



7th Emergency Environmental Health Forum (EEHF)

25-26 November 2016

Kathmandu, Nepal

Building knowledge. Improving the WASH sector.

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Acknowledgements

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Special thanks go to the EEHF Scientific Review Committee members:

- Andy Bastable (Chair), Oxfam
- Oliver Cumming, London School of Hygiene and Tropical Medicine (LSHTM)
- Lauren D'Mello-Guyett (Forum Coordinator), LSHTM
- Dominique Portreud (Global WASH Cluster Coordinator), UNICEF
- Nick Brooks, CARE Australia
- Murray Burt, UNHCR
- Peter Maes, MSF
- Jamal Shah, UNICEF

Contributors



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Executive Summary

The 7th Emergency Environmental Health Forum (EEHF) took place from 24th - 25th November 2016 in Kathmandu, Nepal. It brought together water, sanitation and hygiene (WASH) experts from organisations such as Action Contre la Faim (ACF), the International Rescue Committee (IRC), Médecins Sans Frontières (MSF), Oxfam, the Red Cross/Red Crescent Movement (ICRC, IFRC), UNHCR and UNICEF and as well as academic experts from institutions such as the London School of Hygiene and Tropical Medicine (LSHTM) and Tufts University. The forum provided an opportunity to exchange recent field experiences and explore innovative approaches amongst over 150 attendees and discuss ways for future action and interventions for WASH in emergencies.

The EEHF explored the themes of:

- Menstrual hygiene management in emergency settings;
- Hand washing technologies and uptake of hygiene practices;
- Water treatment and supply;
- Alternative sanitation technologies and waste management;
- WASH and nutrition;
- WASH programming in disease outbreaks.

With increasing numbers of vulnerable populations- both politically and environmentally- there is a need for effective use of interventions for greater impact the health of those affected. The shortfalls in humanitarian assistance funding demand efficient and well considered programmes. The EEHF highlighted the need for more evidence-based programming in the WASH sector and the important relationship between practitioners, academia and donors.

In conclusion, there is a need:

- To establish rigorous but feasible research methodologies for emergency settings;
- To record, report and disseminate disaster response experience to the humanitarian audience;
- To build the capacity of local research partners and nations in crises settings;
- To generate research questions at a practice, policy and research level for humanitarian WASH
- To build new partnerships with donors, practitioners and researchers for research delivery



Figure 1: Photograph of 7th Emergency Environmental Health

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Thursday 24th November: First Session

Opening Address

Andy Bastable, Chair of the Interagency Group and Editorial Review Committee

Andy Bastable (Oxfam) introduced the 7th EEHF, noting that the EEHF was established by the Inter-Agency Watsan group to focus on public health. The objectives of this year's two-day forum are for practitioners to share field learning and experience, to use documented field practice to stimulate discussion on best WASH practice and to identify and discuss options for future WASH research questions. He highlighted the need for more evidence-based programming in the WASH sector and the important relationship between practitioners and academia. The key topics for this forum include Urine Diverting Dry Toilets (UDDT) and alternative sanitation technologies, Menstrual Hygiene Management (MHM), disease outbreaks, handwashing in emergencies, water treatment and supply, WASH in health care facilities, WASH and under-nutrition, waste treatment and sanitation.

Andy Bastable noted the tragic death of Dr Jeroen Ensink in December 2015 and a minute silence was held to commemorate his memory. Jeroen Ensink played a major role in organising previous EEHFs and in bringing together the academic and NGO sectors. The [Jeroen Ensink memorial scholarship fund](#) was launched recently to enable a student from South Asia and Sub-Saharan Africa who would not otherwise have the opportunity to study a MSc at LSHTM.

Please share: <https://www.lshtm.ac.uk/study/funding/jeroenensinkscholarship.html>

Keynote Speech

Professor Subodh Sharma, Kathmandu University

To give an in-country perspective, Professor Subodh Sharma (KTM University) highlighted the importance of WASH in the Nepalese context specifically in relation to climate change, natural disasters and health. He noted that the geological diversity of Nepal is essential for understanding the impacts of climate change and its linkages to health impacts such as vector borne diseases, water borne diseases and water washed diseases. He shared the results of recent reviews on climate change in Nepal, climate-sensitive diseases in Nepal, precipitation and diarrhoeal diseases, temperature trends and malaria outcomes, contamination in protected and unprotected water sources and types of WASH interventions in Nepal. Major challenges in WASH in Nepal include: issues around high quality data in areas of higher elevation, limited funding for WASH in schools and institutions, inequality of service provision across sub-groups of the population and the lack of web based monitoring and evaluation systems.

Oliver Cumming, London School of Hygiene and Tropical Medicine

Oliver Cumming (LSHTM) presented on trend, gaps and opportunities in emergency environmental health research. Key trends in humanitarian assistance include protracted crises, a growing number of displaced people globally and emerging and re-emerging diseases. While there have been increasing levels of humanitarian investment, needs still remain unmet (as indicated by under-funded UN appeals

(Figure 2)). There is therefore a need for effective, efficient and sustainable WASH interventions and research has an important role to play in determining which interventions offer the best value for money.

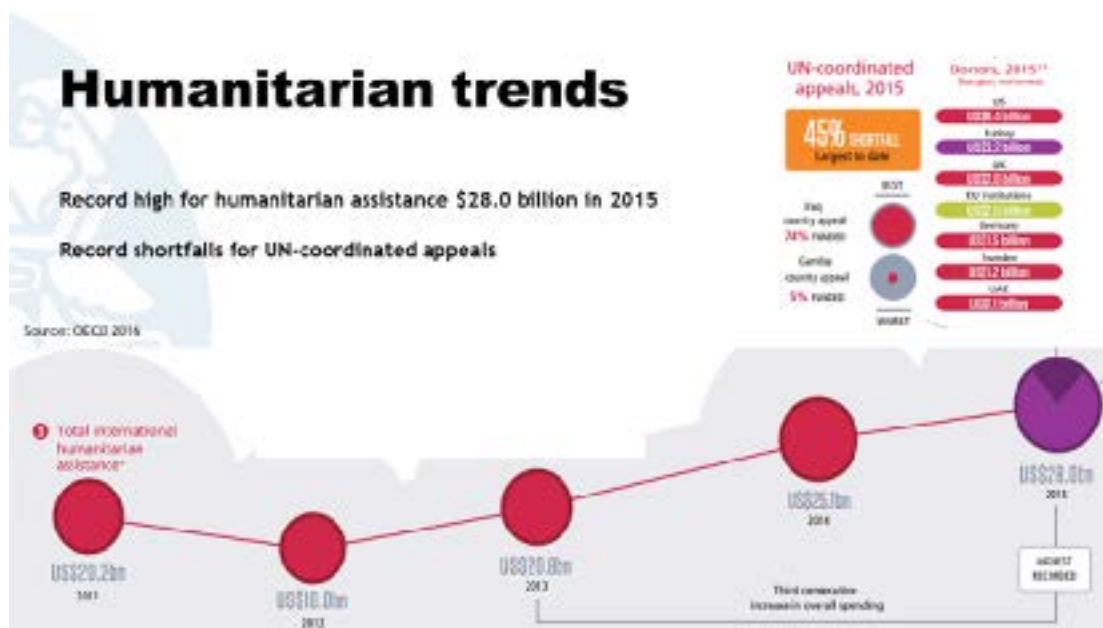


Figure 2: Visual of humanitarian trends (Oliver Cumming)

Key challenges in conducting public health research in humanitarian settings include the use of evidence from non-humanitarian settings (which may not be appropriate), establishing a counterfactual in operational research studies, finding feasible but rigorous methodologies, limited capacity for research scale up and the need for developing research capacity at the national level. While research on health in humanitarian crises has increased in recent years, there are issues with study quality. Existing WASH specific evidence is mainly in grey or unpublished literature and few WASH studies have produced statistically significance evidence. While there are numerous humanitarian WASH guidance manuals produced by multiple agencies, these sometimes have conflicting messages and limited quantifiable indicators.

New opportunities to address the evidence gap for humanitarian WASH include increasing practice, policy and research engagement as well as new funding calls for diverse activities. In relation to the key themes of the EEHF, there is a need to develop “good enough” research methods and to consider how behaviour change theory applies. Oliver Cumming concluded that researchers, facilitators/ funders and implementers are all needed to make progress on this important topic.

First Session: Questions and Discussion

Brian Reed (WEDC) asked if people being directly affected by climate change are getting more attention than those who are indirectly affected (i.e. people migrating). Prof Subodh Sharma (KTM University) replied that in Nepal it is people affected by food scarcity, loss of livelihoods, issues around land tenure and migration who are most affected. He said that in Nepal the issue of climate change itself is critical and is affecting the whole country. Robert Fraser (IFRC) asked if anyone is researching the effectiveness of the use of increased resources into humanitarian aid, noting that increased funding doesn't equal effectiveness. Oliver Cumming (LSHTM) replied that this is where research and evaluation can add value but that it can be challenging to seize this opportunity due to the fast moving nature of the humanitarian sector. LSHTM is seeking ways to respond faster to emergencies and have research protocols ready. Oliver Cumming agreed that more money doesn't equal more results and that research is a key tool to ensure it does.

Jean McCluskey (Independent) asked if anyone has looked at the uptake of results of research and whose responsibility it is to operationalise that learning. Oliver Cumming noted that research funding often stops after publications which can be challenging for promoting research uptake; donors are starting to recognise this and supporting research uptake in their funding. He said that research uptake activities should start at research inception and continue throughout the research process.

Maysoon Dahab (ELRHA) asked how donors in the WASH sector can coordinate identifying and funding a complementary set of WASH questions. Oliver Cumming said that the EEHF provided a good opportunity to start to identify WASH questions and there are recent reviews which summarise key research topics. He suggested engaging with the donor community to understand which questions others are tackling in order to avoid duplication.

Marion O'Reilly (Oxfam) commented that a 2014 gap analysis highlighted hygiene promotion and community engagement as key issues. She noted that creative thinking and a joined up approach is needed to address these topics.

Dinesh Bajracharya (Oxfam) asked whether there is any research on the effectiveness of donors making a sustained funding commitment over time in to build upon early response commitments. Oliver Cumming (LSHTM) said he was not aware of research on this question but agreed that waves of funding is a challenge in humanitarian response. He noted that WASH is a particularly interesting sector to review this due to the infrastructure components.

Thursday 24th November: Second Session

Theme 1: Handwashing in emergencies

1.1 Using emotional motivators to promote handwashing with soap in emergencies- Foyeke Tolani (Oxfam)

Foyeke Tolani (Oxfam) presented formative research conducted with mothers in three countries affected by crises - Pakistan, The Philippines and Nepal - to better understand motivating factors for handwashing with soap among this target group. Using both quantitative and qualitative methods, the researchers found that despite the disruption an emergency causes to a mother's life, mothers continue to be motivated by handwashing drivers related to nurture, affiliation, purity and disgust.

Although some motives were context specific - such as the concept of shame in The Philippines and purity in Pakistan and Nepal - nurture and affiliation were found to be crosscutting drivers of behaviour in all 3 contexts (Figure 3). Foyeke Tolani concluded that mothers are resilient in crisis and prioritise the immediate needs of their child. She noted that using emotional motivators such as nurture and affiliation has the potential to be more effective than health messages alone.

