Exploring an alternative sanitation option for refugee camps

Safe sanitation is crucial in humanitarian crises, but there are challenges with implementing traditional options. This study, 'Alternative Sanitation in Protracted Emergencies', explores urine-diverting dry toilets (UDDTs) as an innovative alternative option in Hilaweyn camp, Ethiopia. It was conducted between 2014 and 2017 by the Centers for Disease Control and Prevention (CDC) with two implementing partners, Oxfam and the Norwegian Refugee Council (NRC), and with oversight provided by the United Nations High Commissioner for Refugees (UNHCR).

The study findings validated and reinforced the use of UDDTs at Hilaweyn camp, inspired implementers to consider alternative sanitation options in other refugee camps in Ethiopia, and made an important contribution to the evidence base for UDDTs in humanitarian crises. They have helped to shape additional pilots of UDDTs in Gambella, western Ethiopia, and informed standard operating procedures for using UDDTs for Oxfam, NRC and UNHCR.

The study also helped to develop the technical capacity of local researchers, with the expectation that this will support future work, and fed into the design and best practice implementation of UDDTs. This case study demonstrates the indirect, long-term nature of delivering change through research, with impacts influenced by multiple stakeholders and projects over time

Title: Alternative Sanitation in Protracted Emergencies

Location: Ethiopia

Study type: Mixed methods with longitudinal performance evaluation

IMPACTS

- Validated and reinforced UNHCR's use of UDDTs at Hilaweyn camp, and helped humanitarian agencies understand the appropriate contexts for UDDT use
- Oxfam and UNHCR jointly published standard operating procedures for UDDTs partly informed by study findings
- Strengthened technical capacity of local researchers

RESEARCH IMPACT LEARNING

- The value of mixed methods research for informing humanitarian implementation and decision-making
- The importance of extending focus beyond a single project- value of funding support for piloting and scaling new approaches

BACKGROUND

Access to safe sanitation is key to preventing the spread of communicable diseases and reducing mortality in crisis-affected settings. However, traditional sanitation options, such as pit latrines and pour flush toilets, may be impractical in some refugee camps, due to overcrowding, poor soil and flooding.

UDDTs separate waste (urine and faeces), making treatment easier and reducing odours. They have for many years been used in non-crisis settings but have only seen limited use in humanitarian settings.

Hilaweyn refugee camp in Dollo Ado, Ethiopia, at the time of project inception had a population of 36,000 Somali refugees. With limited water and rocky soil, latrines and pour flush toilets were difficult and expensive to dig. Alternative sanitation options were sought in this camp, providing an opportunity to study UDDTs in a refugee setting.

THE STUDY

This mixed methods study aimed to determine the safety and acceptability of UDDTs in refugee camps to provide evidence and inform guidance on their use at scale in humanitarian crises. It examined the performance and use of the toilets under real field conditions, with findings feeding back into their on-site management to create a safe end product and strengthen best practices.

To evaluate the biological performance of the UDDTs, a selection of 20 were seeded with known quantities of parasitic worm eggs, and samples were collected and analysed at regular intervals over a 12-month storage period. Laboratory research was also done to understand the optimal combination of lime/ash to stored waste needed to enhance microbial inactivation.

To evaluate the acceptability of the UDDTs, quantitative surveys were carried out across 400 households of people both using and not using UDDTs. They were conducted 18 months apart to determine changes in use, condition and perceptions of the UDDTs.

Inside a UDDT in Hilaweyn camp Dollo Ado, Ethiopia. Credit: Courtesy of Molly Patrick/CDC

FINDINGS

The study found that refugees in the Hilaweyn refugee camp were using the UDDTs, and that they were using them correctly and consistently. Reported satisfaction levels were significantly higher among respondents in the second survey: 97.0% of respondents were 'mostly satisfied' or 'very satisfied' with their UDDT compared to 62.8% in the first survey. Satisfaction depended on factors such as familiarity, cleanliness, and length of time to become accustomed to it. There was no significant difference in satisfaction between UDDT and latrine users.

Biological performance evaluations found that 95% of UDDTs met World Health Organization (WHO) microbial guideline levels for safety at 12-months of storage.

Results from the laboratory research show that the addition of lime (at 2-5% by weight) to increase pH can assist in killing microbes. This could help with safe transport and disposal and provide an additional safety measure if vault contents had to be emptied earlier than 12 months. However, the study suggested that UDDTs may not be suitable for every setting. Conditions in Hilaweyn were very hot and dry, which helped to inactivate micro-organisms. Barriers to uptake and scaling up of UDDTs in humanitarian contexts may be the initial cost, complexity, and maintenance.

COMMUNICATIONS AND ENGAGEMENT

Implementing partners Oxfam, NRC and UNHCR were vital to support CDC to form strong collaborations with local partners – crucial to the study's success. Relationships with in-country partners and laboratories – mainly Arba Minch University, the Southern Agricultural Research Institute and the government-run Ethiopian Public Health Institute – supported the use of complex data collection and analysis methods. Having shared objectives with other organisations also fostered an important enabling environment for maximum impact of the study findings.

