Research Paper

When is shared sanitation acceptable in low-income urban settlements? A user perspective on shared sanitation quality in Kumasi, Kisumu and Dhaka

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ABSTRACT

Shared sanitation facilities (SSFs) have contributed considerably to sanitation access in many low-income settlements. While many SSFs are of unacceptable quality, others have been found to be a hygienically safe and a socially and economically viable sanitation option. Within its framework, the WHO/UNICEF Joint Monitoring Programme (JMP), evaluating progress on the Sustainable Development Goals, considers shared sanitation as 'limited sanitation'. Overall, there is uncertainty about the criteria to distinguish between unacceptable and acceptable quality of SSF. In our study, we used a user-centred qualitative approach in low-income urban settlements in Kumasi (Ghana), Kisumu (Kenya) and Dhaka (Bangladesh) and conducted 17 focus group discussions to evaluate how SSF users define the quality of an SSF and which aspects they consider as essential priorities for good-quality SSF. In descending order, the user priorities identified are: *immediate water access*, *cleanliness*, *gender-separated toilets*, *flush toilets*, *lighting for use at night*, *lockable/functional doors*, *tiling*, *handwashing stations* and *privacy*. This list can serve as input to the sanitation guidelines, local building codes and the establishment of minimum national sanitation standards. SSFs that meet these minimal criteria can then be promoted as an incremental step when individual household facilities are not feasible.

Key words | low-income urban settlements, monitoring, quality, shared sanitation, Sustainable Development Goal 6, user-centred qualitative approach

HIGHLIGHTS

- Previous research has identified user acceptability aspects for adequate sanitation. Very little research has been done which aspects users prioritise.
- No research has been done that qualitatively collected priorities of users of shared sanitation facility (SSF) in the context of low-income urban settlements and, at the same time, evaluated the prioritisation by SSF users across different contexts.

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- Our research provides new information to distinguish between general SSF user quality concerns and priorities.
- Our identified list of user priorities can assist in defining investment priorities that improve SSF to increase user satisfaction.
- On the other hand, this list can serve as input for future sanitation guidelines, local building codes and the establishment of minimum standards as, for example, documented in national sanitation policies.
- Establishing minimum criteria could then inform the development of a revised JMP framework that categorises SSF meeting these criteria as 'basic sanitation.

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INTRODUCTION

Sanitation, health and well-being

Worldwide, 2 billion or 1 in 4 people still lack a basic sanitation service and 673 million still practise open defaecation (WHO 2019). Inadequate sanitation leads to environmental pollution and has significant negative health (Heijnen *et al.* 2014) and non-health consequences (Hutton & Whittington 2015). In September 2015, the 17 Sustainable Development Goals (SDGs) were adopted by all member states of the United Nations. SDG6 aims at ensuring the availability and sustainable management of water and sanitation for all.

Monitoring sanitation access within the SDGs

To evaluate progress towards the SDGs, the WHO/UNICEF Joint Monitoring Programme (JMP) service ladder is used to benchmark and compare service levels across countries, regarding access to safe sanitation. The service ladder builds on the established improved/unimproved facility type classification. Improved sanitation facilities are those designed to hygienically separate excreta from human contact (flush/pour-flush toilet, flush to piped sewer system, flush to septic tank, flush to pit latrine, pit latrine with slab, composting toilet, twin pit latrine with slab, container-based sanitation and flush/pour flush to don't know where (WHO 2019)). The JMP service ladder divides improved sanitation facilities into three categories: limited, basic and safely managed services. Depending on the management of excreta, individual household (HH) facilities are categorised as either basic (improved facilities not shared with other HHs) or safely managed services (improved facilities not shared with other HHs and where excreta are safely disposed of *in situ* or transported and treated offsite). In contrast, shared sanitation facilities (SSFs) are at best classified as a limited solution. The reason is that '[it is] extremely difficult – for global monitoring purposes – to differentiate between shared toilets that are hygienic, accessible and safe, and the more common ones, which are poorly designed and managed' (Evans *et al.* 2017). The total number of SSF users has increased from 335 million (= 5.4% of the world's population) in 2000 to 627 million (= 8.3%) by the end of 2017 (WHO 2019, 2020).

