Stockholm Evaluation Unit

OCB EBOLA REVIEW

Part 6: Logistics

[December 2015]

This publication was produced as part of a broader review on OCBs response to the Ebola emergency. It was prepared independently by Xavier Henry.

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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Front Cover Photo by Agus Morales/MSF:

"*MSF protection kits distribution in West Point, Monrovia*"

ACRONYMS

CDC	Centre for Disease Control
E-Cell	Emergency cell
E-log	Emergency logistician
ECHO	The European Commission's Humanitarian Aid and Civil Protection department
ETC	Ebola Treatment Centre
Fieldco	Field coordinator
Flyco	Flight coordinator
GCHV	General Community Health volunteers
HCD	Havilland Canada Dash
HQ	Head Quarter
HP	Health Promotion
HR	Human Resource
ISOS	International SOS
MoH	Minister of Health
MoU	Memorandum of Understanding
Medivac	Medical Evacuation
NGO	Non-Governmental Organisation
Logco	Logistic coordinator
Logsan	Logistician sanitation
LTL	Logistic Team Leader
OC	Operational Centre
OCB	Operational Centre Brussels
OCG	Operational Centre Geneva
SHU	Staff Health Unit
TBA	Traditional Birth Attendants
UNHAS	United Nations Humanitarian Air Service
UNICEF	United Nations International Children's Emergency Fund
UNMEER	United Nations Mission for Ebola Emergency Response
UNMIL	United Nations Mission in Liberia
VHF	Viral haemorrhagic fever
Watsan	Water sanitation
WFP	World Food Program
WHO	World Health Organisation

EXECUTIVE SUMMARY

The 2014-2015 Ebola outbreak in West Africa has been unprecedented in terms of the number of countries affected, the spread of the disease, the number of people infected and its urban settings. At the onset of the outbreak it was difficult to forecast the logistical modus operandi for such an emergency.

The logistics department, in support to the task force, tried to constantly adapt its response to the needs, to the evolution of the outbreak and to the geographical locations it touched. However, setting up a logistical tactic was complicated by the high staff turnover, the lack of human resources and by the unpredictability of this specific disease. MSF Operational Centre Brussels (OCB) implemented many technical innovations to guarantee the adequacy of its operational activities. It also provided technical advice on several different topics to other actors setting up Ebola treatment centres (ETCs).

One of the outstanding measures implemented by OCB was the organization of a mass Home Protection and Disinfection kit distribution in Monrovia, Liberia to attempt to slow down the epidemic. In Liberia, a major challenge was represented by the size of the outbreak, particularly in urban and densely populated settings like the capital Monrovia. The kits (including chlorine, gloves, soap, etc.) were distributed in the poorest and more densely populated areas of the city. The purpose of the distribution was to give a chance to people to protect themselves at household level in case a family member got ill or died. The kits also allowed people to disinfect their homes in order to reduce the risk of transmission and to safely handle dead bodies while waiting for the ambulance. Two strategies were developed for the distribution:

- Targeted distribution to prioritized groups, taking into consideration their actual or presumed potential exposure and mass distribution.
- A specific health promotion (HP) strategy developed to ensure the safe and efficient utilization of the kit through tools such as leaflets, films and demonstrations. In order to ensure the optimal and correct use of the kit, the HP activities were reinforced by follow-up phone calls to the recipients.

MSF OCB distributed approximately 70 000 home protection and disinfection kits, reaching a total of approximatively 600 000 people in Monrovia.

Various transport challenges were identified during the Ebola outbreak. The different strategies were progressively setup according to the needs and the spread of the epidemic.

For the first time MSF was confronted with staff being contaminated with Ebola (by the end of 2014, across all 3 countries, a total of 28 staff - 25 nationals and 3 international – had been contaminated). While medical evacuation of national and international staff suspected with Ebola to the capital cities remained complicated, MSF's decision to charter its own helicopter to be used for this purpose in all the three affected countries (Liberia, Sierra Leone and Guinea) improved the situation. Medical evacuation of international staff outside the affected countries was extremely difficult to secure at all levels, mainly transportation assets needs, diplomatic levels validations and international regulations. Because of these factors and despite considerable efforts and lobbying from OCB, international staff had to accept the risk of falling ill and not being able to be repatriated. Nevertheless through the MSF network (partner sections, other Operational Centres (OCs) in the MSF movement), evacuation procedures were negotiated with government of some countries (mainly European countries). The question whether national staff should have the possibility to be evacuated for better medical care remained unresolved. At the same time, OCB also fought against flight restrictions. Through lobbying Brussels Airlines, OCB helped to convince them to keep air routes operating between Europe and the affected countries.

