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**ENSURING AVAILABILITY AND SUSTAINABLE MANAGEMENT
OF WATER AND SANITATION FOR ALL**

**WASH interventions in emergencies and outbreaks:
two systematic reviews and impact analyses**

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There is a lack of evidence-base for WASH interventions in emergencies, although many agencies collect various types of evidence that is not formally published or widely shared. The aim of this work is to help provide policy relevant evidence of WASH interventions by summarizing the information collected by NGOs, UN agencies, or local governments responding to humanitarian emergencies and disease outbreaks. A systematic search covered academic databases, agency websites, and direct solicitation of humanitarian actors. Qualitative and quantitative research methodologies, as well as, both published and grey literature were eligible for review. More than 15,000 manuscripts were identified, 1,500 abstracts assessed, and 500 full texts reviewed. Final included manuscripts will be summarized using the GRADE summary of findings around the themes of: use of service; health-related outcomes; non-health related outcomes; barriers and facilitators to implementation; and cost-effectiveness. This work will establish a real-world evidence-base for humanitarian WASH policy.

Background

During a humanitarian emergency many low and middle-income countries are overwhelmed and require emergency assistance. The number of people in need of humanitarian aid is only expected to increase with climate change and growing populations (Walker et al. 2012).

Emergency water, sanitation and hygiene interventions (WASH) aim to provide access to basic water and sanitation needs, as well as, promote safe practices that reduce preventable waterborne and communicable diseases (Greaney et al. 2011; Watson et al. 2007). Emergency WASH interventions can include a wide variety of activities and products (e.g. water filters, latrines, soap distribution, or hygiene education) that are typically not intended to provide long-term sustainable solutions, but instead rapid relief within hours or days after the onset of the emergency (Greaney et al. 2011). However, the humanitarian sector has a general lack of evidence to base programming decisions. The reasons for lack of collection of data include the priority of response over research, limited staff capacity, ethical considerations, and physical access (Clarke et al. 2014). Many emergency WASH interventions are carried out in contexts dissimilar to the rural development settings from which they were adapted (Parkinson 2009; Darcy et al. 2013). Additionally, research has also shown that many humanitarian responders rely on intuition and ‘if it worked before it will work again’ mentalities when faced with complex situations (Darcy et al. n.d.; Loo et al. 2012; Steele & Clarke 2008).

Evidence-based programming in humanitarian response is scarce, and without clearly defined processes, the confidence in choosing a WASH strategy is undermined (Brown et al. 2012). New evidence-based strategies are needed to support decision makers as demand for humanitarian responses grow (Parkinson 2009; Darcy et al. 2013). The objective of our work is to determine the effectiveness of short-term WASH interventions in low- and middle-income countries for non-protracted emergency response and disease outbreaks.

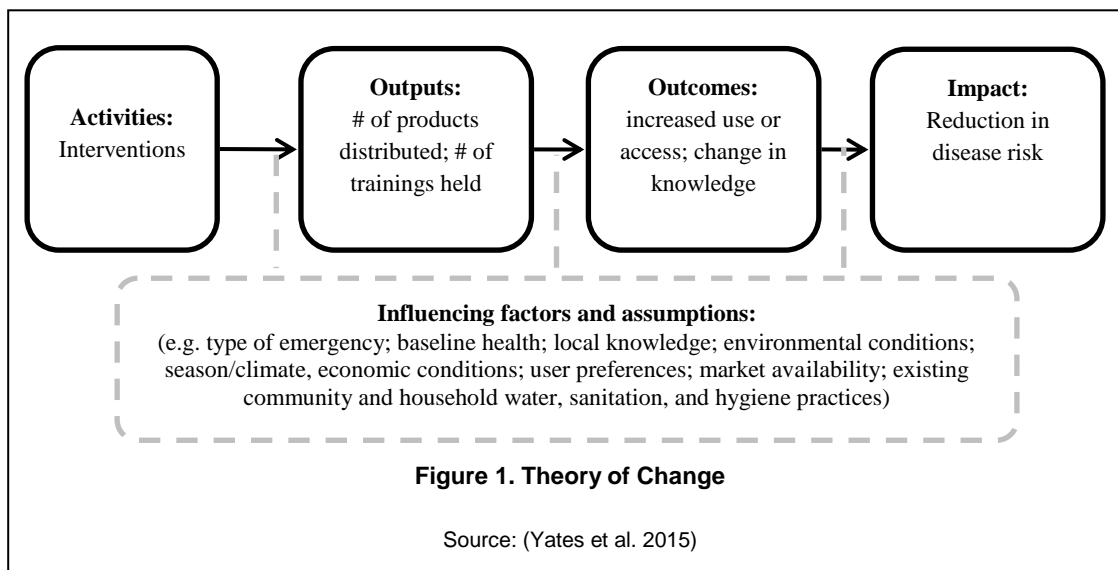
Intervention theory

To address the variety and complexity of WASH components used in emergencies, we grouped the interventions into eight categories:

