



OCB EBOLA REVIEW

Part 2: Water and Sanitation

[December 2015]

This publication was produced as part of a broader review on OCBs response to the Ebola emergency. It was prepared independently by **Murray Biedler and Elio de Bonis**.

DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of **Médecins sans Frontières** or the **Stockholm Evaluation Unit**.

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ACRONYMS

ACF	Action contre la faim
CVS	Committées des Vielle's' Sages
ETC	Ebola Treatment Centre
HR	Human Resources
IFRC	International Federation of Red Cross and Red Crescent Societies
MedOps	Medical Operations
MSF	Médecins Sans Frontières
SCF	Save The Children Fund
Sitrep	Situation Report

EXECUTIVE SUMMARY

This document is a set of findings from the Ebola Review that are specifically relevant to the Water and Sanitation (Watsan) component of MSF OCB's Ebola Response. Given the duration of the Ebola outbreak, the large number of human resources engaged in the response and the transboundary complexities which implicated the 3 countries of Guinea, Liberia and Sierra Leone, there is a mass of information and experience accumulated for the Watsan Sector response to Ebola.

FINDINGS

In terms of Findings, 8 specific issues were identified from the results of the review as being the most important and provided influence or impact on MSF's Ebola response. The value of these findings are demonstrated in the presentation of their content and the source of information which is well-referenced. Interviews play a key role in this process and the Watsan section of the review was fortunate to have easy and regular access to many key Watsan actors who were present at MSF OCB HQ. The key Findings are grouped into the following topics:

- Guidelines
- Outreach
- Biosecurity
- Waste Management
- Management of Bodies – Burial and Cremation
- Watsan and Health Promotion
- MSF as Technical Referent
- Kit Distribution (Household Protection & Disinfection for Ebola)

CONCLUSIONS

- The general conclusion is that Watsan played a significant role in this Ebola outbreak, more than in previous outbreaks and at a variety of levels ranging from infection control and bio-security in ETCs and outreach activities, to internal and external trainings and technical support.
- There was access at certain points over the year to more than one set of Guidelines for Ebola response, which varied in detail and explanation on the implementation of actions and protocols.
- Outreach was not implemented consistently and this is partly attributed to a lack of human resources but was also an Operational decision. However interviews indicate that there is also not a common understanding of what effective outreach activities consist of, and potentially a lack of understanding on the importance of outreach.
- The development of Bio-security checklists and visits to ETCs is clearly a strategic innovation arising from this outbreak experience. The fact that it is implemented by non-project staff is a recognition of the need for periodic external checks on operations. The results was an external support which focused on safety of staff, patients and visitors but without operational and contextual pressure.
- Waste management challenges were clearly linked to allocation of ETC sites. The possibility of options for site selection often do not exist in urban settings compared to rural contexts, but they are much worse in the larger capital cities than in small cities.

- Safe burial protocols can be confronted by cultural sensitivities, but the issue of cremation is much more sensitive; unlike safe burial, it is almost impossible to adapt mass incineration of bodies to cultural sensitivities.
- Health Promotion plays a key role alongside Watsan in outreach activities and has contributed to improvements in outreach protocols for PPE as well as to team security in outreach activities in communities.
- MSF Watsans played an active role as technical referents, which included operational support to external actors and organisations, especially in trainings which include development of training videos. MSF also became a referent without consciously seeking to do so.

LESSONS LEARNED

- ⇒ It is necessary to finish contributions and drafting of the Guidelines as soon as possible, capitalizing on experiences from the recent outbreak that has not been included yet into the 2014 Draft. This process is slowed down by contributions from persons with alternate work agendas and commitments and no overall editing.
- ⇒ A wider understanding of the role of outreach is necessary in order for outreach not to be sidelined as a strategy partly due to human resources pressures and eventually become relegated as a second priority in outbreak control.
- ⇒ In an emergency of this long duration there is eventually a fatigue of infrastructure (in this case temporary ETCs) and human resources that sets in. This must be kept in mind during the ongoing coordination of a response.
- ⇒ While it is not possible to control how external actors observe and / or interpret MSF operational activities, logistics or supply, it is possible to influence the external uptake of MSF protocols and guidelines.
- ⇒ Avoid installation of large central ETC sites which generate contaminated and other waste very rapidly, or at least avoid installation of sites within confines of large mega-cities where transportation and or storage of waste is more problematic than in smaller cities or a city periphery. At the same time research should be done on waste reduction techniques and practices (e.g. re-usable material such as PPE elements). This strategy can be strongly complemented by collaboration with other organisations to manage ETCs. If there is no choice on avoiding large cities, a number of smaller sites would be preferable.
- ⇒ Avoid cremation, especially total incineration, unless cremation is a culturally acceptable practice among the affected population. If the above are engaged as emergency solutions, they must be considered as a very temporary measure.

RECOMMENDATIONS

1. **Appoint** either **an editor** half or full-time, in order to capitalize on recent experience gained from implementation of **Draft Guidelines**.
2. **Updated guidelines must emphasize the role of outreach** and clearly explain its implementation, especially the expected roles of individual actors of Watsan, Medical and HP, and the importance of each role. This needs to be supplemented with outreach training that is tailored for each of these individual actors.
3. **Biosecurity checks**, and the reasoning behind them (e.g. long duration of interventions), **must be integrated into the guidelines** and also mainstreamed into coordination priorities, especially for longer term emergencies of this nature.

BACKGROUND

OCB's response to the Ebola outbreak in Western Africa has undoubtedly been complex and challenging. Questions have come up also whether the choices made were timely and right. This is why the OCB management has commissioned an extensive multi-sectorial review of the intervention.

The review looks at the time period from the 1st March 2014 to 31st March 2015. It identifies key learning areas based on examples of good and bad practice as well as make recommendations for possible future best practices which can potentially improve guidelines, departmental strategies and learning for future similar interventions.

A summary report that highlights main findings from the 9 reviews is available.

INTRODUCTION

On March 21, 2014 the Ebola outbreak in Guinea was laboratory confirmed. VHF-experienced teams composed of Medical, Logistics and Watsan were quickly dispatched to the field to set up Case Management Facilities and start other outbreak control measures. Watsan experts were mainly occupied with overseeing provision of water and sanitation facilities and waste management but were also key coordinators of biosecurity activities in ETCs and in Outreach activities. Additional tasks included interventions in regular health structures, design of ETC layout, support for construction, recruitment and training of staff, definition of means required/orders, daily coordination for strategic response based on data analysis with Epidemiology and Coordination, and team security. This included ensuring VHF protocols (even before laboratory confirmation and authorities' acknowledgement).¹

By late July, the epidemic had spread to major cities in Guinea, Liberia and Sierra Leone and the situation had become out of control. The demand for human resources dramatically increased as MSF's role in the global response became more increased in scale. With limited experienced staff, the need for preparing lesser experienced staff to join the response became pressing. Training strategies were put into place which ultimately included MSF training of external organisations as they finally joined the response to the outbreak. A First Responders training was launched in Brussels which ran from August 2014 to February 2015, while similar trainings with other organisations were initiated in the field. The Watsan sector experts were heavily involved in these training initiatives while also addressing the demands for response in the field. This review examines their roles both as technical referents and as key experts in the Ebola response, and attempts to identify findings and lessons learned that can be translated into recommendations for future actions.

