



## Determinants of households' cleaning intention for shared toilets: Case of 50 slums in Kampala, Uganda



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### A B S T R A C T

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Cleaning shared toilets is important if users are to receive the significant health, social and economic benefits associated with having access to these facilities. However, achieving and maintaining hygienic toilets shared by several user households in urban slums is usually a challenge. This study assesses determinants of households' cleaning intention for shared toilets in Kampala, Uganda. Using a structured questionnaire for the household interviews and an observation checklist, data from 1019 users of shared toilets was collected in 50 randomly selected urban slums. Data analysis showed that most of the shared toilets are unhygienic. Less than a quarter of the shared toilets, for instance, were hygienically clean to users' satisfaction. The main cleaning intention determinants ( $p$ -value  $< .05$ ) included: importance of using a clean toilet, the effort involved in cleaning the toilet, the disgust felt from using a dirty toilet, and cleaning habits. Although it is important to have access to sanitation facilities, emphasis should be placed on how to engage users to ensure that the facilities used are appropriately cleaned and maintained.

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### Introduction

There has been slow progress in regard to slum dwellers having access to improved sanitation in urban developing cities (Martínez, Mboup, Sliuzas & Stein, 2008; UN, 2012; WHO/UNICEF, 2012). Some of the reasons for inadequate sanitation in urban informal settlements vary from population explosion (Omambia, 2010; UN-Habitat, 2012), the reluctance of the authorities to develop sanitation systems (Huchzermeyer, 2008; Mara, 2003), to tenure security (Scott, Cotton & Sohail Khan, 2013) and negligence of the household owners (Isunju, Schwartz, Schouten, Johnson & van Dijk, 2011). Increasing population densities in slums has contributed to diminishing space for many on-site conventional sanitation systems (Katukiza et al., 2012; Schouten & Mathenge, 2010). This explains why shared as opposed to private sanitation facilities are dominant in slum settlements (Gulyani & Talukdar, 2009; Karn, Shikura & Harada, 2003; Kulabako, Nalubega, Wozzi & Thunvik, 2010; Mukhija, 2002).

Although shared toilets are currently classified as unimproved by the United Nations Joint Monitoring Programme for Water and

Sanitation, they are the most significantly increasing excreta disposal system in most slum settlements (WHO/UNICEF, 2012). Shared toilets are facilities where each toilet room is used by different households/families (Gulyani & Talukdar, 2008; Günther et al., 2011). This fact underpins their importance and explains why some experts envision them as the most feasible excreta containment option for densely populated slum settlements (Schouten & Mathenge, 2010). Several studies indicate that improvements in water, sanitation and hygiene significantly reduce a wide range of preventable diseases, such as diarrhoea, cholera, and trachoma (Ashbolt, 2004; Bartram & Cairncross, 2010; Connolly et al., 2004; Fewtrell et al., 2005; Mara, Lane, Scott, & Trouba, 2010; Montgomery, Desai & Elimelech, 2010). Diarrhoea alone is one of the leading causes of child mortality among children less than 5 years of age in the world (UNICEF, 2012) causing approximately 2.5 million deaths per year (Kosek, Bern & Guerrant, 2003). Africa and South-East Asia have the highest diarrhoea mortality rates (Boschi-Pinto, Velebit, & Shibuya, 2008) among this demographic group. In addition to its high child mortality rate from diarrhoea, Africa also has very high adult mortality due to diarrhoea (Boschi-Pinto et al., 2008).

It has been shown that if sanitation facilities are poorly maintained or inappropriately used, it is difficult to guarantee the health of the users and the convenience of using the facilities (Buttenheim,

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2008; Kimani-Murage & Ngindu, 2007; Owusu, 2010). Studies indicate that while some populations in developing countries have access to clean toilet facilities, most in urban informal settlements are dirty (Bartlett, 2003; Rheinländer, Samuelsen, Dalsgaard & Konradsen, 2010; Tumwine et al., 2003). Using dirty toilets is often a health hazard for the users (Sijbesma, 2008). Holistically, while personal, domestic and environmental hygiene are important to prevent diseases related to poor sanitation and poor hygiene, maintaining the cleanliness of shared toilets is just as crucial.