In low-income urban areas with poorly developed infrastructure, high population growth coupled with high poverty levels leaves SSF often as the only viable sanitation option (Cardone *et al.* 2018; Tidwell *et al.* 2019b). Thus, some authors claim that the definition of basic/safely managed sanitation should be changed to include SSF under certain circumstances (Rheinländer *et al.* 2015; Evans *et al.* 2017). Others exercise caution because unhygienic and poorly managed SSF leads to adverse effects on public health (Heijnen *et al.* 2014). The new guidelines on sanitation and health, which serve as the normative guidance in the design of sanitation programmes, state that SSFs which 'safely contain excreta can be promoted […] as an incremental step when individual HH facilities are not feasible' (WHO 2018).

Monitoring shared sanitation quality

While many SSFs are indeed of unacceptable quality, there is at the same time uncertainty about the criteria to distinguish between unacceptable and acceptable quality (Evans *et al.* 2017). So far, research has not determined a

set of indicators that allow for monitoring and evaluating the quality of SSF. But, what does quality mean? The answer depends on who is asked. While scholars claim to take an impartial theoretically grounded perspective, individuals are often concerned with their immediate personal reality. Thus, users and their perspectives on sanitation priorities are fundamental to consider. It is so both in terms of trying to meet their needs with public investments and in terms of ensuring user acceptance and, thus, supporting intervention success.

User priorities: current state and gaps

Previous research has identified user acceptability aspects for adequate sanitation. (Acceptable SSF is available and affordable; functional; clean; located close by and physically easy to access; safely available 24/7 to everyone of all genders and ages, abilities and conditions without long waiting times; providing privacy; equipped with anal cleansing materials; includes handwashing and body washing provisions for menstruating girls/women; and provides respective safe and private waste deposit provisions for used anal cleansing and menstrual health management materials.) Very little research has been done on which aspects users prioritise (Schouten & Mathenge 2010; Tidwell *et al.* 2019b). No research has been done that qualitatively collected SSF user priorities in the context of low-income urban settlements and – at the same time – evaluated the prioritisation by SSF users across different contexts. Further research is needed to distinguish between general SSF user quality concerns and priorities. This can support investment strategies and inform a monitoring framework that responds to user concerns and priorities. In this paper, we tackle the following research question: 'With respect to SSF quality, what are user quality concerns for SSF in three different low-income urban contexts and which quality concerns do users consistently prioritise across them'?

Study context, ethics approval and consent to participate

This paper presents qualitative results and is part of the QUISS (www.sandec.ch/quiss) study funded by Water & Sanitation for the Urban Poor (WSUP) (https://www.wsup.com/research). The study obtained ethical approval from the Ethical Review Committee (ERC) at Eawag (Switzerland), from the Council for Scientific and Industrial Research (CSIR), Accra (Ghana), the ERC of the Jaramogi Oginga Odinga Teaching & Referral Hospital (JOOTRH) in Kisumu (Kenya) and the ERC of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b). Study participants were informed of the aims of the study and their rights. All respondents gave verbal consent to participate in the study.

METHODS

Study design

Our research adopts the SSF categorisation developed by Evans *et al.* (2017), which distinguishes between (a) shared HH toilets, (b) compound toilets, (c) community toilets and (d) public toilets. ((a) Toilet in one HH also used by other HHs; (b) Toilets used only by the people living in a particular compound; (c) Non-HH toilets used by a restricted group of HHs; (d) Toilets open to anybody.) For data collection and analysis, we targeted users of shared HH toilets and compound toilets.

Study setting

Data were collected in low-income settlements (Kumasi, Ghana (Accra Town, El Shadai, Oforikrom, Ahwiamu), Kisumu, Kenya (Nyalenda A, Nyalenda B, Manyatta A, Manyatta B) and Dhaka, Bangladesh (Duari Para, Kamalapur, Kamrangirchar, Maniknagar, Satala, Agargaon)) in Kumasi (Ghana), Kisumu (Kenya) and Dhaka (Bangladesh). Typically, these settlements are crowded and often consist of several tenant HHs sometimes living together with residential proprietors. Sanitation is provided at the compound level with the several HHs using an SSF together.