REVIEW METHODS & LIMITATIONS

REVIEW METHODS

The review methodology consisted of 6 main components:

- Terms of Reference
- Desk Review
- Interviews

¹ Cathelain, Francois, Communication, November 23, 2015

- Field & Site Visits
- On-line Survey
- Analysis

The coordinator of the Watsan review component participated in developing the Terms of Reference with the Stockholm Evaluation Unit, the Review Coordinator and coordinators of other review sectors of Medical Operations and Human Resources. The Watsan coordinator was assisted by another Watsan expert, Elio de Bonis, who contributed to the other review elements of desk review, field visits, interviews and the development of the Watsan Component of the Survey. Specific Watsan interviews are listed in Annex II, but Watsan review experts participated with the Medical review experts in almost all of the field interviews held in Liberia, Sierra Leone and Guinea. This list of interviews can be found in the Medical Operations Review report Annex and complements the list of Watsan interviews in Annex to this report.

Terms of Reference

This activity constitutes a critical review and not a typical evaluation of an emergency intervention. With a main focus being on identifying lessons learned, the ‘critical’ aspect of the review refers to maintaining an objective approach to identifying, describing and analysing as much as possible both positive and negative lessons. Ultimately the aim is to identify key events or actions which translated into game changers and influenced the response of MSF to the Ebola outbreak. The description and analysis of events and actions are essential in determining whether a specific phenomenon is a game changer or not. These are not review activities linked to the Watsan Sector alone; in the overall response to Ebola there was a strong overlap and collaboration both in the field and in OCB HQ between Watsan and Med Ops and also with Logistics and Supply. This became evident in the TOR-building process where we see that a number of questions to be addressed were transversal with other review sectors. Individuals from the OCB Watsan Unit and / or the Task Force were available for a number of consultations and contributed significantly to the Watsan component of the TORs. For the Watsan section of the Review the TORs can be represented in 5 main questions:

1. How effective was the Ebola Intervention, with specific questions for Watsan on Guidelines, Outreach and HP?
2. How successful was the infection control in terms of Biosecurity in ETCs and Outreach activities and how was this monitored?
3. How successful was Ebola Waste Management (including management of bodies)?
4. How did Watsan contribute to the MSF role of Global Technical Referent on Ebola?
5. What was the role of Watsan in the distribution of Hygiene kits in Monrovia?

The questions are much more detailed in the full TORs and can be found in Annex, but the above are necessary to present in this report because they constitute the basis for interviews and survey questions. As the review for Watsan advanced beyond the TOR stage and into description and analysis, the process of triangulation of information from multiple sources clearly benefited from exchanges with other review experts; especially those in the MedOps review team.

Desk Review

The desk review consisted of a review of the following types of documentation:

- Field reports such as sitreps, monthly reports or end of mission reports from not only Watsan coordinators but also actors in MedOps, Logistics and MSF Supply for transversal questions

- E-mail communications between HQ, the field and external actors where relevant
- Guidelines and protocols that were available or employed during the Ebola response
- Data in tabular or graphic form such as charts, graphs or transposed onto maps

Much of the above information was in electronic format that was filtered and organized for access via the Knowliah system engaged by MSF for this Review.

Interviews, Field and Site Visits

Interviews were conducted both at OCB HQ and in during the field visits to Guinea, Liberia and Sierra Leone and were either recorded in writing or audio recording and transcription. For Watsan at HQ level, almost all interviews were conducted with members of the Watsan Unit or senior Watsan coordination who were active in the Ebola Task Force, Watsan coordination in the field, or both. Other HQ interviews included group briefings from the Head of the Ebola Task Force (Rosa Crestani), a direct interview with Rosa Crestani (with medical review expert Marie-Pierre Allie) and a direct interview with Hilde De Clerk, epidemiologist in the OCB Medical Department. Interviews were held in the field in the following locations and times:

Figure 1: Field Visits and Timings West Africa

Country	When/Where	Who was interviewed
Guinea	10/08 – 26/08 <ul style="list-style-type: none"> • Gueckedou • Macenta • Nzirekori • Conakry • Forecaraiih • Meneah • Kosoro 	<ul style="list-style-type: none"> • Prefecture Authorities • Ministry of Health • UNICEF • INGOs (Alima, Bioforce) • MSF OCB Staff (National and International) • Traditional Authorities (Kosoro Village) • Prefecture Task Force
Sierra Leone	26/08 – 03/09 <ul style="list-style-type: none"> • Freetown • Bo • Kailahun • Daru • Kenema 	<ul style="list-style-type: none"> • Ministry of Health Staff • Daru PHU staff • Civic Authorities • Traditional Authorities • SLRCS (Kailahun) • SLRCS (BO) • GRC (Deputy Manager) • CDC • MSF OCB Staff
Liberia	04/09 – 08/09 <ul style="list-style-type: none"> • Monrovia 	<ul style="list-style-type: none"> • INGO (Oxfam, Samaritans Purse, ICRC, Global Partnership) • Vice President of Liberia • Ministry of Health Staff • EOC • WHO • MSF OCB Staff

The Guinea visit was the longest with just over 2 weeks duration and involved visits to ETC sites (some decommissioned and some operational), interviews with local authorities, MSF national staff on one village visit. For reasons of both logistics and common review objectives of Watsan and MedOps, most of the interviews were conducted jointly with the Watsan expert Murray Biedler and the MedOps expert Dr. Javier Gabaldone. Watsan-only interviews were conducted with MSF Senior Watsan coordinator, ETC and Outreach Watsan Coordinators, Watsan National Staff at Nongo ETC, with Watsans in the Forrecariah Outreach teams, UNICEF and BioForce. The review team for field visits was assisted by MSF National Staff Angeline Tinguano who is the Health Promotion Coordinator for HP in Communities. Due to distances and rainy season, travel by air and car consumed up to 40% of the field time.

The duration of visits to Sierra Leone and Liberia were shorter (8 and 5 days respectively), due to the fact that both countries needed to be visited in the 2 week window. A challenge for all field visits would

be that many key MSF and International actors who were involved in Ebola response had departed or, in the case of some National Staff, had dispersed. As in Guinea, many of the Watsan interviews were conducted jointly with the Watsan expert Elio de Bonis and the MedOps expert Marie-Pierre Allie, except for one Watsan interview with the ICRC.

On-Line Survey

An on-line survey was conducted during August 2015 with questions derived from the TORs for all operational sectors. The response from all sectors varied but for Water and Sanitation, out of 62 (international) staff on the mailing list 19 replied to Watsan questions. This is approximately 30 % which is a significant sample size that allows us included some survey information into our section of the review.

Analysis

The first line of analysis consisted of combining information from both Watsan experts and comparing the results of desk studies and interviews to identify key information that addressed the TORs and can also provide concrete support to findings. For triangulation on transversal questions such as biosecurity or Watsan and training, information was shared, checked and discussed with other experts in MedOps, HR, Logistics and Supply.

LIMITATIONS

The sheer volume of information was a challenge that was addressed by the Knowliah system, but for review purposes there were additional issues which sometimes resulted in information being relegated in value from a valid reference to anecdotal information. They include:

- Reports and emails not always signed, authored or dated
- Email content not regularly identified in the subject window, thus making search for key thematic information difficult or incomplete