Emotional motivators for HWWS among mothers affected by an emergency in 3 countries

Type of Motivators	Pakistan	Philippines		Nepal
		Rural	Urban	
Cross-cutting		<ul style="list-style-type: none"> •Affiliation •Nurture 		
Context specific	<ul style="list-style-type: none"> •Purity 	<ul style="list-style-type: none"> •Disgust •Comfort •Shame 		<ul style="list-style-type: none"> •Purity •Disgust •Comfort

Figure 3: Emotional motivators among mothers in three emergency settings (Foyeke Tolani)

1.2 Handwashing for Ebola outbreak contexts: comparison of the safety and efficacy of soap, hand sanitizer, and 0.05% NaDCC, HTH, and NaOCl Chlorine solutions- Marlene Wolfe (Tufts University)

Marlene Wolfe (Tufts University) presented on an evaluation of six handwashing methods in Ebola outbreaks. Different agencies recommended different methods during the 2014 West Africa outbreak. The six methods used were; soap and water, alcohol-based hand sanitizer (ABHS), and 0.05% NaDCC, 0.05% HTH, stabilized and non-stabilized chlorine solutions across two studies. The first study evaluated the impact of frequent handwashing on skin irritation that may increase transmission risk, and the second study evaluated the safety and efficacy of handwashing methods on the removal, inactivation, and persistence of model organisms. The test organisms were *E. coli* (ATCC 25922) and Phi6 (HER #102), which was selected as a surrogate for the Ebola virus based on preliminary work

The safety study involved 108 subjects, randomised across one of six methods, who washed their hands ten times daily for 28 days. They were examined daily for irritation outcomes. The amount of irritation in this study was very low, challenging concerns that chlorine may be more harmful to skin. There were no clinically significant differences in terms of safety.

The efficacy study involved 18 volunteers over 4 days. In this second study, chlorine performed similarly or better than other methods for removal of both organisms and resulted in significantly less *E. coli* in rinse water (Figure 4).

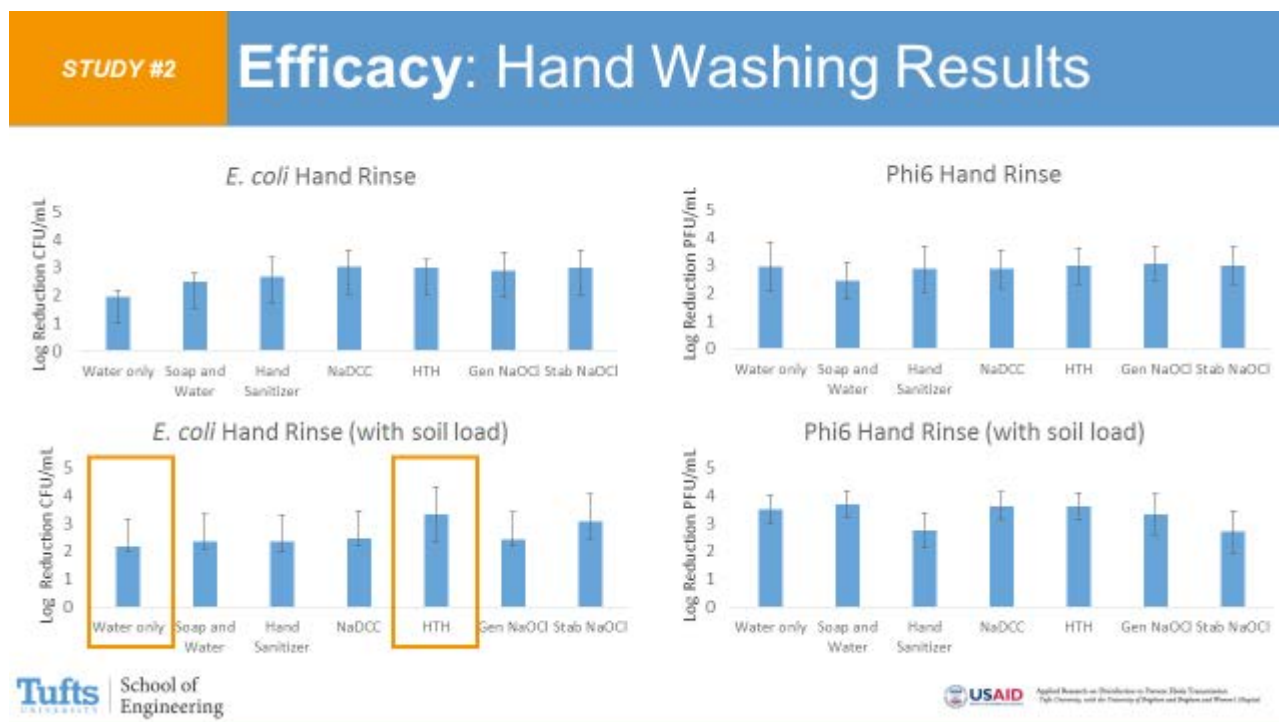


Figure 4: Efficacy of six hand washing solutions on *E. coli* and Phi6 surrogate (Marlene Wolfe)

The results from both studies suggest all handwashing methods are comparable in terms of safety and efficacy. They also suggest that chlorine methods can reduce ongoing transmission via rinse water. Marlene Wolfe recommended that responders use the most readily available and acceptable materials for their context.

1.3 Rapidly deployable handwashing interventions in complex emergencies: results from a trial in a displaced persons camp in the DRC- Thomas Handzel (CDC)

Thomas Handzel (CDC) presented on a trial of three rapidly deployable handwashing interventions in a displaced persons camp in the Democratic Republic of the Congo: handy wash taps, nudges (painted blocks leading from latrine to handwashing station) and triggering (using shame as a motivator to elicit handwashing practices). The aim of each intervention was to improve rates of handwashing with soap at three critical events and was in comparison to a control group.

The research team evaluated rates of handwashing with soap or soapy water (powdered soap mixed with water in vessel) at the latrines and in households in each intervention arm compared with the control arm over a five-week period. The addition of soapy water increased handwashing after latrine use in all groups. The study found improved handwashing practice at latrines in the handy wash tap (RR 1.18, 95%CI 1.04-1.34) and nudge arms (RR 1.20, 95%CI 1.13-1.27) compared with those in the control arm. Improved household handwashing practice was observed in the handy wash arm compared with the control arm (RR 1.96, 95%CI 1.42-2.71). The study saw no difference in handwashing practices at latrines or households between the control arm and the triggering arm.

The findings suggest that improved taps for handwashing containers, behavioural nudges (Figure 5), and improved access to handwashing stations and soap in the household can improve handwashing behaviour in a camp setting. The research team recommended a need for sustained provision of soap at latrines (and households) to allow for safe handwashing practices, and suggest that ash is not a viable alternative to soap in this context. Thomas Handzel suggested replicating the intervention in an acute emergency and over a longer period of time to see if there are similar results.

Nudges



Figure 5: Nudges handwashing intervention in Democratic Republic of Congo (Victoria Trinies)

Questions and Discussion: Handwashing in Emergencies

The session concluded by inviting any questions from the floor for discussion by a panel chaired by Robert Fraser (IFRC). The panel consisted of the speakers: Foyeke Tolani (Oxfam), Marlene Wolfe (Tufts University) and Thomas Handzel (CDC).

Jean Lapègue (ACF) asked if free-residual chlorine decay was considered in the Tufts University study. Marlene Wolfe said that the residual of the chlorine solution was tested and carefully controlled in the study and highlighted that we still don't know how much chlorine is enough for handwashing. She recommended a related study on this topic (<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0156136>).

Thomas Handzel (CDC) asked if Tufts University intended to follow up with an efficacy study on 0.04 or 0.03 chlorine solution. Marlene Wolfe answered that there are no plans for this but there are open questions about hand washing protocols which they are interested in, i.e. the time for handwashing and how to vary protocols.

Matt Arnold (MSF) asked if the starting point was the chlorine would not be as efficacious as other methods for handwashing in the Ebola context. Marlene Wolfe answered that this was the concern that the research started with and the research found that there were not significant differences across the methods. Matt Arnold noted the practicalities of handwashing in different contexts and that sometimes chlorine was more practical, for example in Ebola Treatment Units. Marlene Wolfe agreed that it was important to consider the reality when using a handwashing solution.

Peter Goodfellow (Save the Children) asked about applying the Tufts University research to future protocols and what advice would be given to responders in a context where both chlorine and soap were available. He suggested that making both options available could be a good approach. Marlene Wolfe said it was important to align recommendations between different responders and highlighted that acceptability was important; if there are two options then this might be a criterion for determining which to use.

Ammar Fawzi (GOAL) raised the issue of compliance, noting that in the Ebola response treatment centre staff often washed their hands multiple times but did not follow proper protocol when handwashing. He asked if compliance was considered in Tufts' study. He also mentioned preference for different methods during the Ebola outbreak. Marlene Wolfe agreed that compliance was important and said that considering the reality of following protocols is an important next step for moving this research forwards.

Another question from the audience noted that soap was not always a priority in emergencies compared to more immediate needs and asked if it was enough to recommend that people in

emergencies use water with a chlorine residual for handwashing. Foyeke Tolani (Oxfam) responded that there is still an open question about effectiveness and there is not enough evidence to suggest chlorinated water/water with a chlorine residual would do the same and she would therefore continue to advocate for the use of soap. Brian Reed (WEDC) agreed and noted that using water with a chlorine residual would not be sufficient as the residual would decrease over time. Foyeke Tolani said we need to keep communicating about using soap when hands are visibly dirty.

Jean McCluskey (Independent) asked about dissemination strategies for sharing the knowledge from this session and whether practitioner guidance would be produced. Foyeke Tolani said a set of materials and activation ideas had been created and tried in Nepal (findings not yet available). Marion O'Reilly (Oxfam) noted that it was a learning exercise and Oxfam seek to capture the learning for all staff. Robert Fraser (IFRC) said that everyone here had a responsibility to communicate the results to their own networks.

Thursday 24th November: Third Session

Theme 2: UDDT in Emergencies

2.1 Urine diverting dry toilets in emergency settings- Andy Bastable (Oxfam)

Andy Bastable (Oxfam) presented on Oxfam's UDDT research in Bangladesh. Flooding is a major issue in Bangladesh which means there are challenges with digging pit latrines as well as flooding of these latrines. The study tested four types of sanitation; emergency mobile urine diversion toilet, UDDTs, floating latrines and pit latrines. It included testing people's preferences for anal cleansing in UDDTs and urine collection for use on crops.

The study found that each type of sanitation had challenges. The results found that the portable emergency UDDT had issues around instability and rusting. The floating toilet had a higher cost and was a new technology for users to adapt to. Andy Bastable noted that UDDTs have a high initial cost which may be restrictive for poorer families, take up more space than pit latrines and can be used incorrectly (i.e. water getting into faeces chamber).

