are not accompanying the fast pace of urban population growth. This means access to basic services and livelihoods in the city remain precarious for many. Today, about 1 billion people live in informal settlements; this number could reach 3 billion by 2050 (UN DESA, 2013). Many of these settlements are located in disaster-prone areas, vulnerable to the threat of climate change. How countries manage urbanisation over the next 15 years will be critical to reducing poverty and environmental sustainability, and, ultimately, will define governments' ability to achieve most SDGs.

In addition, city governments have an important role to play in managing urban growth and in the implementation of the SDGs more generally (Lucci, 2015). Although the level of decentralisation varies by country, broadly speaking local governments have responsibilities for delivery of basic services (e.g. water, sanitation and land-use decisions leading to housing provision, among many others) that are clearly linked to many of the goals. To achieve the SDGs, local governments need to be on board. This gives citizens (and civil society) an additional lever to use for influence to bring about change.

1.2 Leaving no one behind in cities

But it is not just trends at city level that matter: what happens within the city is equally important. The SDGs, through a commitment to 'leaving no one behind', have made it clear progress needs to reach the poorest and most marginalised. In part, this emphasis seeks to address some of the shortcomings of the MDGs. While significant improvements were made during the MDG period on income poverty, health and education outcomes, the poorest groups (e.g. women from ethnic minorities) saw the least progress (Bhatkal et al., 2015).

In the urban context, inequalities between different groups, including their place of residence – for example a slum settlement versus a wealthy neighbourhood – can be particularly salient. A large proportion of the urban poor live in slums, due to a lack of affordable housing within the city. Given their informal nature (lack of tenure or contravention of building regulations), residents are often stigmatised and neglected by governments. This affects their access to safety nets and to financial resources and services, even when provided by the private sector (e.g. bank accounts, insurance, and loans). In line with the 'leaving no one behind' agenda, we disaggregate SDG performance on selected targets for slum dwellers to highlight these within-city inequalities.¹

By identifying in what areas progress needs to be accelerated or existing trends reversed to achieve selected targets at city and slum settlement levels, we hope to provide a useful framework for analysis that can be replicated in other cities, and used by city government

¹ Another particular salient inequality when thinking about urbanisation is migratory status, as in many contexts temporary rural to urban migrants are excluded from citizenship rights and social protection programmes (Tacoli et al., 2014). Data are often missing on this, which makes it hard to disaggregate outcomes for them.

authorities and campaigners, to prioritise different areas and support a sense of urgency to act.

This paper is structured as follows. Section 2 describes our approach; Section 3 provides a brief history of

Mumbai's slums; Section 4 presents SDG performance for selected targets in Mumbai and its slum settlements; and Section 5 concludes.

2. Our approach

We chose Mumbai for our analysis as it is one of the largest cities in India, and indeed the world, and has the largest concentration of slums in the country (Bag et al., 2016; UN DESA, 2014). Data availability was also a key consideration. The last two rounds of the Demographic and Health Survey (DHS), 1998/99 and 2005/06, allow for disaggregation of data at city level and also identify slum households in Mumbai, following India's census definition of these settlements (Government of India, 2011b; IIPS and ORC Macro, 2000; IIPS and Macro International, 2007). Mumbai is the only city that has data for both survey rounds, meaning we can follow trends over time for the city and its slums.²

Table 1 shows the three selected targets and corresponding indicators for analysis. Where possible, we sought to include targets and indicators used in other work on SDG progress (Nicolai et al., 2015, forthcoming) to situate our work alongside estimates at more aggregate levels. We also tried to include indicators identified in the SDG framework (IAEG, 2016). But ultimately, data availability (namely, whether it is possible to estimate for these indicators drawing on DHS data) and relevance in the urban context informed our choice.

