Alternative Sanitation in Protracted Emergencies

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Background and Rationale

Alternative Sanitation in Emergencies

- There is an increasing need for sanitation alternatives in humanitarian emergencies, which often occur in areas with difficult soil/ground conditions, flooding, or lack of space.
- In these settings, traditional, below-ground sanitation systems, such as latrines, may be technically and financially impractical.

Urine-diversion dry toilets (UDDT)

- UDDTs are an above-ground sanitation system designed for dry excreta management.
- Urine diverted at squat plate, storage facilitates waste over 6-12 month period.

Study Location

Hiloweyn Camp, Dollo Ado, Ethiopia

- Established 2011
- Somali refugees
- Official estimate (2014): 7,000 HH
- Mostly self and locally based food risk

UDDT Program (~1,000 UDDTs; 1,800HHs)

- 2012-2013: Single-family UDDT (Phase 1; n=140)
- 2014: Shared-family UDDT (Phase 2a; n=120)
- 2015: Shared-family UDDT (Phase 4; n=150)

Objectives

Given scale-up of UDDT program in Hiloweyn, objectives were to:

- Measure the acceptability of UDDTs over time
- Measure the performance of the UDDTs over time
- The WHO recommended log10 reduction of treated excreta in agriculture (<1 log10 helium or Ascaris ova) and <1000 E. coli per gram total solids) used as a common performance measure
- Key environmental parameters associated with microbial inactivation tested (temperature, moisture content, pH)

Acceptability

Objectives:

- Determine if adoption of UDDTs changes over time
- Determine if UDDTs are consistently and correctly used by and where
- Determine if attitudes and preferences of UDDTs are more positive than for other forms of sanitation available
- Determine the factors contributing to satisfaction with sanitation system among users and non-users of UDDTs

Methods:

- Two, cross-sectional surveys, 18-month apart
- Sample size: 420 households
- Stratified sampling design from Phase 1-3 households and from latrine users (4 groups)
- Sample random sampling of households
- Questionnaire: demographics, sanitation practices, sanitation preferences and UDDT observation
- Walk-chi-square (p=0.05), multivariate logistic regression: modelling

Results:

- Correct and consistent use high at both surveys
- Microbial, at least one non-ova per HH: 34.9% to 74.6% (p=0.032) from baseline to endline (child <5 years)
- Cleanliness and structural indicators improved from baseline to endline
- Years in the camp and cleanliness highly associated with satisfaction

Conclusions

- Adoption and current, consistent and correct use of the UDDTs was high (increased with time of use)
- UDDTs users not more or less satisfied than latrine users
- Sanitation services generally well managed in the camp
- Hot, extremely dry environment in Hiloweyn likely representing an ideal location for a sanitation technology
- Overall, UDDTs were successful in microbial inactivation over a 12-month storage period (not all met guidelines)
- Appropriate precations (e.g. PPE) needed for waste handling after 12-month storage and at secondary storage site/locations (time at 2-5% if handle and safety precautions can be ensured)

Recommendations

- Additional research in 2 different cultural settings, 2 different environmental conditions (e.g., more temperate and humid environments), and 3 earlier in emergency phase
- Improved research to enable child <5 years use
- Additional experiments on time add in-use add under range of environmental conditions (e.g. higher moisture content)

Lessons Learned

- KAP or other sanitation-specific surveys to understand previous practices may assist with targeted implementation strategies for different demographic groups (e.g. previous sanitation access)
- Programming needed to allocate sufficient resources to educational sessions to emphasize consistent cleaning and correct use practices early in the introduction of UDDTs (i.e., provision of cleaning kits to HHs)
- Time of use significantly impacts satisfaction level of UDDTs, so may be more appropriate for protracted emergencies vs acute phase
- UDDTs may meet WHO guideline for reuse in hot, arid environments, after 12-months storage
- Promoting conditions which discourage stored waste (e.g. additive use) and secondary treatment (pH <12) may help improve UDDT performance
- Strong management and oversight required such that proper use of the UDDTs is maximised (e.g., to prevent fluid from entering the waste vault) and safe handling and disposal can be ensured

Project Partners

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