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When is shared sanitation improved sanitation? - The correlation between number of users and toilet hygiene

Günther, Isabel and Niwagaba, Charles B. and Lüthi, Christoph and Horst, Alexandra and Mosler, Hans-Joachim and Tumwebaze, Innocent K.

ETH Zurich

December 2012

Online at <https://mpra.ub.uni-muenchen.de/45830/>
MPRA Paper No. 45830, posted 08 Apr 2013 13:00 UTC



When is shared sanitation improved sanitation?

The correlation between number of users and toilet hygiene

The international debate on the question of whether shared and/or public sanitation facilities should be considered improved is still open. The concern is that a shared sanitation facility cannot be maintained in hygienic conditions when used by too many people. The analysis of 1'500 randomly selected toilets in the urban slums of Kampala showed that only 22 percent of households have access to private sanitation facilities; the remaining 78 percent share their toilet with an average of 6 households. There is a clear and strong correlation between number of users and the condition and cleanliness of a toilet stance. Less than 20 percent of private toilets are dirty, whereas 60 percent of sanitation facilities are dirty if they are shared by more than 10 households. This policy brief asserts that toilet facilities shared by not more than four households can be conside-

red "acceptable" or improved, with "only" about 25 percent classified as dirty by an objective evaluation.

Background

In light of the 2015 Millennium Development Goal (MDG) deadline, the international debate on what constitutes "adequate" or "acceptable" sanitation¹ has gained prominence among development agencies and sanitation experts alike. The debate on the question of whether shared and/or public sanitation facilities should be considered "improved" is still open. Currently, the Joint Monitoring Programme (JMP) does not include shared sanitation facilities in its category of improved sanitation (UNICEF/WHO, 2012). While the JMP does acknowledge the importance of such sanitation facilities compared to no facilities at all, it argues that the lack of cleanliness and the increased health

risks of shared sanitation disqualify them from being considered improved. In contrast, several sector experts have argued that, especially for the case of urban and densely populated areas, shared sanitation is the only technically and financially viable solution (Mara and Alabaster, 2008; Schouten and Mathenge, 2010). Moreover, UN-Habitat recognizes a shared sanitation facility to be improved if a “reasonable” number of individuals use it (UN-HABITAT, 2006). In this policy brief we attempt a definition of what constitutes the maximum (possible) number of users per toilet to maintain acceptable, i.e. hygienic or improved, sanitation.

Methodology

This policy brief is based on a study sample of 1,500 households from 50 randomly selected slum zones in Kampala City, Uganda. None of these households has a sewerage connection. A detailed description of the study is presented in Günther et al. (2011). To evaluate the hygienic conditions of sanitation facilities, households were in a first step asked about the cleanliness of the toilet they use. Second, interviewers personally inspected the household's sanitation facility and rated its hygienic condition. Last, a picture of the inside of every sanitation facility (1,500 in total) was taken and coded ex-post by a single researcher. We therefore circumvent

the problem of subjective valuations of cleanliness by triangulation. The following coding rules were applied to differentiate between hygienic or adequate and unhygienic or inadequate sanitation access:

- Clean or acceptable: The latrine is generally clean. Neither liquids, dirt, paper nor mud is visible within the squatting area of the toilet. Minor liquids and/or paper is acceptable if found in the corners. Examples are presented in Figure 1.
- Dirty or very dirty: A considerable amount of solid material (e.g., paper, excrements, construction materials, etc.) is visible. Big puddles and liquids are present. It is difficult to use the toilet without getting dirty. In the worst case, sanitation facilities are barely usable or dangerous to use. Examples are presented in Figure 2.

In addition to cleanliness, the number of households per toilet stance was calculated by asking households how many other households used their sanitation facility. The number of users was then divided by the number of available stances/cubicles per facility - which was recorded by inspection by the interviewers - to obtain the user load per stance.