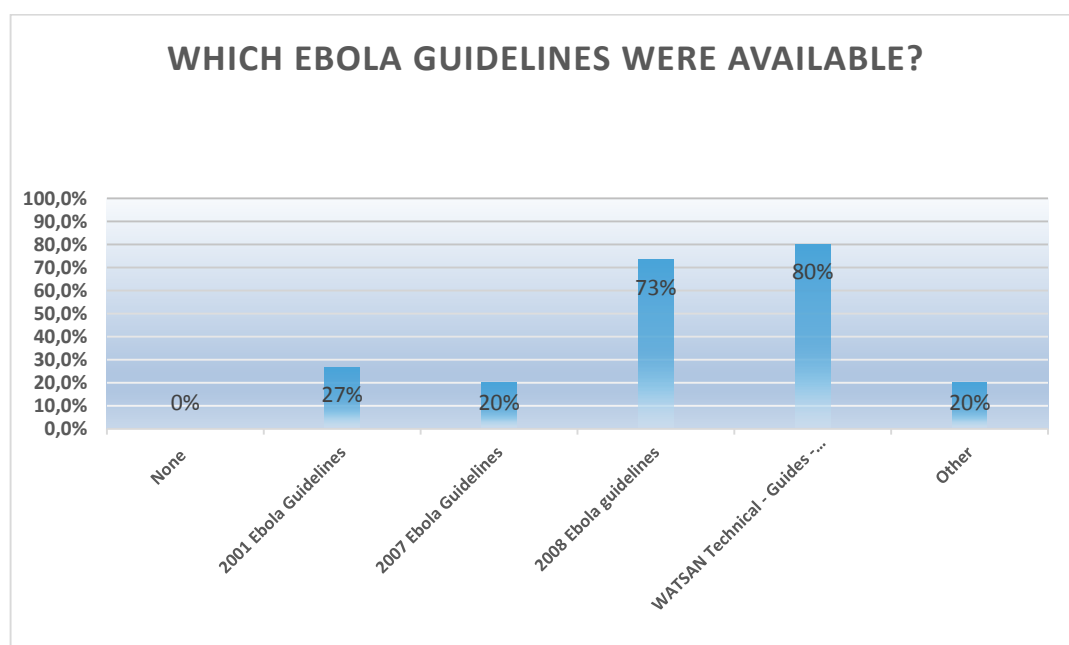
A common understanding of terms and terminology was not always existing, which sometimes resulted in misunderstandings and/or incorrect assumptions. In addition to persons employing the same words to express different things, there was more than one Guideline was available and in use by Watsans and other operational actors during the response, making the exercise of linking guidelines to operational decisions and strategy choices difficult.

FINDINGS

GUIDELINES

It became clear after first interviews with the Watsan coordinators at HQ level that more than one Guideline for Ebola Response was in use at the same time². One guideline providing detailed information targeting senior decision takers (2001 version, replaced by 2007 version that was in process of being updated by the 2014 draft version) and a 2008 summary that targeted junior implementers who were more concerned with the how than with the why questions³. This was later confirmed by the online survey in the responses to the first question under Section 13: “During your WATSAN mission which Ebola Guidelines were made available to you?”

Figure 2: Ebola On-line Survey, Question Section 13, Guidelines



Within a choice of responses based on a list of all Ebola Guidelines developed by MSF, the above responses suggest that 4 sets of Guidelines were available and used, although the majority appear to have relied on the 2008 Guidelines and Draft Guidelines in development during 2014 and development and writing of individual chapters still ongoing. The 2008 version and the Draft Guidelines available in 2014 and still being refined were the main reference documents. However a quick review of the different versions indicates differences, mainly in detail, with the earliest version of 2001 being 124 pages (71 without annexes), 2007 version of 296 pages, version 2008 of 138 pages and the current draft of 23 Chapters and 382 pages. The latter is still being developed for content and chapter titles range from a modest 2 pages to a comprehensive 90 pages.

²Watsan Head of Unit, Interviews, OCB HQ 29/07/15 , Larcin, L & Dinca, A, (Watsan Task Force), MSF OCB HQ, 17/09/15,

³ Watsan Head of Unit, Communication, 25/11/2015

Implications of Multiple Guidelines

Senior Watsan Coordinators worked with the 2008 MSF Ebola Guidelines⁴ (and later with the recent 2014 draft) and found the 2008 Guidelines adequate for their needs in the beginning⁵. Guidelines for 2008 were easily accessible, and was a reasonable tool for working with, but for inexperienced Watsans they needed to be complemented by on-site training at ETCs in the field. Delays or problems in implementation occurred with less-experienced persons in the field not being able effectively interpret the 2008 Guidelines. It was observed that lesser experienced persons felt better prepared with more detailed guidelines⁶. With increase in scale of cases, gaps began to appear and the 2008 Guidelines could not cope with the newly arising questions and challenges such as management of large numbers of bodies and cremation⁷.

There is also a risk that certain topics are addressed differently in the selection of guidelines. A good example is outreach activities which appear in the following:

- 2001 Guidelines in notes for Medical Outreach.
- 2007 Guidelines in notes for Health Centre Outreach
- 2008 Guidelines in section Surveillance, Case Detection and Transport
- 2014 Draft Guidelines in notes for Environmental Health (updated April 2014)

It was also observed that application of guidelines and protocols has become dogmatic and impacts the polyvalence of the response. This contributed to a narrow focus on clinical activity and also a tendency to follow rules too strictly and with a knock-on mentality for incoming staff to repeat existing protocols without questioning them. Where guidelines are too simple, this risk is higher. One example cited was where family visits in an ETC were put on hold due to increased case load. By the time operations returned to normal the coordination had changed and incoming coordination maintained the ban on family visits simply because it was an existing protocol. Simplified Guidelines of 2008 (compared to the earlier version) do not address the 'why' of required activities and actions which can allow for adjustment of protocols to the complexity of Ebola and response.⁸ Experienced staff involved in biosecurity checks observed this and said that part of their tasks was to break down this dogmatic approach to either the guidelines or installed protocols and try to inject more polyvalent coordination and implementation. As described above, the new draft guidelines are again more detailed and it is clearly the objective of some contributors to explain why certain actions, activities and protocols are recommended.⁹

OUTREACH

Outreach Activities

Outreach activities in the context of Ebola consisted of response to alerts, with team composition usually consisting of 2 cars, Watsan, Medical, Logistic (driver) and HP staff. Health Promotion and awareness-

⁴ Sterk, Esther. "Filovirus haemorrhagic fever guideline (draft)." Médecins Sans Frontières, 2008.

⁵ Watsan Coordinator, Interview, MSF OCB Ebola Team Guinea 15/08/2015 and Larcin, Lionel, Watsan Task Force support, OCB HQ, 17/09/2015

⁶Watsan Head of Unit, Interview, OCB HQ 29/07/15

⁷ Watsan Task Force support, Interview, OCB HQ, 17/09/2015 "Protocols not adapted to scale. The scale resulted in adjustment of protocols of triage such as the installation of Waiting Bays in Elwa 3 for the large patient inflow at triage zone (2008 Guidelines not effective for this problem)."

⁸ Series of Consultations for TORs, OCB HQ, May, 2015

⁹ Medical expert, Interview, OCB HQ, September 24, 2015

raising activities on Ebola in the communities are not regarded as outreach in an Ebola response.¹⁰ Watsan expats played a key role in Outreach teams for overseeing infection control and team biosecurity, and Watsan activities were important in Outreach as can be seen in an extract of a Job Description for Outreach Hygienists in the table below¹¹

Operational / Technical responsibilities	
Water, hygiene and Sanitation	<ul style="list-style-type: none"> • All tasks are done in accordance with MSF protocols and training instructions • Support to the Medical Team for patient and care taker transfers from community to Treatment centre • House decontamination / disinfection within the community • Safe Dead Bodies preparation for safe burial(decontamination + Body packing), mouth swab sampling, transportation from the community to crematorium / burial site • Ensure Infection control whilst assisting medical team during outreach activities (hands / feet / items decontamination, waste management on site, and safe disposal at arrival to Treatment Centre)

and in Outreach Sitreps which show the Watsan coordination role and of training of Outreach team personnel¹². Watsans were also key actors and facilitators in trainings of MSF staff for Outreach activity.