As mentioned above, we produced estimates for these indicators at city and slum settlement levels. To identify

slum populations we used two different definitions. First, we used the one included in the survey data based on the Indian census definition of slums.³ Second, we created a slum variable based on the UN Human Settlements Programme (UN-Habitat) definition of slums, the one used to measure progress on the MDGs and now the SDGs. According to the latter, a slum household is defined as a set of people living under the same roof in urban areas who lack one or more of the following:

- access to improved water services
- access to improved sanitation services
- a sufficient living area, with no more than three people sharing a sleeping room
- durable housing of a permanent nature that protects inhabitants against extreme climate conditions and⁴;
- secure tenure that prevents forced evictions (this is included in the definition but not in slum measurement as there are insufficient data on it; UN-Habitat, 2004, 2010)

We are fully aware of the data limitations faced when seeking to analyse SDG performance at subnational level and for informal settlements in particular (Box 1, page 10).

2 The 2006 DHS also allows disaggregation for seven other cities, but because these data were not available in 1998 the analysis excludes them.

3 In 2001, India conducted for the first time a national slum census. Slums were identified at the neighbourhood rather than at the household level, and were defined as those satisfying any of the following three criteria: 1) all specified areas in a town or city notified as 'slum' by state or local governments and union territory administration under any act, including a 'slum act'; 2) all areas recognised as 'slum' by state or local government and union territory administration that may have been formally notified as 'slum' under any act; or 3) a compact area with a population of at least 300 people or around 60–70 households of poorly built and congested tenements in an unhygienic environment, usually without adequate infrastructure and proper sanitary and drinking water facilities (IIPS and Macro International, 2007). For a more detailed discussion of the differences between definitions, see Lucci et al. (2016).

4 Note that for the 1998 round of the survey no information available was on quality of housing, so UN-Habitat for that year takes into account only three criteria: access to 'improved' water, access to 'improved' sanitation and overcrowding. This meant that for 2006, to make it comparable, we used the same limited definition of slum based on these three deprivations only.

Table 1: Targets and indicators used in our analysis

Target	Indicators used
Target 6.1 Universal access to water	Access to improved water sources <ul style="list-style-type: none">• piped water into dwelling, or yard/plot• public tap or standpipe• tubewell or borehole• protected dug well• protected spring• rainwater and• bottled water (if water for cooking and personal hygiene is from an improved source)^a Access to piped water in premises (that is, into dwelling, or yard/plot; a more ambitious indicator that excludes shared facilities, which can be overcrowded in dense urban settlements)
Target 6.2 Universal access to sanitation	Access to improved sanitation <ul style="list-style-type: none">• flush toilet to piped sewer system, septic tank or pit latrine• ventilated improved pit latrine• pit latrine with slab and• composting toilet^b
Target 11.1 Ensure access to housing for all	Number of slum dwellers (this is the SDG indicator suggested for this target as it measures precarious housing conditions, more details below)

Notes: *a) Improved water and sanitation follows the World Health Organization (WHO)/UN Children's Fund (UNICEF) Joint Monitoring Programme (JMP) definitions (<http://www.wssinfo.org/definitions-methods/watsan-categories/>).*

b) Note that the questions used in 1998 and 2006 to measure access to sanitation were not exactly the same. In 1998, there is no specification of whether pit toilets/latrines had a slab (the requisite to be considered 'improved'); as such, we considered the latter unimproved. We also attempted a second approach, adjusting our 1998 estimates using the proportion of pit toilets/latrines with a slab out of all improved sanitation for 2006. This provided similar results to the first approach used.

Box 1: Tracking SDGs at subnational level – an overview of data limitations

When analysing SDG progress at subnational level, there are a number of data challenges:

Lack of disaggregation and large margin of error

Data from household surveys (the instrument most commonly used to create the indicators needed to track SDG progress) are often representative at regional or broad urban/rural levels, but it is rare to find surveys that are representative of more detailed geographies, such as cities or, at an even more granular level, informal settlements. The latter would require bigger sample sizes, which are more costly. In the case of Mumbai, the DHS rounds used in the analysis are representative at city level, but this is not common. And, even where disaggregation is possible, as the number of observations becomes smaller the margin of error surrounding the estimates is likely to increase.

Lack of frequency

Although in some countries surveys are produced every year, or every three years, in other cases there can be long lags between survey rounds. For example, for the purposes of this analysis, the most recent round of DHS data we could use for India was collected in 2006 – that is, it is 10 years old. A new round of data has been collected but was not yet available.