Environmental and health aspect

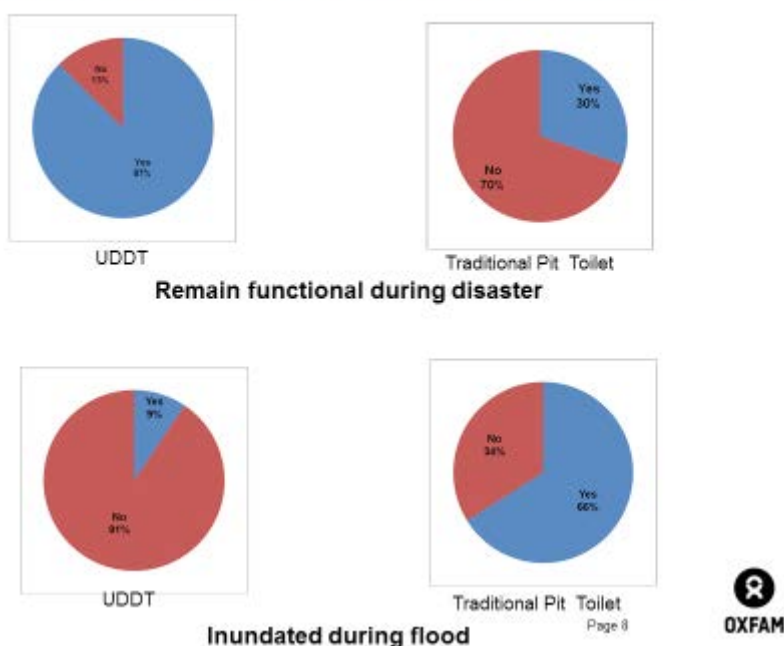


Figure 6: Environmental and health aspects of UDDTs during disasters (Andy Bastable)

2.2 An Acceptability and Environmental Evaluation of Urine Diverting Dry Toilets (UDDT) in Hiloweyn Camp, Dollo Ado, Ethiopia- Molly Patrick (CDC)

Molly Patrick (CDC) presented results from an evaluation of acceptability and treatment efficacy of UDDTs installed and scaled-up between 2012 and 2014 in Hiloweyn refugee camp in Ethiopia. The evaluation aimed to document the suitability and role of UDDTs in this setting, and determine factors contributing to acceptability and performance to inform introduction in other Ethiopian refugee camps and other potential settings.

Two cross-sectional household surveys (April 2015 and October 2016) collected observations and information on sanitation knowledge, attitudes and practices. The first survey found that observed and reported correct and current usage of UDDTs was high. However, observations identified that 16-30% of the UDDTs had structural faults and lack of cleanliness indicators. Shared-family UDDTs had more lack of cleanliness indicators than single-family UDDTs, and lack of cleanliness was highest in shared-family UDDTs that were newer (<1 year). In terms of acceptability, single-family were more satisfied than shared-family UDDT users and satisfaction was lowest among new UDDT users.

Factors significantly associated with greater satisfaction with UDDTs were cleanliness of the UDDT (research results suggest the condition of UDDTs improved over time) and length of time in the camp (possible proxy for length of time of exposure to

and/or use of the UDDTs). UDDT user satisfaction was also compared to that of traditional latrine users, and there was no significant difference found between UDDT and latrine users.



Figure 7: Image of UDDT in Ethiopia (Molly Patrick)

To assess environmental conditions and microbial inactivation over time, 20 closed, shared-family UDDTs were studied. Nylon bags seeded with *Ascaris lumbricoides* ova were embedded into existing waste in vaults. After 0, 6, 9 and 12 months, temperature, pH, and moisture content of waste were measured; bags were also assayed to determine inactivation of *Ascaris lumbricoides* and naturally-occurring *E. coli*. Over 9 months of storage, temperature inside UDDTs ranged from 32-36°C, the average moisture content of material decreased from 9% to 4%, and pH remained at ~9.0. UDDTs containing <1000 *E. coli*/g total solids increased from 30% and 89% from 0-9 months. *Ascaris lumbricoides* ova percent viability decreased from 77% to 3% by 6 months; 9- and 12-month data are currently being analysed. These data suggest a substantial decrease in *Ascaris lumbricoides* viability and *E. coli* concentrations in waste stored for at least 9 months in closed UDDT vaults under hot, dry, alkaline conditions.

Yegerem Tsige (UNHCR) talked about the implementation and scale up of UDDTs in Hiloweyn Camp, noting that there was increased demand over time. Mobilisation was the most challenging areas as users have to move after defecation for anal cleansing; interestingly this was improved as the project scaled up. Another challenge is that children were not using the UDDTs; this is partially because

families were worried children would fall and also concern that children might not use them properly.

Murray Burt (UNHCR) noted that there has been a reliance on pit latrines in Sub-Saharan Africa and Asia. They are the cheapest option except in locations with difficult rocky, flood-prone or congested ground conditions; these are the type of area that UNHCR often work in. Recently UNHCR has partnered with the Bill and Melinda Gates Foundation to take this work forwards and UNHCR are also working with Oxfam on another study in Ethiopia. The goal is to find a robustly tested design for UDDTs which includes hardware and software components.

Extended panel discussion on UDDT in Emergencies

The session concluded by inviting any questions from the floor for an extended panel discussion chaired by Jean Lapègue (ACF). The panel consisted of the speakers: Molly Patrick (CDC), Murray Burt (UNHCR), Thomas Handzel (CDC), Andy Bastable (Oxfam) and Yegerem Tsige (UNHCR).

Ritva Jantti (Finnish Red Cross) asked about how challenges relating to accessibility for young children, disabled or elderly people were overcome in the Ethiopian camp context. Molly Patrick (CDC) noted that the majority of people not using UDDTs were children under five, plus some elderly and disabled people. Yegerem Tsige (UNHCR) said that potties are provided to families for children under five. Further adaptation may be needed for children under five; at present open defecation is happening for this group.

A question was asked from the audience about menstruation and how this worked for UDDTs and whether cost was a barrier. Murray Burt (UNHCR) said that when the full life cycle of UDDTs was considered it came out as the cheapest option. Yegerem Tsige (UNHCR) noted that plastic bags had been provided and collected by female hygiene promotion volunteers for the disposal of MHM materials. There were challenges about the ultimate disposal of these materials as burning was not acceptable to the community. They reverted back to disposing MHM materials in pit latrines due to the lack of acceptable final disposal option.

Another audience member asked a question about the sustainability of the infrastructure. Andy Bastable (Oxfam) noted that the initial aim of UDDTs is not reusability of urine or faeces as compost but that this is an added benefit. The primary aim is to save on costly desludging costs. Murray Burt (UNHCR) noted that the intended design life is about 15 years and any reuse would be an additional added value.

Brian Reed (WEDC) asked about testing the floodwater for contamination - Andy Bastable (Oxfam) said this wasn't tested, only the wells. He noted there was potentially a public health risk in a densely populated area.

A member of the audience asked what the panel thought about using UDDTs in a rapid onset urban emergency. Andy Bastable (Oxfam) highlighted the enormous costs of desludging in urban emergencies giving Haiti as an example, stating that alternative sanitation could play an important role here including UDDTs. It involves more management costs but would be cheaper over time than the high cost of desludging (which has associated issues of where the sewage goes). Thomas Handzel (CDC) said that getting acceptability and good practice early on was important; while the technology is appropriate it depends how quickly it can be done in an acute emergency phase.

Jean Lapègue (ACF) asked about scaling up UDDTs in refugee situations. Murray Burt (UNHCR) said UNHCR were seeking evidence to show this was a good on-site above ground option and ongoing work with the Bill and Melinda Gates Foundation should add to this body of evidence. He emphasised that UDDTs are a key part of future sanitation options.

Thursday 24th November: Fourth Session

Theme 3: Water Treatment and Supply

3.1 Borehole diagnosis and rehabilitation as an alternative to new borehole drilling- the Médecins Sans Frontières approach in rural Niger- Mamadou Zongo (MSF)

Mamadou Zongo (MSF) presented on the implementation of an innovative mobile workshop for the diagnosis and rehabilitation of dysfunctional boreholes in the Guidan Roudji district of Niger.

Over a period of 109 weeks, 50 boreholes in the district were diagnosed. The most common diagnoses were chemical and/or coliform contamination. Six (12%) did not require any rehabilitation, for 10 (20%) the identified problems were too slight, and for 3 (6%) the necessary skills and material for rehabilitation were not available. The remaining 31 boreholes (62%) were rehabilitated successfully: for 7 (23%) minor problems persisted, but all provided sufficient quantities of potable water post-intervention. In the specific case of fluoride contamination in a subset of boreholes in the region, a proof-of-concept of sealing off the fluoride-holding layer in one borehole was performed successfully.

For the 31 rehabilitated boreholes, the total cost (diagnosis+rehabilitation) was 130,200 USD, amounting to 2 USD per capita. This study showed the feasibility and added value of diagnosing and rehabilitating boreholes in LMIC.

Interestingly, the mobile workshop allowed a refined diagnosis of the hydrogeology around the borehole, on the one hand allowing for specifically tailored interventions (such as patching of the

contaminated layer, as illustrated in the case study), and on the other hand providing a better understanding of the hydrogeological complications in the area, guiding future drilling initiatives.

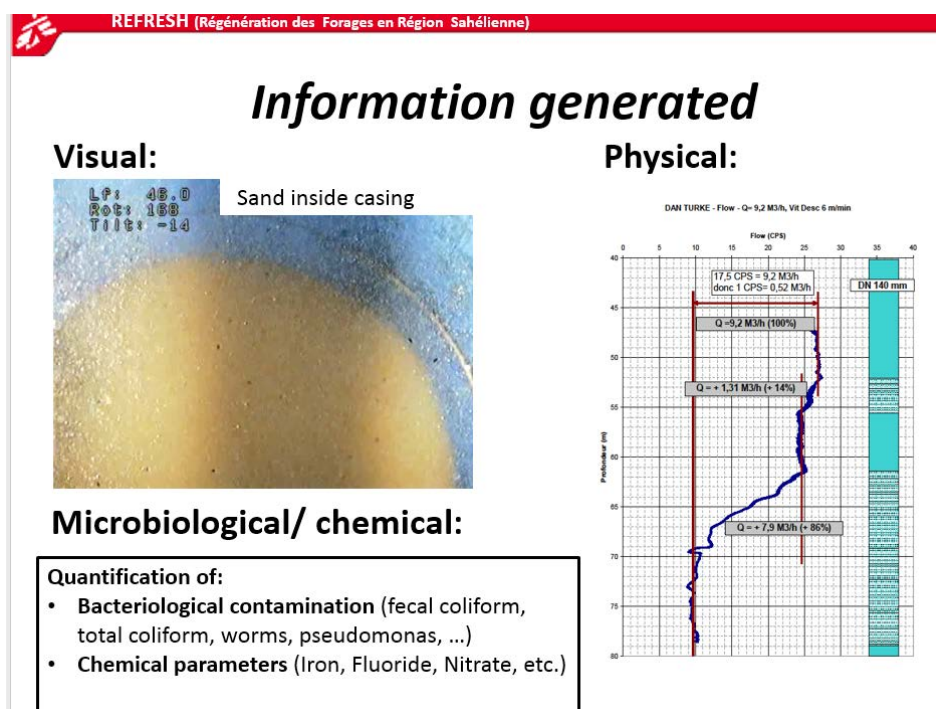


Figure 8: Visual, microbiological and chemical diagnosis of a borehole (Mamadou Zongo)

3.2 Bulk chlorination of drinking water supplies in cholera-affected wards of Dar es Salaam, Tanzania- Thomas Handzel (CDC)

Thomas Handzel (CDC) presented on a pilot of the use of 8.68gm NaDCC tablets to treat bulk drinking water supplies to improve chlorination during the 2015 cholera outbreak. He noted that private water vendors are an important source of water in Dar es Salaam as very few households have in house pipe connections. Water sold in Dar es Salaam did not have consistent detectable free chlorine residual (FRC). The research project sought to improve community level chlorination among water vendors in targeted cholera affected areas by treating water with 8.68g NaDCC tablets.

