

Understanding customer attrition in container-based sanitation organizations: A case study approach

Rebecca Ventura*, Dr. Froggi VanRiper*, and Dr. Amy Javernick-Will

**Presenting Authors*

RESEARCH PROBLEM STATEMENT

Over one-third of the world's urban population lacks access to safely-managed sanitation services (UNICEF/WHO, 2021). Many urban households face a unique set of challenges in gaining access to safely-managed sanitation services due to the often limited available space for new sanitation infrastructure and limited vehicle access for pit emptying services. Container-Based Sanitation (CBS) is a type of subscription-based sanitation service where households or individuals subscribe and in return gain access to toilet technology that collects excreta in removable receptacles, and the service provider transports containerized excreta for treatment. CBS toilets, including their excreta-collection containers, are often compact in size and portable making them well-suited for high density areas with limited space.

While CBS organizations have successfully provided safely-managed sanitation services for households in urban settings, past research has noted high rates of customers attrition (EY, 2018; VanRiper, Russel, Cramer, et al., 2022). There is a dearth of research on what drives this customer attrition in CBS organizations. Only one study, by VanRiper and colleagues (2022), has investigated why subscribers in Haiti left a CBS service. While this study identified drivers that cause households to leave the CBS service in Haiti, the drivers behind CBS customer attrition in other contexts has not been evaluated. Further, previous research has found that households that terminate use of CBS services risk losing access to safely-managed sanitation completely (VanRiper, Russel, Tillias, et al., 2022). As the world works towards achieving Sustainable Development Goal (SDG) 6.2 by 2030, which calls for "access to adequate and equitable sanitation and hygiene for all and end open defecation" (WHO & UNICEF, 2017), there is a need to mitigate this attrition. Therefore, to achieve SDG 6.2 and support households in gaining and sustaining safely-managed sanitation access, there is a need to study why customer attrition is occurring and what strategies may be effective at mitigating customer attrition rates in CBS services.

Thus, this study seeks to capture CBS practitioners' perspectives of (1) what drives subscribers to leave CBS services and (2) the strategies they've used to address customer attrition. Furthermore, this study seeks to identify how these strategies may move CBS organizations along a public-private continuum. Thus, this research seeks to answer the following research questions:

1. What do CBS practitioners perceive to be the main drivers of customer attrition in their operations?
2. How have CBS organizations tried to reduce attrition rates across the communities they operate in?

3. How do practitioners' attrition mitigation strategies move them along the public-private continuum?

To answer these research questions, we conducted semi-structured interviews with practitioners from seven CBS organizations. CBS organizations that operate in diverse contexts were selected for this study because previous work has noted how CBS organizations' operations have been influenced by contextual factors. For example, one study noted how CBS organizations have faced challenges with gaining local and national government buy-in effecting their ability to reach households that cannot afford to pay for their sanitation services (Russel et al., 2019). Therefore, as this research study strives to characterize customer attrition in CBS organizations and the strategies that could be taken to reduce attrition rates, it is important to consider contextual factors in the analysis. Finally, previous research has suggested that organizations providing public services face a tension between organizational mission and the imperative of financial sustainability, causing them to operate along a public-private continuum (Lewis & Zolin, 2004; Mader, 2011). Therefore, this study sought to also identify how the CBS organizations' strategic decisions move them along this continuum and what tradeoffs may be occurring with this movement.

METHODOLOGY

To identify the drivers of customer attrition and the strategies CBS organizations take to reduce this attrition we conducted a cross-case comparative analysis of seven CBS organizations operating across 6 countries. One practitioner from each CBS organization was interviewed. Semi-structured interviews asked participants to describe (1) the nature of customer attrition they have noted in their work and the drivers they believe led customers to exit the service, and (2) the strategies they have used to reduce attrition. Finally, participants were asked to share, if available, documentation they have regarding their organization's strategies.