1. Increasing water access - (i.e. well repair; well cleaning; water tankering);
2. Source-based water treatment (i.e. bucket chlorination; Dispensers; well chlorination; bladders);
3. Household water treatment (HWT) (i.e. PuR® Purifier of Water; Aquatabs; water filters; Safe Water System);
4. Hygiene Promotion (i.e. key hygiene promotion messages, handwashing campaigns; CLTS, CATS);
5. Distribution of soap and/or hygiene kits (i.e. non-food item distribution);
6. Environmental hygiene (i.e. rubbish collection; household disinfection);
7. Installation of temporary/permanent sanitation (i.e. latrines construction); and
8. Distribution of latrine alternatives (i.e. pee-poo bags; port-a-potties).

The descriptions of the eight categories are not definitive but is representative of projects carried out in acute emergencies. Interventions described above could be implemented as standalone projects, in combination, or with other sectors like health or nutrition. We separated interventions where possible, but also acknowledged synergies when separation was not possible.

Evaluation of the interventions follows Theory of Change principles outlined by Howard White (White 2009). The theory of change is a framework that outlines the transition between intervention activities and community impact (Figure 1). We incorporated the theory of change framework into the review by analyzing the factual and counterfactual information to show the progression from activities to impact, but also identify risks and assumptions that could greatly influence the interventions. A theory of change was established for each intervention.



Selection process

Populations, Interventions, Comparisons, Outcomes, and Study Types (PICOS) framework was used from the onset of the review to increase transparency as to how and why studies were selected (Yates et al. 2015).

Populations: Any disaster or outbreak affected population in a low or middle-income country within 12 months of the disaster or outbreak was eligible for inclusion.

Interventions: Interventions were limited to WASH categories described above. Only short-term WASH interventions in response to a humanitarian emergency or specific disease outbreak were eligible. Dates for inclusion were 1995-2015.

Comparisons: Type of emergency, intervention, population groups, and timing is a sample of the comparisons that were carried out.

Outcomes: Several different outcomes were used to assess the interventions. ‘Use of services’ was assessed through: self-reported use (i.e. reported by the beneficiary with no verification), confirmed use (i.e. observations or water testing used to verify reports), and effective use, which is the demonstrated

microbiological improvement in treated water. Other outcomes assessed, were disease reduction (i.e. morbidity and mortality rates) and non-health related outcomes like preferences, quality of life, psycho-social impacts. Economic information, specific analysis or costs, are also gathered.

Study types: Published and unpublished studies were eligible for inclusion. Academic databases were searched with keywords, but we also searched websites and solicited ‘grey’ (unpublished) literature from UN agencies, governments, and non-governmental organizations in the form of project reports, impact analysis or expert discussions. With limited experimentally designed studies in humanitarian contexts, our inclusion criteria were broad and included: experimental, quasi-experimental, non-experimental, and qualitative designs. Specific exclusions were: personal blogs, diaries, newspapers articles, magazine articles, and legal proceedings/court documents. Books and dissertations were not specifically searched but may be included in the review if other criteria were met. Also, systematic reviews were specifically not included, but used for independent reference tracing.

The selection of studies adhered to the principle standards of the Cochrane Intervention Reviews (Higgins et al. 2013). Three stage filtering process was used, with independent double screening for abstract and full text review.

Assessment

Quantitative studies were assessed by a tool based on the Cochrane Handbook Risk of Bias Tool structured and used by Baird et al. (2013) (Higgins & Green 2008; Baird et al. 2013). The qualitative assessment of bias was adapted from Spencer et al. 2003 “Quality in Qualitative Evaluation: A Framework for assessing research evidence” (Spencer et al. 2003). When sufficient data was available, we used PROGRESS-Plus for subgroup analysis considering common groupings (e.g. gender, age, general) and equity based groupings (e.g. religion, disability) (Anon 2008). The overall quality of evidence assessment for this review was summarized with the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach.

Results and discussion

Ten electronic databases were searched, along with more than 50 government and agency websites. Solicitation of documents from key humanitarian actors was also carried out through personal contacts, global email lists, and conferences. We identified more than 15,000 citations, screened 1,500 abstracts, and reviewed 500 manuscripts. We are currently completing full-text review for final inclusion criteria and data extraction. At this stage, there is an approximate balance between the number of published and grey literature studies that have passed the abstract screening. The vast majority are in English, with some French and Spanish manuscripts.

By the time of the conference, we will be able to provide recommendations through a synthesis of lessons-learned around the themes of: use of service; health-related outcomes; non-health related outcomes; barriers and facilitators to implementation; and cost-effectiveness related to WASH interventions in humanitarian emergencies and disease outbreaks. The variety of data sources and field research methods combine to establish a stronger foundation for humanitarian WASH evidence.

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