Incomplete data

Even when data are available they can underestimate certain populations. By design, household surveys miss groups like the homeless, people in institutions or migrants, and when sampling frames are based on census data they could be up to 10 years out of date. In countries experiencing rapid urban growth, this means surveys may miss out more recent informal settlements.

Varying definitions and inadequate indicators

Finally, definitions of slum settlements vary considerably. UN-Habitat has introduced an internationally comparable definition based on five deprivations, as mentioned above, but countries often have their own definitions. These variations can lead to huge differences in the estimates produced (Lucci et al., 2016).

Further, even within the same country the nature of inadequate housing may vary (e.g. homelessness, overcrowding or exposure to disaster-risk areas), but nationally accepted definitions of housing deprivations may not capture these differences. In addition, in the Indian context, slums are ‘notified’ or ‘non-notified’ depending on whether they are recognised by government. This distinction can sometimes be arbitrary following political incentives (e.g. to access funds from national or regional governments or to show better results).

Other challenges relate to the indicators used to track SDG progress, and the extent to which they are appropriate in urban contexts, particularly in dense informal settlements. For instance, access to water and sanitation refers to types of facilities used but does not include information on how many people share these services, waiting times and the frequency and affordability of the service, which can be crucial in these settings.

Sources: Carr-Hill (2013); Lucci and Bhatkal (2015); Lucci et al. (2016).

3. A brief history of Mumbai's slums

In colonial times, until the late 18th century, Mumbai was mainly a marine supply point. After the establishment of railways and the cotton boom, the fortunes of the city changed in the 19th century. While this meant a faster supply of cotton from the cotton-growing areas of the hinterland to factories in Britain, the availability of raw cotton and cheap labour also led to domestic production of cotton and the establishment of textile mills in Mumbai. Workers migrated from the rest of Mumbai province to work in the cotton and shipping industries. Often, men would migrate to work in the city, leaving the rest of the family in the village; they were accommodated in hostels (*chawls* in local language, often constructed by factory owners for low-income workers). These labour settlements grew around mills and other places of employment. Later on, the *chawls* became tenements, as family members migrated to the city to live in overcrowded single rooms. Densities increased and housing structures deteriorated. During the late 19th century, the city grew towards the north, engulfing neighbouring villages (e.g. Dharavi, Byculla, Khar). Poor living conditions in now well-known areas such as Dharavi go back to this time (Bag et al., 2016).

At the beginning of the 20th century, the cotton boom came to a halt, but opportunities arose in other industries, especially manufacturing (e.g. chemicals, printing, consumer goods). This meant the city kept attracting migration from other areas, with workers often settling in areas with poor living conditions, leading to the proliferation of slums (Bag et al., 2016).

As discussed later, recent trends in slums growth, in a context of a growing urban population, vary depending on definitions and sources used. To date, about half

the population of the city lives in slum conditions (Chandramouli, 2013). Housing options for the poor in Mumbai include *chawls*, *patra chawls* (consisting mainly of semi-permanent structures, which can be both authorised and unauthorised), *zopadpattis* (squatter housing), Slum Rehabilitation Authority (SRA) buildings and pavement dwellings. Although pavement dwellings and *chawls* have poor slum-like conditions, these do not fall under the legal definition of 'slum' (MCGM, n.d.).

Each state in India, in the case of Mumbai Maharashtra, is free to frame its own laws, policies and programmes for slum upgrading, except with regard to land owned by central government agencies. In Mumbai, the SRA was set up as the single coordinating authority, with multiple executing agencies such as private sector developers, public bodies, non-governmental organisations (NGOs) and cooperative housing societies of slum dwellers. It was made the planning authority for slum areas, and the municipal and state legislation was amended to give it the power to make changes to the development plan of the city and to provide building permissions (Burra, 2005).

Over the years, there have been a number of acts recognising slum dwellers that aim to provide better living conditions. In the early 1970s, the Maharashtra Slum Areas (Improvement, Clearance and Redevelopment) Act protected certain slums from eviction. In the mid-1990s, the Slum Rehabilitation Act, enacted by the government of Maharashtra, sought to protect the rights of slum dwellers and promote the development of slum areas. According to the Act, anyone who could produce a document showing residence before January 1995 would be protected from eviction.