In addition, during the Ebola outbreak there were a lot of teams that required transportation for contact tracing, patient investigation and outreach activities. Fleet management represented a huge component of each project. However, it was not always well managed and adequate to the needs. Otherwise, the logistics department systematically received very positive feedback on its reactivity. This emergency showed MSF's enormous capacity of adaptation and transformation.

The main **recommendations** for logistics are:

⇒ Strengthening the logistical input to the e-cell (decisional and tactical input) could allow a more adapted emergency response with better quality. It could also help the operations to mitigate risks about the organization and follow up of logistic activities

⇒ Adapt/adjust Tools & Procedures to the emergency (report/tactic monitoring, car fuel movement follow-up, maintenance, supply, finance, etc.)

⇒ Identify a suitable technical solution for ambulances in a highly contentious disease outbreak (MSF intersection Logistic department in order to share ideas, investment / risks etc)

⇒ Revise the international protocol for medical evacuations based on the Ebola experiences and prospectively search for alternative future solutions (Staff Health Unit (SHU))

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 23 March 2014, Ebola virus disease was identified in Guinea. The role of logistics in the field was mainly to support watsan and medical activities. Logistic experts were occupied to set up Case Management Facilities and lead outreach activities.

Then Ebola virus disease spread rapidly in the region, affecting neighbouring countries Liberia and Sierra Leone including the first large urban outbreaks of Ebola. By late July, the situation had become out of control.

OCB's outstanding response to the epidemic included an essential role of logistics. The logistic department, tried to constantly adapt its response to the needs, to the evolution of the outbreak even if setting up a logistical tactic was complicated in such a volatile and complex context.

The first purpose of this review is to provide a critical analysis on effectiveness of the logistic intervention including two transversal subjects which are transport challenges and the Protection and Disinfection Kit Distribution in Monrovia.

The second purpose is to identify findings and capitalize lessons learned based on evidence that can be translated into recommendations to better respond in the future actions.

EVALUATION METHODS & LIMITATIONS

Methods

The review methodology was based on:

- Desk review (Field reports such as sitreps, monthly reports or end of mission reports, E-mail communications between HQ, the field, guidelines etc.)
- Interview (At OCB Headquarter (HQ) level logistic department, Emergency cell (E-cell), task force, SHU+ MSF expatriates from the field + other OCs)
- Coordination meetings among consultants and transversal issues discussions

Limitations

The scope of the logistics component is limited because the supply and ETC construction were treated separately. Very little written information was available because of a lack of logistic reporting.

As most ETCs have been dismantled and national and international staff involved have been moved to other projects, a field visit was not part of this logistic review.

FINDINGS

GENERAL ISSUES ON LOGISTICS

1. The role and set up of logistics and the challenges during the Ebola response

According to the 2008 MSF Viral Haemorrhagic Fever (VHF) guidelines, the role of logistics in the field was mainly to support watsan and medical activities. So at the onset of the outbreak, the logistics response for the Ebola outbreak remained classic. Logistics experts were in the field, while the logistics team in HQ was supporting the supply issues. In OCB, the set-up of the E-Cell includes a log/supply who facilitates procurement and gives advice without being decisional on the logistic tactic. During this first Ebola period, the E-log/supply was busy finding transportation means for medical evacuations to Europe and solving supply issues. Discussions about the development of a strategy between the E-Cell and the logistics department only started in August 2015 with the beginning of the task force. For this reason, strategic adaptations of logistic support to the contextual reality was late, which leads to difficulties to ensure an adequate level of quality for beneficiaries and staff (e.g. the conditions of hospitalization for patients and the conditions of work for staff were inadequate in many ETCs). The split of the log position could have been done earlier in July when the volume of activity became very high and it was no longer possible to cover the support needed with only one person.

The main logistical challenge was the need to quickly and pragmatically adapt to a volatile and complex context. Delays in the definition and implementation of at least the first three pillars of a classic Ebola response were also due to the reluctance of national authorities, in Sierra Leone for example, to recognise the epidemic, thus preventing an effective and expeditious MSF intervention[1].

Logistics in the field had to adapt its strategy on a day-to-day basis. Moreover, the unpredictability of the context meant that the strategy was purely reactive. In some cases, for example, decisions to open ETCs – Bo ETC in Sierra Leone or ELWA in Monrovia – were taken so quickly that the logistics department had no other alternative than to implement reactive interventions instead of a preconceived strategy, causing delays and constant transformation of most of the centres (i.e. the building of a 240 beds ETC in Monrovia).