In previous Ebola outbreaks the Outreach team was usually a part of the ETC team, but in this outbreak the Outreach teams evolved to become separate teams with their own coordination and sometimes own accommodation (at the time of this writing, Forrecariah Guinea outreach teams are an example of this strategy where MSF maintains outreach teams but not an ETC.). Outreach team activities were often coordinated by Watsans and these activities were sometimes part of Watsan Field Reports¹³, and once in the field it is, the Watsan who is responsible for Outreach Team members respecting and applying Biosecurity protocols¹⁴.

Outreach was implemented differently between the 3 countries, with strong success from the beginning in Guinea Forestière, and this was linked to a good alert system with MOH, which in this case actually included MSF communications channels. This meant that alerts were received rapidly and also that no pertinent medical or epidemiological information was lost in transfer. While outreach as a defined activity does not include community awareness raising and HP on Ebola with MSF, the key role of the public and the communities in the alert system needs to be acknowledged. In Guinea, as of October 2014, the authorities established an Ebola emergency number (114) to facilitate contacts from the public. In Guinea Forestière, key senior persons in the community (Committé des Vielle's Sages – **CVS**) were identified as communication focal points for transmitting alerts and facilitating awareness. Outreach was also linked to the strong interest of ETC coordination or medical to participate in outreach activities as being part of a necessary exercise to understand better the wider picture of the outbreak.¹⁵

¹⁰Watsan Task Force support, Interview, OCB HQ, September 17, 2015

¹¹Human Resources Officers, Emergency Desk OCP, Job Description for Outreach Hygienist, circulated to MSF Operations Centres, email 13 October, 2014

¹²MSF_OCB_OUTREACH AMB + DBC, LIBERIA, MONROVIA, SITREP OUTREACH WEEK 50, 26 December, 2014

¹³OUTREACH WATSAN SITREP Week 6 Feb 2 – Feb 8, 2015

¹⁴“Watsan (hygiénistes) : il met en pratique toutes les explications données par le HP, il est l’ouvrier et s’assure que toutes les règles de la Biosécurité sont respectées et appliquées sur le terrain.”, Feedback Activities Outreach Donka, 25 November, 2015

¹⁵Medical expert, Interview, OCB HQ, September 24, 2015

The First Responders Training was innovative and attempted to dress a clear need, but that was limited to the ETC environment. As more organisations became involved in the response, some MSF operations were able to free up human resources for outreach activities. Other organisations also became involved in strategies to move out of the ETC which included outreach-type activities, and an additional and different set of skills were required from the trainings. Consequently, and following the dynamic of this long epidemic, the need to develop a second level training for Ebola experienced teams moving from EMC to Outreach activities became clear.¹⁶ There were also variations of outreach activities within countries, with different outreach team configurations employed ¹⁷, or for example the fact that outreach activities began much later in Conakry than in Guinea Forestière. In Liberia, during the early stages of the outbreak, the comprehensive and integrated Ebola strategy based upon six pillars of intervention was considered not possible due to the high number of infected persons, number of locations and the MSF OCB commitment in other countries. Except in Foya, where the 6 pillar approach was successfully implemented, the early focus was on increasing capacity of isolation and later community awareness and health promotion. Only in Oct/Nov 2014, with other actors responding did MSF OCB in Liberia decide to redesign its response and focus on the other remaining pillars such as surveillance and contact tracing¹⁸.

Outreach Implementation

There was a variation in the implementation of outreach (e.g. dressing and undressing or team composition), even though standard protocols existed in pre-2008 Guidelines. Adaptations of protocols and specific problems would be communicated by the field Watsan Coordinator to the OCB HQ Watsan Coordinator initially and then the Watsan reference in the Ebola Task Force when that was set up.¹⁹

In the recent outbreak, with the separation of Outreach teams from the ETC team, there was a consequence of a heavier workload on coordination (an extra team activity) and this also contributed to medical staff in the ETC becoming more distant from the communities and also the source or epicentre of the outbreak. This also contributed to a changing perception on the original purpose behind outreach, to confront the outbreak. In Conakry outreach was during certain phases of operation seen more as an ambulance service to collect patients and bodies. Where there is resistance from the community to these short visits, this becomes in effect a situation where it is more the community that influences the response to the outbreak and not MSF.²⁰

BIOSECURITY

Biosecurity is the combination of all measures of infection control taken and activities implemented to reduce the risk of transmitting infection:²¹

- To medical & non-medical staff.
- To patients' visitors and attendants.

¹⁶Bachy, C, Final Report First Responders Ebola Training Course, March 12, 2015. A course on Water and Sanitation in outreach was developed by Azzura d'Inca, Estifanos Debasu, Cokie Vandervelde, OCB and Daniel Sagues, OCBA and tested at the EBC on January 29, 2015.

¹⁷Outreach Coordinator, Interview "Outreach in Donka was different from Gueckedou or Forrecariah. Due to limited resources the team was 5, 1 Watsan, Med, 3 Hygienists and 1 HP. 2 cars, ambulance and team car. Gueckedou and Forrecariah teams included 4 Hygienists."

¹⁸MSF OCB Liberia 2014 annual report

¹⁹Watsan Coordinator, Interview, MSF OCB Ebola Team Guinea 15/08/2015

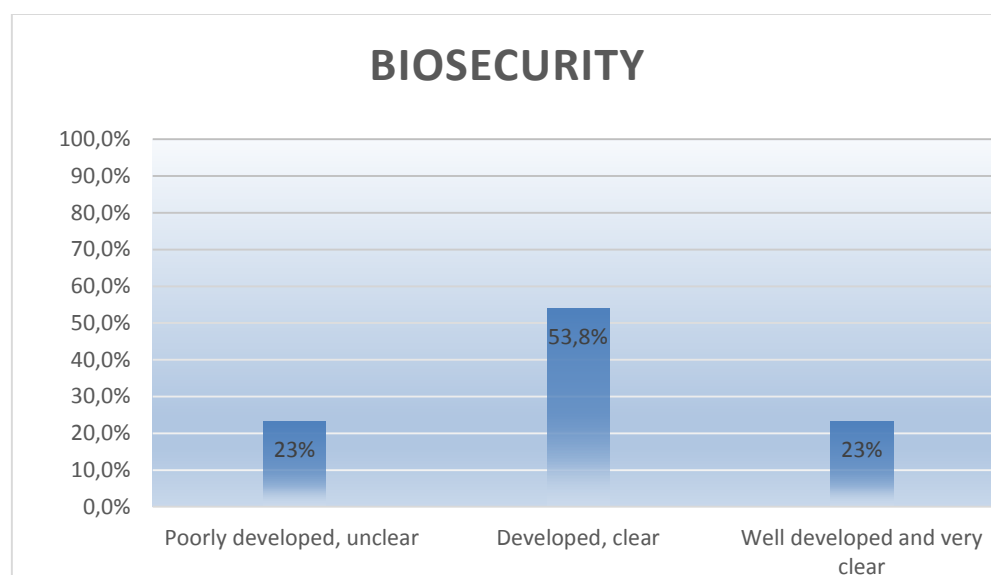
²⁰De Clerck, H, Interview, OCB HQ, 24/09/2015

²¹MSF, Draft Ebola Guidelines, Chapter 5 Infection Control, Draft 2014

- To healthy (non-FHF) admitted suspected cases.
- To other non-suspected patients.
- To the community.