All interviews were audio recorded, transcribed using Trint software (Trint, 2022), and then imported into QSR NVivo software (NVivo, 2021) for deductive and inductive analysis. Qualitative data was coded for drivers and the corresponding strategies used by the organization to address attrition. Qualitative coding was first done deductively based on a codebook developed from key themes identified from the literature and from documentation shared by the participants. Interviews were then inductively coded to capture new themes as they emerge during the interview process. Following the preliminary analysis of interviews, within-case results were validated with participants, and a cross-case comparative analysis was conducted using word tables (Yin, 2009) to identify the similarities and differences between each organization, their drivers of customer attrition and the strategies they employed.

KEY FINDINGS

Top two drivers of customer attrition and associated mitigation strategies

In total, fifteen drivers and fifteen attrition mitigation strategies were identified. The most common driver of customer attrition was due to economic challenges. Six cases described experiencing this driver of attrition. This aligns with prior work which found that economic challenges were a commonly cited factor for users terminating their CBS sanitation service contracts (VanRiper, Russel, Cramer, et al., 2022). Five cases developed individual repayment plans with subscribers that faced economic challenges to help them maintain their service even when behind on payments. Two cases adopted customer vetting strategies to gain subscribers that were more likely to pay for the service regularly with the tradeoff that they are less likely to service the lowest income households in their service area. The presence of this driver across multiple cases demonstrates the difficulty CBS providers face in sustaining safely-managed sanitation services for financially vulnerable households. All CBS organizations captured in this study provide a subsidized subscription fee, yet many of them still experience attrition due to household economic challenges. Recent scholarship has described similar cases of market failure in the provision of sanitation services using a private enterprise model (Cairns-Smith et al., 2014; Schrecongost et al., 2020; Trémolet, 2013). Furthermore, multiple cases captured in this study currently operate without significant government funding or logistical support and therefore have needed to seek strategies that do not involve significant government involvement to mitigate attrition driven by economic challenges. Ultimately this tension between providing public services to economically challenged households while simultaneously pursuing their organization mission of serving all households in need of safely-managed sanitation puts cases in a difficult situation.

The second most common driver of customer attrition was due to subscribers losing access to the CBS service area. Cases generally described adopting fewer mitigation strategies to prevent subscribers from leaving the service area because it was attributed to contextual factors that were outside of the service provider's immediate control. For example, one case described how subscribers in their service area were increasingly moving out of their urban service area to rural areas of the country due to increasing local and global inflation rates which were straining their ability to pay for all basic needs, including sanitation services. A separate case described how housing and tenure norms in their service areas cause households to have to move regularly. When confronted with this driver, three organizations required customers to subscribe for a minimum of 1 year. A tradeoff of this strategy is that these cases are less likely to serve transient households or households that may otherwise temporarily lose access to their sanitation (e.g., due to home construction).

Furthermore, dissatisfaction with CBS service or technology was not a significant driver of customer attrition. While two cases did mention dissatisfaction, they emphasized that it was only in rare cases that subscribers would leave the service because they were dissatisfied with it. This may be due, in part, to the cases' current marketing strategies which involve training households on using a CBS toilet, repeated follow-up with new subscribers to address any concerns or problems with the toilet, and conducting community-level demonstrations to provide households opportunities to see the toilet before subscribing.

Pivot points along the public—private continuum

A majority (4 of 7) cases described a “pivot point” where, when confronted with the economic challenges of their customers and subsequent uncertainty with maintaining their own finances, adopted strategies that moved them toward the public or private pole of the public—private continuum. Three cases described taking strategies that led them to pivot toward the public pole which included accepting CBS subscribers based on sanitation need rather than ability-to-pay, increasing reliance on external funding sources, and developing future plans to collaborate with, gain recognition, or seek increased promotion of CBS services by the local or national government. Similarly, four cases described adopting strategies that led them towards the “private” pole including, adopting customer vetting strategies to predominantly accept CBS subscribers based on ability-to-pay and seeking to increase internally generated funding sources through additional marketing strategies. Ultimately, participants more commonly associated this pivot with economic challenges than any other attrition driver described by participants.