2. Creation of the task force: guiding the logistical strategy in an unpredictable context

The focal point of Ebola task force for logistics was to take in charge the daily logistical management at HQ level, gathering all information regarding logistic needs.

With the support of the logistics department, the task force initiated a process of research and development around ETC construction that was unusual for emergencies. Nongo ETC, as the last one that was built, is a good example resulting from this process of learning and improvement, even if it took a long time to be built.

Sending a logistician from HQ to visit all projects in the three affected countries proved to be beneficial. In fact, his input and global overview of all ETCs allowed the task force and the logistics department to find solutions and give a better support to the field. However, the logistics task force suffered from a high HR turnover both in the field and within the task force itself.

[1] OCB Year Ebola Report final version Brussels March 15

3. Human resources: the big challenge

Logistic priorities changed often because of the high turnover of staff (two months maximum) and the different level of experience in the field. Among many staff interviewed, short missions and high staff turnover were perceived as the main cause of problems to ensure a qualitative work. This made management very complicated, it worsened communication and made team development and cohesion difficult In that sense the opportunity to secure continuity and coherence with experienced national staff was also not used. For instance in Gueckedou a national staff worked as storekeeper on the base even though he had completed the international training "watsan in emergency" and could have been able to give a technical hand to the watsan team.

In addition, the initial organigram could not be followed due to the lack of HR covering key positions. Logistics managers had to be polyvalent and often filled many functions at the same time because of the scale of the outbreak. A log in Gueckedou, for example, had to assume four roles at the same time (fieldco, log, watsan and admin). In Bo, the logco assumed the role of construction manager on top of his own. Responsibilities and tasks were not always clear for the people involved, as no job descriptions were provided. This was a cause of tension in the teams and was reported to have led to burn out.

4. Reports, tools and procedures

Handovers were not systematic and only a few written reports or formalized knowledge-containing documents were transmitted, which meant that most of the knowledge was passed on orally. For instance before January/Feb 2015, it was very difficult to find a logistic report or logistic hand over. Therefore, the information was not always passed from one colleague to the other. Lessons had to be learned and relearned all over again, mistakes were repeated and problems were recurring. There were no methods of capitalizing on and collecting lessons learned that could allow for readjusting tactics.

As often during emergency phases (one to three months periods), implementing tools and procedures are not the first priority. As the overall emergency response lasted for over one year, this lack of procedures and standard tools became a problem (i.e. the lack of fuel monitoring caused some corruption, logisticians many times bypassed supply doing its own supply and causing confusion in the follow up, etc).

It also has to be said that many tools are perceived by logisticians as too heavy and not adapted for emergencies (i.e. Buphagus for the management of investment material). So generally people were applying procedures according to their understanding or past experiences, knowing that a big number of expatriates had a limited experience with an Ebola emergency.

5. MSF logistics rarely had such an impact on other organizations

However, because of its recognized experience in Ebola emergencies, MSF rapidly became one of the major reference points for other actors. Both at HQ and in the field, MSF played a significant role in sharing Ebola-specific information, as well as in mentoring, sensitising and advising other NGOs (French Red Cross, International Medical Corps etc.), authorities and the international community. MSF OCB had been somehow the motor and the catalyst of ETC building and therefore conducted technical support visits to other ETCs and provided recommendations on technical standards, but also protocols, training. This was appreciated and contributed to build the confidence of other actors taking part to the outbreak

response. Sharing knowledge and building partnerships were important in addressing the scale of the outbreak.

HOME PROTECTION AND DISINFECTION KITS DISTRIBUTION

1. Unconventional methods to control the Ebola epidemic in an urban context

1.1 A controversial and risky strategy

In August 2014, the number of cases in Monrovia exploded. MSF, the Ministry of Health (MoH) and other actors did not have the capacity to isolate all the suspected cases and the ambulance system was not working properly. To tackle this difficult situation, MSF decided to distribute basic protection and cleaning material to reduce transmission at household level.

Many suspected cases could not be admitted to the ETC due to lack of space and resources, and were left with no other option than to go back home, thus risking to contaminate their families. The kits were not designed to allow people to provide home based care, but to give them a chance to protect themselves if a family member got ill or died. The kit also allowed people to disinfect their homes and to safely handle dead bodies while waiting for the ambulance.