4. SDG performance at city level: Mumbai's example

In this section, we present our analysis of the three SDG selected targets in turn: access to water, access to sanitation and access to housing.

4.1 Access to water

Current situation and trends over time

Target 6.1 establishes that by 2030 everyone should have access to safe and affordable drinking water. In 2015 at global level, 90.9% of the global population and 96.4% in urban areas had access to improved water, up from 82.5% and 95.5% in 2000, respectively (WHO/UNICEF JMP, 2015). In fact, the MDG target of halving the proportion of people without access to an improved water sources was met five years ahead of time (UN, 2014). In the case of urban areas, we can see that access measured in this way started from a high base in 2000 (95.5%), but, as we discuss below, there are questions on the extent to which this indicator is appropriate for dense urban settlements (Mitlin and Satterthwaite, 2013).

Our analysis of household-level data for Mumbai shows that the city and slum settlements enjoyed near universal provision in 1998 and 2006 (IIPS and ORC Macro, 2000; IIPS and Macro International, 2007; Table 2). Access in 2006 was higher than access in India overall (86.5%) and slightly higher than the urban average (94.3%).⁵ More recent estimates based on a slum survey carried out in 2014 for four Indian cities show Mumbai's slums have nearly universal access to 'improved' water sources (Bag et al., 2016). Interestingly, Bag et al. included in their survey more detailed information about water services, such as waiting times and frequency of access. They find that, while a relatively small 4.5% of slum households in Mumbai that use standpipes need to travel or wait for 30 minutes or more for the water source, frequency of the service is an issue, with 17.3% of slum households having access to the water source for less than two hours a day. Unfortunately the data does not include further information on the affordability of the service or the extent to which connections are provided by formal suppliers.

We also present estimates using a more ambitious definition of access to water – that is, whether households have piped water on premises. Unlike the access to the indicator for access to 'improved' sources, this excludes shared facilities, which can be in high demand and overcrowded in the context of dense urban settlements. This changes the picture slightly. First, a look at data over time suggests a much lower initial level for the city and slum settlements – 64.5% and 55.8% respectively – and a larger improvement of over 20 percentage points between 1998 and 2006. Second, access to water in Mumbai at city and slums levels in 2006 was somewhat lower (closer to 90% rather than the near 100% using 'improved' access). It remains higher than the urban average (51.4%), reinforcing the finding that Mumbai performs better than other cities in the country.

However, more recent estimates based on Bag et al. (2016)'s slum-specific survey suggest current access is lower than our estimates for 2006, with only 59.6% of households having access to personal standpipes. Differences with our estimates may owe to the different methods used (Bag et al. conduct a slum-specific survey, which is therefore not strictly comparable to our estimates) as well as more recent changes in slum populations, particularly as newer settlements are likely to have fewer services (Patel et al., 2014). The latter is also a reminder that urbanisation means the SDGs are moving targets; over the period under study, 1998–2006, Mumbai's population rose by 3.5 million (UN DESA, 2015).

Further, Bag et al. (2016) find that, even among those households with access to piped water on premises, frequency of access can be a problem, with 10.7% of slum households having access to water for less than two hours a day. Finally, none of these indicators account for the quality of the water, and the methods adopted for water purification. Even with piped water supply, water can be contaminated.

Effort needed to reach universal access to water by 2030

Using the MDG definition of access to 'improved' water sources, Mumbai is on track to deliver on this target. Yet a more nuanced picture emerges when we use a more

⁵ The average for urban areas and India is sourced from WHO/UNICEF JMP (2015).

ambitious indicator of access to water – that is, how many households have piped water in their dwelling or in their plot/yard. Using household level data for 2006, DHS data suggest the city would be 10 percentage points away from universal provision, and slum households 12–13 percentage points. However, more recent estimates from a slum survey show the shortfall could be much bigger, at around 40.4 points. If as an illustrative example we consider the historical growth rates in access to water on premises for slum settlements between 1998 and 2006 (an annual compound growth rate average of 5%), closing this shortfall in 15 years could be within reach.