A pilot of a three-month supply of NaDCC tablets was distributed to 644 water vendors in cholera affected areas of Dar es Salaam by ward health officers. Methods included focus group discussions and a vendor survey. In Kinondoni district, 73% of vendors visited reported treating their water during the first monitoring visit and of these, 88% had detectable FRC; at the second visit, 71% of vendors visited reported treatment, and of these 87% had detectable FRC.

Bulk Chlorination Project Objective

- *Improve community-level chlorination among water vendors in targeted cholera affected areas*
 - *Dar es Salaam 15 highly affected wards*
 - *Morogoro 8 highly affected wards*
 - *Zanzibar 2 highly affected shehias*



Figure 9: Free chlorine residuals found amount water vendors in Dar es Salaam vendor's water (Thomas Handzel)

Key results included a high and consistent use of tablets from vendors and increased compliance associated with WHO engagement. CDC found that it was a novel community approach to bulk chlorination. While this was initially set up as part of an emergency response, CDC now seeks to make this programme more sustainable through cost recovery by integrating social mobilisation activities and increasing consumer demand. The program could potentially be expanded to new cholera affected wards within implementing districts, new districts, schools and health facilities.

3.3 How do we monitor the effectiveness and appropriateness of innovative approaches in humanitarian WASH? : a case study on point of use (POU) water treatment with ceramic water filters (CWFs) in IDP camps in Rakhine, Myanmar- Tom Wildman (Oxfam)

Tom Wildman (Oxfam) presented a case study on water supply in the IDP camps of Rakhine State, Myanmar. Camps in Rakhine State are very densely packed with a shallow groundwater table, as a result water supply is generally provided through hundreds of shallow tube wells. The groundwater is extremely vulnerable to contamination due to the shallow water table. Due to the logistical challenges of ongoing bucket chlorination, coupled with the target populations' dislike of chlorine, WASH actors almost universally chose to distribute CWFs for household-level treatment of water.

While this approach was hailed by many as an innovative approach to water treatment in a protracted crisis, there were challenges

about the quality of evidence available. Monitoring of performance was limited initially to a small number of focus group discussions which focused solely on user satisfaction, with limited or no monitoring of filter performance and effluent water quality. Distribution of 25,000 CWFs went ahead with no standardised monitoring in place.

OFDA then sought to improve monitoring and to support the cluster to generate a stronger evidence base. Melissa Opryszko (OFDA) noted that there were high risk health issues to the displaced population as well as previous research which suggested CWFs may not be effective. An evaluation of the CWFs found that the filters had a lifespan of around 13 months, around 62% of the population were using them. The community had mixed messages about the quality of water post filtration (31% thought there was an improved water quality, 28% decreased water quality). Water quantity was not included in the study and a follow on study may take place.

Recommendations emerging from the study include implementing a standard household level M&E approach that is done in a statistically robust way mixing qualitative and quantitative methods and building in contingency plans for occasions when new sanitation approaches don't work.

Recommendations for M&E of New Approaches

- Standardized M&E
- HH level M&E... FGDs alone are insufficient
- 95% confidence level & random sampling
- Qualitative + Quantitative

- Contingency plans... what now?

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Figure 10: Recommendations for monitoring and evaluating new emergency WASH approaches (Tom Wildman)

3.4 Emergencies: from data to decision (beyond data for the sake of data)- Matt Arnold (MSF)

Matt Arnold (MSF) focused on what the best approach is in any given situation to measure, monitor and represent/report Free Residual Chlorine (FRC) data to a quality that can better guide decision making and whether this could be ‘crowd sourced’.

Examples of manual data collection, data entry and mapping were given from the Haiti 2011 context where the programme wanted to identify areas of Port-au-Prince that were poorly served with adequately treated water and see if this relates to cholera incidence.

Another example in Mtendeli Refugee Camp, Tanzania was given where over 3000 manual measurements (PoolTester and DPD) were manually entered into Open Data Kit (ODK) using a smartphone. This gave good spatial, temporal and quantitative data which enables adjustment of automatic chlorination or the network itself. The data was also easy to map and represent visually which informed operational decisions on the right level of chlorination at boreholes and in households.

Mtendeli Refugee Camp - Tanzania



Over 3,000 manual measurements at tap stand and HH level using an Open Data Kit

FRC, turbidity and observational records helped to ensure correct chlorination of water supply and reporting to UNHCR.

From Data to Decision – EEHF Presentation, Matt Arnold, MSF, November 2016.

Figure 11. Example of Open Data Kit smartphone based data entry in Tanzania (Matt Arnold)

Matt Arnold noted there are still issues with this approach; manual data entry can lead to errors, testing devices can complicate fieldwork and it is often challenging to integrate measurement, data management and mapping so data can actually be used for decision making. He proposed that a future solution could be integrated hardware and software; one example of this is a company called AKVO who have developed a photo-meter that connects to a phone for water quality testing. MSF have piloted this approach in Delhi and seek to use it in an outbreak setting where they are implementing chlorination of water supply.

Questions and Discussion: Water Treatment and Supply

The session concluded by inviting any questions from the floor for a panel discussion chaired by Melissa Opryszko (OFDA). The panel consisted of the speakers: Mamadou Zongo (MSF), Thomas Handzel (CDC), Tom Wildman (Oxfam) and Matt Arnold (MSF).

Ritva Jantti (Finnish Red Cross) asked what has been done with the data from the Myanmar study; Tom Wildman (Oxfam) answered that people have now realised it is a problem but action hasn't necessarily been taken yet. Tom Wildman (Oxfam) said that in this context it was extremely challenging to get anyone to acknowledge the importance of monitoring at household level so recognising its importance is the first step. He also noted that after several years of protracted crisis, agencies have the responsibility to test the effectiveness of interventions in a robust way.

A member of staff from Oxfam Nepal asked whether the issues in Rakhine Camp related to the hardware or the software; Tom Wildman (Oxfam) said the question was extremely pertinent but because of the lack of monitoring and evaluation it's impossible to answer.

Marion O'Reilly (Oxfam) asked about the feasibility of rigorous monitoring at the household level and when monitoring is "good enough" given the multiple demands on field staff. Tom Wildman (Oxfam) noted that if we are aiming for a public health outcome at the household level, then monitoring needs to take place at the household level.

Murray Burt (UNHCR) asked about studies on our taste threshold for chlorine given that increasing chlorination level is a common response in emergencies and often it is increased in an uncontrolled way. Tom Wildman (Oxfam) said this was an issue in South Sudan in 2013 and data showed that the water had been over-chlorinated, with major issues maintaining consistent chlorination levels. Andy Bastable (Oxfam) added that they had tested taste by giving people unmarked cups to test the threshold of what people would drink which found people would drink up to 0.6 - unfortunately this research was not documented. Thomas Handzel (CDC) noted that tolerance for amounts of chlorine is localised and depends on the context.

Richard Luff (Independent) asked what the panel thought about third party independent monitoring of FRC and other indicators. Matt Arnold (MSF) said that monitoring should be planned in budgets from the start and that this is something we should improve ourselves. Jean Lapègue (ACF) said that monitoring should be done by implementing agencies to inform programme decisions however there might be a role for third parties to coordinate evaluation in an accountable way.

Panel Discussion: Trends for the future: emerging infections, WASH and public health in emergencies

- Murray Burt (UNHCR) introduced and chaired this panel discussion on emerging trends including climate change, population movement, new diseases and changes to old diseases. The panel consisted of Oliver Cumming (LSHTM), Danielle Lantagne (Tufts University), Thomas Handzel (CDC), Brian Reed (WEDC).

The panel discussion covered several key themes.

Learning from the past:

- Thomas Handzel (CDC) said that the Ebola outbreak showed we weren't clear on the role of WASH in the response. One of the key lessons learnt was that we needed to answer WASH questions to inform the response; community of responders came together quickly to answer these key questions and issue preliminary guidance.
- Danielle Lantagne (Tufts University) said we need to get ahead of the curve by looking at emerging diseases before outbreaks happen and improving preparedness for diseases which might outbreak.
- Brian Reed (WEDC) said we need to encourage and train staff who can think critically and make decisions on the ground.
- Marion O'Reilly (Oxfam) noted that Oxfam have written up a short document outlining how to complement work done by medical agencies with community outreach and WASH services. Oxfam are keen to discuss more with other agencies perhaps by setting up a MoU in advance to improve preparedness for this type of approach.

New threats and changes to old threats:

- Oliver Cumming (LSHTM) noted that the WASH sector stepped back in the early stages of Ebola because it was thought as a medical response. There was a sense that the WASH community was waiting for directions from medical colleagues but in future we need to have a systems level approach. He said that environmental and medical health should move in tandem to respond to future outbreaks.

- Thomas Handzel (CDC) said that we should be worried about respiratory infections and influenza. We need to plan for the role of the WASH sector in this kind of response.
- Danielle Lantagne (Tufts University) said we need to think about person to person, vector borne and respiratory as different routes of transmission for WASH responses. How does WASH link to cholera vaccinations? What's the link between WASH and vaccines?
- Oliver Cumming (LSHTM) noted that WASH and vaccines is a really important question and is also relevant for diseases like rotavirus. Also adding that the link between WASH and nutrition is growing traction and needs more focus from all sectors. Individuals who have concurrent enteric infections are also likely to be the poorest, most vulnerable and under-nourished. This is critical for organisations to consider at an operational level.
- Brian Reed (WEDC) highlighted that WASH isn't about health alone, it's also about dignity and privacy. We need to ensure this is part of the debate and isn't forgotten in academic research.

Inter-sectoral links:

- Alex Czerniewska (LSHTM) asked about the divide between international development and emergency sectors and noted that we need to cross this divide not just the sectoral divide. She said that in Liberia WASH programmes were largely focused on Ebola because it was mainly the emergency sector responding but we could better look for opportunities for longer term projects and transitioning from response to recovery to development.
- Murray Burt (UNHCR) agreed that we need to strengthen the linkage between humanitarian and development sectors.
- Danielle Lantagne (Tufts University) commented on a systematic review which found that humanitarian and development programmes linking together is a predictor of success and something to build on.