During a visit from HQ the idea was developed to distribute kits. The team in the field was responsible to organise the distribution itself. The project was formally approved by the Liberian Minister of Health (MoH) and represented an innovative strategy tailored to the specific context. However, it was also considered controversial, risky and challenging.

The strategy was controversial because distributing this kind of kit was not in accordance with a number of HP messages spread by MSF and other actors among the community. Indeed, usually the HP team had encouraged people to go to the ETC when presenting Ebola symptoms. The new message with the kit was to ensure the population's protection directly in their households in case of somebody presenting Ebola symptoms or dying, even if performing disinfection procedures without adequate training in general is considered potentially dangerous.

The risk factor was made up of a variety of elements:

- People could have misunderstood how to use the kits and therefore risked infection.
- The kit could create a false sense of security leading to a risky attitude on touching sick people/death body when it was recommended to avoid any contact if sick people in the family (or contact only with protection items).
- There was an additional risk of transmission of the virus among the population due to large gatherings during distribution sessions even if it was considered scientifically as a low risk.
- Distribution sessions could be potentially dangerous for the staff involved in them, not only because of potential contamination issues but also due to potential insecurity in a crowded environment.
- HR were not deemed sufficient to carry out the distribution. It was originally planned to accomplish the distribution with 4 distribution teams, supervised by two distribution managers but the majority of the distribution was done with 3 teams and 1 distribution manager.

1.2 Content of the kit

The kit was composed by good quality products provided by MSF supply and, after distribution, prices of similar items in local markets decreased. Some kits were sold in the markets but not in significant amounts as households preferred to keep them in case of necessity. Two kits were distributed to each household.

- LEAFLET = Sensitisation + Technical
- CHLORINE, NaDCC granules, 0,5 kg
- GLOVES, EXAMINATION, latex, disposable, large
- GLOVES, CLEANING, rubber, reusable, pair, large
- BUCKET, 20 l, plastic, + LID
- BUCKET, 20 l, plastic, + LID + hole + tap
- HAND SPRAYER, 1l, plastic
- SOAP, 100g
- BAG, dustbin, plastic, 100 l, black, 70 microns, roll
- GOWN, SURGICAL, nonwoven, s.u., XL
- MASK, SURGICAL, IIR type, s.u.

2. Distribution Methods

2.1 Target distribution

Four main target groups for the distribution were identified:

- Families with sick relatives who could not be admitted at ELWA 3 because of lack of bed space and isolation capacity.
- Relatives of patients admitted to ELWA 3.
- Categories which, due to the nature of their work, were more at risk of exposure to the Ebola virus, such as transporters, midwives, traditional healers and private ambulance personnel.
  Staff from MSF and MOH, ambulance dispatch and case investigation personnel. This last group was included in the distribution not because the environments in which they worked constituted a higher infection risk factor, but in case they had sick people at home.