Figure 1: Examples of “acceptable” hygienic conditions



Figure 2: Examples of “unacceptable” hygienic conditions

Empirical Results

95 percent of households in Kampala’s slum areas use a covered simple pit latrine or a ventilated improved pit latrine (VIP). Hence, from a technical point of view (UNICEF/WHO, 2012), 95 percent of households in Kampala’s slums have access to improved sanitation. However, 78 percent of users share their toilet with at least one other household, and with almost six households on average. Of these 10 percent share their toilet with more than ten and up to 100 households. Only 22 percent of households have access to private sanitation facilities that are not shared with others² and are therefore improved by JMP standards (UNICEF/WHO, 2012).

The question therefore is: *Do 22 percent or 95 percent of the population in the urban slums of Kampala have access to improved sanitation?*

According to households’ perception, 20 percent of toilets are dirty or very dirty. The interviewers recorded 27 percent of sanitation facilities being unclean, and the picture-coding confirmed 27 percent of sanitation facilities as unhygienic. Hence, the observation of the interviewers and the coding of the pictures yield the same results, whereas households’ perceptions on their own sanitation suggest 7 percentage points’ cleaner toilets. We have to analyze the correlation between number of toilet users and the cleanliness of sanitation facilities. Figure 3 shows the main results, relating user load to toilet dirtiness.³

In general, user households perceive their toilets to be cleaner than an objective observer would. This is especially true for private toilets and toilets shared between two or three households (Figure 3). For both subjective and objective evaluations, there is a clear correlation be-

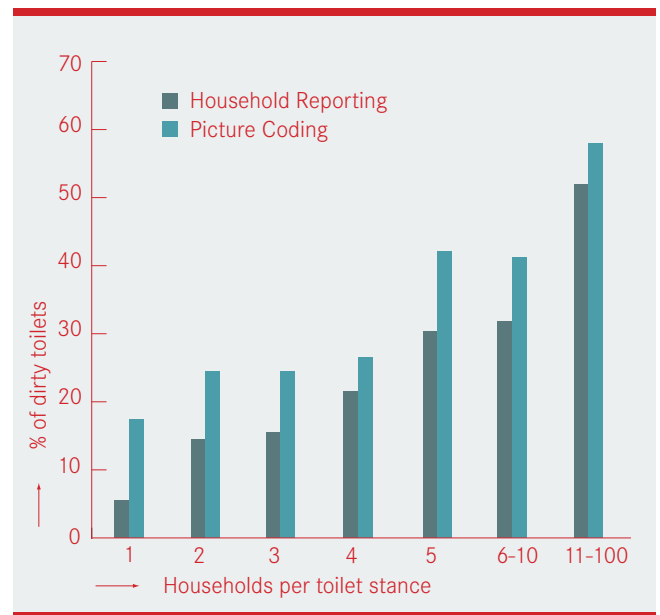


Figure 3: Relation between toilet users and toilet hygiene

tween the number of households sharing and the ability of households to keep their toilets clean. Less than 20 percent of private toilets are dirty, whereas more than 50 percent of sanitation facilities are filthy if they are shared by more than 10 households. Figure 3 also indicates a clear rise in dirtiness if the number of users increases (a) from one (private) to two households, (b) from four to five, and (c) from below 10 to above 10 households per stance.⁴

Conclusion and Policy Implication

Our analysis shows that private toilets are much cleaner, especially in households’ perception. However, facilities being shared by a maximum of four households can still be considered as “acceptable” or “improved” sani-

Study Highlights

- 1) 1500 sanitation facilities in the urban slums of Kampala were photographed and systematically rated for their cleanliness.
- 2) From a technological perspective, 95 percent of toilets are improved; taking the number of users into account, only 22 percent of households have access to improved sanitation.
- 3) Households perceive their toilet facilities cleaner than an objective observer would; this is especially true for private toilets.
- 4) The number of households per toilet stance is strongly correlated with dirtiness.
- 5) Toilet facilities shared by not more than four households in urban slums can be considered as “acceptable” or improved, and international standards reconsidered accordingly.