EXPECTED CONTRIBUTIONS AND IMPLICATIONS

If the globe is to reach SDG 6.2 by 2030, there is a need to reduce economic barriers to providing safely-managed sanitation services to low-income or economically insecure households. Results from this study demonstrate that recognition from local and national governments is crucial for reaching the most economically challenged households in CBS organization service areas. Further this research suggests that when organizations are faced with uncertainty related to their financial sustainability and with a customer service base that faces economic challenges, they may pivot towards the private pole of the public-private continuum. This results in the most economically insecure households not gaining access to the safely-managed sanitation services that they need. This pivoting highlights the challenges sanitation organizations take when operating in the absence of a public utility and significant governmental support.

Finally, this research contributes to the broader understanding of what drives changes in household sanitation access and behavior. Practically, this study provides valuable insight for CBS service providers or other subscription-based services that provide public goods and are seeking to mitigate customer attrition.

CITATIONS

Cairns-Smith, S., Hill, H., & Nazarenko, E. (2014). *Urban Sanitation: Why a portfolio of solutions is needed.*

EY. (2018). *Global Leaders In Household ContainerBased Sanitation Services: A COMPARATIVE ANALYSIS.*

- Lewis, I. A., & Zolin, R. (2004). *THE PUBLIC TO PRIVATE CONTINUUM MEASURE AND THE ROLE OF STAKEHOLDER BOARDS AS A PROXY FOR MARKETS IN THE GOVERNANCE OF AIR NAVIGATION SERVICES*: 5(2).
- Mader, P. (2011). Attempting the Production of Public Goods through Microfinance: The Case of Water and Sanitation. *Journal of Infrastructure Development*, 3(2), 153–170.
<https://doi.org/10.1177/097493061100300204>
- NVivo. (2021). [English]. QSR International Pty Ltd. <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>
- Russel, K. C., Hughes, K., Roach, M., Auerbach, D., Foote, A., Kramer, S., & Briceño, R. (2019). Taking Container-Based Sanitation to Scale: Opportunities and Challenges. *Frontiers in Environmental Science*, 7, 190. <https://doi.org/10.3389/fenvs.2019.00190>
- Schrecongost, A., Pedi, D., Rosenboom, J. W., Shrestha, R., & Ban, R. (2020). Citywide Inclusive Sanitation: A Public Service Approach for Reaching the Urban Sanitation SDGs. *Frontiers in Environmental Science*, 8, 19. <https://doi.org/10.3389/fenvs.2020.00019>
- Trémolet, S. (2013). Sanitation economics: Understanding why sanitation markets fail and how they can improve. *Waterlines*, 32(4), 273–285. <https://doi.org/10.3362/1756-3488.2013.029>
- Trint. (2022). Trint. <https://trint.com/>
- UNICEF/WHO. (2021). *Progress on Household Drinking Water, Sanitation and Hygiene (2000-2020)*. *Who/Unicef Joint Monitoring Programme for Water Supply, Sanitation and Hygiene*. 1–4.
- VanRiper, F., Russel, K. C., Cramer, L. A., Tillias, D., Laporte, J., Lloyd, E., & Kramer, S. (2022). Container-Based Sanitation Services and Attrition: An Examination of Drivers and Implications. *Frontiers in Environmental Science*, 9(February), 1–13.
<https://doi.org/10.3389/fenvs.2021.817142>

VanRiper, F., Russel, K. C., Tillias, D., Cramer, L., Laporte, J., Lloyd, E., & Kramer, S. (2022). The sanitation arc: An alternative examination of WASH behavior change. *Journal of Water, Sanitation and Hygiene for Development*, 12(1), 90–101.

<https://doi.org/10.2166/washdev.2021.162>

WHO & UNICEF. (2017). Progress on Drinking Water, Sanitation and Hygiene. In A. Grojec (Ed.),

Who. <https://doi.org/10.1371/journal.pone.0164800>

Yin, R. K. (2009). Case Study Research Design and Methods. In *Applied Social Research Methods Series*

(Fourth, Vol. 5). SAGE Publications, Inc.