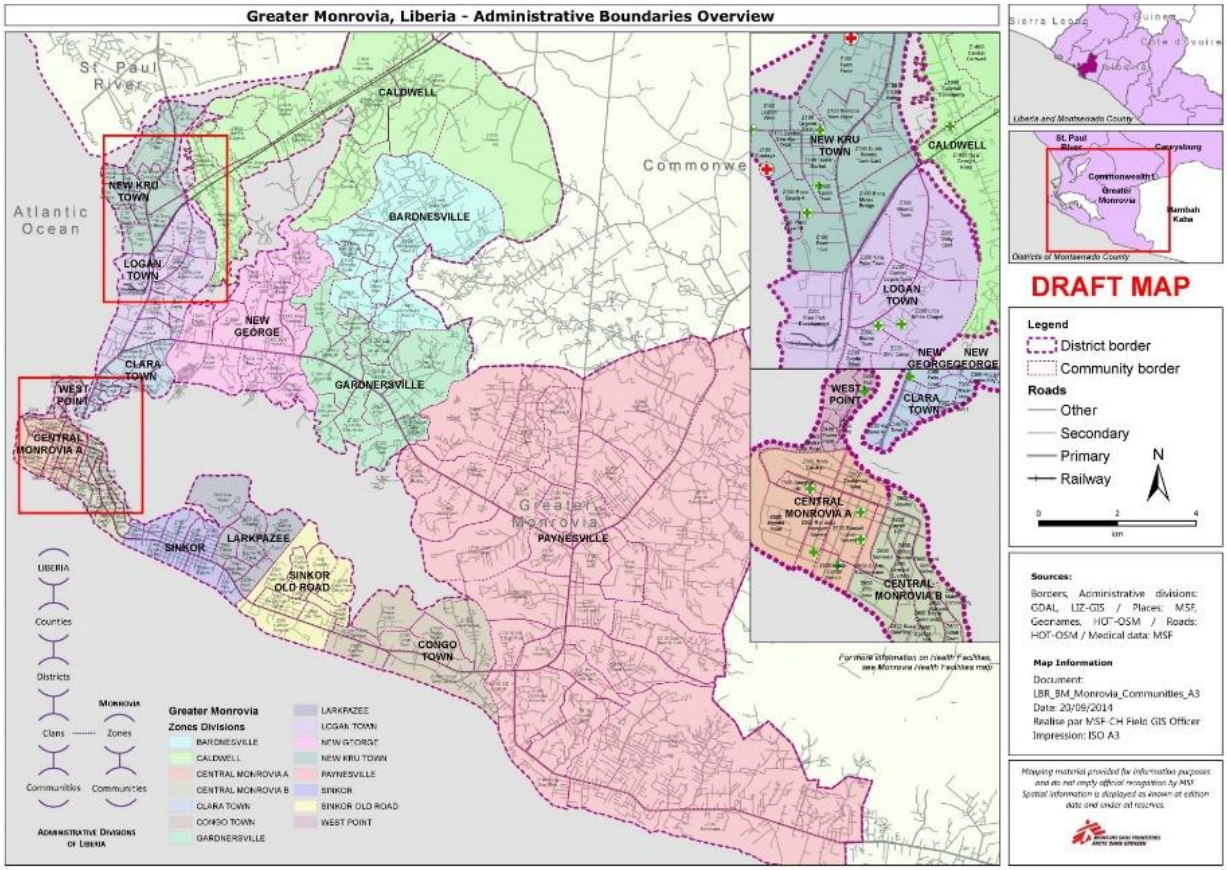
2.2 Mass distribution

The mass distribution of kits was difficult to plan due to the wide spread of the virus across the whole city of Monrovia. It was not possible to have priority areas to protect following epidemiological analysis and MSF OCB was not supposed to cover all the city. Priority was given to the districts with high density of the poorest population in the city. The mass distribution allowed to:

- Spread HP messages within quite isolated communities.
- Calm down the situation in West Point, in which a forced quarantine had increased the tension among the population of an already rough area.

- Improve MSF acceptance, even if the organization was already well known for its interventions during the civil war.

Different areas where MSF made mass distribution in Monrovia



3. HP strategy

Initially, the idea of a mass kit distribution was not well received by the HP teams because there were some doubts of the impact of this distribution and some team dynamic issues. This caused two weeks a delay in the definition of an HP and education strategy tailored to this specific situation. However, the mass distribution represented a good platform for spreading HP messages within a considerable part of the community. Sensitisation on Ebola and how the virus is transmitted was done through various tools:

- An informative leaflet was included in each kit.
- A mass video projection was organized to cover as many people as possible among the target population.
- Live demonstrations and basic training of key people within the community (women, youth associations and community leaders) on how to protect and disinfect households, as well as on how to limit spread of the disease.

After the distribution, community dwellers and MSF General Community Health volunteers (GCHVs) were available to provide information and demonstrations concerning the use of the kits. Moreover, in order to verify and ensure the optimal and correct use of the kit, follow-up phone calls to the recipients were made three to five days after the distribution. The phone call was also an opportunity to deliver HP messages.

4. Implementation and limitations of the kit distribution

The initial objective was to do target and mass distribution at the same time but the team revised the schedule because it was deemed too ambitious and the timeframe for the organisation of demonstrations, training and the distribution itself was underestimated.

4.1 Limitations of the targeted distribution

Since it was impossible to conduct the targeted and mass distributions at the same time and with the same teams, MSF decided to start with the targeted groups first. This was the most time consuming and logistically heavy part because, even if the different groups were relatively small, they were situated in different locations. HP also took time because it was necessary to train other demonstrators and trainers (MoH staff supervisors for their staff who received kits, Centre for Disease Control (CDC) phone centre operators for families calling for guidance and MoH case investigation teams) so that they could correctly demonstrate the use of the kits.

An additional two groups were identified for the distribution. However, various problems prevented them from being covered:

- **Transporters/taxis:** The team at the doors of ELWA 3 sometimes distributed kits to vehicle drivers but there was no clear procedure for this, so MSF approached the taxi trade union. However, the organisation was unable to establish a workable strategy to distribute kits to the more than 9000 registered taxi and moto-taxi drivers. The number was simply too high, so this kind of distribution was never conducted.
- **Traditional healers and Traditional Birth Attendants (TBAs):** HP community mapping of traditional healers and TBAs did not produce interpretable results until week 40, when the mass distribution was already underway. Therefore MSF did not hire enough staff to extend the distribution this group. In addition some of the ones identified were contested by the MoH.