Study Description

The results presented in this policy brief are part of a larger three-year research study conducted by Makerere University, the Swiss Federal Institute of Technology (ETH Zurich), the Swiss Federal Institute of Aquatic Science and Technology (EAWAG), and a Kampala based local NGO (SSWARS). The study is carried out by five senior researchers and three PhD students from Uganda and Switzerland. The objectives of the study are to systematically analyze the sanitation situation of Kampala’s low income households and to identify and test promising interventions to increase access to and maintenance of sanitation facilities in poor urban areas.

For more information about the project please visit <http://www.nadel.ethz.ch/forschung/u-act>.

tation, with less than 20 percent being dirty according to households' perception and about 25 percent classified as dirty by an objective evaluation. In Kampala a single stance VIP costs about \$550. Hence, sharing sanitation facilities by four households costs 137\$ per household⁵ and 183\$ per clean sanitation access (as not every household that has access to a facility benefits from clean sanitation).⁶ For comparison, private sanitation costs \$550 per household and 660\$ per clean sanitation access.

Given that the average household size in Kampala's slums is 4.5 (Günther et al., 2011), this translates into an acceptable user load of less than 20 persons per toilet stance. If a sanitation facility is shared by five or more households, this leads to a large fraction of unhygienic toilets, especially when more than 10 households are sharing. This large quantity of users does not seem to be capable of properly maintaining a sanitation facility. Moreover, if toilets are not kept clean, there is a large probability that people will resort to open defecation (Günther et al., 2011). Our research findings thus recommend that not more than four households (or 20 individuals) should share a toilet stance to ensure long-term hygienic and sustainable use.

¹ The terms sanitation facility, latrine and toilet are used interchangeably in this policy brief to refer to a covered simple pit latrine or a ventilated improved pit latrine (VIP), the most widely used sanitation facility in Kampala's low-income areas.

² This either means private access or, e.g., a sanitation facility with two stances shared by two households.

³ Note that the picture coding was almost identical to interviewers' observations. For the sake of clarity, we therefore only report one dimension in Figure 3.

⁴ A logistic regression confirmed that the difference of dirtiness is statistically significant between 1 and 2, between 4 and 5, and from below to above 10 households per stance. No significant difference (at a 5% level) was found between 2,3, and 4 households per toilet and between 5,6,7,8,9 and 10 user households per toilet. Results are available from the authors on request.

⁵ Cost per household = $\frac{\text{Cost per toilet stance}}{\text{Number of sharing households}}$

⁶ Costs per clean sanitation access = $\frac{\text{Cost per household}}{\text{Share of clean toilets}}$

Funding



Austria Development Cooperation (ADC), Department for International Development (DFID), Ministère des Affaires Étrangères et Européennes (MAEE), Swedish International Development Cooperation Agency (SIDA), Swiss Agency for Development and Cooperation (SDC), Bill & Melinda Gates Foundation

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Research Team



Günther, Isabel

Assistant Prof. Development Economics, PhD
Centre for Development and Cooperation (NADEL)
Swiss Federal Institute of Technology Zurich (ETHZ)
isabel.guenther@nadel.ethz.ch



Niwagaba, B. Charles

Senior Lecturer, PhD
Department of Civil and Environmental Engineering
College of Engineering, Design, Art and Technology
(CEDAT) / Makerere University (MAK)
cniwagaba@tech.mak.ac.ug



Lüthi, Christoph

Senior Scientist, PhD
Department of Water and Sanitation in Developing
Countries (SANDEC) / Swiss Federal Institute of
Aquatic Science and Technology (EAWAG)
christoph.luthi@eawag.ch



Horst, Alexandra

PhD Student Development Economics
Centre for Development and Cooperation (NADEL)
Swiss Federal Institute of Technology Zurich (ETHZ)
alexandra.horst@nadel.ethz.ch



Mosler, Hans-Joachim

Associate Prof. Psychology, PhD
System Analysis, Integrated Assessment and
Modelling (SIAM) / Swiss Federal Institute of
Aquatic Science and Technology (EAWAG)
hans-joachim.mosler@eawag.ch



Tumwebaze, K. Innocent

PhD Student Psychology
Department of Psychology
University of Zurich
kamara.innocent@gmail.com