Preparing for the future:

- Andy Bastable (Oxfam) commented that the difference with this Ebola outbreak is that it was in an urban context and this will happen again. He said that there will be more disease outbreaks in urban contexts and guidance on how long Ebola can survive in water, sewage etc. was slow to come out. Andy noted that we can predict that diseases will mutate and we'll need this kind of information again. He asked the panel about how we can be better prepared for future diseases and get this kind of information ready.
- Danielle Lantagne (Tufts University) agreed that it is important to investigate survivability of diseases and some research on this is taking place in the USA. She noted Ebola virus has never been found in human sewage and that the strain of Ebola in the West Africa epidemic lasted longer in blood than previous strains.

Survivability research should be done with the actual virus in BSL4 labs as pre-preparedness. She said that the WASH sector has a role to advocate for this but isn't necessarily in the best position to do this research.

- Oliver Cumming (LSHTM) said that the WASH community needs to articulate their research agendas to the right research communities. Coming from the academic sphere he noted that joint engagements such as the EEHF are a good place to collaborate. He is currently involved in WHO sanitation guidelines and global water pathogen project - the WASH community might want to consider engaging with this work as they have the expertise to ask the right questions.

Final remarks:

- Thomas Handzel (CDC) commented there's no WASH in the Global Health Security Agenda and asked how can we include that within our own platforms. Increased awareness of WASH in HCFs has been very important for the WASH sector and should improve quality of care across all platforms.
- Oliver Cumming (LSHTM) said that WASH in HCFs is one of the great breakthroughs in the last 12 months opening up space for coordination. LSHTM is currently working on the research and evidence agenda of the Global Plan with a particular focus on Health Care Associated Infections (HCAI) and Antimicrobial Resistance (AMR).
- Brian Reed (WEDC) said we needed to increase knowledge management and information sharing - we need to share our successes and failures both within the sector and outside it.

Friday 25th November: First Session

Theme 4: Menstrual Hygiene Management, WASH in Health Care Facilities and WASH and Nutrition

4.1 Learning from the development of a cross sectoral toolkit for improving menstrual hygiene management in complex humanitarian emergencies- David Clatworthy (IRC)

IRC conducted a global assessment to examine MHM in humanitarian response, including key challenges, lessons learned, and existing practices. Information was collected through a literature review, key informant interviews with humanitarian practitioners across disciplines, and qualitative research conducted with adolescent girls, women, and program staff in three diverse emergency contexts (IDPs in displacement camps in Myanmar, refugee camps in Tanzania, refugee settlements in Lebanon). The objective was to contribute to the evidence base, to develop evidence based monitoring and to develop an MHM toolkit for emergencies with a particular focus on WASH.

Key Informant Interviews (KIIs) with practitioners found that barriers to MHM programming included gender of programming staff, discomfort discussing the topic, it's not prioritized as a life-saving intervention, women and girls don't always ask for support and a lack of written guidance or documentation. Key challenges highlighted by women and girls related to distribution of materials, inadequate latrines, lack of privacy and safety, concern that others would see menstrual materials, difficulty in drying clothes and pads, difficulties in purchasing materials (especially in cash programming contexts) and cultural beliefs on appropriate waste disposal.

The draft toolkit targets six sectors and is now being piloted in Tanzania. It will become available in 2017. Key learnings included the need to improve talking with beneficiaries about MHM and coordinating within the sector. IRC are seeking partners who are interested in testing the toolkit and looking for more case studies.

Challenges experienced for girls and women:

- **Distribution of materials** - frequency, amount, targeting, type
- **Inadequate latrines** - water, lighting, hygiene
- **Privacy and safety** at home and at latrines
- Worry that **men or boys (or anyone)** will see menstrual materials
- Difficulties in **drying cloths/pads**
- Difficulties **purchasing** materials
- **Cultural beliefs** esp around disposal
- **Access to information**, especially girls on menstrual health education



Figure 12: Challenges experienced by girls and women relating to MHM in emergency settings (David Clatworthy)

4.2 Disinfection of surfaces in the Ebola context: efficacy assessment of four chlorine types using *E. coli* and bacteriophage Phi6- Karin Gallandat (Tufts University)

Karin Gallandat (Tufts University) noted that different organisations gave different recommendations about the disinfection of surfaces in the Ebola context.

The objectives of this research were to:

- Compare the efficacy of four commonly available chlorine solutions (sodium dichloroisocyanurate (NaDCC, pH 6-7), high-test hypochlorite (HTH, pH 9-11), stabilized sodium hypochlorite (NaOCl, pH 9-11) and non-stabilized NaOCl (pH 7)) for the disinfection of three surface types
- Evaluate how recommended practices affect surface disinfection efficacy
- Determine how presence of a soil load mimicking human liquid waste affects surface disinfection efficacy.

Context	Objectives	Methods	Results	Conclusion
Disinfection recommendations				
Target	Action	Disinfectant	Exp. time	Source
Hospital, ETU	Pre-clean surface	0.5% chlorine	10 min.	WHO, 2015
Household	Cover spills	0.5% chlorine	15 min.	CDC, 2014
Hospital	Pre-clean surface	"Chemical disinfectant for non-enveloped viruses"	Not specified	CDC, 2014
ETU	Do nothing	0.5% chlorine	15 min.	MSF, 2008





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Figure 13: Disinfection recommendations for different surfaces (Karin Gallandat)

The test organisms were *E. coli* (ATCC 25922) and Phi6 (HER #102), which was selected as a surrogate for the Ebola virus based on preliminary work. The surface carriers were 8-cm discs of stainless steel, heavy duty tarp and nitrile. The four tested recommendations were representative of the MSF, WHO and CDC guidelines for surface disinfection: 1) do nothing before applying chlorine, 2) wipe the disc with a surgical towel, 3) cover the spill with a surgical towel and 4) wipe the disc and then cover the spill.

The research found that a 10-minute exposure time was sufficient to remove minimum 5.1log *E. coli* across all recommendations, surfaces and chlorine types. Phi6 was never detected after disinfection, except on nitrile in three opportunities when covering the spill. Surface type and test organism are the most important parameters for disinfection efficacy. All chlorine types were equally efficacious. Pre-cleaning did not improve disinfection efficacy. Covering is only desirable if transmission of the disease by splashes is a concern. In summary, a 15-minute exposure to 0.5% chlorine (independent of chlorine type, surface type, practices and presence of organic matter) should be enough to disinfect surfaces in an Ebola outbreak.

4.3 Impact of WASH on the treatment of Severe Acute Malnutrition (SAM): scientific research in DRC, Chad and Pakistan, and operational manual- Jean Lapègue (ACF)

Jean Lapègue (ACF) showed a video looking at WASH and nutrition from www.generation-nutrition.org. He reported on a series of research projects in DRC, Chad and Pakistan with the aim of demonstrating the effect of WASH on the recovery of children between 6 and 59 months admitted in SAM treatment. ACF used a quasi-experimental approach in DRC and randomized control trials in Chad and Pakistan.


The DRC study sought to understand the effects of water treatment on the treatment of SAM. It found that treatment time of children was reduced by 4 days (an average treatment is 30.4 days). This has cost savings and improves water quality at the community level although results are not as rigorous as a RCT. The Pakistan study sought to see if addition of water quality treatment at household level can reduce treatment time, change response to treatment or reduce the risk of relapse. Results are not yet available.

The Chad study added a household WASH component to a routine programme for SAM. It was a 13-month cluster RCT with two arms. Both arms received a routine treatment package, hygiene promotion - the intervention group additionally received a WASH minimum package. The study objectives were to:

- Assess evidence on WASH kit adherence
- Generate evidence on how the intervention impacts morbidity outcomes
- Understand how the intervention affects nutritional outcomes (weight gain and time to recovery, proportion of cured children, proportion of relapse after discharge)


Results confirmed that WASH positively impacts morbidity indicators (as per previous studies) and there were also results on nutritional outcomes, finding a robust effect of WASH in terms of recovery and non-responders (children who do not respond to the treatment and begin to put on weight). There was also some effect on relapse proportions but the sample was too small to verify this.

Operational challenges included finding appropriate sustained human resources in an insecure operational environment and ensuring nutritional protocol adherence. Jean Lapègue concluded that WASH increases curation rates and that the WASH kit should be better used with sustained use after discharge. The research will be extended by 12 months and a case control study will be done. ACF will be delivering a manual about operationalising WASH and nutrition in January 2017.



Household 3 months WASH kit given at admission (HC)

Content
safe drinking water storage container
Soap 750g x 3 months
Aquatabs / 3 months
A plastic Cup
Instructions leaflet



Price of the kit = 10 euros /HH for 3 months

Demonstration of the kit done at health center, at admission repeated at each weekly visit of the child-mother dyad

Figure 14: WASH Kits distributed to households enrolled in the study (Jean Lapègue)

Questions and Discussion: Menstrual Hygiene Management, WASH in Health Care Facilities and WASH and Nutrition

The session concluded by inviting any questions from the floor for a panel discussion chaired by Marion O'Reilly (Oxfam). The panel consisted of the speakers: David Clatworthy (IRC), Karin Gallandat (Tufts University) and Jean Lapègue (ACF).

Brian Reed (WEDC) asked about the MHM literature review and if any practical guidance on sanitation design or waste disposal was found. David Clatworthy (IRC) said there were concepts but not much evaluation or testing.

A member of staff from UNICEF asked what are good indicators for MHM. David Clatworthy (IRC) noted that it's not necessarily positive to add more indicators and we only want to add what is necessary. IRC are looking into whether there are proxy indicators to use (such as latrine ratios, soap availability) or data that's already collected.

David said that KAP surveys may include MHM but you need the right circumstances to discuss these topics. Qualitative approaches are sometimes the best way to collect this.

Tim Grieve (UNICEF) asked if IRC were able to look at the availability of suitable MHM products on the market across the three contexts. David Clatworthy (IRC) said that markets weren't really within the scope of the study but noted that Lebanon had cash transfer programming. He said that in Myanmar there were Buddhist and Muslim camps which received different materials, with the Buddhist camps receiving disposable materials and Muslim camps receiving reusable materials. Disposables entering the market led to people ultimately using a mixture of materials of Myanmar. David Clatworthy said that we need to better understand if cash programming is effective and how this affects MHM.

A member of IFRC staff noted that often women are not allowed to be at home during menstruation and that, in Nepal, a woman recently died in the cow shed during menstruation. David Clatworthy (IRC) said that every culture has different lore around menstruation and associated restrictions and that we need to tackle harmful cultural beliefs to create a supportive environment where women and girls don't feel shamed

Smiti (NCV) asked about MHM in emergencies and what the consequences are if women are asked to stay outside the camps during menstruation, noting this has been seen in other districts of Nepal. She noted the challenges of providing materials and orienting women and girls on how to use these materials and disposal methods. David Clatworthy (IRC) said that the WASH cluster needs to work with the protection cluster during emergencies and that we need to be cautious about stigma, terminology and how we introduce MHM.

Tim Grieve (UNICEF) asked about the residual chlorine levels in the ACF Chad study and how this was measured when it was already extremely low. Jean Lapègue (ACF) said they needed to understand why this was low and a further in-depth study was needed - this has informed and will orientate the next research.