Biosecurity protocols were seen as being normally adequate, as was the case with the 2008 Guidelines, during the beginning of the outbreak. However the scale of the outbreak demanded adjustment or development of protocols, such as with cremation and incineration. With the duration of the outbreak there was a structural and human resource ‘fatigue’ which lead to a weakening of the implementation of protocols. Examples of this are noted in WATSAN Reports, In Kailahun it was reported that a lack of expert WATSAN staff (with Watsan coordination arriving late in the epidemic) resulted in a relaxing of safety precautions (biosecurity) among the Watsan team²². Watsan coordination played an important role in following up on biosecurity and supporting new Watsans. It was also observed that original temporary facilities that had been standing for a period longer than expected, such as at Donka ETC in Conakry, were becoming structurally weak, requiring much maintenance and becoming a source of risk.²³

Figure 3: Watsan view of Biosecurity protocols



Following an incident in Monrovia in which an MSF expatriate staff was infected, there were recommendations to initiate biosecurity checks on ETCs as follows:

1. To organize a systematic review of all the bio security measures in each project site every 2 to 3 weeks
2. To have this job done by an MSF expert but external to the mission, every MSF isolation unit should be visited by a HQ expert on a regular basis (3 to 4 weeks)

This was to be organized at HQ level with the persons involved in the response and the different directors involved (ops and med)²⁴. Biosecurity checks were implemented at ETCs on a regular basis. A

²² Watsan Report, Week 37, Kailahun

²³ Medical expert, Interview, OCB HQ, September 24, 2015 and Watsan Coordinator, Interview, MSF OCB Ebola Team Guinea 15/08/2015

²⁴ Task force and Staff Health Unit, Contamination of an expatriate by Ebola virus, Monrovia, Liberia; September 2014; Conclusions of the analysis of this incident, MSF OCB, September 24, 2014

Figure 4: Example of Bio Security Check List

WASTE MANAGEMENT

The combined challenge of limited site space and water table was especially problematic in Monrovia and later Nongo. ETC sludge management and waste storage system flushing protocols for temporary waste/sludge storage in ELWA3 and evacuation/trucking protocols for safe collection and transportation to long-term storage/waste site were developed. Due principally to the seasonal heavy rains the high water table on which ELWA3 was sited precluded effective soil infiltration, thus large quantities of latrine sludge/liquid accumulated was not able to infiltrate as required. During the peak of the rainy season this also resulted (accidental overflow) a proportion of the overflow from the latrines in the High Risk zone of the ETC into the Low Risk Zone²⁶. An accord was reached with the ICRC in Monrovia to

²⁶Watsan Coordinator MSF-OCB Liberia, Communication, “URGENT - Intervention on rain water flow from High risk to Low risk”. 31/10/2014

transport waste away from Elwa site, but this did not result in a sustainable solution to the management problem. The long-term storage of liquid sludge collected from various ETC's in Monrovia posed a potential problem as the duration of survival of the virus in storage was not known. Large quantities of liquid/semi-liquid waste were stored in 2 x 8000m³ open bio-digesters at the Fiama site identified by the WHO/UNICEF. At the departure of OCB this was managed by the Liberian authorities.

The urban context is also identified as problematic, especially in the very large capital cities of Conakry, Monrovia and Freetown. In the urban settings there are problems with site size and on-site waste management, smoke from burning where sites are almost always located in or close to residential areas.

Where high technology is applied (e.g. incineration), this requires resources for operation (fuel, electricity) and maintenance (spare parts) which has inherent problems for handover and can lead to problems and risks²⁷.

In smaller cities in the regions it is more easily possible to identify waste disposal sites and also have easier access to them with transport. In the large capitals, due to constant bad traffic, transportation of dangerous waste was not seen as the best solution. Waste management was sometimes shared out or delegated to other organizations such as ACF, UNICEF (who usually delegate their tasks), and Croix Rouge Francaise²⁸.

MANAGEMENT OF BODIES

In all 3 countries the management of dead bodies was usually handed over to the IFRC National Red Cross organizations. This sharing of tasks sometimes had challenges. For example, dead body management was not well implemented by the IFRC in Monrovia during the height of the outbreak with the consequence that MSF had to take back management of this task.²⁹

Burial

Families wanting to see bodies of deceased family members was complicated due to the need to keep infected bodies in body bags. In Guinea, with a large Muslim population, there is a tradition of wrapping bodies in a white sheet before burial. These cultural activities were not safe and alternative solutions were found with a design of body bags which opened around the face to allow families to view the body, and viewing sites at ETCs designed for presentation of the body but with a barrier to keep family at safe distance. For wrapping of bodies, white body bags were employed and for preparation of bodies of Muslim faith, MSF requested assistance from Imams in training MSF staff.

Cremation

Cremation was a contentious issue in Monrovia where it was ordered by the Liberian Government but

²⁷MSF OCB Watsan, Ebola Task Force, Interview, 30/11/2015

²⁸Watsan Task Force support, Interview, OCB HQ, September 17, 2015

²⁹Watsan Head of Unit, Interview, OCB HQ 29/07/15, "IFRC was responsible for dead bodies. High water table in mass burial site resulted in floating bodies (photographed by NY Times) which became very publicly circulated. Eventually MSF took back the responsibility of managing bodies."

faced resistance from family members and residents in Monrovia living close to the cremation site.³⁰ Watsan coordination observed that initially there was a cultural resistance to cremation in Monrovia. However, this resistance was eventually put aside by the local population once bodies of Ebola infected persons began to accumulate in such unmanageable numbers that the local population became afraid and accepted the need for an effective solution to manage this situation. However there were soon problems which arose. In cremation, the bodies are completely burned and ashes are not returned to the families. With wider public awareness of the use of cremation, rumours began to circulate about bodies and / or body parts being stolen; thus the perceived need among the public to hide the occurrence of deaths and dead bodies rather than to announce them or to deliver them for cremation³¹.

Cremation activities in Monrovia started in August 2014 with the process of using existing altar facilities built for Indian cremation. The altar site was expanded and a new facility constructed to increase the capacity for a high number of bodies³². Cremation on the scale needed in Monrovia prompted a request to purchase incinerators to deal with the size of the problem. However, incinerators functioning on this scale for human bodies are difficult to find, and the best available option to deal with the expected volume was not an optimum design. This was based on best support from the supplier and ease of installation in the field.³³ Design problems did exist and included the following:

- Managing bodies was problematic and not safe when loading numbers of bodies into the burn box from the top and required complex Operation & Maintenance in full PPE.
- No protocols were in place for workers to use this system, although these were developed.³⁴
- Difficult to operate as intensively as planned as the incinerator needed to cool prior to re-engaging in a new incinerator cycle.
- Other organisations observed and considered the use of this incinerator.

WATSAN AND HEALTH PROMOTION

The main operational collaboration between Watsan and HP was with outreach activities. HP would facilitate communication with the community where the patient was to be collected. HP member explained to the community what was happening and why. This explanatory process also accompanied the collection of the patient, potentially contaminated material and the decontamination of the house of living quarters of the suspect case. HP members of the Outreach team received training from the Watsan coordinator.³⁵ Technical staff (Watsan and Hygienists) would be dressed in full PPE and would do the collection of the patient, with Watsan controlling biosecurity and waste collection and safety of staff. Medical staff/person would be responsible for triage and diagnosis.

³⁰Watsan Sitrep Week 49 – 50 Liberia, “The majority of body preparations ended in the families not wanting to give out the body for cremation without return on swab results. Temporary coping strategy: preparing the body in the body bag and leaving it with the family until return of results (with large HP support!). If Neg.: safe burial by family, if pos.: pick-up for cremation. To be resolved ASAP!!”

³¹Sitrep OCB Monrovia Week 41 F, “Increasing rumors, sources of information saying that cremation is less and less accepted by the population of Monrovia. It might even be a reason not to come to the ETC. MSF started pushing for a solution where the community can have the choice between cremation and safe burial.”