The results for access to water in Mumbai show that the indicator choice, as well as having up-to-date granular information, is critical to assess SDG current and projected progress for the city and its informal settlements. As part of the SDG monitoring process, a new indicator of safely managed drinking water services has been proposed, which should be more ambitious than the definition of access to ‘improved’ water sources used under the MDGs and take into account quality and availability aspects of water provision (IAEG, 2016; for a more detailed discussion of the limitations of data availability and the shortcomings of particular indicators, see Lucci et al., 2016).

4.2 Access to sanitation

Current situation and trends over time

SDG Target 6.2 aims to achieve universal access to sanitation. Globally, access to improved sanitation grew from 54% in 1990 to 68% in 2015; at current growth rates, this target will be missed by 2030. In fact, in *Projecting progress*, Nicolai et al. (2015) give this target a grade ‘D’, meaning a ‘revolution’ is needed to meet the target, as ‘business-as-usual’ scenarios only get us one quarter of the way. In India, in particular, progress on sanitation has been slow. Over the MDG period, access to ‘improved’ sanitation increased from 23.7% in the late 1990s to 31.5% in 2006 and 39.6% in 2015 (WHO/UNICEF JMP, 2015).

Our analysis of household data for Mumbai suggests access to ‘improved’ sanitation decreased slightly from 34.9% in 1998 to 32.2% in 2006 (Table 3), although this trend was not statistically significant. This lags the average for urban areas for that year (58.0%), highlighting that sanitation is a key challenge facing the city.

In the case of slums, trends and levels of access to ‘improved’ sanitation vary significantly depending on the slum definition used. Following the census definitions of slums,⁶ we find that households started from a very low level of access in 1998 (3%) and improved over time, reaching 21.5% in 2006. More recent estimates by Bag et al. (2016), using their own slum survey, put the percentage of households in Mumbai slums having access to personal sanitation facilities at 25.9% in 2014, confirming that

Table 2: Access to improved water sources and to piped water on premises, 1998 and 2006

	Access to ‘improved’ water sources (%)				Access to piped water on premises (%)			
	1998	2006	Annual change	2015	1998	2006	Annual change	2015
Mumbai slums (census definition)	99.8% [99.6-100]	99.9% [99.9-100]	0.02%	97.7%*	55.8% [46.2-65.4]	87.3% [80.4-94.1]	5.8%	59.6%*
Mumbai slums (UN definition)	98.3% [96.9-99.7]	99.9% [99.9-100]	0.2%	-	59.5% [52.9-66.2]	88.1% [80.6-92.2]	5.0%	-
Mumbai	98.7% [97.5-99.8]	99.9% [99.9-100]	0.2%	-	64.5% [58.3-70.7]	89.5% [84.9-94.2]	4.2%	-
Urban areas	91.6%	94.3%	0.4%	97.1%	49.1%	51.4%	0.6%	53.8%
National level	78.6%	86.5%	1.2%	94.1%	20.1%	24.0%	2.2%	28.2%

Note: * These figures are for 2014 rather than 2015.

Sources: Authors’ calculations based on IIPS and ORC Macro (2000) and IIPS and Macro International (2007) for slums and Mumbai (1998 and 2006); confidence intervals in []. WHO/UNICEF JMP (2015) for urban areas and national estimates. Bag et al. (2016) for Mumbai slums (2014).

6 See footnote 4.

access to adequate sanitation remains a key challenge for slums in the city to date. However, numbers using the UN-Habitat definition of slums⁷ show a different picture. According to these figures, access to ‘improved’ sanitation facilities decreased between 1998 and 2006, with only 10.5% of the population in slum settlements having access to non-shared improved facilities. One reason why estimates following UN-Habitat definition of slums may be lower is that the definition is wider and may capture more households, including in more recent and smaller settlements, which may be more deprived.⁸

In short, irrespective of the estimates used, sanitation remains a key challenge for the city and particularly for slum settlements, which perform worse than the city as a whole. The most recent estimates suggest only a quarter of slum households had access to personal facilities in 2014. At the same time, over 70% of slums households had access to shared facilities, and about a third of slum households had to wait more than five minutes to access a toilet (Bag et al., 2016). While, ideally, non-shared facilities should be the standard to aspire to, in some contexts ‘limited sharing’ can offer a transitional solution in the short to medium term, provided the facilities are well maintained. The community toilets provided by slum

federations (Mitlin, 2015) are one such example, which under current definitions would count as an ‘unimproved’ facility. The challenge remains to find more nuanced indicators that can separate inadequate and unhygienic shared facilities from those that can provide a basic and safe service, particularly in the short to medium term.