Oliver Cumming (LSHTM) asked whether ACF recorded mortality in their study and whether including only outpatients excluded patients who were in a worse condition. Jean Lapègue (ACF) said they did not monitor mortality but he will share the published studies later in 2017 with more details. Jean Lapègue (ACF) said that nutritional treatment is about outpatients and in-patient treatment is more of a luxury. The research was dedicated to outpatient treatments, it might be interesting to have a more comprehensive study but this comes with associated costs and complications.

Matt Arnold (MSF) asked what the starting point is for further work on surface disinfection work such as the Tufts Study - noting that it is important not to confuse survivability within the environment with recommendations for within health care facilities. He noted that healthcare workers generally wear PPE so are protected in

Ebola Treatment Units. Karin Gallandat (Tufts University) replied that they followed the most standard protocol and decided to scale this up; there are limitations to laboratory work in comparison to field studies but it also provides a high level of accuracy. Previously recommendations were inconsistent because of a lacking evidence base, the research hopes to strengthen this evidence base but research is needed at different levels. Matt Arnold (MSF) highlighted the importance of consulting health care workers, particularly national staff, in terms of what is practical. Karin Gallandat (Tufts University) agreed that it is important to have these exchanges with practitioners.

Friday 25th November: Second Session

Theme 5: Waste Treatment and Sanitation

5.1 Innovation in sanitation- pushing the limits of CLTS/CATS in emergency response- Richard Luff (Regional WASH Consultant)

Richard Luff introduced a presentation on the damage to household toilets in the aftermath of the 2015 Nepal earthquake and the contradictions between relief and development. Pre-earthquake, Nepal used a CLTS/CATS demand-led approach and was making progress towards ODF. Richard Luff noted that generally in relief phase goods and cash are given out unconditionally and the transition phase shifts to conditional cash and goods.

Richard Luff's key recommendation was that it is necessary stop supply driven relief as soon as possible in order to start development, taking into account any significant residual public health, dignity and protection risks. He suggested a paradigm shift to plan for a demand led intervention at the outset, while implementing supply driven emergency measures as required in the relief phase. To achieve this the following is needed:

- much clearer WASH programme policy developed with this goal in mind
- stronger leadership from the global level to ensure it is implemented
- a critical mass of major agencies committed to this approach

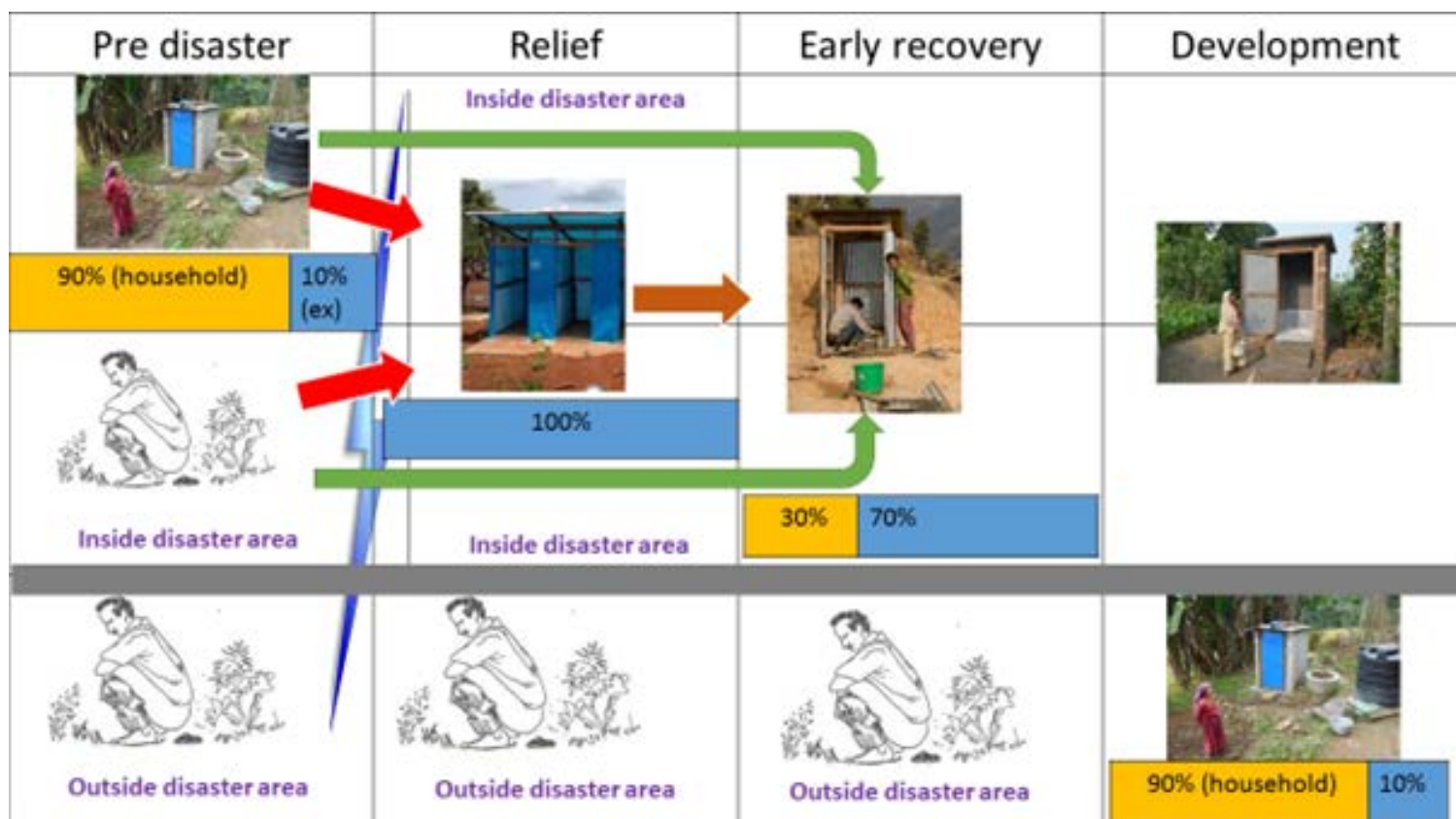


Figure 15: Visual of stages of emergency response (Richard Luff)

5.2 Biological Additives to Enhance Sanitation Facilities Lifespan in Refugee Camps- Murray Burt (UNHCR)

Murray Burt (UNHCR) presented on the use of biological additives for pit latrines. A recent UNHCR study consisted of a field trial in Chad using a commercial biological product called LICE, and a laboratory scale research field study conducted in Naivasha, Kenya.

Phase I in Dosseye Refugee Camp, Chad showed some positive results but had limitations including uncontrolled testing and misunderstanding of the protocol. There were many uncontrolled variables in these field trials so UNHCR chose to do some more controlled and scientifically robust field trials. Phase II repeated the testing with a more controlled approach and greater fidelity to the protocol; results showed a 100% volume reduction which raised some questions. Limitations included dried up latrines which needed an additional water injection. The latrines were continuously monitored; 7 months on the results showed slower accumulation of sludge in pit latrines with LICE.

The UNHCR-UNESCO IHE laboratory scale 60-day research study in Naivasha, Kenya discovered that the LICE could considerably reduce odour and flies (95%-100% reduction at 95% confidence levels) in fresh faecal sludge.

However, no stabilization or sanitization could be achieved, potentially due to the non-optimal ambient conditions (temperature below the optimal 37°C, which might have inhibited exogenous bacteria). There was no statistically significant volume or mass reduction in sludge mass and no statistically significant effect on E.coli.

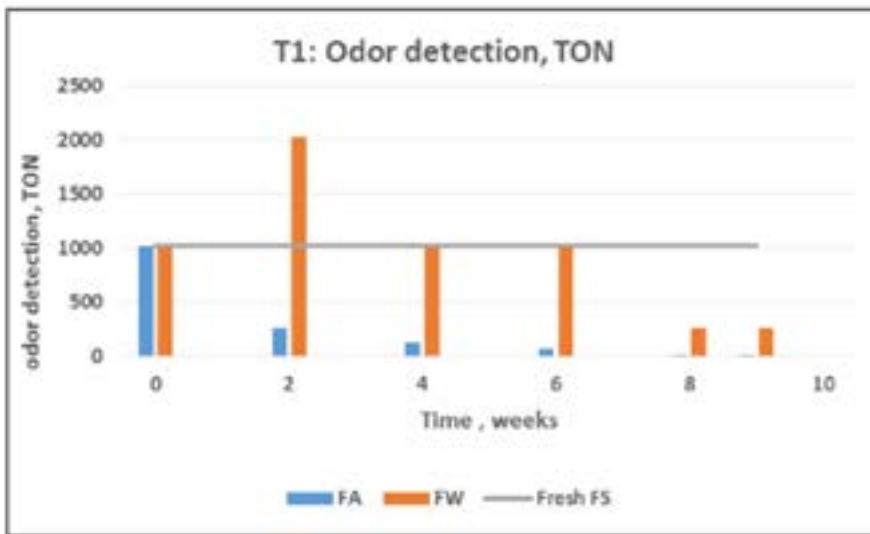


Figure 4-13: Odour detection in step-feeding trial

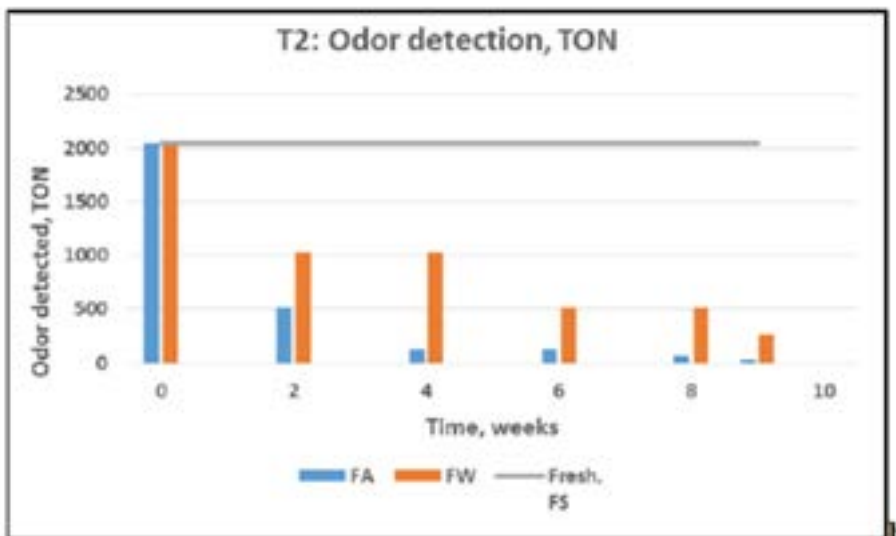


Figure 4-14: Odour detection in batch experiment

Figure 16: Odour detection in UNHCR LICE study (Murray Burt)

LICE achieved a 17% odour and fly attraction reduction - however labour, transport and product costs may be up to 7000 Euros per cubic metre suggesting it is an expensive intervention. There is a potential for LICE to reduce odour and fly attraction but further evidence is required to determine the conditions where LICE may be effective at accelerating sludge volume reduction and sludge sanitisation.