³²Communication to HQ Watsan, Watsan Coordination concerning improvement of design of altars for cremation, 28 August, 2014

³³Communication to Review Team Logistics Expert, October 22, 2015

³⁴Watsan Task Force support, Interview, OCB HQ, September 17, 2015

³⁵Watsan Coordinator, MSF OCB Ebola Team Guinea 15/08/2015

MSF AS A TECHNICAL REFERENCE

MSF, and consequently Watsan activities and staff, became technical references for External or non-MSF organisations which resulted in the following:

- A major activity for MSF Watsans involved briefings in Brussels as a first phase for new actors, and then training of staff from other organisations in Europe and also in the field.
- Short training videos for ETC activities were made by Watsans in Brussels
- MSF technical experts, such as Watsans, visited ETC sites of other organisations
- MSF activities or material were regarded by external organisations as the technical reference for Ebola response, such as design of ETCs, transit centres and incineration machines (which were not appropriate for cremation).³⁶³⁷³⁸
- MSF Watsans were also heavily involved in developing the trainings and the training videos, the latter which required significant time investment³⁹
- External outreach training?

An MSF OCB team including WatSan assisted with the set-up and training of Samaritan's Purse and MoH staff who ran and maintained the Foya ETC. Even though Samaritan's Purse experienced specific problems including security incidents and 2 staff infections (unconnected to the running of the ETC in Foya as the infection took place in Monrovia) this intervention was considered an outstanding success⁴⁰. Support of MSF to external organisations also had their impacts on these organisations beyond just technical or advisory support. A biosecurity visit to the French Red Cross ETC in Macenta included a review and remarks on their protocols. The Red Cross eventually translated details from the visit and remarks into updated protocols (including Watsan protocols). This underlines impact of OCB Watsan checklists and guidelines for other organisations and the need to finish the Draft Guidelines⁴¹.

In all 3 countries MSF Watsans were involved in trainings of external organisations, most notably the national Red Cross Associations, in the management of dead bodies and safe burials. This was especially important not only because of the scale of the outbreak and subsequent deaths, but also because of Government decrees requiring safe burials. It was important to ensure as much as possible that organisations involved in implementing safe burials were trained on how to do this correctly and safely to minimize risk for themselves and not provide an additional opportunity for the disease to spread.

Finally, the survey results indicate that a number of Watsans, during their deployment, spent a significant amount of their time, some between 25 to 50%, supporting and training external organisations.

³⁶Watsan Task Force support, Interview, OCB HQ, September 17, 2015

³⁷Wash Cluster Report, WHO, ICRC and Global Communities interested in MSF experience and information on cremation practice.

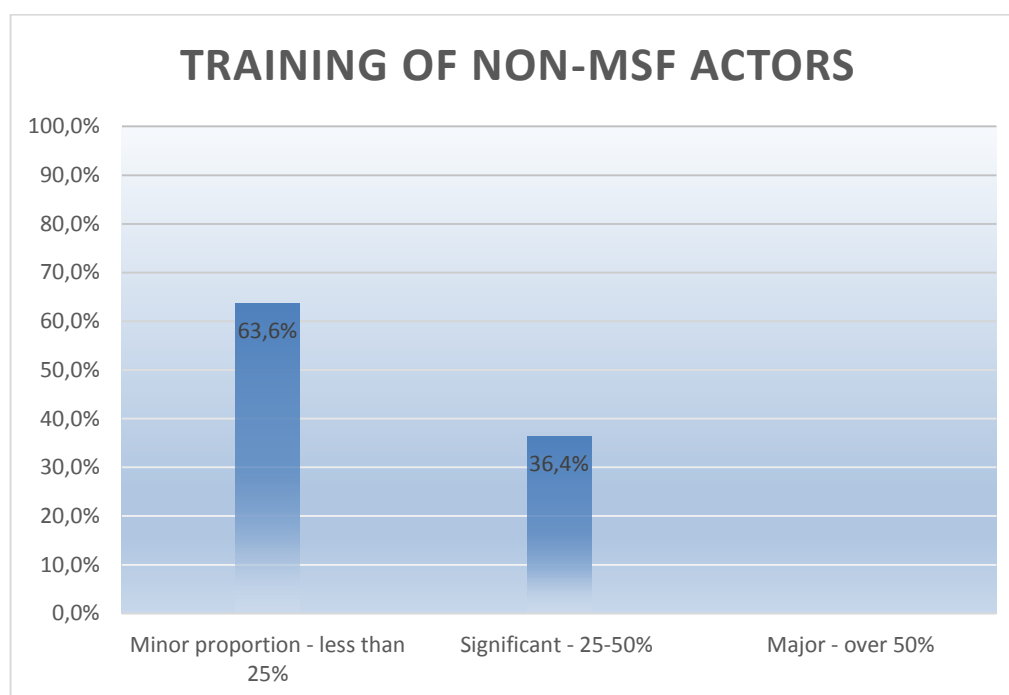
³⁸Save The Children, Director Operations Liberia Programme, Communication to MSF EMC Liberia, request "Plans for transit holding facility, 25 November, 2014

³⁹Watsan Unit, Interview, OCB HQ, September 21, 2015

⁴⁰Country Director Samaritan's Purse Interview, Liberia, September 08, 2015

⁴¹Medical expert, Interview, OCB HQ, September 24, 2015

Figure 5: Watsan role of technical reference



KIT DISTRIBUTION

During August 2014 in Liberia, the suburb of Monrovia known as West Point was isolated by the Liberian Army through setting-up of check-points following the looting of the ETC. The security situation was quickly deteriorating and the army was called to establish security check-points. Following an assessment by ACF and MSF OCB staff, it was decided that the best response in the given situation was the supply by mass distribution of an Ebola Home Protection and Disinfection Kit⁴². Following this decision MSF OCB Watsan and Logistics collaborated in the design and distribution of the Monrovia Ebola kit^{43,44}. In addition to the large-scale kit distribution in Monrovia, kits were provided for MOH Health Staff, MSF National Staff (for home use), and also for some Institutions. In instances where the ETC in Monrovia was overwhelmed by large numbers of persons trying to enter the facility when the ETC was at full capacity, kits were sometimes provided to persons who were not allowed to enter.⁴⁵

ADDITIONAL OBSERVATIONS

One recurring finding is that MSF OCB Watsan played a significant role in this Ebola outbreak and at a variety of levels ranging from infection control and bio-security in ETCs and outreach activities, to internal and external trainings and technical support. Most of the ETC national staff received minimum

⁴²Watsan Head of Unit, communication, Kits are defined as “Household Protection and Disinfection kit” and including leaflets for “self –use”. Leaflets remain the most problematic part, the difficulty being to give full explanations on how to limit risk in a clear and concise way for a wide range of public, 16/11/2015. This was a last resource strategy, note before used in Ebola, but in cholera where access / acceptance in populations was difficult.

⁴³Watsan Head of Unit, Interview, OCB HQ, September 17, 2015

⁴⁴MSF OCB Emergency Unit Communication, Final report, Kit distribution Monrovia, Ebola context, September-November 2014 , March 31,2015

⁴⁵Watsan Task Force support, Interview, OCB HQ, September 17, 2015

training for bio-security and infection control necessary for working inside the ETC. All Watsan-related profiles in the national staff (ranging from Watsan to waste management and hygienists) received additional and task-specific training which was regularly updated. The records of missions and engagements for both International and National Staff allow for a comparison between the impacts of Watsan International Staff on National Staff compared to other key sectors such as Medical International Staff. By filtering the core Watsan and Medical Profiles for National staff, excluding Health Promotion and Pharmacy staff, and assuming a fairly standard deployment for International Staff, Figures 6 and 7 clearly indicate the relative importance of Watsan-related activities. Even more interesting is the ratio of Watsan International Staff compared to mobilization of Medical Human Resources; International Watsan Human Resources were lower in number, but proportionally higher in relation to the National Staff of their sector. Data review shows that this difference is not a result of much higher repeat missions of International Watsans; with indications that the highest repeat missions were occurring within the International Medicals.