Data collection

Data collection took place between January and March 2019 using focus group discussion (FGD) according to Morgan & Krueger (1998). We defined user quality concerns as aspects

that affect the user's experience in a positive or negative way when using or avoiding using SSF. This includes aspects that make an experience (in-)convenient and/or (dis-)comforting and/or has perceived adverse/beneficial health/well-being effects. User quality priorities were captured by asking about current toilet status and complaints and what makes a facility convenient and comfortable, and (indirectly), by asking about the accessibility and availability of the facility, as well as the necessities for provision of privacy, safety and security. All respondents were also asked to describe what they considered as a high-quality toilet.

Sampling

We defined four sample criteria for FGD participants:

- Users living in low-income urban settlements.
- Users of SSF in compounds.
- Participants must be from different compounds.
- Participants must use different SSF.

We conducted five FGDs in Ghana and six FGDs in Kenya and Bangladesh, each with eight to twelve participants between 18 and 65 years of age. Overall, 17 FGDs were conducted, of which eight were women-only, five were mixed and four were men-only. The composition was as follows:

- Ghana: two women-only, two mixed, one men-only
- Kenya: three women-only, one mixed, two men-only
- Bangladesh: three women-only, two mixed, one men-only

Data analysis

Audio recordings of the FGDs were translated to English and transcribed. Data were analysed, applying directed and inductive content analysis according to Mayring (2015) using the Atlas.ti 8 software. Directed content analysis requires a predefined set of codes, i.e. labelling statements capturing a certain theme with a descriptive code. This allows for validation and comparison with previous topic-related research findings. In inductive content analysis, first, narrow codes representing the statement's content are assigned and through refinement, themes are inductively captured. This allows for the gaining of direct information from the data. Labelling statements with codes that thematically capture their contents or message allows sorting and structuring in a logical way a large number of statements into meaningful and comparable data clusters. For example, we used a tree-diagram organisation where codes can be hierarchically organised in code groups, which contain thematically related codes, which in turn can consist of further sub-codes. For the directed content analysis, we collated a list of existing user quality concerns, which we used as predefined codes (Schouten & Mathenge 2010; Satterthwaite *et al.* 2015; Giné-Garriga *et al.* 2017; Simiyu *et al.* 2017; Cardone *et al.* 2018; Tidwell *et al.* 2018) (For example, this included codes, such as cleanliness, functionality, availability, privacy, safety, size, odour-free, physical access, distance/location, lockable/functional door, key available 24/7, use at night, affordability). These codes provided the basis for coding the FGD transcripts. The number of codes inductively increased throughout the coding exercise. The codes were only used as codes if users referred to them.

Coding

User statements can be labelled with one or more codes. Subsequently, assigned codes are highlighted in *italics*. In the first round, we used the collated list of codes (= directed approach) or, if no existing code from the list could be assigned, complemented with a new code. In the second round, all transcripts were checked, emerging codes refined, merged or deleted. Throughout the third round of coding, codes and sub-codes were subsumed into code groups. For example, when participants mentioned that soap (for handwashing) is essential, in the first round, the code *soap* as well as *handwashing station* were assigned to the statement. In the second round, *soap* was structured as a sub-code of *handwashing station*. In the third round, *handwashing station* became a code of the emerging code group *Technical Components*, as did, for example, the emerging code *tiling*. After the second round, by which time it was felt that new information was not forthcoming (theoretical saturation), 199 codes were defined. For the evaluation, only codes (no code-groups or sub-codes) were used.

Evaluation

When participants explicitly expressed quality concerns, the statements were labelled with the code *Quality Aspects User*

View. For example, if a user expressed that 'soap for washing hands' is a necessity, apart from *soap* and *handwashing station*, the statement was coded with *Quality Aspects User View*. When a statement is labelled with two (or more) codes, we refer to this as code overlap. Comparing the code overlaps of *Quality Aspects User View* with all other 198 codes possibly assigned to a particular statement allowed for evaluating which aspects users most commonly related to SSF quality. In a first evaluation step, we evaluated overall user priorities. Overall user priorities are those that are consistently mentioned across genders and context. We defined the evaluation criteria as:

1. Overlap of a particular code (e.g. *handwashing station*) with *Quality Aspects User View*.
2. Mentioned in every country.
3. Mentioned in at least two different FGD types per country.

