Research Paper

Experiences of shared sanitation – towards a better understanding of access, exclusion and 'toilet mobility' in low-income urban areas

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ABSTRACT

Sustainable Development Goal (SDG) target 6.2 calls for 'adequate and equitable sanitation for all'. In dense, rapidly urbanising cities, the challenge of providing household sanitation means that many countries include shared, community and public toilets in their national strategies to meet global goals. However, shared sanitation is associated with several problems including poor management and exclusion. This study examines shared sanitation access and use by using innovative mapping methods in compound house units in Fante New Town, Kumasi, Ghana. This study reveals that 56% of house units have at least one toilet. Of the 47% of people living in these house units, almost a third were excluded from using the toilet. Tenure status was the main driver for exclusion, with nearly half of people reporting non-usage 'not allowed' to use the toilet by the landlord. This study outlines key policy interventions to address broader institutional and regulatory barriers to shared sanitation. At the settlement level, this includes the provision of safe, well-managed public toilets and engagement with landlords to improve house unit toilet access. At the national and global level, this study calls for nuanced indicators to assess the quality of access and to ensure shared sanitation works for everyone.

Key words | exclusion, Ghana, SDG 6, shared sanitation, urban

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INTRODUCTION

The Sustainable Development Goals (SDGs) set out a wide range of global development imperatives to which member states of the United Nations (UN) are now committed. SDG 6 focuses on water and sanitation services. SDG 6.2 sets a 2030 deadline for the world to 'achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations' (UNDP 2015). The indicator selected to measure SDG 6.2 is 'the proportion of the population using safely managed sanitation'. The SDGs are more ambitious than the preceding Millennium Development Goals, both in terms of scale (SDG 6.2 calls for universal access) and the level of service ('safely managed sanitation' implies complete systems for the safe management of excreta, rather than just access to an improved toilet).

To reach these more ambitious targets, many countries and commentators argue that shared sanitation facilities will have to be included in national programmes (Evans *et al.* 2017). Shared sanitation is an umbrella term that includes public toilets (usually, but not always, accessed on a 'pay-per-use' basis), community-shared toilets (usually

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managed by a local voluntary, community-based, or small-scale private provider and used by a limited number of households) and toilets which are shared between known households, often located within a shared compound. The most recent estimates from the UN suggest that at least 600 million people worldwide depend for their sanitation solely on a toilet that is of an 'improved type' but which is shared with other households (WHO/UNICEF 2017).

Many scholars assert that in informal urban settlements with high population densities, shared sanitation is the only viable option (Schouten & Mathenge 2010; Mara 2016). Limited space makes private facilities unfeasible (Katukiza *et al.* 2012; Mara 2016), and their cost makes them unaffordable for the urban poor (Mara & Alabaster 2008; Adubofour *et al.* 2012). Under these circumstances, community-based shared sanitation is considered to be an affordable alternative, provided they are well maintained (Katukiza *et al.* 2012). The UNICEF/WHO Joint Monitoring Programme (JMP) for Water, Sanitation and Hygiene suggested, during the development of recommendations for post-2015 monitoring, that when a limited number of people who know each other share a sanitation facility, any increased risk associated with shared sanitation is mitigated (WHO/UNICEF (2014, p. 33) and further discussed in Heijnen *et al.* (2015)). This is supported by Mara (2016) and Obeng *et al.*'s (2015) studies which find that outcomes from sanitation facilities shared between neighbours are better than those of communal facilities.

While shared sanitation plays an important role, some scholars have concerns. One of the most commonly cited concerns relates to health outcomes. Several studies claim that shared sanitation is a major risk factor for diarrhoea. For example, a multi-country study by Fuller *et al.* (2014) observed a 44% higher diarrhoea prevalence in Madagascar among users of shared sanitation facilities compared to users of private facilities. The impact of poor health outcomes among users of shared sanitation on toilet use behaviour was not examined by the study. Heijnen *et al.* (2014) also found that users of shared sanitation facilities are at increased risk of helminth infection and polio, as well as prenatal death and prematurity, although they also noted that there are numerous potential confounders to these relationships since populations sharing sanitation are more likely to be poor than those who do not. While these studies show a connection between health outcomes and sharing, they do not establish the causal pathway for these elevated risks.