Figure 6: Comparison Watsan National Staff to International Staff

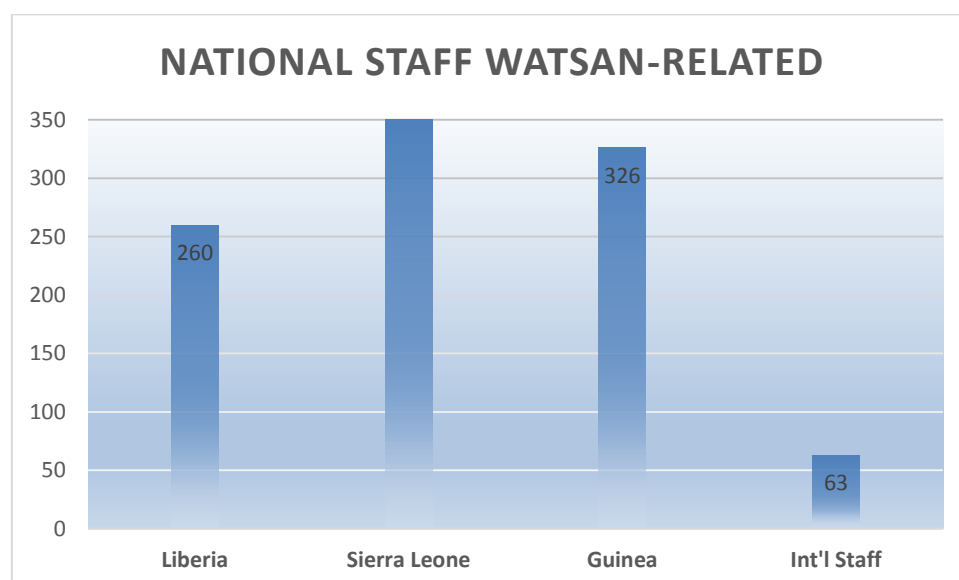
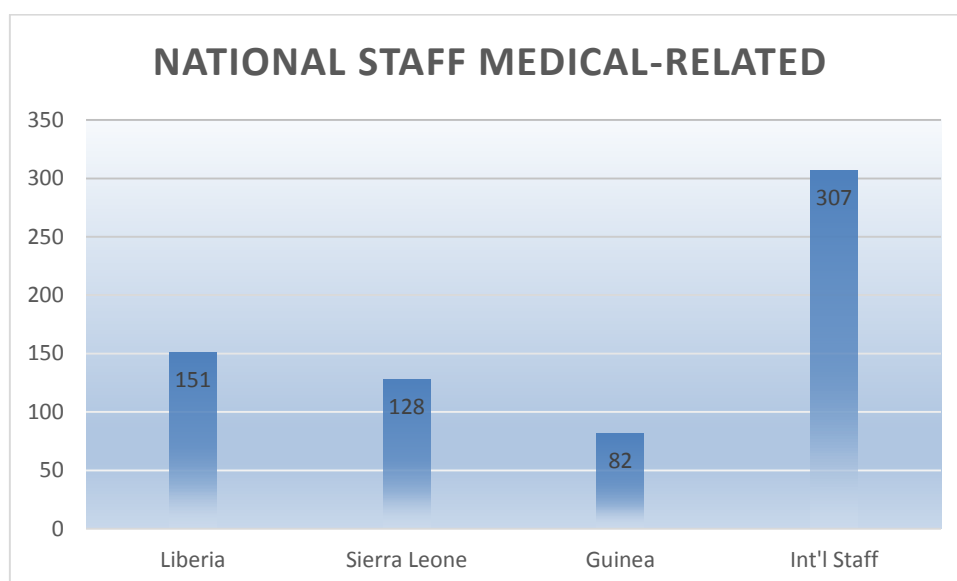


Figure 7: Comparison Medical National Staff to International Staff



An observation had been made that National Staff were sometimes frustrated with International staff who stayed for short duration missions, often requested unnecessary changes, held positions of authority but were less experienced than National Staff. Interviews suggest that this is rarely the case between Watsans and National Staff but was more often friction between National Staff and Medical Staff. This has been linked to the fact that Watsans work very closely with large teams of National Staff and are the providers of essential training on safety and biosecurity, which Medical Staff do not always participate in.⁴⁶

The role of water and sanitation in communities may have an impact on Ebola's spread. An Open Defecation Free (ODF) study of Global Partnership's CLTS program (Community Led Total Sanitation) presents remarkable results and if validated suggests that there is a strong link between CLTS and community health status (Ebola Resistance). The report claims that:

'100% of ODF communities' status study communities remained Ebola-free during the Ebola outbreak, and had maintained Ebola-free status at the time of the study. Survey results confirmed that there were no cases of EVD in any of the 104 households residing in verified ODF communities. Overall, households in CLTS communities were 17 times less likely to have any cases of Ebola than households in non-CLTS communities. Communities that did not participate in any CLTS activities had higher rates of Ebola and more confirmed case fatalities. Survey results confirmed that 236 households (76%) that did not participate in CLTS programs reported confirmed Ebola cases. Of the 239 total CLTS households involved in the survey, 36 reported cases of Ebola (15%)."⁴⁷ The above program began in early 2014, before the Ebola outbreak arrived in the area where the sanitation program was being implemented. In recent article the CEO of Global Partnership states that "... we would be remiss in assuming that these findings mean that simply becoming open defecation free prevents Ebola. Rather, the findings suggest that those

⁴⁶Medical expert, Interview, OCB HQ, September 24, 2015 and Fontana, L, Watsan Coordinator, MSF OCB Ebola Team Guinea 15/08/2015

⁴⁷*Open Defecation Status, Community-Led Total Sanitation and Ebola Virus Disease (EVD) in Voinjama and Kailahun Health Districts, Lofa County, Liberia (2014) June 2015.*

http://www.globalcommunities.org/publications/Global-Communities-Ebola%20Study%20Report_081015.pdfCommunity Led Total Sanitation (CLTS) – ODF study of Global Partnership CLTS program.

who had been exposed to Community-Led Total Sanitation education – especially education led by a member of their own community – were far more likely to adhere to healthier behaviours and practices.” Global Partnership’s follow-up objective is to conduct more research into the exact causal relationship of these findings, and they are looking for medical research partners with whom we can work to understand the full implications of these findings.⁴⁸

⁴⁸President and CEO, Global Communities, article *284 Communities at the Epicenter of the Ebola Outbreak Remained Ebola-Free - How Did That Happen? What Can We Learn from Them?*, Huffington Post, September 2015

CONCLUSIONS

GUIDELINES

There was access at certain points over the year to more than one set of MSF Guidelines for Ebola response, which varied in detail and explanation on the implementation of Watsan-related actions and protocols. A tendency has been observed among younger or lesser experienced staff to implement guidelines and protocols in a dogmatic way, and this lacks the flexibility that is sometimes required to adjust to the complexity of this Ebola outbreak. In dealing with this particular Ebola context of a much larger scale than preceding outbreaks and also transboundary across 3 countries, there was a need for flexibility on implementing existing protocols and innovation to address new challenges. Consequently, guidelines and protocols can best facilitate flexibility of implementing protocols or developing new ones by explaining why specific activities are necessary and equally suggesting where adjustments can be made based on judgment and a given situation. The draft 2014 MSF Guidelines for Ebola are aiming to provide this format and content, but they are still in progress and with chapters varying widely in amount of content and detail, with different formats and poor coherence between the chapters.

Lessons Learned

- ⇒ It is necessary to finish contributions and drafting of the MSF Guidelines for Ebola as soon as possible, including capitalization of experience from the recent outbreak that has not been included yet in the 2014 Draft. However, this process is being slowed down because the contribution appears to be from persons with alternate work agendas and commitments and with no overall editor.