Cleanliness is recognized as an important component of hygiene behaviour (Cairncross & Shordt, 2004; Curtis, Cairncross & Yonli, 2000; Sijbesma, 2008). There is increasing awareness among public health practitioners of hygiene's contribution to the realization of benefits from the provision of safe water and improved sanitation facilities (Bartram & Cairncross, 2010; Esrey, Potash, Roberts & Schiff, 1991; Montgomery et al., 2010). Some researchers have argued that while there is a clear and pressing need for increased levels of investments in water and sanitation facilities, they need to be accompanied by well-designed hygiene programmes or the environmental health benefits produced by these investments could be lost (Tumwine et al., 2002). Nevertheless, hygiene is still given little consideration in the public health field (Curtis et al., 2011). Research on hygienic shared toilet usage and the cleaning of shared toilets by users is also limited among public health practitioners and researchers. Despite these research deficits, the appropriate use and maintenance of shared toilets in a clean way is prioritized by health practitioners.

This article provides insight into the determinants of households' cleaning intention for shared toilets in urban slums. It is based on a primary study conducted in randomly selected slums in Kampala, the capital city of Uganda. While encouraging behaviour change, such as hygiene improvement is often complex (Curtis et al., 2000), critical understanding and assessment of the factors that influence the promotion or performance of specific behaviours is always crucial (Mosler, 2012). The role of intention as a determinant factor in individuals' performance of desired behaviours is based on the theories of reasoned action and planned behaviour (Fishbein & Ajzen, 2010). Individual intention to perform hygiene-related behaviours, such as regular cleaning of the shared toilet or hand washing with soap at critical times, may be influenced by both psychological and non-psychological factors (Clayton & Griffith, 2008; Curtis, Danquah & Aunger, 2009; Jenkins & Scott, 2007). The application and relevance of these theories is further expounded in the RANAS model [R(isk), A(ttitudes), N(orms), A(bilities) and S(elf-regulation)] of behaviour change (Mosler, 2012) that was developed from a pool of social cognitive theories. Psychological belief factors, such as attitudes, norms, abilities, risks, habits and expressed demand are discussed in this paper.

## Material and methods

### Research area

Field research was carried out in randomly selected slums of Kampala, the capital city of Uganda. Like most cities in developing countries, over 60% of the population in Kampala resides in slums (UBOS, 2005; UN-Habitat, 2007). Kampala district is divided into 5 areas that are presently referred to as municipal councils by the Kampala Capital City Authority (KCCA). These are: Central, Makindye, Kawempe, Nakawa and Rubaga. The municipal councils are divided into parishes, and there are a total of 64 parishes. The last administrative units in the parishes are villages or zones. Out of 307 villages in Kampala City, 188 are recognised as slums by the city authorities. Approximately 61.2% of the people, more than half of the population in Kampala, live in slums (Tumwebaze et al., 2012).

Research for this study took place in all 5 municipal councils, in 39 parishes and 50 slums.

### Procedure

Data was obtained using structured household questions and an interviewer checklist. The interviewees were slum household residents and only those persons aged 18 or over who consented to be interviewed were enrolled in the study. The household was the unit of analysis in this study and interviews were done at only one household per housing unit. Each housing unit often contains a number of households. In addition, because of the close nature of the households and dense housing units in most of the slums, interviewees were enrolled from every third housing unit. Preference was given to the respondents of the first household of each unit. However, in cases where no one was home at the first household, or only persons under 18 years of age were present, or the eligible person in the household did not consent to be interviewed, the interviewers then approached the next household.

Household interviews were conducted in the local native language (Luganda), which is the language most spoken in the slums. A team of 15 interviewers were recruited and trained on the data collection process and the interviewers were mainly university graduates. Each household interview lasted approximately 45 min. A team of 3 interviewers normally did 30 household interviews in 2 days, with each interviewer interviewing respondents of 5 households per day. Five local leaders from the 5 municipal councils were also recruited as field supervisors to guide and introduce the interviewers in the zones.

### Sample

A total of 1500 household respondents participated in this research. Of the 50 randomly chosen slums (random sampling with STATA) in Kampala, 390 respondents were from the municipal councils of Kawempe and Makindye, 330 from Rubaga, 210 from Nakawa and 180 from Central. The reason why there were more respondents in Kawempe and Makindye may be due to the fact that these areas have the highest number of slums in Kampala district (Tumwebaze et al., 2012). Data from 1019 respondents that shared toilets with different households (families) was analysed.