Poor health outcomes associated with shared sanitation are understood to be due to lack of cleanliness. Shared toilets are less likely to be cleaned on a regular basis than private facilities and more likely to have faeces and flies present (Heijnen *et al.* 2015; Routray *et al.* 2015). The picture may be more complex; however, Exley *et al.* (2015) found that shared sanitation facilities were considerably less contaminated by *Escherichia coli* than private toilets. User acceptability of sanitation facilities can often be weakened by the lack of cleanliness (Roma *et al.* 2010). A number of studies have found that shared sanitation facilities are less likely to be functioning than individual household latrines, with some being closed for significant periods of time due to blockages (Routray *et al.* 2015). During this time, the likelihood of users practising unsafe sanitation behaviour increases.

One of the major challenges when seeking to understand the impact of sharing on sanitation behaviours and health outcomes is that urban populations may not be dependent on a single sanitation facility. Most residents of low-income settlements, for example, may have access to a number of sanitation options including toilets in the compound or household, community-shared toilets, public toilets and toilets in the workplace or at school. Their position within the household (i.e. old/young or tenant/landlord) and the wider community may determine when and how they access a shared toilet and the degree to which they can choose between sanitation options.

For this reason, it may be useful in urban areas to move away from a binary consideration of have/do not have access to a household toilet and towards an understanding of the dynamic use of a range of toilet options. In this study, we attempted to unpack toilet usage in an urban area where users have choices and options – in other words they can be considered to have 'toilet mobility'. This provides a lens through which to examine both the options available to individuals and the reasons for, and barriers to, users accessing these facilities. Toilet mobility can be spatial (i.e. use of multiple sanitation technologies in different locations), change over time (i.e. night and day), and vary according to the demographic group in question. It is also linked to the

provision of toilets in places of work and schools, and to the consideration of the cost of using the range of toilet options available. In this study, we have limited our analysis to the factors that affect access to, and use of, shared sanitation facilities which are located within the house where a person lives. This study examines this issue through a detailed case study of Fante New Town, Kumasi, Ghana.

METHODOLOGY

Study site

The study was conducted in Fante New Town, an electoral ward in Kumasi, Ghana. Kumasi has a population of around 2.7 million and is located in the Ashanti region of Ghana. According to the most recent shit flow diagram (SFD) report for the city, a high percentage of people are reliant on 'public' toilets (39%). Fifty-seven per cent of the population use 'private' toilets, but many of these are shared. There are a range of disposal routes – many of the pit latrines are well-designed Kumasi improved latrines, and many septic tanks have outlets connected to proper soakaways. There is also a nascent market for new container-based services provided by a local social enterprise, 'Clean Team'. There is a faecal sludge treatment plant and emptying services are prevalent, but approximately 45% of faecal flows are disposed illegally into the environment (Furlong 2015).

The most recent population census in 2010 stated that the population of the Fante New Town electoral area was 42,000 (Djagana 2017). Fante New Town, and Kumasi as a whole, is a popular destination for migrants, particularly those from the north of Ghana. A significant proportion of this migrant population is transient and some, including those who work as truck pushers (labourers who use carts or wheelbarrows to transport goods), sleep on the streets and do not have access to private sanitation facilities (Djagana 2017). It is mostly for this population that the public toilets in Fante New Town were constructed. Over time, however, the local population increasingly patronised the public toilets themselves, in part due to the legal abolition of bucket latrines which were previously very common (Caplan 2010). As a result, similar sanitation behaviours are now practised by the different ethnic and tribal groups (Djagana 2017).

In order to identify interactions between multiple household groups and multiple sanitation options, data collection focused on a bounded area of Fante New Town (Figure 1). The research was facilitated by two key informants in the

Figure 1 | Study area (latitude 6.692691, longitude −1.616499).

community – a toilet artisan and one of the elected local assembly members for Fante New Town. The specific study area was chosen through consultation with both key informants. It was selected as being typical of Fante New Town and having a range of different toilet provisions.

Communal living in Ghana means that multiple families live within a single compound or house unit sharing sanitation, cooking and other facilities. This makes defining a 'household' complex. For the purposes of this study, the term 'house unit' was used to refer to a group of people living under the same roof, often within a compound house. House units consisting of several separate families were prevalent in Fante New Town. The number of people living in a house unit, therefore, varied from two to 80. While the median was 20, over half of the people lived in house units with between 25 and 80 residents.