Recommendation

- ⇒ An optimal approach would be to appoint an editor. In order to capitalize on recent experience gained from implementation of Draft Guidelines, and also from information and studies occurring both inside and outside MSF in 2015, the end of 2016 should be a maximum deadline with a first draft by August 2016. The editorial style (format and content) must be established to ensure coherence between all contributions. This can be achieved within an editorial facility or review group dedicated to driving this process, but an editor is still necessary to ensure coordination of contributions. While other MSF Operational Centres have valuable contributions on hand for the various chapters, the editorial process would be best centralized within MSF OCB because of its large role in the Ebola response, and equally important MSF OCB's investment in information and knowledge management in preparation for this review.

OUTREACH

Outreach was not implemented consistently and this is partly attributed to a lack of human resources. However interviews indicate that there is also not a common understanding of what effective outreach activities consist of and therefore there is a lack of understanding on the importance of outreach which manifested itself in the field. This resulted in some cases of outreach being implemented as an ambulance service rather than an Ebola management strategy. There was also a clear trend in this outbreak of outreach being very much driven by the Watsan role of biosecurity, and this is a change from the past Ebola interventions where medical actors, especially from ETCs, were active in outreach in order to get contact with the community and population and also to build the bigger picture of an outbreak from first-hand experience.

Lessons Learned

- ⇒ A wider understanding of the role of outreach is necessary in order for outreach not to be sidelined as a strategy due to human resources pressures and eventually become relegated as a second priority in outbreak control.

Recommendation

- ⇒ Updated guidelines must emphasize the role of outreach and clearly explain its implementation, especially the expected roles of individual actors of Watsan, Medical and HP, and the importance of each role. This needs to be supplemented with outreach training that is tailored for each of these individual actors, i.e. outreach for Watsan, outreach for Medical and outreach for HP.

BIOSECURITY

The development of Bio-security checklists and visits to ETCs is clearly a strategic innovation arising from this outbreak experience. The fact that it is conceptually driven by non-project staff (i.e. checks implemented by persons from HQ or persons dedicated specifically for this activity) is clearly a plus and is a recognition of the need for periodic external checks on operations to ensure their integrity. In addition to sharing drafts of Guidelines and designs of ETCs, other organisations implementing ETCs, such as the Red Cross in Macenta, Guinea, would also be clear beneficiaries of this strategy.

Lessons Learned

- ⇒ In an emergency of this long duration there is eventually a fatigue of infrastructure (in this case temporary ETCs) and human resources that sets in. This must be kept in mind during the ongoing coordination of a response.

Recommendations

- ⇒ Biosecurity checks, and the reasoning behind them (e.g. long duration of interventions), must be integrated into the guidelines and also mainstreamed into coordination priorities, especially for longer term emergencies of this nature.

WASTE MANAGEMENT

Waste management challenges were clearly linked to allocation of ETC sites. The possibility of options for site selection often do not exist in urban settings compared to rural contexts, but they are much worse in the larger capital cities than in small cities, and where technical solutions such as transport of waste and storage offsite is extremely difficult to implement due to both traffic problems and limited space.

Lessons Learned

- ⇒ The solutions on waste management challenges for the moment are more strategic than technical. Avoid installation of large central ETC sites which generate contaminated and other waste very rapidly. If there is no choice in avoiding large cities, a number of smaller sites would be preferable. Where possible, and if relevant to the dynamics of the outbreak, rather install ETCs in smaller cities where access to nearby open spaces for waste management is much easier. This strategy can be strongly complemented by collaboration with other organisations to manage ETCs

MANAGEMENT OF BODIES

Safe burial protocols can be confronted by cultural sensitivities, but burial protocols can be adjusted to cultural sensitivity such as with the use of body bags that allow facial viewing and white body bags to help conform to Islamic burial. The issue of cremation is much more sensitive. Cremation may have been accepted by some of the Monrovia population over a certain period, but initial resistance returned and was exacerbated by rumours of bodies and parts disappearing. Mass cremation makes it very difficult, if not impossible, to return even ashes to family members. The result is that, unlike safe burial, it is almost impossible to adapt mass cremation of bodies to cultural sensitivities. This issue was ultimately resolved in Liberia by the identification of a cemetery site, which allowed cremation to be discontinued by MSF.

Lessons Learned

- ⇒ Avoid cremation, especially mass cremation, unless cremation is a culturally acceptable practice among the affected population. As in the case of waste management, avoid installation of large capacity ETCs, which although they may have a large carrying capacity for patients, will also have a potential for accelerated accumulation of dead bodies which becomes more quickly unmanageable than would be the case in smaller ETCs.

WATSAN AND HEALTH PROMOTION

Health Promotion plays a key role alongside Watsan in outreach activities and has contributed to the evolution of outreach protocols for PPE as well as team security in outreach activities in communities. The role of community actors in awareness-raising and alerts (e.g. CVS in Guinea) is not clearly recognized in the outreach process and, by default, the potential role that HP awareness raising in communities can (and probably does) contribute to the outreach alert process. The fact that the HP role in response to alerts and the HP role of awareness-raising in communities are implemented by separate teams suggests a degree of disconnection between outreach activities and the communities.

Lessons Learned

- ⇒ Integrate the health promotion teams and activities for outreach and community awareness-raising.

MSF AS TECHNICAL REFERENT

MSF Watsans played an active role as technical referents to external actors and organisations, especially in trainings. As well as this active role, MSF also became a referent without consciously seeking to be. Being almost the only experienced organization for Ebola response meant that MSF activities in operations, their protocols, guidelines and the selection of materials and equipment also became references or benchmarks for external organisations.

Lessons Learned

- ⇒ While it is not possible to control how external actors observe and / or interpret MSF operational activities, logistics or supply, it is possible to influence the external uptake of MSF protocols and guidelines.

Recommendation

- ⇒ The optimal objective of MSF in this context is to improve the quality of external actors' operations. This can be influenced by integrating lessons learned and updating existing draft guidelines as soon as possible. Depending on the evolution of future outbreaks in terms of scale, a review of lessons learned should include identifying indicators for signalling when and how external actors become essential to a response. The potential rules and roles of that engagement, such as Watsan external trainings in bio-security, infection control or outreach should be first defined, and then factored in to the human resources planning.

ANNEXES

ANNEX I: TERMS OF REFERENCE

<http://evaluation.msf.org/ocb-ebola-critical-review-work-page-1>

ANNEX II: LIST OF INTERVIEWEES

[First name Last name, Title]	[Function]
Peter Maes	MSF OCB Watsan Head of Unit
Francis Cathelain	MSF OCB Watsan Ebola Task Force
Azzura d’Inca	MSF OCB Watsan Ebola Task Force
Lionel Larcin	MSF OCB Watsan Ebola Task Force
Luca Fontana	MSF OCB Watsan Coordinator, Guinea
Nuttinck, JY	MSF OCB Watsan Unit
Suleiman Nizeyimana	WatSan Coordinator, Nongo ETC, Guinea Conakry
Julian Serafin	MSF OCB Outreach Coordinator, Guinea Conakry
Hilde de Clerck	MSF OCB Medical Department Mobile Implementation Officer
Outreach Team (group)	MSF OCB, Outreach Team, Forrecariah, Guinea
Barry Mamadou	UNICEF Wash Specialist, Guinea Conakry
Bruno Bellaton	ICRC WatHab, Monrovia
Jefferson Hodges	MSF Liberia Watsan
Josh Balser	Global Communities, Program Coordo, Liberia
A Djassira	Oxfam Liberia, Water Supply Program

Some more people have been interviewed jointly with the medical review team, those names are listed in the respective report.

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