The study results were disseminated at events attended by multiple high-profile stakeholders. The first was at the Environmental Health Forum in 2016, bringing together UN agencies, academics and international humanitarian agencies, including water, sanitation and hygiene (WASH) practitioners. Here, the study team also convened a discussion forum focused on alternative sanitation in humanitarian contexts. The second was at a workshop held in Addis Ababa in 2016, hosted by the study team, bringing together and facilitating knowledge exchange between local and international partners. Here, the NRC also shared their learnings from their pilot in Gambella, western Ethiopia. Finally, results were presented at the University of North Carolina – Chapel Hill Water and Health 2017 conference in partnership with the WHO and UNICEF, focused on the water-related Sustainable Development Goals, engaging academics, policymakers and practitioners.

Key outputs from the study included a technical report of the findings, and a peer-reviewed article in the *International Journal of Hygiene and Environmental Health*. A second manuscript has been submitted for publication.

UPTAKE AND IMPACT

The study findings have validated and reinforced UNHCR's use of UDDTs at Hilaweyn camp. They have inspired humanitarian agencies to consider alternative sanitation options and helped to strengthen the argument to use UDDTs in certain humanitarian contexts. While the study has made an important contribution to the evidence base for UDDTs in humanitarian crises, other data on UDDTs has become available and so the influence of this study specifically is hard to determine amid the broader evidence base. However, key stakeholders report that the study findings have improved the knowledge and operational and technical capacities of humanitarian agencies to make evidence-based decisions on alternative sanitation.

"[The study] helped to document the reasons why UDDTs work in certain contexts and don't in others" – Key Informant Interview, UNICEF Yemen

Since the study was completed, the International Rescue Committee (IRC) has constructed more UDDTs at Hilaweyn camp, and some at another location, Buramino camp. While explicit linkages between this instrumental impact and the study's influence could not be validated, feedback from IRC's WASH lead in that setting indicates a pathway between the study's validated impacts on UNHCR's knowledge, approaches and practices, and these changes later implemented by IRC in the same setting, as the two actors work together.

"...partly because of the CDC study, UDDTs are now an accepted option in UNHCR's alternative sanitation toolbox...which is a big step forward"
– Robin Lloyd, Senior WASH Officer, UNHCR

In 2018, supported by the Bill and Melinda Gates Foundation (BMGF), Oxfam and UNHCR jointly published standard operating procedures for UDDTs, which reference the biological performance evaluation data from the study. Oxfam also updated its own standard operating procedures for refugee camps in 2020, again referencing data from the study.

In Gambella, Oxfam is now implementing a large pilot of UDDTs with support from the NRC and a further pilot of 4,000 UDDTs across five refugee camps for a UNHCR project also funded by BGMF. Given that Oxfam was a study partner and noting the updated Oxfam standard operating procedures, it can be inferred that the study contributed to the decisions made around these pilots.

The technical capacity of local researchers has also developed; five student researchers at Arba Minch University in Ethiopia are now learning more about the laboratory methods used in the study. It is inferred that this has built capacity of local partner organisations to conduct similar work in future.

Finally, the study findings informed the refinement of UDDT design and best practice implementation, for example how to best empty and store waste.

RESEARCH IMPACT LEARNING

THE VALUE OF MIXED METHODS RESEARCH FOR INFORMING IMPLEMENTATION AND DECISION-MAKING

The study shed light on a specific technical question important to humanitarian agencies leading on WASH. It demonstrated the value of mixed methods for generating both reliable results and valuable contextual insights to inform humanitarian implementation and decision-making. Discovering where UDDTs may *not* work well was as important as understanding where they *do*; findings tell humanitarian actors *not* to scale up UDDTs in settings where they may be less effective.

VALUE OF FUNDING SUPPORT FOR PILOTING AND SCALING NEW APPROACHES

The study impact shows the importance of activities beyond a single project for evidencing, piloting and scaling innovations, and of investing in useable outputs such as guidelines and standard operating procedures. In this case, follow-on funding from the BMGF was critical for sustaining the impact of the original R2HC study. Rarely is sustained change to humanitarian policy and practice influenced by a single project. More often, it traverses an indirect pathway, as in this case study. With an evidence base developing through the contributions of multiple stakeholders, progress gradually expands and deepens from 'knowing' to 'doing'.

PARTNERS

Centers for Disease Control and Prevention; Oxfam; Norwegian Refugee Council; United Nations High Commissioner for Refugees

ABOUT ELRHA

Elrha is a global organisation that finds solutions to complex humanitarian problems through research and innovation. This study was funded by Elrha's Research for Health in Humanitarian Crises (R2HC) Programme which aims to improve health outcomes by strengthening the evidence base for public health interventions in humanitarian crises.

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R2HC captures detailed case studies through a process that triangulates and validates evidence on uptake and impact. The case study methodology and full version of this summary case study including references are available on request.

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