In the second evaluation step, we assessed gender differences regarding the previously identified quality priorities. To this end, we compared normalised code distributions by FGD type. For example, assuming the code *handwashing station* overlapped 29 times with *Quality Aspects User View* across the 17 FGDs and assuming that men and women equally prioritise a handwashing station. If so, the code *handwashing station* should have a normalised distribution of 33%: 33%: 33% between women-only: men-only: mixed FGDs. Comparing code distributions among FGD types allowed for evaluating if one gender is more strongly in support of a particular identified priority.

RESULTS

In the first evaluation step, based on our evaluation criteria we identified nine user quality priorities (Table 1). None of these priorities was consistently mentioned in every FGD. However, reliable and direct water availability, as well as clean toilets, reached the highest score. The code (general) *water availability* overlapped 54 times with *Quality Aspects User View* in 15 out of 17 FGDs. *Cleanliness* overlapped 28 times with *Quality Aspects User View* in 13 FGDs. Additionally, *gender-separated toilet* overlapped 27 times with *Quality Aspects User View* in 12 FGDs. Furthermore, adequate *sanitation technology* overlapped 28 times with *Quality Aspects User View* in 11 FGDs. Particularly, in Ghana and Kenya, this concerned *flush WCs* as the preferred option. Moreover, four different *additional technical components* met the evaluation criteria. They are *lighting*, *lockable/functional door*, *tiling* and a *handwashing station*. *Lighting* overlapped 22 times with *Quality Aspects User View* in nine FGDs. *Lockable/functional door* overlapped 18 times with *Quality Aspects User View* in 12 FGDs. *Tiling* overlapped 17 times with *Quality Aspects User View* in 10 FGDs. Users reported that this increases *cleanliness* due to easily cleanable surfaces. The availability of a *handwashing station* overlapped 10 times with *Quality Aspects User View* in eight FGDs. Finally, *privacy* met the evaluation criteria. *Privacy* overlapped 18 times with *Quality Aspects User View* in eight FGDs. Participants largely linked this to the availability of *gender-separated toilets* and menstrual health management (*MHM*) provisions, as well as to the presence of a *lockable/functional door*.

In summary, according to the designated evaluation criteria and based on their score, quality priorities from a user perspective for SSF are (in descending priority):

1. Water availability in close proximity
2. Cleanliness
3. A gender-separated toilet
4. Flush WC
5. Lighting
6. A lockable/functional door
7. Tiling
8. A handwashing station
9. Privacy

Regarding the second evaluation step, Figure 1 indicates gender differences concerning the particular quality priorities. Women expressed a higher concern for almost all quality priorities. Only two quality priorities were more important to men than women. These are *sanitation technology* (flush WC) and *tiling*. For the *flush WC*, the distribution is with 28%: 34%: 38% rather balanced, but more important to men. For *Tiling*, the distribution is with 6%: 36%: 57% imbalanced. *Tiling* was by far more important to men than women, but mostly mentioned in mixed FGDs. Conversely, concerning *water availability*, the distribution is 40%: 13%: 47%. Similarly, regarding *cleanliness*,

Table 1 | Quality aspects from a user perspective (distribution binarised, selection)