### Questionnaire

The variable items and questions were structured by socio-demographic variables, the sanitation situation and intention variables.

#### Socio-demographic factors

The socio-demographic questions items aimed at capturing information about: the respondents' sex (male/female), education level, household ownership status (tenant/owner), number of people living in the household, and number of children under 5 years of age in the household.

#### Sanitation situation

These questions captured data on the sanitation facilities used by the household respondents (private/shared/public/none), and their perceived cleanliness (scale: very dirty to not dirty at all), the number of households sharing a toilet room, the facilities used by children under 5 years of age, whether shared toilet rooms were lockable (yes/no) and the main problem concerning the cleaning of the shared toilet (nobody feels responsible for cleaning/expensive to buy water to clean/no cleaning materials or detergents/always dirty/difficult to clean because of construction design/no problem/others).

### Cleaning intention determinants

**Intention.** Cleaning intention – the dependent variable in this study was surveyed through posing the question: “how strongly do you intend to keep this toilet clean?” there were 5 possible answers, ranging from not strong at all to very strongly

**Perceived vulnerability getting a disease.** Perceived vulnerability getting a disease has an influence on behaviour performance (Schwarzer, 2008). The question here was: “how high or low do you feel are the chances that you could get sick if you used a dirty toilet?” Nine response scales ranging from very low to very high were used to measure the risk

**Attitudes.** Attitudes refer to the evaluation of entities or behaviour by individuals in terms of the outcome expectancies or associated benefits (Eagly & Kulesa, 1997; Mosler, 2012). In addition, attitudes have an affective component on the feelings aroused towards a given entity or behaviour performance (Trafimow & Sheeran, 1998). The questions here were: “how effortful is it to clean your shared toilet?” the responses ranged from not at all effortful to very effortful. “How much do you like or dislike using a clean toilet?” scale 1, I dislike it very much, to scale 9, I like it very much. “Do you think it is disgusting to use a dirty toilet?” five response scale – not at all disgusting to very disgusting

**Injunctive norms.** Injunctive norms refer to the approval or disapproval by individuals of the behaviour of others (Cialdini et al., 2006; Schultz, Nolan, Cialdini, Goldstein & Griskevicius, 2007). This was assessed with the question: “do you think that, over all, people who are important to you rather approve or disapprove that you leave a toilet dirty?” the response scale ranged from 1, nearly all disapprove to 9, nearly all approve. Here, we also assessed if users talk to each other about how the toilets are used by asking the question: “how often do you talk to the other users of your toilet about the importance of keeping it clean?” the response scale went from 1, (almost) never to 5, (almost) always

**Personal norm.** A personal norm relates to an individual's feelings or internalized values to perform or not to perform a given behaviour or task (Ajzen, 1991; Harland, Staats & Wilke, 1999; Harland, Staats & Wilke, 2007; Mosler, 2012; Perugini, Gallucci, Presaghi & Ercolani, 2003). Personal norm was assessed with the question: “How important is it for you that the toilet you use is clean?” Responses on a scale of five ranged from not important at all to very important.

**Ability.** Ability factors relate to individuals' personal beliefs and confidence to perform a desired behaviour (Ajzen, 2002). This factor was measured by the question: “how easy or difficult is it to keep the toilet you use clean?” the responses ranged from very difficult to very easy

**Habit.** A habit is a routine behaviour performed automatically or more less without thinking whether to perform it or not (Bargh & Chartrand, 1999; Kraemer & Mosler, 2010). This question was asked to measure whether shared toilet users perceived cleaning them to be a habit: “Is cleaning the toilet you use something you do as a matter of habit?” The responses ranged from not a habit at all to very strong habit.

### Checklist

After completion of the household interviews, the interviewers did a checklist concerning the toilets of the respondents. The information recorded was: whether they were able to find the toilet the household uses (yes/no), the materials used to construct the

toilet slab (wood/concrete or cement/concrete and ventilated/plastic/no slab at all), the cleanliness of the toilet slab (very dirty to not dirty at all) and whether the toilet was smelly or not.