Effort needed to reach universal access to sanitation by 2030

The efforts needed to reach universal provision for the city and its slum settlements vary depending on the definitions of slums used and years considered. Based on our own analysis of household data for 1998 and 2006 only, the city would need to reverse the current trend to achieve the goal by 2030. The same is true of trends for slum settlements using the UN-Habitat definition of slums. However, using the census definition of slums provides a different picture: if the historical rates of growth observed between 1998 and 2006 were to continue, the sanitation target would be achievable.

More up-to-date estimates, based on a slum-specific survey, provide a more accurate picture. Drawing on Bag et al. (2016)’s recent estimate of 25.9% of slum households having access to improved sanitation in 2014 and combining it with 21.4%, our estimate for 2006 suggests

Table 3: Access to sanitation, 1998 and 2006

	Access to ‘improved’ sources (%)			
	1998	2006	Annual change	2015
Mumbai slums (census definition)	3.0% [1.5-4.5]	21.5% [10.4-32.6]	27.9%	25.9%*
Mumbai slums (UN definition)	18.1% [13.7-22.7]	10.5% [6.2-14.8]	-6.6%	-
Mumbai	34.9% [28.6-41.3]	32.2% [23.3-41.0]	-1.0%	-
Urban areas	53.4%	58.0%	1.0%	62.6%
National level	23.7%	31.6%	3.7%	39.6%

Note: * These figures are for 2014 rather than 2015.

Sources: Authors’ calculations based on IIPS and ORC Macro (2000) and IIPS and Macro International (2007) for slums and Mumbai; confidence intervals in []. WHO/UNICEF JMP (2015) for urban areas and national estimates for ‘improved’ sources only. Bag et al. (2016) for Mumbai slums (2015). In the case of sanitation, we also analysed data for a more restrictive indicator of sanitation that includes only non-shared flush or pour flush toilets connected to a sewer system (the most effective way of disposing of wastewater in dense urban areas (Satterthwaite, 2014). This did not make much difference to the numbers for the city and slum settlements reported in Table 3. This is because this is the most frequently used type of non-shared improved facility in Mumbai in the years we have data for.

7 Those households lacking access to improved water, sanitation or sufficient living space (see Section 2 and footnote 5).

8 While the census definition includes a density criterion (according to the 2001 census a slum requires at least 300 people or 60-70 households in a compact area), the UN Habitat definition does not. This means that more recent, and possibly, more deprived households may be excluded from the census definition.

38% of slum households would have access to improved facilities by 2030, far below the target for universal provision (Figure 1). Note that this is only for illustrative purposes, as the estimates use different data sources and methods and therefore are not strictly comparable.

4.3 Access to housing

Current situation and trends over time

Target 11.1 seeks to ensure access for all to adequate, safe and affordable housing and basic services, and to upgrade slums. The main indicator proposed for this target is the number and proportion of people living in slums, following the target used by the MDGs (IAEG, 2016). While the framing of the target does not make clear what the value to be achieved by 2030 would be, as a very minimum slum populations should not increase in relative or absolute terms, and as a maximum no one should live in slum-type conditions. Globally, the Overseas Development Institute's (ODI's) scorecard estimated that slum populations are projected to increase from around 850 million today to over 1 billion people by 2030 worldwide (Nicolai et al., 2015).