4.2 A mass distribution well organised with robust logistic capacity

No major problem occurred during the mass distribution, which was modelled around the Haiti experience after the earthquake where MSF OCB made various distributions in violent areas in Port au Prince. Preference was given to a mobile approach with the distribution site, quickly set up around a truck using a perimeter fence and early in the morning. Indeed an early start for distribution was decided (between 5am and 6am) to minimize security risks from certain sections of the population (alcohol

related) avoid clashing with daily community activities but also in order to prepare the following days activities.

The distribution was made directly from the truck itself. Specific characteristics of this distribution were the implementation of a "no touch" approach and the spreading of a strong message to communities that any disturbance would have caused the cessation of the distribution. Each beneficiary had to throw a token on the table before receiving the kit without any contact with the distributor and with the people in the queue.

4.2.1 Limitations of the mass distribution

The distribution presented some challenges and limitations. These were:

- Keeping the pace with the distribution teams (planning, timing etc.) for the targeted zones.
- Training beneficiaries after the completion of the distribution due to their other engagements and priorities for the day.
- Problems between the chairmen of community and the community in sharing tokens. This caused tensions and forced the MSF team to stop and report the distribution several times.
- In West Point, only one physical site was available but it was impossible to conduct distribution directly from the truck because of risk of disturbance. Instead, the distribution took place in a building in which kits were stockpiled every four days and distributed block by block.
- No ideal location for a mass projection of HP messages was found. In the absence of such a place, reaching each and every recipient became very challenging.

5. Supply

This topic is further developed in the supply part of the review.

The teams were able to distribute faster than MSF Supply could produce and ship the kits. It should be noted that MSF placed an order for 20 000 extra kits in week 38, when the team realised that the initial order of 50 000 kits would not be sufficient (it was difficult to find a way to know the correct number). This adjustment of the number (and following order) delayed the end of the distribution by another two weeks. After the distribution, the number of cases significantly decreased and the context no longer justified repeating the activity.

6. HR

HQ were aware that the kit distribution represented an imperfect solution to a difficult situation. Unfortunately, some international staff did not support the objective and the strategy behind the distribution, producing a lot of discussion and misunderstanding at the field level. It was necessary to reinforce, to all HR involved, that the kit was not perfect and that it would not resolve the entire epidemic, but that it was important to support, in this critical and tense period, a part of the population. Finally, the fear of exposing the teams to potential dangers caused one demission and two refusals to take up a post.

7. Studies providing useful data on such unconventional intervention in Ebola context

7.1 Figures of the recipients

1. Kits received : **73,181** (50,000 initial order : 20,000 supplementary order : 3181 extra so as not to waste an existing charter)
2. Total distributed : **65,109**
3. Targeted distribution directly by distribution team : 3980
4. Targeted distribution via MoH and ELWA 3: 3383
5. Mass distribution : **55,537** (>99% coverage)
6. MSF acceptance distribution : 2209
7. Donations : 830
8. 1029 distributed via ELWA 3 and MoH, before September 10th 2014

Number of respondents to survey by category of distribution (conducted by epidemiologists[2])

Distribution Category	No of Respondents
Health Workers	448 (32%)
Mass Distribution	480 (34%)
Targeted	460 (33%)
Total	**1388**

7.2.1 Summary of Survey Findings

Despite some important limitations[3] of the survey conducted, MSF was able to collect valuable information about kits recipients' attitudes and practices that can help MSF's ongoing health promotion efforts:

- High rate of kit use (95%) among households with a sick or dead person.
- The use of the kit was also reasonably high (55%) in households without a sick or dead person; this use appeared to be prevention-oriented.
- 26% of households were using the kit for both hand washing and cleaning or spraying.

It appeared that the kit was useful and instructions were understandable. Out of 325 respondents 97 to 99% found the kit complete, reported that they had received training and found the instructions and leaflet understandable.

Compared to the targeted distribution groups, health workers consistently reported a less consistent: 1) use of gloves, 2) washing of gloves with chlorine and 3) use of the hand sprayer. It is quite surprising and it could indicate an "arrogant" attitude towards the use of the kit. Alternatively, they thought having already been briefed on Ebola case management rendered the kit useless. More intensive training of health workers on the kit use would have been helpful.