Quality Aspects User View	Ghana			Kenya			Bangladesh		
	Women-only	Men-only	Mixed	Women-only	Men-only	Mixed	Women-only	Men-only	Mixed
Water Availability	✓	x	✓	✓	✓	✓	✓	✓	✓
Cleanliness	✓	✓	✓	✓	✓	x	✓	✓	✓
Gender Separated Toilets	✓	✓	✓	✓	✓	x	✓	✓	✓
Sanitation Technology (Flush WC)	✓	✓	✓	✓	✓	✓	✓	x	✓
Lighting	✓	x	✓	✓	✓	✓	✓	x	✓
Lockable door	✓	x	✓	✓	✓	✓	✓	✓	✓
Tiling	✓	✓	✓	x	✓	✓	✓	x	✓
Handwashing	✓	x	✓	x	✓	✓	✓	✓	✓
Privacy	✓	x	✓	✓	✓	✓	✓	x	✓
Odour / Smell	✓	✓	✓	✓	x	✓	x	x	✓
Cleaning Arrangement	✓	✓	✓	✓	x	x	✓	✓	✓
Space Availability (inside)	x	✓	x	✓	x	✓	✓	✓	✓
Safety / Security	✓	x	✓	✓	✓	x	✓	x	x
Toilet-User-Ratio	✓	x	x	✓	✓	✓	✓	✓	x
Detergent	✓	x	✓	x	x	x	✓	✓	✓
Vermin	✓	x	x	✓	✓	x	✓	x	x
Queuing / Waiting Time	✓	x	x	✓	✓	x	✓	✓	✓
Tissue / Toilet Paper	✓	x	x	✓	✓	x	✓	✓	✓

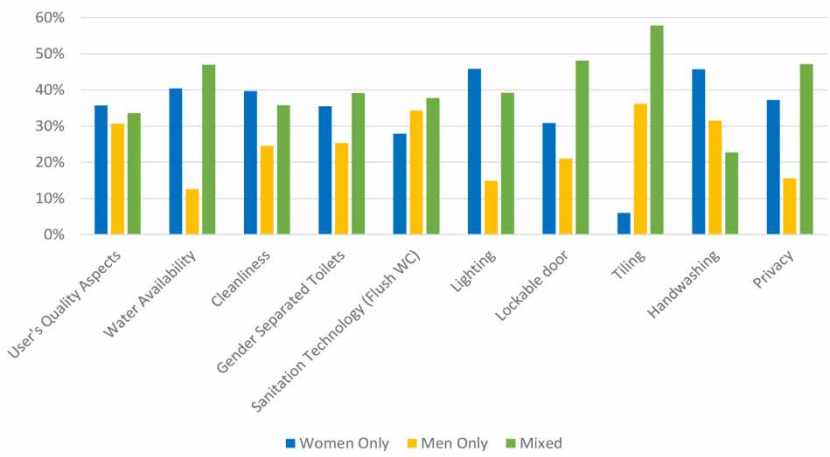

Figure 1 | User Quality Priorities by gender (distribution normalised).

the distribution is 40%: 25%: 35%. That the share for *water availability* and *cleanliness* is lowest for men's statements and highest for women's statements suggests that women have a higher concern for immediate water availability. It is very likely that this is due to increased body hygiene requirements for women (Mitlin 2011), as well as that women are often responsible for cleaning activities (Kwiringira *et al.* 2014). The distribution for *handwashing stations* (46%: 31%: 23%) indicates that women have a higher concern for hygiene. The comparison further suggests that *privacy*, *lighting* and *lockable/functional door* are closely related to *safety/security* and more important to women compared with men. The same is true for *gender-separated toilets*. Overall, the distribution for *privacy* statements (37%: 16%: 47%) indicates that this is by far more important to women, but does not rely on a 'safe space' to be discussed. *Additional technical components*, such as *lighting* (46%: 15%: 39%), *lockable/functional door* (31%: 21%: 48%) and *gender-separated toilets* (36%: 25%: 39%), were all more important to women compared with men. Code overlaps between *lockable/functional door* and *privacy* and *lockable/functional door* and *safety/security* show that it is slightly more important for *privacy* (21 overlaps) compared with *safety/security* reasons (15 overlaps).

DISCUSSION

In general, the study confirms previous findings on important user perceptions of aspects determining acceptable sanitation, but provides more detailed information on user priorities. Overall, *water availability* and *cleanliness* were the most prioritised quality aspects. These two are closely related: Users perceive *water availability* (in close proximity) as essential to keeping the facility clean. *Water availability* as a user priority confirms previous study results (Schouten & Mathenge 2010). Past research shows that across all countries and genders, users perceive a close water source as essential for cleaning (Kwiringira *et al.* 2014). *Cleanliness* being the highest priority is consistent with the results from Schouten & Mathenge (2010). With water being immediately available for *flush WCs*, participants expect *cleanliness* to increase with concomitant beneficial effects, such as decreasing *odour/smell* and *vermin* (Rheinländer *et al.* 2013).