## Results

Of the 1019 respondents, 31.1% in Makindye municipal council used shared toilets, followed by 24.2% in Kawempe, 22.5% in Rubaga, 11.5% in Nakawa and 10.7% in Central. Only 11.1%–16.7% of the respondents regarded their shared toilets as not dirty (Table 1). On the other hand, only 3.2% of the shared toilets were not dirty at all as observed by interviewers.

From the perspective of hygiene, most of the shared toilet rooms ranged from dirty to a little bit dirty (Table 1). A few respondents mentioned that their toilet rooms were not dirty. This was confirmed by the observations of the interviewers who reported that more shared toilet rooms were dirty than what respondents reported. The interviewers also observed that 60.1% of the respondents' toilets smelt badly.

The majority of the respondents were female (75.8%), and shared toilets (rooms) with users from other households. The excluded respondents in this analysis ( $n = 481$ ) were those who used private toilets, public toilets, or had no access to any toilet facility. 68.6% of the interviewed respondents were tenants, while 31.4% owned their homes. The mean number of people living in each household was 4.34 (min = 1 and max = 30). More than half (64.5%) of the respondents had children under five years of age living in their households (mean = 1.85, min = 1 and max = 12).

In regard to access to sanitation facilities, there were three times more users of shared toilets (67.9%) than those using private toilets. The mean number of toilet user households per room was 6.32 (min = 2 and max = 98). According to the respondents, more than half (61.7%) of the children less than five years of age used the same

**Table 1**  
Respondents' perceived dirtiness of shared toilets in each municipal council.

Kampala municipal councils	Very dirty	Dirty	Quite dirty	A little bit dirty	Not dirty at all	Total
Respondents perceived shared toilet cleanliness						
Central	2 1.9%	25 23.1%	15 13.9%	48 44.4%	18 16.7%	108 100.0%
Kawempe	4 1.6%	78 31.6%	19 7.7%	107 43.3%	39 15.8%	247 100.0%
Makindye	4 1.3%	46 14.6%	91 29.0%	148 47.1%	25 8.0%	314 100.0%
Nakawa	0 .0%	17 14.7%	40 34.5%	47 40.5%	12 10.3%	116 100.0%
Rubaga	3 1.3%	38 16.6%	55 24.0%	114 49.8%	19 8.3%	229 100.0%
Total	13 1.3%	204 20.1%	220 21.7%	464 45.8%	113 11.1%	1014 100.0%
Observed cleanliness						
Central	6 6.3%	45 46.9%	18 18.8%	27 28.1%	0 .0%	96 100.0%
Kawempe	19 10.9%	74 42.5%	11 6.3%	65 37.4%	5 2.9%	174 100.0%
Makindye	19 6.6%	98 33.8%	90 31.0%	70 24.1%	13 4.5%	290 100.0%
Nakawa	10 8.7%	48 41.7%	37 32.2%	19 16.5%	1 .9%	115 100.0%
Rubaga	13 5.8%	84 37.7%	37 16.6%	79 35.4%	10 4.5%	223 100.0%
Total	67 7.5%	349 38.9%	193 21.5%	260 29.0%	29 3.2%	898 100.0%

Notes: Cross tabulation of respondents perceived and interviewers observed dirtiness of the shared toilets by municipal council divisions.  $N = 1014$  for respondents perceived cleanliness and  $N = 898$  for interviewer observations.

toilets as adults. Another common excreta disposal alternative for children of that age was the use of potties or small buckets.

The main reasons for the lack of cleanliness of the shared toilets was the lack of cleaning equipment (32%), no cooperation to clean toilets among user households (31.5%) and careless use, often leaving it dirty after use (29.2%). Slightly more than half (52%) of the shared toilets had no locks. This could be another reason why most of them are dirty since they are open and accessible to the public.

Most of the respondents reported having a strong intention to keep their toilets clean. 48.3% of them had a very strong intention and 40.6% a strong intention. Only less than 1% reported having no intention at all to keep their shared toilets clean. The most significant determinants of households' cleaning intention for shared toilets were: the perceived importance to use a clean toilet, effortful behaviour, the ease to keep the toilet clean and the communication of the users with each other (Table 2).

Overall 34% of the variability in of the respondents' cleaning intention was predicted by the analysed variables. By order of importance from the standardized beta coefficients, respondents cleaning intention is influenced by personal norm to use clean toilet ( $\beta = .25$ ), effortlessness cleaning shared toilet ( $\beta = .20$ ), ability belief to keep shared toilet clean ( $\beta = .18$ ), talking frequency to toilet users ( $\beta = .16$ ), habitual toilet cleaning ( $\beta = .15$ ) and affective belief to use a dirty toilet ( $\beta = .12$ ).