Research methods

Data were collected during a two-week period in June and July 2017, using three tools: toilet mapping, natural group discussions and focus group discussions. Mapping, using the mWater Surveyor application (version 8.4.6), was conducted to locate sanitation facilities in the study area. At each house unit, the presence or absence of a toilet facility was logged along with the GPS coordinates. Where the toilet facility was accessible (i.e. not occupied or padlocked), it was examined, photographed and recorded. Figure 2 summarises the available facilities.

Natural group discussions were held to identify the number of occupants living in each house unit and to confirm the presence or absence of a toilet. If there was a toilet, the technology and the number of toilet users were established, as well as any reasons for partial or non-use. If there was no toilet, the reason for not having a toilet was discussed, and the way in which the residents met their sanitation needs was established. The use of toilet facilities outside of the house unit was also explored. Toilet use was self-reported by house unit members during natural group discussions. As self-reporting can result in desirable behaviours being over-reported, two focus groups were conducted at the end of the study to validate the findings. Extensive pre-testing of the focus group guides was undertaken. The participants were recruited by two key informants. The first group comprised of six males, three of whom were community leaders. The second group of participants were five women. Both groups comprised landlords and tenants. The focus groups explored the factors affecting sanitation behaviours. Responses were coded, and the number of times the topics were mentioned was counted and analysed.

Full ethical approval was obtained from the Faculty of Mathematics and Physical Science (MaPS) at the University of Leeds and the Faculty of Engineering joint faculty research committee. All official and regulatory permissions necessary for conducting research in Fante New Town, Ghana, were also coordinated and obtained.

RESULTS

A total of 152 house units were mapped. More than half of the house units were occupied by multiple tenants and a live-in landlord. A smaller proportion was occupied solely by the family who owned the property, and the remainder was occupied by multiple tenants and owned by a live-out landlord. The total estimated population studied was 2,743.

Toilet coverage and technology

In total, 158 toilets were identified within the house units studied (Figure 2). Figure 2 shows clearly that neither public nor 'private' toilets in house units are distributed evenly throughout the area. The northern part of the study site has a less dense penetration of toilets in housing units, but most house units here are closer to the public toilets than the southern part of the community.

Eighty-four per cent of toilets inside house units were flush toilets, and 12% were Kumasi ventilated-improved pit latrines (KVIPs). Of the remainder, 3% were bucket latrines (locally referred to as 'pan' latrines), which are illegal, and one house unit had a subscription to the Clean team service. In addition to household toilets, there were five public toilet facilities with 57 seats collectively, all of which used flush technology. There were no specific eligibility requirements to use the public toilets, but all were operated on a pay-per-use basis.

Fifty-six per cent of house units had at least one toilet; 35% had one and 21% had more than one. Houses without

