Where Shared Sanitation is the Only Immediate Option: A Research Agenda for Shared Sanitation in Densely Populated Low-Income Urban Settings

James B. Tidwell, 1,2* Jenala Chipungu, 3 Ian Ross, 4 Prince Antwi-Agyei, 5,6 Mahbub-Ul Alam, 7 Innocent K. Tumwebaze, 8 Guy Norman, 9 Oliver Cumming, 10 and Sheillah Simyu 10

1World Vision Inc., Washington, District of Columbia; 2Harvard Kennedy School of Government, Cambridge, Massachusetts; 3Centre for Infectious Disease Research in Zambia, Lusaka, Zambia; 4London School of Hygiene and Tropical Medicine, London, United Kingdom; 5Nhance Development Partners Ltd, Kumasi, Ghana; 6University of Energy and Natural Resources, Sunyani, Ghana; 7International Centre for Diarrheal Disease Research in Bangladesh, Dhaka, Bangladesh; 8Temple University, Philadelphia, Pennsylvania; 9Water and Sanitation for the Urban Poor, London, United Kingdom; 10African Population and Health Research Center, Nairobi, Kenya

Abstract. Shared sanitation is not currently accepted within the international normative definitions of “basic” or “safely managed” sanitation. We argue that pro-poor government strategies and investment plans must include high-quality shared sanitation as an intermediate step in some densely populated urban areas. User experience must be considered in establishing the definition of high quality. We call for additional research on effective interventions to reach these quality standards and for the development of rigorous measures applicable to global monitoring.

INTRODUCTION

Sustainable Development Goal (SDG) target 6.2 calls for universal access to safely managed sanitation by 2030, defined as “the use of an improved sanitation facility which is not shared with other households and where excreta is safely disposed in situ or transported and treated off-site.” Meeting this target in a rapidly urbanizing world with densifying urban spaces is profoundly challenging. Globally, 24% of urban dwellers live in informal settlements, characterized by poor housing quality, infrastructure, and services along with high population density, leading to poorer health outcomes than rural or formal urban areas. Residents in these contexts are a major contributor to the large and growing reality of shared sanitation use globally, with the number of users increasing from 249 million in 1990 to 603 million in 2015. Sanitation shared by more than one household is not considered to meet the SDG standard of either basic or safely managed sanitation under current WHO/UNICEF Joint Monitoring Programme for Water and Sanitation definitions. Shared sanitation comprises a range of technologies and management/user models, ranging from toilets shared by a small number of neighboring households to public toilets used on occasion by thousands of people. These facilities may be categorized by location, physical or social aspects of access, size, and models of ownership, management, or payment. Acceptability varies greatly across these many types of shared sanitation, although here we restrict our focus to shared household sanitation (i.e., not public toilets).

A systematic review in 2014 did not support the inclusion of shared sanitation in general as “improved” under the Millennium Development Goals, although it concluded that existing evidence was limited and of poor quality. A subsequent multicountry study with focus on moderate to severe diarrhea in children found that shared sanitation use was generally associated with higher disease risk but found it to be protective in some settings. Other recent studies have reported that toilets shared exclusively between neighbors are more

* Address correspondence to James B. Tidwell, World Vision Inc., 3001 St. NE, Washington, DC 20002. E-mail: btidwell@worldvision.org

In order to provide our readers with timely access to new content, papers accepted by the American Journal of Tropical Medicine and Hygiene are posted online ahead of print publication. Papers that have been accepted for publication are peer-reviewed and copy edited but do not incorporate all corrections or constitute the final versions that will appear in the Journal. Final, corrected papers will be published online concurrent with the release of the print issue. Copyright © 2020 by The American Society of Tropical Medicine and Hygiene
facilities, whether inside the dwelling or outside. Shared household sanitation services in low-income settlements are often on-site facilities provided by landowners, some of whom reside within the settlements. Landowners usually prioritize construction of rental units over sanitation facilities, thinking they are the better investment, thus forcing tenants to continue sharing the few available sanitation facilities. Insecurity of tenure in some settlements also contributes to substandard housing and sanitation facilities. When toilets are not provided or are of low quality, residents sometimes also access pay-per-use public toilets and may use many different sanitation facilities regularly even if they are provided a high-quality toilet at home. However, factors such as distance, cleanliness, cost, and operating hours influence the use of public toilet facilities. In addition, the lack of access to low-quality sanitation facilities also poses a greater challenge to vulnerable populations, such as women, the elderly, people with disabilities, and children.

In rented accommodation, landlords usually have responsibility for sanitation provision, whereas tenants take responsibility for cleaning. Operation and maintenance costs and responsibilities are sometimes taken up entirely by landlords or shared between landlords and tenants. Shared sanitation facilities are often dirty because of limited participation in cleaning, especially when there are many users, experiencing the same challenges as management of any common-pool resources whose maintenance depends on actions of other users. The uncleanliness and lack of participation in cleaning lead to dissatisfaction among the users of shared sanitation facilities, disagreements and conflicts among users, and psychological stress, and in extreme cases, users can opt to use alternatives such as open defecation or “flying toilets.” User commitment and social capital are critical for successful collective management of shared sanitation facilities, including the need to strengthen communication and accountability between landlords and tenants. Our suggested priority research questions for the setting and user experience are as follows:

1. What kinds of experiences do users, and especially women, children, and those with disabilities, have with different kinds of shared sanitation?
2. What are the key drivers of demand for improving the quality of shared sanitation?
3. How can we assess the impact of shared sanitation quality on user experience?
4. What is the impact of improvements in the structural quality and management systems on the overall physical and mental well-being of shared sanitation users?