[2] OCB Protection and disinfection kit distribution details telephone survey analysis

[3] MSF OCB kit distribution summary of survey finding external

8. Impact of the distribution

Scientifically it is not possible to know if the kit distribution had an impact on the outbreak because necessary data is simply not available for this type of analysis. The impact of outbreak control was not measurable even if one could notice that after distribution, there were less cases in many areas where kits were distributed and even if it was the general trend decreasing of cases in the whole city. In fact, several factors may had have the impact on reduction at the same time: the increase in bed capacity, the increase of awareness and understanding of the population, the increase of knowledge on preventive measures at community level and distribution of the kits. All these factors together may be the reason for the decreased numbers at this time of the outbreak in Monrovia (not the same in the other countries, areas…).

So, the biggest challenge and the key of the success of this distribution was to highlight Health Promotion messages at this moment in order to ensure that the population has a good acceptance and understanding of the outbreak and its development. Particularly for general population residing in several crowded high-poverty neighbourhoods which were difficult to reach; if you have the community behind you, you win.

TRANSPORTATION CHALLENGES

Various transport challenges were identified during the Ebola outbreak. Different strategies were progressively setup according to the needs and the spread of the epidemic.

1. The two big challenges: international repatriation and commercial flight restrictions

Finding transport for international repatriation in case of Ebola symptoms and trying to anticipate the restriction of commercial flights were the two key challenges during the outbreak.

1.1 The international medical evacuation related to Ebola exposure: the obstacle course

Theoretically, using commercial aircrafts during the first 48 hours window between accidental blood exposure and the medical care in a specialised centre does not constitute a risk. However, in practical terms, it is very difficult to guarantee the safe reception of an exposed person in the home country within 48 hours. Belgium was one of the few countries that made this possible. For this reason, MSF avoided having persons exposed to haemorrhagic fever travelling on commercial aircraft, both because of the potential risk it posed and for the potential negative publicity[4]. It was anyway a necessity to find an aircraft company to transport Ebola cases with secure equipment.

1.1.1 Transportation possibilities for medivac

The main issue was to find an air company accepting to fly with appropriate equipment and staff accepting to evacuate positive Ebola cases. Since the beginning of the epidemic, different MSF representatives (log E-Cell, log front office, OCB task force, health staff unit and OCG), with the help of World Health Organisation (WHO), searched for transport solutions. The perception of some companies

[4] MSF VHF Guideline 2008

contacted by MSF was that they had too many interlocutors at MSF and it was not clear who was responsible (International SOS (ISOS), MSF's medivac insurer, at the beginning complained to MSF Airops of this lack of coordination).

ISOS had a problem of identifying a plane and staff accepting the deployment. Nearly all air companies refused to transport Ebola patients and finally ISOS declined the possibility to organise medivacs. It was considered not profitable and too risky.

Through the support of WHO, the USA based Phoenix Air agreed to provide medivac services on a case by case basis. This company flew only under the green light of the US Ministry of Defence. The plane was well equipped and ready to transport staff to Europe. However, Phoenix Air announced that priority would be given to American citizens if a choice had to be taken. WHO and MSF staff would be their second priority.

The main constraint was that more than 40 hours were needed from validation to destination, which is a long time for a medivac. Moreover, Phoenix Air was not always available to provide the service. Additional solutions were needed in case MSF was confronted with the need to do several medivac in the all area at the same time.

Medicair had already a plane with some specificity (it was used by MSF for a Lassa case medevac). Medicair was contacted for one of the cases and they accepted to transport to Europe. Good communication and trust between MSF and them gave space for adjustment, common risk taking and understanding.

The French military agreed to do medivacs as well and in fact they were the first ones contacted for MSF's 2nd case, but they needed 60 hours to evacuate the patient. MSF deemed it too long for an evacuation and they requested Medicair.

At the end of 2014, Air Rescue from Luxemburg, financed by The European Commission's Humanitarian Aid and Civil Protection department (ECHO), was able to provide medivac services. Germany also made a plane available for medivacs but the service was very expensive (1 million euros compared to 150,000 Euros by Phoenix).

The centralised know how around medical evacuations for the MSF movement in OCB, with the support of WHO, facilitated the process. However, only three people had the knowledge and experience on Ebola medivac coordination.