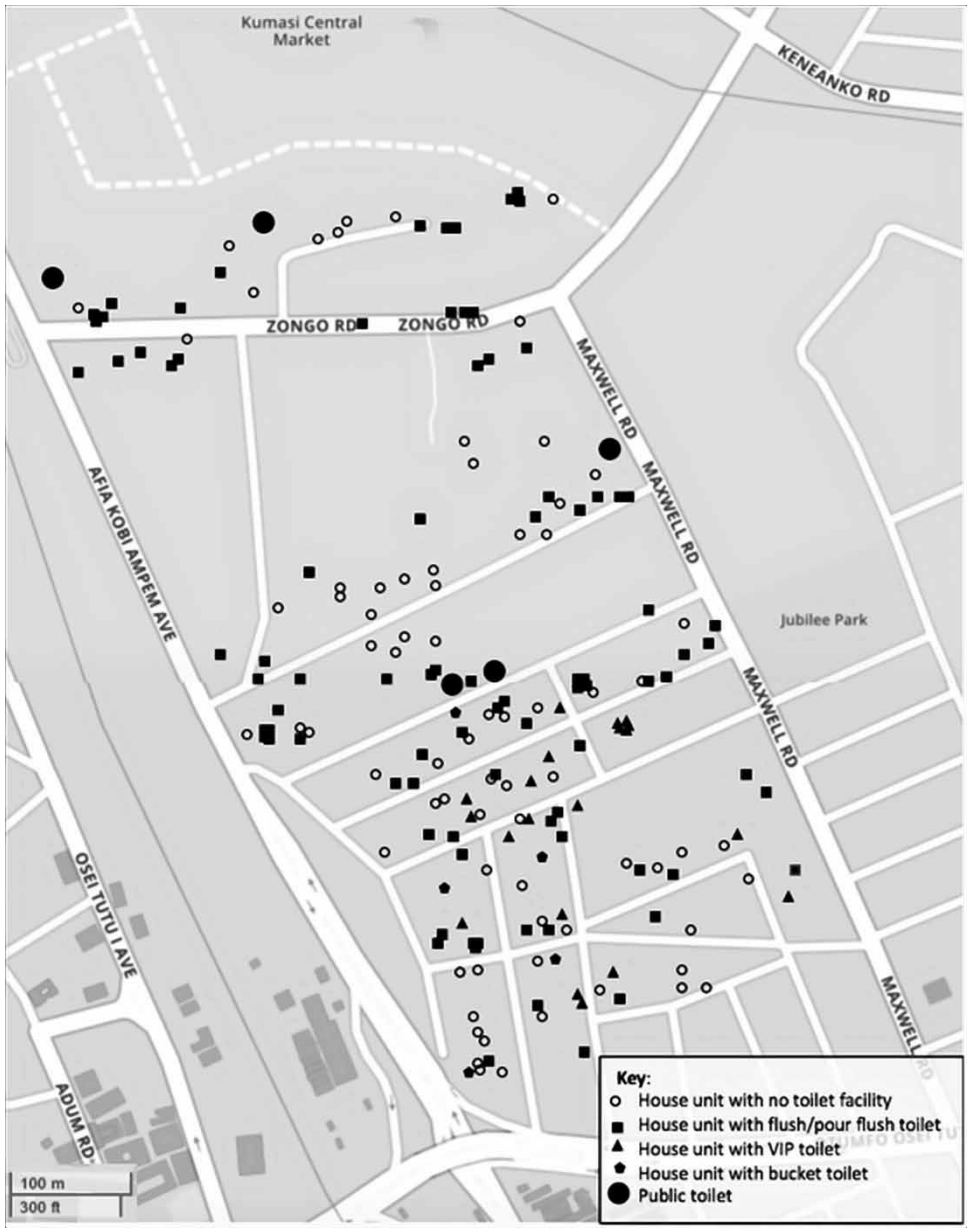

Figure 2 | Location of toilet facilities in the study area.

a toilet facility were larger on average (22 people) than those with one or more toilet facility (15 people).

Access to 'private' toilets

Figure 3 shows the distribution of the population according to whether they used a 'private' toilet and if so, the type of 'private' toilet they used.

Forty seven per cent of the population lived in a house unit with one or more toilets. Assuming everyone living in a house unit with one or more toilet uses that toilet, the average number of potential users per toilet was therefore eight.

In 59% of house units with at least one toilet, all the residents were using the toilet(s). Of these house units, half had less than 11 residents. The largest number of residents in these house units was 25. In the majority of cases, users were sharing both the toilet sub- and super-structures.