**Effective interventions.** Shared sanitation interventions generally target one or both of two key results: the cleanliness of facilities and improving structural quality through new construction or modification of existing facilities. Shared cleaning has been promoted through direct-to-household behavior change communication focused on flushing toilets, solid waste disposal, and use of a potty to collect child feces, along with the provision of water pouring cups and storage containers. Beyond this individual focus, other interventions have addressed social dilemmas and collective action problems around shared cleaning. In Uganda, meetings were held between landlords and tenants to discuss challenges and make commitments to cleaning by creating a sense of cleaning obligation, ease, approval, and changing affective beliefs. In Zambia, because of the challenges of high turnover of tenants and the existing system of verbal, daily rota turns being hard to manage, a new system was introduced to improve cleaning. A weekly rota system was promoted with a “symbol of responsibility” hanging above the door of the responsible tenant so that they were accountable for any failure to clean, resolving the key management challenge and signaling social norms to new residents without the need for whole-of-plot meetings.

Infrastructure improvement has been attempted through assessing tenant willingness to pay for better sanitation through increased rent and then leveraging that via emotional demonstrations and games to help landlords decide to intentionally improve sanitation quality. Although this approach was successful, potentially because in the study area, 42% of landlords initially thought that tenants were not willing to pay for anything beyond a basic sanitation service, communicating latent demand may only be the first step in the process of improving infrastructure quality. Some gains have also been observed by providing loans or subsidies, promoting regulatory enforcement and legal approaches to solving tenure challenges and through coproduction and collective action among residents. We suggest the following priority research questions on designing effective interventions:

5. What are the most effective management systems for different kinds of shared sanitation?
6. What combination and/or sequencing of market-based approaches, financial products, regulatory and legal frameworks, and collective action/coproduction is needed to drive sustainable improvements in shared sanitation quality?

**Measurement and monitoring.** Measurement of different aspects of shared sanitation quality is important for routine monitoring by service providers to global monitoring by the WHO/UNICEF Joint Monitoring Programme for Water and Sanitation to rigorous impact evaluation. Using a sanitation quality index and toilet cleanliness index, a study of Quality Indicators for Shared Sanitation in three countries found that reliance on improved technology type and toilet sharing may not serve as an adequate indicator of toilet cleanliness or overall toilet quality. Preliminary findings from this study show that in addition to toilet technology and sharing, other factors such as the location of the toilet, whether the door has a lock and whether the floor is tiled, significantly influence overall toilet quality. Characteristics of sanitation infrastructure can be objectively and rapidly measured, and structural quality had more of an impact on observed cleanliness and reported satisfaction than cleaning behavior in a study in Zambia. However, measuring infrastructure alone is insufficient. Two users, for example, an adolescent girl and a middle-aged man, may experience the same toilet very differently. Assessment of user experience and quality-of-life impacts may be required in many cases. Work is ongoing in urban Mozambique to develop a measure of sanitation-related quality of life, which captures the extent of achievement of outcomes most valued by users. For rural areas, Caruso et al. developed an experiential measure of women’s sanitation insecurity, conceptualized as an
exposure, rather than an outcome. It was subsequently used to show that latrine access was associated with higher mental well-being.

Those who fund, design, monitor, and evaluate programs require simple validated measures that can be applicable across settings, whether for infrastructure quality or user-reported outcomes. Many measures mentioned earlier have been developed and/or applied in only one setting thus far and insufficiently consider outcomes further down the service chain. We suggest the following priority research questions around measurement and monitoring:

7. What easy-to-use measures of shared sanitation quality can be validated and applied across multiple settings?
8. How can user experience evaluations be used to make judgments about the quality of different types of shared sanitation and of shared sanitation interventions?
9. What additional measures are needed to understand the impacts of different kinds of sanitation further down the service chain—for example, regarding pathogen exposures and/or quality of life of sanitation workers?

CONCLUSION

In many settings, private household sanitation is a distant prospect. So, understanding the conditions under which high-quality shared sanitation leads to positive user experiences, seeking to improve these conditions, and developing rigorous measures may lead to adequate prioritization of higher quality shared sanitation in dense urban areas. Therefore, we suggest a final research question to be added to the agenda:

10. How can we promote the prioritization of improving the quality of shared sanitation in these dense urban contexts?

Received August 9, 2020. Accepted for publication September 29, 2020.

Published online November 16, 2020.

Financial Support: This work was partly funded by UKAID through the SHARE Research Consortium.

Authors’ addresses: James B. Tidwell, World Vision Inc., Washington, DC, and Harvard Kennedy School of Government, Havard, MA, E-mail: btidwell@worldvision.org. Jenala Chipungu, Centre for Infectious Disease Research in Zambia, Lusaka, Zambia, E-mail: jenala.chipungu@icridz.org. Ian Ross and Oliver Cumming, London School of Hygiene and Tropical Medicine, London, United Kingdom, E-mails: ian.ross@lshtm.ac.uk and oliver.cumming@lshtm.ac.uk. Prince Antwi-Agyei, NHance Development Partners Ltd, Kumasi, Ghana, and University of Energy and Natural Resources, Sunyani, Ghana, E-mail: prince.antwi-agyei@uern.edu.gov. Mahbub-Ul Alam, International Center for Diarrheal Disease Research in Bangladesh, Dhaka, Bangladesh, E-mail: mahbubulalam@icddrb.org. Innocent K. Thukwabazi, Temple University, Philadelphia, PA, E-mail: kamara.innocent@gmail.com. Guy Norman, Urban Research, Guildford, United Kingdom, Email: guy.norman@mail.gu.ac.uk. Sheillah Simiyu, African Population and Health Research Centre, Nairobi, Kenya, E-mail: simiyu@aphrc.org.

This is an open-access article distributed under the terms of the Creative Commons Attribution (CC-BY) License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

REFERENCES


46. Scott P, Cotton A, Sohail M, 2015. Using tenure to build a “sani-