Surprisingly, *odour/smell* and *vermin* did not meet the evaluation criteria. Other research reports these to be major user quality concerns (Rheinländer *et al.* 2013; Tidwell *et al.* 2018). *Odour/smell* did not meet the evaluation criteria because it was mentioned in Bangladesh in mixed FGDs exclusively. *Vermin* did not meet the evaluation criteria because it was mentioned in women-only FGDs in Ghana and Bangladesh exclusively. The results for *odour/smell* are consistent with the findings on *vermin*. For both, the highest concern was found in Ghana and the lowest in Bangladesh. Participants found dirty toilets and *odour/smell* to be reasons for *vermin*. It is likely that due to the high concern for general *cleanliness*, users indirectly included a reference to *odour/smell* and *vermin* when referring to *cleanliness*.

Our data confirm past research that found *handwashing stations* to be SSF user priorities (Tidwell *et al.* 2019a). Our FGD data point to a current lack of functional *handwashing stations*. This is consistent with previous SSF research, which found that only 3% of SSF to be equipped with a functional *handwashing station* (Tidwell *et al.* 2019a). Users prioritise *handwashing stations* for personal hygiene motives.

Users prioritise *lighting*, *lockable/functional door* and *tiling* for *cleanliness*, *privacy* and/or *safety/security* reasons. This is consistent with previous findings and recommendations (Simiyu *et al.* 2017; Cardone *et al.* 2018; Tidwell *et al.* 2018). Women prioritised *lighting* and *lockable/functional door* for *privacy* and *safety/security* reasons. Men prioritised *lighting* and *tiling* for *cleanliness* reasons. Easily cleanable surfaces are expected to decrease the effort needed for cleaning and, thus, to increase likeliness of SSF users to clean (Tumwebaze *et al.* 2014). Because references to tiled floors are largely absent from scientific literature, we were surprised to find *tiling* among the emerging user priorities. Conversely to Tidwell *et al.* (2019a), we found higher support from men for tiled floors.

We also expected users to express the presence of *lockable/functional doors* to positively influence *cleanliness* as they prevent outsiders from entering (Tumwebaze *et al.* 2014; Simiyu *et al.* 2017; Tidwell *et al.* 2019a). However, very few statements support this assumption. Generally,

the use of the SSF by outsiders is not a common issue reported. This is surprising as data suggest that most doors are only lockable from the inside and stay open when not in use. This finding is consistent with past research (Tidwell *et al.* 2018). Except in the Bangladesh context, solid *lockable/functional doors* are the norm in most cases.

Interestingly, *safety/security* did not meet the evaluation criteria. As a user quality priority, *safety/security*, did not meet the evaluation criteria because it was mentioned in Bangladesh in women-only FGDs exclusively. Like *cleanliness* and *privacy*, *safety/security* is a dependent variable, as its 'provision' is dependent on different and interdependent factors. A reason for fewer references might be that *safety/security* reveals strong links to *privacy*, for example, via a *lockable/functional door* (Simiyu *et al.* 2017; Tidwell *et al.* 2018). It is possible that participants indirectly refer to *safety/security* when mentioning *privacy*.

Regarding *gender-separated toilets*, women prefer these for *privacy*, whereas men for *cleanliness* reasons. The men complained about visible bloodstains. Both motives indicate inadequate *MHM* provisions. This includes a lack of or inadequate personal hygiene facilities for women, leading to humiliating and unhygienic conditions. In this sense, *gender-separated toilets* are linked via *MHM* to *privacy* and *cleanliness*. The importance of sanitation services responding to women's (enhanced) needs is well established (Mitlin 2011; Hueso *et al.* 2018). Interestingly, all of the men-only FGDs explicitly mentioned and supported *gender-separated toilets*.