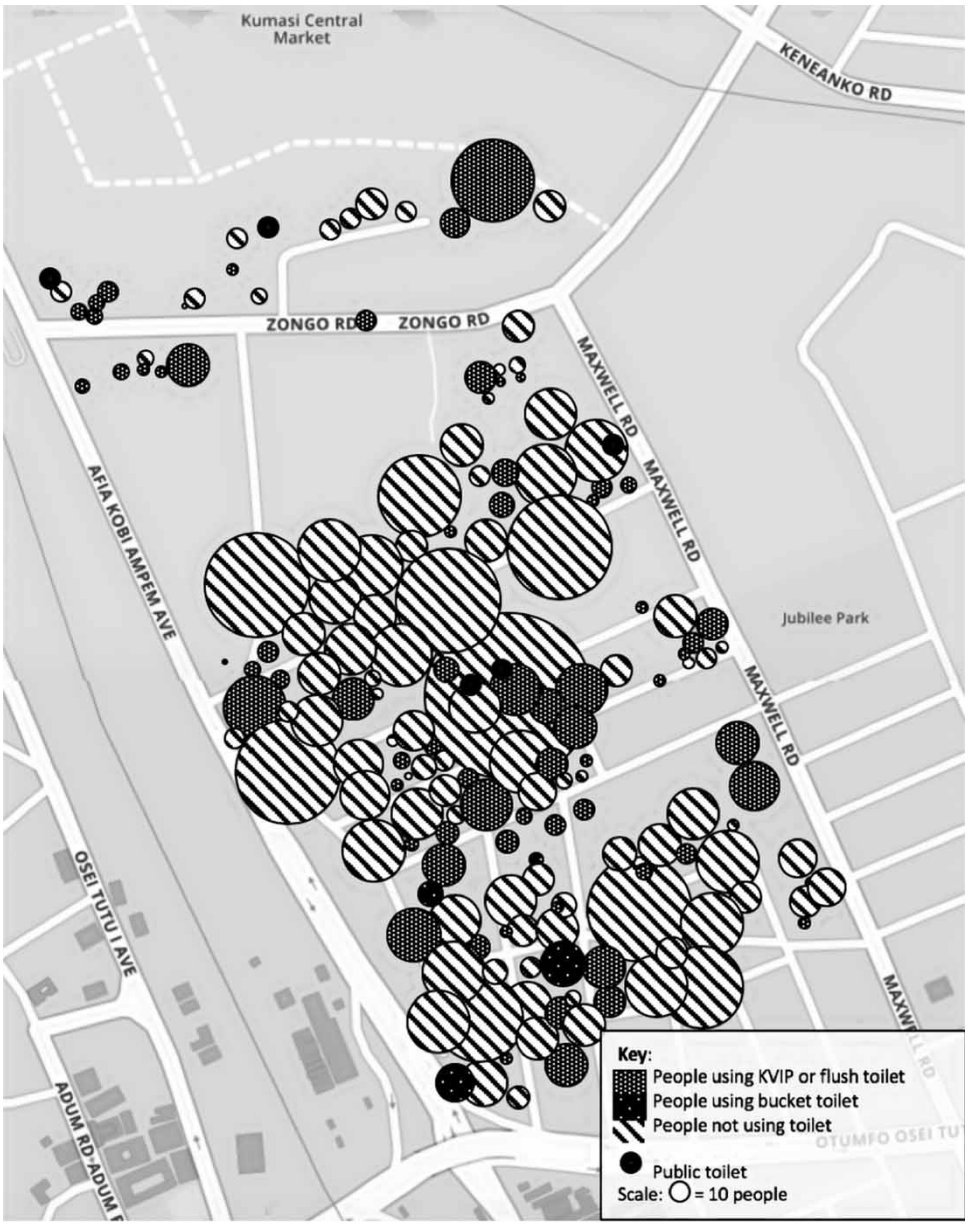

Figure 3 | Individual toilet use in the study area.

Thirty five per cent of people who lived in house units with one or more toilet facility did not use them. The rate of non-use of toilets was higher in house units with only one toilet (46%) compared to those with more than one (19%).

In summary, 56% of house units had at least one toilet and 47% of the population lived in a house unit with at least one toilet, but only 31% of the total population were using a toilet in the house unit where they lived.

For people who lived in house units without toilets and people who did not use the toilets inside the house unit for defaecation, the alternative was either to use the public toilets or to practise a variety of open defaecation, particularly at night time. These include the use of so-called flying toilets which were often disposed of with the household waste and the use of buckets which were emptied into open drains. It is worth noting here that observation suggests that urination in the open is significantly more widespread than open defaecation.

Box 1 | Reasons for non-use of house unit toilets

Case Study: House Unit A

Fifty people reside in this house unit and there is one flush toilet. Only the landlord is permitted to use the toilet because she reports that the toilet uses a lot of water and the water bill is too difficult to split between all the residents. The remaining 49 residents patronise the public toilets, with many practising open defaecations outside of opening hours.

Factors impacting access to house unit toilet facilities

Among people living in house units with toilets who did not use them, a range of reasons were given (Box 1). The most significant factor, reported by almost half of the participants (49%), was non-permittance. About 84% of those who reported non-permittance as a barrier to toilet use stated that they were not allowed because the toilet was used exclusively by the landlord and their family.