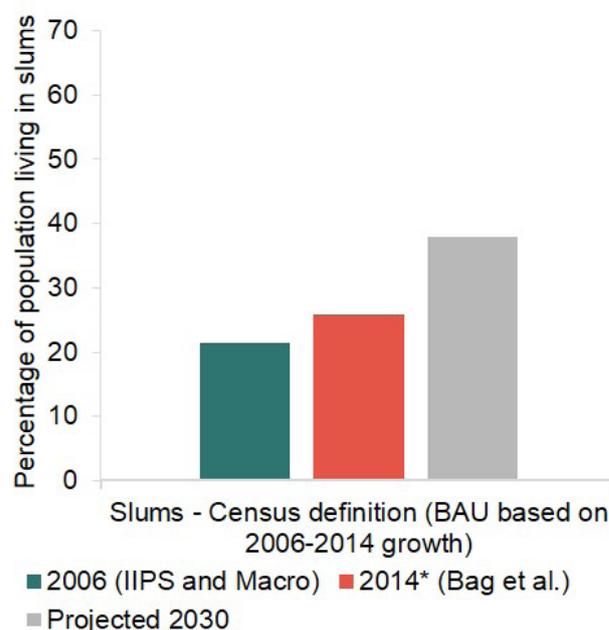
Our estimates of the number of slum dwellers for Mumbai for 1998 and 2006 suggest the direction of the trend varies depending on the slum definition used. While using the census slum definition we find that the proportion of households living in slum settlements between 1998 and 2006 increased (at an annual average of 0.7%), the opposite is true using the UN-Habitat definition (the proportion of slum households decreased at a 0.6% per annum), although in both cases the trends need to be treated with caution as confidence intervals are large. Note that it is not possible to have a more detailed discussion of trends for specific housing deprivations (e.g. tenure situation, structure of dwelling) as this information was not included in the 1998 dataset.

Estimates from other available sources, such as the 2001 and 2011 slum census, also point to a declining trend in slums in Mumbai, from 54.1% of the population in 2001 (or 6.4 million people) to 41.3% in 2011 (or 5.2 million people) (Chandramouli, 2013, Government of India 2011a, 2011b).⁹

Effort needed to reach universal access to housing by 2030

As an illustration, we estimate the proportion of slum households in 2030 under current trends. As mentioned above, one difficulty in making such projections is that

Figure 1: Projecting progress on 'improved' sanitation in Mumbai settlements – an illustration



Sources: Authors' calculations based on IIPS and Orc Macro (2007) for 2006 values. Bag et al. (2016) for 2014

the directions of trends for the period under study differ depending on the definition of slums used. Using the census definition (estimates drawing on this saw an increase of 0.7% annual growth between 1998 and 2006) we find that about 66% of households would live in slums in 2030, up from 56% in 2006. Following the UN-Habitat slum definition (estimates saw a decrease of -0.6% per annum between 1998 and 2006), the share of slum households would reach 65.8% by 2030, a reduction from 75.8% in 2006.

Our projections drawing on household data are higher than those resulting from the latest slum census estimates for a different time period (2001 and 2011). Assuming current trends continue (-2.7% annual change), by 2030 there will be 24% of the population living in slums, a considerable decrease from the current level of 41%.

Finally, in terms of implementing this SDG, it will be crucial to build on the lessons of the MDGs. The MDG 'slum' target was used in some cases to justify evictions, making the situation of these marginalised communities worse (Huchzermeyer, 2013). While a target to reduce the number households living in slum-type conditions is

9. Differences in the direction of the trend based on DHS (following the census definition of slums) and census data may be due to the different time periods considered.

a necessary aspiration, it is equally important to monitor the way governments seek to achieve this target, which

requires in-situ slum upgrading in addition to long-term city planning and provision of affordable housing.

Table 4: Slum populations in Mumbai – comparing estimates over time from different sources

	%					Absolute numbers (millions)				
	1998	2001	2006	2011	Annual growth	1998	2001	2006	2011	Annual growth
Estimates (census definition; households)*	52.9% [43.4-61.4]		56.0% [51.6-60.4]		0.7%					
Estimates* (following UN-Habitat; households)	79.4% [75.4-83.5]		75.8% [68.7-82.9]		-0.6%					
Slum census data (population)		54.1%		41.3%	-2.7%		6.4		5.2	-2.2%

Sources: *Authors calculations based on IIPS and Orc Macro (2000) and IIPS and Macro International (2007); confidence intervals in []. Census data quoted in Chandramouli (2013) and MCGM (n.d.).

5. Conclusion

This paper has sought to illustrate city-level performance for three selected SDG targets. Further, in line with the ‘leaving no one behind’ agenda, we have also attempted to disaggregate outcomes for our three targets for slum populations, a salient marginalised group within cities.