From Table 2; personal the norm factor of perceived importance to use clean toilet ( $\beta = .25$ ), attitude factors (disgusting to use dirty toilet ( $\beta = .12$ ) and effortlessness in cleaning shared toilet ( $\beta = .20$ )) and cleaning habit ( $\beta = .15$ ) have higher influence on respondents cleaning intention for the shared toilet facilities. This means that the more the perceived importance to use a clean toilet or effortlessness to clean, the stronger the respondent's cleaning intention for the shared toilet. In addition, the more respondents perceived cleaning as a habit and using dirty toilet as disgusting, the stronger was the cleaning intention.

## Discussion

To clean is a behavioural hygiene practice. While the lack of cleanliness of shared toilets is one of the reasons why they are considered unimproved, according to the United Nations Joint

Monitoring Programme for Water and Sanitation (WHO/UNICEF, 2012), no clear definition of cleanliness exists. However, in a policy brief on shared sanitation by Günther et al. (2012), the authors state that a latrine is considered clean or acceptable if neither liquids, dirt, paper or mud are visible within the squatting area of the toilet. They maintain that if considerable amounts of solid material, such as excrement or liquids, are present in a toilet, it would be difficult to use without getting dirty (Günther et al., 2012). The results in this study suggest that most of the shared toilets in Kampala's slums are dirty. The slums in Makindye municipal council had the least facilities that were not dirty, while Kawempe slums had the dirtiest shared toilets (Table 1). Six of every ten shared toilets checked by the interviewers smelt badly. The inadequacy of proper hygiene among the users of most shared toilets has been reported in a cross section of studies conducted in different urban slum settings in other developing countries (Bartlett, 2003; Gulyani & Talukdar, 2008; Tumwine et al., 2003). It is, therefore, important to know what determinants would influence cleaning intentions of the users of shared toilets so that they are kept hygienically clean.

Table 2 details the determinants found to significantly influence the cleaning intentions of shared toilet users. First, respondents' cleaning intention were very strongly associated with their perceived importance to use clean toilets. In this study, 8 out of every 10 household respondents who perceived using a clean toilet as very important also expressed strong intentions to engage in cleaning toilets. Thus, in slums where dwellers are informed and know about the importance of using a clean toilet, there is a high likelihood that the people would have a motivation to keep them clean. Cleanliness is reported by slum dwellers as one of the most important attributes for a toilet to be considered as convenient and hygienically safe to use (Biran, Jenkins, Dabruse & Bhagwat, 2011; Nyametso, 2012; Tumwebaze et al., 2012; Wegelin-Schuringa & Kodo, 1997).

Secondly, respondents' cleaning intention for shared toilets is significantly related to their perceived disgust about using dirty toilets. The respondents who perceived the use of dirty toilets as very disgusting had a very strong cleaning intention for shared toilets. Avoiding the disgust people feel when using a dirty or smelly toilet is one of the reasons why they desire to invest in, demand or build sanitation facilities (Avvannavar & Mani, 2008; Jenkins & Sugden, 2006; Siu, 2006). Sometimes, users who greatly dislike using a dirty toilet may offer to do regular cleaning, irrespective of whether others do not participate in doing so. A qualitative study on health, hygiene and appropriate sanitation conducted in some urban slums in three developing countries (Bangladesh, India, Kenya) reports on a case scenario of a single mother with children in Nairobi who often had to clean a shared toilet before her children could use it (Joshi et al., 2011). The experience of disgust, which is an affective reaction to a bad situation, can lead to the adoption of positive behaviour, i.e., the willingness to clean the shared toilet. Along with disgust is the understanding that cleanliness assists in the avoidance of the risk of contamination (Curtis, 2007; Curtis & Biran, 2001; Dellström Rosenquist, 2005; Rozin, Haidt & McCauley, 2005).