However, the results also point to aspects of choice relating to the toilets themselves. While 18% of flush toilets in house units were not being used by everyone who lived in the house unit, this rose to 37% for KVIP toilets and 60% for pan latrines. The one and only 'Clean Team' toilet was not used by all house unit residents.

Nine per cent of people stated that they did not use their house unit toilet due to the technology; usually having a preference for flush toilets, 6% because the toilet was in a bad condition and 4% because the toilet had a foul odour. Other reasons for not using the house unit toilet were that the respondent did not pay to get it unblocked (2%), use by all members increases the frequency of emptying (1%), aversion for paying monthly maintenance fees (<1%) and embarrassment of having to knock (<1%). For 14% of non-users of a toilet in a house unit, there was no reason for non-usage; in some cases, this appeared to be due to discomfort explaining their reasons in public and in others it was because respondents were not present at the time of mapping. However, the use of multiple data collection tools allowed for triangulation, with observations at the house unit level verified by focus group discussions.

Box 2 | Demographic characteristics of users and non-users

Case Study: House Unit B

Twenty people reside in the house unit which has one pan latrine. One elderly man uses the pan latrine because its location is convenient, while the remaining 19 residents avoid it due to an unpleasant odour and use the public toilets instead.

Demographic factors appear to influence the use of public toilet facilities. In all house units studied, if there was a functional or even semi-functional toilet present, it was always used by elderly residents and people with disabilities. This was the case even when other members of the house unit avoided using it due to its poor condition or odour (Box 2).

Children also had fewer sanitation options available to them. Caregivers reported preventing their children from using the public toilet alone due to fears of them falling in. The demand on caregivers' time having to accompany their child to and from the public toilet was also cited as a barrier to children using public toilets.

Apart from one, all public toilets closed overnight, with some closing as early as 19:30 and not opening until 04:30. During this time, the majority of people who did not have access to a toilet within their house unit and needed to relieve themselves reported that they practised open defaecation. Individuals who used a toilet facility within their house unit did not appear to be affected as the toilet was accessible during the night.

Among house units that did not have a toilet facility, the most commonly cited reason for not having one was the lack of space. Many house owners chose to use space that could be used for a toilet facility for an additional bedroom, washroom or storage instead. In a number of cases, households that did not have toilet facilities at the time of the study used to have a pan latrine but when they were outlawed, they used the space for storage, rather than as a toilet facility.

DISCUSSION AND CONCLUSION

In this study, the location of private and public toilets in Fante New Town was mapped. The distribution of toilets

is patchy, but overall, most people live either in a house unit with one or more toilets, or reasonably close to a public toilet facility. Theoretically, nearly half of the population have the option to choose to use either private facilities shared between households in the house unit or the public facilities (in other words, they have high toilet mobility). However, despite a relatively high level of provision of toilets at the house unit level (56% of house units had at least one toilet), close to 70% of the population appear to be unable to use a toilet in the house unit and therefore experience very limited toilet mobility. A number of factors affect access to, and use of, these private sanitation facilities. Some of these operate in an exclusionary manner. For some people, this relates to the non-availability of a toilet within the house unit. However, for those residing in a house unit with one or more toilets, a number of demographic and regulatory factors constrain the mobility of use.

This study found that the most common reason for non-use of house unit toilets was due to landlords preventing the use of toilet facilities by tenants. Mazeau (2013) and Adubofour *et al.* (2012) also identified the influence of landlords on toilet use. The current study suggests a much stronger role for landlord influence than in the earlier work. Many landlords maintained the sole use of toilet facilities at the house unit level. Mara & Alabaster (2008) promote the provision of facilities to groups of households rather than individual ones. Hawkins *et al.* (2013) support this notion, suggesting that provided groups are small enough, maintaining the cleanliness of the facilities would not be problematic. However, this study substantiates concerns by other scholars that sharing of toilet facilities between too many households, or where intra-household dynamics are adverse, could lead to disagreements and non-use (Obeng *et al.* 2015). This may be a particular problem in the context of Ghana where the prevalence of multi-household units is high. This also highlights the complexity of urban sanitation and underlines the importance of strong contextual understanding in the development of successful interventions (Mazeau 2013).