5.3 Sanitation marketing, septage management and innovative financing models to support the entire sanitation chain post Typhoon Yolanda Philippines- Tom Wildman (Oxfam)

Tom Wildman (Oxfam) presented on post-emergency financing models to scale up sanitation coverage after Typhoon Yolanda in the Philippines in 2014. The WASH sector in the Philippines transitioned to sanitation marketing after the emergency, using social and commercial marketing approaches to scale up supply and demand.

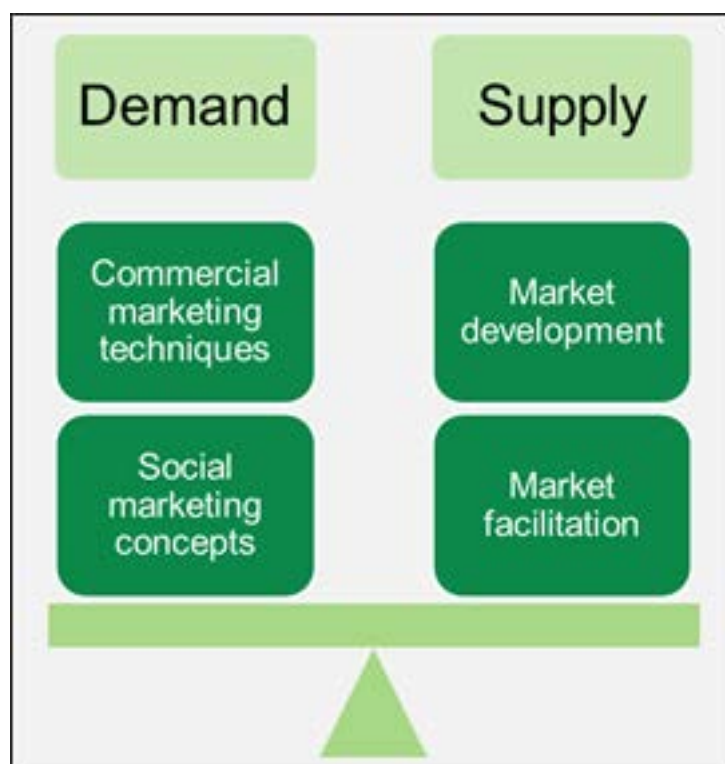


Figure 17: Balancing supply and demand in sanitation (Tom Wildman)

Formative research showed that the main barrier to household sanitation was financial. Oxfam provided support to households through low interest rate home toilet construction loans, private Microfinance Institutions (MFI) subsidies (to reduce membership and service fees of loans) and sanitation savings funds from the Department of Social Welfare and Development (subsidies for the most marginalised families who couldn't afford a loan otherwise).

Oxfam also provided low interest WASH enterprise loans to sanitation entrepreneurs. In collaboration with entrepreneurs, Oxfam developed a low-cost sanitation structure that could be taken apart quickly before a typhoon comes.

The finance products were made a permanent part of the micro-finance partner's offering to customers, government subsidies to sanitation loans have reached 1700 households, nearby municipalities have replicated the approach and funded it themselves. The programme is now owned by the cooperative.

Lessons learned include:

- Key expertise needed is financial not technical - the project improved when it was led by an economist.
- Loans aren't possible for everyone and subsidies are needed (but not temporary and project based)
- Sanitation products need to be affordable while meeting standards
- Monitoring and evaluation needs to go beyond outputs and numbers to understand what is effective.
- There is a value add of working with non-traditional WASH partners, i.e. social enterprise and finance institutions.
- We need to think about sustainability for the next emergency.

Questions and discussions: Waste Treatment and Sanitation

The session concluded by inviting any questions from the floor for a panel discussion chaired by Tim Grieve (UNICEF). The panel consisted of the speakers: Richard Luff (Independent), Murray Burt (UNHCR) and Tom Wildman (Oxfam).

The first question from the audience was about WASH funding and the role of economics in the Oxfam Philippines project. Tom Wildman (Oxfam) said the intention was to train sanitation masons to be entrepreneurs and marketers but a WASH team was not best placed to do this, economic expertise was needed.

A member of the audience asked what is a good enabling environment to introduce sanitation marketing after an emergency and if lessons learnt from the Philippines programme will be shared. Tom Wildman (Oxfam) said this is being written up and that there was a great enabling environment in the Philippines - demand for household sanitation was already there because of CLTS so the main barrier to deal with was finance. The government was also willing to invest in subsidising sanitation which is not common. A micro-finance institution was also willing to subsidise cost.

Lauren D'Mello-Guyett (LSHTM) asked how many of the 1700 households in the Philippines have actually completed and repaid their loan. Tom Wildman (Oxfam) said 400 had repaid but this had

started in June and that the intention is to do prolonged monitoring. An impact evaluation will be done over the new few years which will see more robust results in 2 years.

Marije Broekhuijsen (WASH Cluster) commented that Yemen was doing well on CLTS pre-war but organisations are now constructing free latrines for conflict affected people. She asked for ideas, solutions and case studies for how CLTS or sanitation marketing could work in this context - or any context where other organisations are giving things away for free. Richard Luff said this is a complex issue that needs to be dealt with before the crisis hits and that agencies should commit not to introduce contradictory practices.

Peter Goodfellow (Save the Children) asked for examples from other sectors or government policy where programme policy preparedness has been thought through and has delivered impact. Richard Luff said the debate in the shelter sector has moved towards supporting self-recovery and seeding incentives to scale up, so there is potentially interesting learning there.

Therese Dooley (UNICEF) commented that it was important to respect government sanitation policy and to use a do no harm approach. She mentioned UNICEF experience in Afghanistan which is now moving to a no subsidy approach and the sale of EMOs to schools. She said it is important for the development and humanitarian sectors to rally together. Tim Grieve (UNICEF) highlighted adding a humanitarian addendum to national policy as one approach. Richard Luff said he would like to see an inter-government forum work through these issues.

A member of the audience asked Murray Burt (UNHCR) how LICE works in relation to temperature and what is the effect of increasing the temperature. Murray Burt answered that the testing was done in open climatic conditions which were between 19 - 27°C however LICE's optimum temperature is 37°C. He commented that waste may not naturally reach 37°C unless it is an extremely hot environment.

Andy Bastable (Oxfam) asked if the LICE project was going in the right direction, asking whether the key issue in refugee camps is solids or the water in pit latrines. Murray Burt (UNHCR) noted that the product was defined for septic tanks and for the food waste industry so there was some debate about the amount of water content in the buckets tested. He agreed that latrines normally fill up with liquid due to a high groundwater table or flood infiltration into the latrine and it is not usually solids that has a major effect on the life of a latrine.

Friday 25th November: Third Session

Theme 6: Disease Outbreaks

6.1 Ensuring socio-cultural perspectives influence responses to disease outbreaks: recommendations for WASH actors- Michelle Farrington (Oxfam)

Michelle Farrington (Oxfam) presented recommendations from an analysis of its historical responses to health-related emergencies to determine the extent to which socio-cultural perspectives had influenced programming and whether lessons learnt had contributed to progressively more effective responses. She noted that Oxfam's role in outbreaks is to support health facilities with water and sanitation and to engage communities to support preventative actions against disease transmission.

The review looked at social norms, practises, socially defined status and perceptions. It looked at Oxfam's WASH responses in the past 10 years and examined 8 responses to disease outbreaks in more detail through existing data and key informant interviews. Key themes emerging were disease transmission and treatment, vulnerability, religious beliefs, fear, distrust, myth and rumour.

Why are socio-cultural perspectives important during disease outbreaks?

- Social Norms – the 'rules' of acceptable behaviour
- Practices – those accepted for the treatment or prevention of disease
- Socially defined-status – household, community or wider constructs of gender, age, caste or livelihood that impacts on vulnerability to disease
- Perceptions – collective or individual of risk to contracting and transmitting disease

Socio cultural perspectives have power over how an individual perceives their risk, and their options for treatment and protection

Responses themselves subvert or create socio-cultural perspectives



OXFAM

Figure 18: Socio-cultural perspectives in outbreaks (Michelle Farrington)

Core recommendations include:

- Recognise that illness is not the only driver for health seeking behaviour (others include cost, obligation, tradition and trust).
- Undertake a gendered analysis at the beginning of an epidemic.
- Identify those whose livelihoods leave them more vulnerable to disease transmission.
- Focus on making practices that impact livelihoods safer rather than prohibiting them and negatively affecting livelihoods. Similarly, seek to add to rituals to make practices safe rather than prohibit them.
- Engage with religious groups in a meaningful way and do not underestimate the role of religion and funeral practices in psycho-social health.
- Consider the psycho-social impacts of using fear as a motivating factor.

Michelle Farrington (Oxfam) recommended a phased, agile, dynamic response based on community consultation. Appropriate research and its application requires additional resources - such as anthropologists and social scientists - to be mobilised in the early phases of a response. WASH actors need to improve their use of rapid, action centred learning that can shape responses appropriately as culture and behaviours shift throughout emergencies. She concluded that including socio-cultural perspectives in emergencies can save time, lives and money.

6.2 How to change hygiene behaviours during emergencies: qualitative analysis of programmatic approaches chosen by international responders to the Liberian Ebola (EVD) outbreak (2014-2016)- Alexandra Czerniewska (LSHTM)

Alex Czerniewska (LSHTM) presented on her research on the attitudes of hygiene programme implementers during the Ebola outbreak in Liberia. She conducted semi-structured interviews with 12-15 key informants from international agencies funding/ designing/implementing hygiene behaviour change interventions in communities and/or routine health facilities.



Figure 19: Different messaging throughout the Ebola epidemic in Liberia (Alex Czerniewska)

The research found that fear and affiliation were used as emotional motivators at different points in national campaigns. There were challenges with using fear as a motivator in terms of how it influenced people’s behaviours (some of this messaging meant people felt that it was pointless to change behaviours). Another finding was that a strong preference for hygiene promotion messages to be identical across the country may not always be appropriate for diverse populations (gender, rural/urban). It is important for responders to consider the sustainability and time frame of hygiene behaviours that are being promoted and to decide what is ‘good enough’ in the short term.

An overwhelming emphasis on a biomedical understanding of Ebola transmission didn’t always consider the reality or practicality of community uptake (i.e. of using highly chlorinated water). Additionally, diverse underlying philosophies influenced organisational approaches to hygiene behaviour change. For example, empowerment approaches clashed with emotional motivator approaches, especially motivators that were perceived as negative (i.e. channelling shame or disgust). Provision of materials and educational messages was generally prioritised over more novel methods or evidence based behaviour change approaches from non-emergency settings. Alex Czerniewska concluded that formative research could have anticipated some of these challenges earlier on and it may be possible to adapt this approach for an emergency situation.

6.3 WASH interventions in emergencies and outbreaks: two systematic reviews and impact analyses- Travis Yates (Tufts University)

Travis Yates (Tufts University) presented on two systematic reviews on the topics of WASH in emergencies and WASH in outbreaks. The presentation focused on the review on emergencies. He noted

the ethical challenges around conducting academic research in emergencies especially in relation to experimental approaches. The methodology sought to include high quality academic evidence, grey literature and organisation programme reports as well as to appreciate the reality of what information is readily available.