Thirdly, respondents' cleaning intention for shared toilets is significantly related to how effortless they perceived it was to clean them. The more respondents perceived cleaning a shared toilet as needing much effort, the less they were likely to clean them. In this study, four out of ten household respondents mentioned that it was very effortful to clean a shared toilet. The reasons why some respondents mentioned it was effortful to do so could be related to the absence of cleaning materials or detergents, feeling a lack of responsibility from other users, and the fact that, sometimes, even when one does the cleaning, the toilet can easily be dirtied by irresponsible users.

**Table 2**  
Cleaning intention linear regression.

Variables	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. error	Beta		
(Constant)	.278	.322		.864	.388
Perceived vulnerability to get disease from using a dirty toilet	.054	.032	.063	1.686	.092
Attitude belief to use clean toilet	.004	.012	.012	.335	.738
Effortlessness cleaning shared toilet	.117	.021	.197	5.493	.000
Affective belief to use dirty toilet	.136	.042	.116	3.236	.001
Injunctive norm to leave toilet dirty	.019	.015	.045	1.298	.195
Talking frequency to toilet users	.091	.020	.160	4.457	.000
Personal norm to use clean toilet	.173	.025	.251	6.900	.000
Ability belief to keep shared toilet clean	.050	.010	.177	5.013	.000
Habitual toilet cleaning	.102	.024	.151	4.192	.000

Notes:  $N = 597$ ,  $R^2 = .34$ , Adjusted  $R^2 = .33$ .

Furthermore, respondents' cleaning intention for shared toilets is significantly related to their cleaning habits. The stronger respondents perceived cleaning a shared toilet to be a habit, the stronger were their cleaning intention. In this study, about 4 out of every 10 household respondents reported that cleaning a shared toilet was very much done as a matter of habit. Developing a habit towards cleaning shared toilets is important to be fostered among users and positively affects their cleaning intention, leading to actual cleaning of the toilets as well. The positive influence of developing a habit towards behaviour performance has been reported in some other studies such those on solar water disinfection (Kraemer & Mosler, 2010).

While cleaning a shared toilet may not seem desirable to some users, using a dirty toilet puts their health and safety at risk. Yet, shared toilet users who have no cleaning intention may be willing to pay for cleaning services provided by an entrepreneur. A study conducted in Mathare slum in Kenya reported that households sharing toilets had the option to pay a private entrepreneur to clean them (Thieme, 2010). If toilet sharing households took responsibility to pay for their cleaning, this would maintain their cleanliness too, as well as reduce the risk of exposure to disease causing agents associated with their use (Buttenheim, 2008; Rahman, 2006; Tumwine et al., 2002).

The frequency users of shared toilets speaking to each other significantly impacted on their cleaning intention. The more respondents talked to each other about the importance of maintaining the cleanliness of their shared toilets, the more likely they intended to clean them. Almost 5e of every 10 respondents who reported that they always communicate with other users on the importance of keeping their shared toilet clean had very strong cleaning intention. Although slums are heterogeneous, with a diverse mix of cultures, they are socially united by virtue of sharing common resources like toilets (Joshi, Fawcett & Mannan, 2011). This is why it is important for users to develop a talking culture amongst themselves in order to make good use of their shared toilets, and to maintain them clean.

#### *Implications to practitioners and researchers*

According to the reported and observed cleanliness results, this study has shown that the engagement of shared toilet users to clean their facilities is still inadequate.

Secondly, the study has also shown that factors such as one's understanding of the importance of using a clean toilet, the perceived disgust from using dirty toilets and habit are essential in fostering users' cleaning intention for shared toilets.

This study also suggests that public health practitioners and, especially, those working in urban slum settings, should prioritize and integrate hygiene promotion in their work. In terms of the perspective of hygiene, while the promotion of hand washing with soap is crucial, emphasis on the importance of maintaining the cleanliness of shared toilets should also be stressed in order to improve the health of the residents. However, more user-focused scientific research in the area of cleaning behaviour is recommended in order to assist public health practitioners in the designing of promotion and sensitization messages about the importance of cleaning shared toilets.

#### **Conclusion**

The results of this study indicate that factors, such as the importance to use a clean toilet, the perceived disgust from using dirty toilets and habit, are essential in fostering the cleaning intention of users of shared toilets. It would be useful to keep these and other factors in mind when designing promotional and

sensitization messages concerning engaging shared toilets users in cleaning such toilets.

The use of clean toilets, along with other hygiene practices, such as hand washing with soap, will reduce the risk of exposure to infections in the urban slums of developing countries.

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