Turning to public toilets, age was a significant factor driving exclusion. The barriers to children accessing public toilets are consistent with the findings of other studies. For example, the fear of children falling into the toilet was also voiced by participants in a previous study in Kumasi (Adubofour *et al.* 2012). Likewise, the demand on caregivers' time for the disposal of children's faeces is widely recognised (Choudhury & Hossain 2006). There is limited literature discussing the exclusion of the elderly and people with disabilities from public toilets. However, those that have analysed their access to sanitation facilities note that the issue often stems from lack of mobility (Peprah *et al.* 2015).

Access to public toilets was also constrained by institutional and regulatory dynamics. Four out of five of the public toilet facilities were closed overnight in Fante New Town. This, coupled with the exclusion of many residents from using the toilet facility at their house unit, resulted in them practising open defaecation. A study into communal sanitation in Kibera, Kenya (Schouten & Mathenge 2010) and another in India (Heijnen *et al.* 2015) also found that many communal facilities close at night but failed to investigate how people relieve themselves during this time. Other studies found that even when public toilets were open at night, factors such as increased danger, particularly for women and girls, distance and uneven terrain, limited their use (Jenkins & Sugden 2006; Tumwebaze *et al.* 2012). These barriers to public toilet use at night raise the question of whether, if the population of Fante New Town had continuous access to public toilets, they would use them, or if open defaecation would prevail.

Overall, there seems to be a trade-off between the choices people in the household and community in Kumasi can make and broader structural relationships that prevent them from choosing and accessing certain shared or public facilities. Demographic and regulatory dynamics combine to exclude certain groups (especially tenants, children and the elderly) from accessing safe and hygienic sanitation options at different times. When choices are made, the options may be limited and have negative consequences for health and well-being (e.g. use of dirty latrines or open defaecation). In this sense, 'toilet mobility' is unequally skewed to those who are (a) able to pay for facilities and/or have access in the compound (i.e. landlords and their families) and (b) physically able to access the alternative options. User decisions are, therefore, in a constant trade-off between conveniences, comfort, affordability, accessibility and health.

The implications of these findings for policy responses in Kumasi fall into two broad categories – those which

address broader institutional and regulatory barriers and those which support increased mobility. Structural changes relate to shifting the quality and extent of toilet provision so as to increase options for individuals. This might include the provision and more active management of additional public toilets, including the provision of well-managed and safe options for users at night and adequate and safe accessibility for children, older people, and those living with disabilities, day and night. It could also focus on improving the provision of toilets in the house unit. In large multi-household units, our study suggests that the number of toilets provided is close to inadequate (in house units with toilets, assuming that every resident uses the toilet, the average number of users per seat is eight). On the regulatory side, there are tools available to create incentives for improved household provision (such as enforcing the building regulations that require the provision of suitable sanitation). However, given the risks to low-income households if rents are raised to cover costs, these interventions should be seen within the wider context of sustainable housing supply for Kumasi. Legal or social/economic instruments that ensure landlords provide adequate, well-serviced toilets for each household or a minimum number of tenants, coupled with appropriate financial incentives could also address this. The need for proactive engagement with landlords to encourage the provision of adequate, in-house facilities to tenants in Kumasi has already been noted (see, for example, Mazeau (2013)).

The findings for this study also contribute to the ongoing debate about the extent to which shared facilities should be counted towards universal access in international targets, particularly SDG 6.2. Our research reinforces earlier concerns that access to sanitation that is shared between households does not necessarily equate with access to sanitation that can be used. Irrespective of the number of people living in a housing unit, individuals were found to be excluded from using a toilet for a wide variety of reasons, and this exclusion was overwhelmingly experienced by tenants rather than by landlords. Where access to sanitation is reported by the head of a household during a survey, this may result in an overestimate of the numbers of individuals who have access, since heads of households are highly likely to be landlords in the sort of house units we found in this study and are likely to report access to a toilet even if all the residents cannot use it. At the national and regional levels, therefore, it seems plausible that the introduction and use of more nuanced indicators of the *quality of access* to toilets could begin to address the structural faults inherent in the push for a focus on household toilets and (from some countries), for the inclusion of public and shared facilities in national and international reporting. A measure which assesses toilet mobility and thereby focuses on the agency of individual users and the tendency of structural factors to support this could provide stronger incentives for a more effective provision of sanitation services which work for everyone.

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