A systematic review process was used to identify 15,026 documents through peer-reviewed academic databases (10,326) and unpublished 'grey literature' (2,676 from websites and 2,024 from emails and personal contacts). For the emergency review, 115 evaluations were included and stratified into 13 WASH intervention categories. Half of these were grey literature. Haiti was the most evaluated of the 39 included countries.

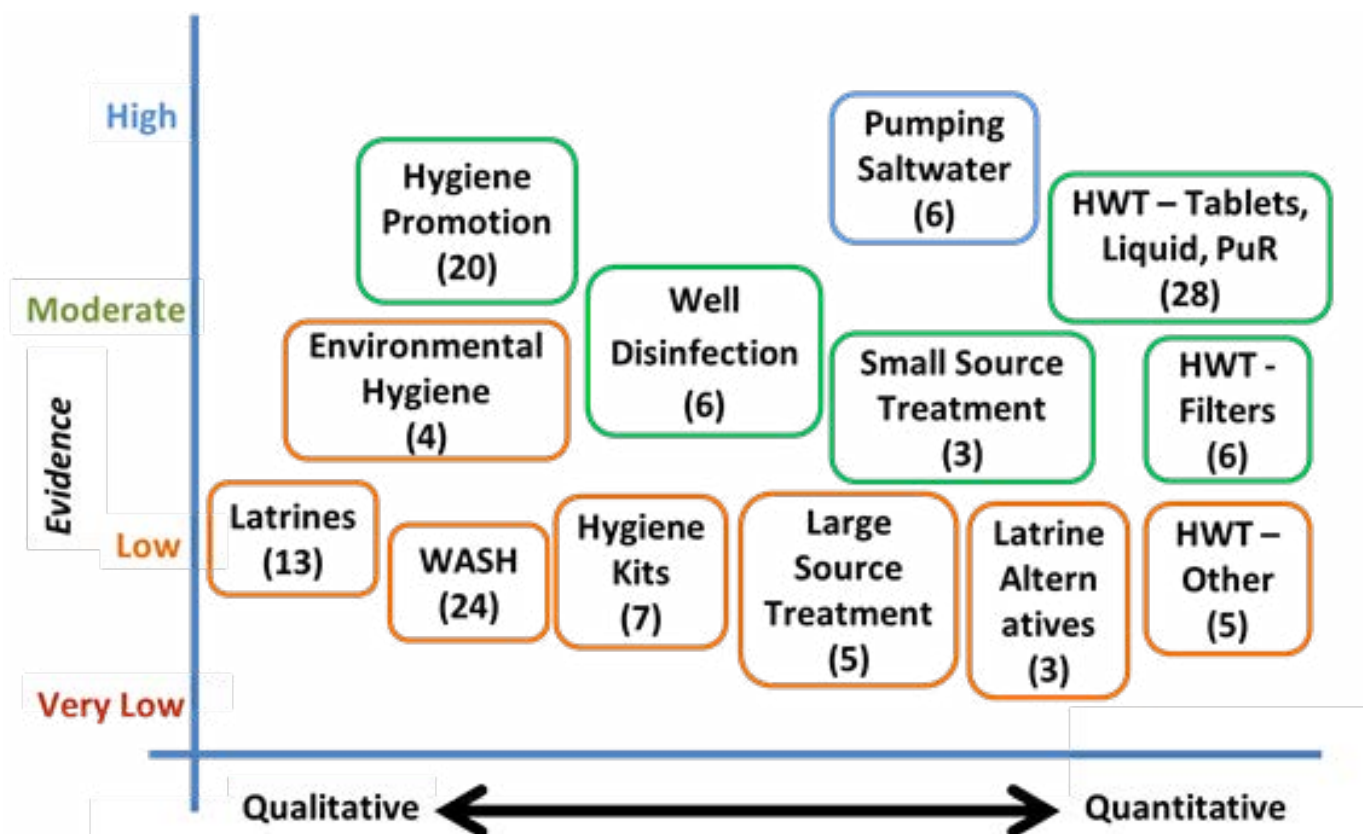


Figure 20: WASH interventions identified through review (Travis Yates)

Of the 13 WASH interventions identified, only well pumping to reduce salinity after seawater intrusion (after tsunami) was clearly not efficacious and not recommended. There was also no positive evidence for household spraying with chlorine.

The review found that the characteristics of successful interventions were:

- Timing and prepositioning of stock
- Simplicity
- Community driven
- Linked with development

The review also noted beneficiary preferences for WASH interventions including:

- Household water treatment with an appealing taste and smell
- Hygiene messages delivered face to face
- Dialogue and communication with communities

Travis Yates concluded that overall the quality of evidence is low and remains lacking. Evidence was not available for certain interventions including water trucking, handwashing and bucket chlorination. WASH solutions are dependent on context and there are no one size fits all solutions.

Questions and discussion: Disease outbreaks

The session concluded by inviting any questions from the floor for a panel discussion chaired by Kit Dyer (Norwegian Church Aid). The panel consisted of the speakers: Michelle Farrington (Oxfam), Alexandra Czerniewska (LSHTM), Travis Yates (Tufts University).

Therese Dooley (UNICEF) asked if the need to standardise messaging comes from the development sector where this is generally best practice. Alex Czerniewska (LSHTM) said there did need to be consistency on how to wash hands but in the Liberia context this became a fear of tailored messaging for different groups with different preferences.

Therese Dooley (UNICEF) asked if there was any experience around the Ebola response being easier in communities where CLTS and CATS already existed. Alex Czerniewska (LSHTM) said that some responders did feedback that ODF communities had no Ebola cases.

Oliver Cumming (LSHTM) asked the panel what can be learnt from development settings for emergencies. Alex Czerniewska (LSHTM) said that we should consider how formative research from development settings can be applied to emergencies, within the constraints of working in emergencies. Michelle Farrington (Oxfam) said it's about linking humanitarian programmes with ongoing development programmes with regard to existing socio-cultural perceptions in that context.

Lauren D'Mello-Guyett (LSHTM) asked how Oxfam would share the upcoming toolkit and seek research uptake of learnings. She noted that this could influence programme manager decisions and could have been used by programme implementers in future such as those in the example given by Alex Czerniewska from LSHTM. Michelle Farrington (Oxfam) noted that this was still in development but that Oxfam is generally very willing to share more widely and this is something that would be of interest. It is important not to work in silos but implementation approaches will probably vary from agency to agency.

Brian Reed (WEDC) commented that the experimental approach is not always the gold standard for social science or for development and we need to be careful about applying this outside science. He noted that grey literature adds value and can be useful. Travis Yates (Tufts University) agreed that publication does not determine the quality of a study and that grey literature can provide high quality information. Oliver Cumming (LSHTM) commented that there are many types of grey literature and that the well-regarded Cochrane Collaboration now allows the inclusion of grey literature in their systematic review process.

Robert Fraser (IFRC) asked what was meant by simplicity in Travis Yates' presentation and if he thought that WASH interventions were over complicated. Travis Yates (Tufts University) responded that an example of simplicity was trying to add handwashing to funeral practices, rather than tell people to stop carrying out funeral practices. Interventions should consider what will work for uptake. There is no intervention which will work in every context, an appropriate solution should be selected from a tool kit and communities should be listened to.

Andy Bastable (Oxfam) asked what the systematic review found about hygiene kits and if there are any recommendations. Travis Yates (Tufts University) said that hygiene kits were generally seen as a delivery modality for household water treatment which made it hard to evaluate. He noted that consistency in terms of contents was important and that responders will generally say they like a free kit they have been given.

Brian Reed (WEDC) asked if there were any gaps which had no research evidence. Travis Yates (Tufts University) noted an evidence gap in bucket chlorination, hygiene kits, water trucking with no evidence existing although these activities have been done for a long time.

John Allen (Mission East) asked how accessible the information that Travis Yates found for the systematic review was if people wanted to follow up in the future. Travis Yates (Tufts University) said he was disappointed with information accessibility and it was sometimes hard to find agency resources and unclear if these were available on national or international websites.

Axel Vande Veegaete (Belgian Red Cross) followed up with a comment that he is currently finalising a systematic review on handwashing and sanitation. He had to limit the grey literature because there was too much /it was hard to search and had a huge number of outcomes in peer-reviewed publications to compare. He commented that a system to sort out the grey literature would be extremely useful. Travis Yates (Tufts University) agreed and noted that making a summary statistic would have been misleading as information wasn't always comparable.

Friday 25th November: Fourth Session

Interagency Panel and Forum Discussion

Andy Bastable (Oxfam) asked the panel, which included Oliver Cumming (LSHTM), Daniele Lantagne (Tufts) and Brian Reed (WEDC), to comment on how we get more evidence and how we define good evidence.

Danielle Lantagne (Tufts University) said that research should be practical and should come from field questions. She said that while RCTs can be important, they often provide evidence about efficacy without considering messy real world situations. Bringing efficacy and effectiveness together will bring us impact. She noted that behaviour change and use comes into this as well. Danielle suggested we think about measuring risk reduction as a proxy for health impact when we can't do health impact studies. She highlighted the importance of monitoring and evaluation, noting that we need to get beyond activities and onto outcomes and impact, which means better evaluation. All programmes should have an aspect of monitoring which doesn't have to be complicated and hard but it can be simple and cheap. She concluded that people need to look at their monitoring results and adapt their programming.

Brian Reed (WEDC) said that researchers and practitioners should partner together to temper enthusiasm for perfectionism with the messy reality. He agreed with Danielle Lantagne that basic information is needed about every intervention and noted that we don't need complex research methods all the time.

Oliver Cumming (LSHTM) said that there have been a lot of interesting discussions about what counts as evidence at EEHF 2016. He noted that there is no one study design that can answer every question; instead your question will point you towards the most appropriate methods and then you have to factor in reality. He encouraged scepticism around of the term 'study hierarchy', noting that we don't need RCTs to answer every question and should seek to avoid over-complicating research designs. Oliver Cumming noted the important of ethics and the opportunity cost from bad research. He advocated for the importance of transparency such as sharing internal evaluation reports and sharing RCT protocols before the research begins. He concluded by saying that research always needs a dissemination strategy and should not be extractive. It was flagged that Waterlines would expressly like submissions from EEHF 2016 presenters and that LSHTM would be willing to partner with organisations to help write papers and disseminate materials.

Jean Lapègue (ACF) said that we need to do operational research with a local partner and to build capacity at an organisational level. He highlighted the importance of using uptake partners to do research uptake as this job needs specific skill and goes beyond dissemination to include capacity building and advocacy.

Closing remarks and plans for next year's forum

Marion O'Reilly and Jean McCluskey encouraged an open evaluation of this year's forum and captured suggestions for next year's forum.

Andy Bastable thanked UNICEF Nepal for organisation, Lauren D'Mello-Guyett for coordinating, Emily Balls for rapporteuring, the session chairs, the Editorial Committee and all attendees for their engagement and contributions.

Jean Lapègue thanked Andy Bastable for his organisation and coordination.

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SHARE Consortium
London School of Hygiene & Tropical Medicine
Keppel Street
London
WC1E 7HT, UK.

Tel: +44 (0)20 7927 2301
Email: contactshare@lshtm.ac.uk

Presentations and **abstracts** from the 7th Emergency Environmental Health Forum are available to download on the SHARE website.



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