Of the three targets included in our analysis, achieving universal water provision (measured using a more ambitious indicator, such as access to piped water to premises) appears to be the most within reach, at only 10 percentage points away from the target at city level. Depending on the source of data (i.e. our own analysis of household data for 1998 and 2006 or Bag et al.’s 2014 estimates), the shortfall in achieving universal provision in slum settlements ranges between 10 and 40 percentage points.¹⁰ The other two targets seem more difficult to achieve. For the ‘improved’ sanitation target, our estimates for 2006 suggest shortfalls of over 65 percentage points for the city and of between 72 and 91 percentage points for slum settlements. In the case of the target on access to housing, depending on the data source, the target is 40 to over 75 percentage points away from completion.

Undertaking this exercise also highlighted some of the data limitations in monitoring SDG progress at the subnational level. Varying indicators can make a big difference in the results obtained. For example, in the case of the water target, if we consider access to ‘improved’ water sources, the target has been achieved in both the city and slum settlements. However, the picture changes when we use a more ambitious indicator that excludes shared facilities (which can be overcrowded in dense settlements). This huge variation in levels and change reinforces the point that a dashboard approach is needed, and where possible, the latter should consider a wide range of indicators of the quality, affordability and reliability of services.

Definitions matter too. Our analysis of the sanitation target provides a good example of how the slum definition used can also have a sizeable effects on estimates, as we find the direction of trends and levels of access to ‘improved’ sanitation varies significantly depending on whether we follow the census definition of slums or that set out by UN-Habitat. This draws into relief an important concern over whose definitions matter, as there is a potential tension between international and national measures and which to focus on. Further, limited historical

information on housing deprivations (e.g. on housing structure and tenure which were not included in the 1998 survey round) makes it difficult to assess trends over time in this area. Again, this calls for a dashboard approach where a range of housing indicators are followed over time.

In addition, our analysis highlights the need for a granular focus within and across cities. While levels of access to water in 2006 do not appear to be as different as they are between the city and slum settlements, they are above average for urban areas. But the reverse is true of access to improved sanitation, with slum settlements performing worse than the city and the city lagging the average for urban areas.

Finally, the fact that we are relying on data for 1998 and 2006 to understand trends over time for Mumbai, and to compare Mumbai with levels and trends for its slum settlements following different definitions, underscores the issue of lack of frequent data, and the fact that the rates of growth we are using to provide illustrative examples of what performance could look like in 2030 are likely to be grossly out of date. To address this issue, where possible we quoted more recent estimates from other studies, such as Bag et al. (2016), who provide estimates for slum households only, using their own primary data collection. We also encountered challenges around comparing indicators over time. For example, the 1998 survey did not include information on the quality of housing, which meant we had to adjust the UN-Habitat definition of slum households and consider only three deprivations instead of the four commonly used in measurement. Similarly, in the case of access to ‘improved’ sanitation, the categories used in 1998 were not strictly comparable with those in 2006, as in 1998 there was no specification of whether latrines used had a slab (the latter are a condition of ‘improved’ sanitation).

With urban populations growing fast in the developing world, how cities manage urbanisation over the next 15 years will define governments’ ability to achieve most SDGs. As discussed, Mumbai’s population rose by 3.5 million over the period under study, and by almost 7 million between 1995 and 2015 (UN DESA, 2015). Growing urbanisation also means the SDGs are moving targets, with local governments needing to keep up with the growth and not fall behind on targets.

¹⁰ The differences between sources is large and deserves further exploration. Patel et al. (2014) using 2006 DHS data find similar findings to ours, that is, high figures for access to improved water services. Bag et al. provide more recent estimates for 2014 so this could partially explain the differences, suggesting that more recent settlements may be more deprived in this area.

The first step in taking action is to have a better grasp of SDG progress at a city level, and how it varies across cities, including disaggregation for slum populations. There is an opportunity now to set a proper baseline for SDG targets at city and slum settlement levels, and to make these baseline data, alongside historical trends (where these

exists), easy to access, for instance through user-friendly online portals. This will highlight areas where progress needs to be accelerated or even trends reversed if the SDGs are to be achieved at city and slum settlement level. Most importantly, it can motivate city governments and campaigners to act.

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