Surprisingly, *toilet–user ratio* and *queuing/waiting time* did not meet the evaluation criteria. Insufficient *toilet–user ratio*, leading to *queuing/waiting time*, impedes toilet availability and has adverse effects on *privacy* and *safety/security*, as well as on *cleanliness* (Günther *et al.* 2011). Low *toilet–user ratios* can lead to long *queuing/waiting times*. *Toilet–user ratio* and *queuing/waiting time* did not meet the evaluation criteria because in Ghana this was exclusively mentioned in women-only FGDs. The highest occurrence of *toilet–user ratios* and *queuing/waiting times* was found in Bangladesh. This is not surprising, as Dhaka is known as the third most densely populated city worldwide (Migiro 2018). Recent SSF research on cleanliness found that in urban low-income settlements, an SSF shared by not more than four HHs can be considered as 'acceptable' (Günther *et al.* 2012). *Queuing/waiting time* is reinforced by toilets serving simultaneously as a *shower/bathing* area and for females to manage *MHM*. In this respect, *gender-separated toilets* and – where possible – designated *shower/bathing* areas could enhance user privacy and produce relief on toilet availability.

Inadequate conditions force users to develop *coping mechanisms*. Women are forced sooner and more often to make use of *coping mechanisms* compared with men (Kwiringira *et al.* 2014; Simiyu 2015). In our case, the most prevalent *coping mechanism* is *accompanying* each other because the toilet is too far away (*distance/location*) and/or when *using at night*. This links to the presence of *lighting*, which is especially relevant to women when using SSF at night (Hueso *et al.* 2018). A *coping mechanism* for the lack of *lockable/functional doors* is to hang up a cloth or, where solid doors without locks are present, to lock these with an inside-rope. Where no locking mechanism is available, people audibly cough from the inside to signal the toilet is occupied or are forced to manually hold the door closed. The third *coping mechanism* reported is using a public toilet instead.

CONCLUSION

Our results confirm previous findings on important user quality concerns determining acceptable sanitation, but provide more nuanced information than past research on user priorities for shared sanitation. We determined nine user quality priorities across three different low-income urban contexts. In descending order, the user priorities are: *immediate water access*, *cleanliness*, *gender-separated toilets*, *flush toilets*, *lighting for use at night*, *lockable/functional doors*, *tiling*, *handwashing stations* and *privacy*. Counterintuitively, *toilet–user ratio*, *waiting time*, *odour/smell* and *vermin* do not figure within our evaluated user quality priorities. From the evaluated user quality priorities, *cleanliness* and *privacy* can be considered as dependent or outcome variables. This means that their 'provision' is dependent on different and interdependent factors, i.e. independent variables. *Immediate water access*, *gender-separated toilets*, *flush toilets*, *lighting for use at night*, *lockable/functional doors*, *tiling* and *handwashing stations* are such independent variables. This means, some of them affect *cleanliness*, some affect *privacy* and some, additionally, affect *safety/security*, an

additional outcome variable. Taking into account the three outcome variables, the remaining seven user quality priorities can be subordinated as dependent variables as follows:

- Cleanliness
  - Water availability in close proximity
  - Flush WC
  - Lighting
  - Tiling
  - Handwashing stations
- Privacy
  - Gender-separated toilet
  - Lockable/functional door
- Safety/security
  - Lighting
  - Lockable/functional door
  - Handwashing stations

By distinguishing between general user concerns and priorities, we determined individual and gender-specific quality concerns of SSF users in Kumasi, Kisumu and Dhaka. Yet, generalisability might be limited as the results are possibly context-specific and refer to shared HH toilets and compound toilets only. In light of this, on the one hand, the list can assist in defining investment priorities that improve SSF to increase user satisfaction. On the other hand, this list can serve as input for future sanitation guidelines, local building codes and the establishment of minimum standards as, for example, documented in national sanitation policies. Establishing minimum criteria could then inform the development of a revised JMP framework that categorises SSF meeting these criteria as 'basic sanitation'. SSFs that meet these minimal criteria can then be promoted as an incremental step when individual HH facilities are not feasible. These qualitative findings were also valuable for the design of the subsequent quantitative phase (results to be published), in which we aimed more specifically to identify the particular 'hard' determinants of SSF quality and potential indicators thereof. These forthcoming results will assist in informing the development of a monitoring framework for SSF and the determination of quality indicators that are aligned and respond to user needs and priorities.

DATA AVAILABILITY STATEMENT

All relevant data are included in the paper or its Supplementary Information.

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