1.1.2 The difficulty of authorisation for medivac

Finding airlines willing to provide medivac services was the first step. However, the most challenging aspect was at the diplomatic level. A number of authorisations were required to obtain the right to fly and there were many restrictions that could block or cause delays in the process. A few examples are:

- Authorizations from health authorities in the patient's country of origin.
- Agreement of the country from which the person was to be evacuated (nationality came into play, as many countries refused a national from another country, Schengen or not).
- Country overflight clearances were compulsory with Ebola cases, particularly when a fuel stop was necessary.

In one case of medivac, a Medicair plane had to refuel in Spain. It got stuck at the airport of departure because the permission to refuel was denied at the last minute, despite Spanish authorities having initially greenlighted the procedure (it was an exceptional closure of air space from Spain because of hysteria in the country caused by the Ebola national case there). Medicair had no other option but to

call MSF in the hope it would solve the problem; it took more than 2 hours to solve the situation and the permission was given without official clearance (only because of pressures and MSF weight on media).

With the occasional help of WHO, MSF started putting pressure for medivacs and medical care on different governments. The nature of Ebola made authorities reluctant to medivac and receive patients suspected with the disease. There was a general lack of commitment among European governments to provide solutions and resources to address the epidemic on the ground. It seemed that the vast majority of EU member states considered acceptable the medivac of their own nationals, but they were not willing to accept evacuating nationals of other countries into their territory. Their reasons were self-protection and the willingness to avoid general panic among their populations. MSF criticised and accused French authorities of being too slow in their response when the medivac of one of its nurses was delayed for more than forty hours. At that point, MSF had to call Air Phoenix.

1.2. Solutions to travel restrictions

The closure of air spaces and the cancelation of commercial flights (Air France, Kenya Airways, British Airways, Emirates airlines, Senegal Airlines and many others)[5] hampered the efficiency of response to the Ebola outbreak. These restrictions caused, for example, supply shortages of medical material and personnel. The logistics department and general direction tried to find out several simultaneous solutions.

The fear of a complete shutdown of flights in the region pushed OCB to contract a plane to transport expatriates from Dakar to the Ebola affected countries. Unfortunately, Senegalese authorities closed their airspace and the plane was never used.

At that point, in the beginning of September, only Royal Air Maroc and Brussels Airlines operated flights in the region. OCB did a considerable advocacy effort to convince Brussels Airlines to continue flying despite the pressure they were receiving from the trade union. Finally Brussels Airlines decided to continue flying to Liberia, Guinea and Sierra Leone. As a contingency plan in case Brussels Airlines would restrict its flights to and from the affected countries, OCB explored the possibility of chartering its own plane from Brussels. MSF Airops was able to find a 150 seats plane, however there was no need to use that option.

For cargo, MSF hired charter flights instead of scheduled ones. This approach worked well and did not pose problems. MSF also used full charters or part of charters paid for by United Nations International Children's Emergency Fund (UNICEF) under the supervision of World Food Program (WFP). A private company also offered a few free charters to MSF for Ebola freight and MSF took the opportunity to use them.

2. Transport solutions inside the three affected countries

Transport needs identified were diverse and complicated in the three affected countries. An effective solution for transportation by air had to be found at the beginning of the intervention especially in case of viral haemorrhagic fever (VHF) exposure. In addition, the need for cars and ambulances for alert

[5] Airops Ebola overview

teams, active case finding and disinfection teams in the field was considerable. These were big challenges for both, rural areas and capital cities.

2.1 Referral system from the field to the capital in case of VHF exposure

2.1.1 Air solution

Referral of ill staff from the field to the capital city of the mission by car was difficult, especially for Guinea, where roads are in bad conditions and the distances large. That's why at the onset of the outbreak, OCB and OCG contracted a plane to transport international staff from Kissidougou (situated approximately two hours by car from Gueckedou and Macenta) to Conakry. This saved two days of car travel and allowed medivac of non-Ebola cases. However the plane was too small to be equipped with the isolation chambers necessary to medivac Ebola patients.

For this reason Foya, in Liberia (situated between 20 and 30 kilometres away from Gueckedou) was a good alternative because it is serviced by a good airstrip and Samaritan's Purse allowed MSF to use their Cessna Caravan in case of VHF exposure.

Another possible solution was to use a helicopter to fly from Gueckedou or Macenta to Monrovia. This route was shorter than the one to Conakry. Two helicopters were potentially available in Monrovia, one offered by Samaritan's Purse and one by a private company. No formal agreement was stipulated between MSF and the potential transporters.

2.1.2 UN transport

UNHAS and UNMIL provided air transport to the eligible humanitarian organizations working in the 3 affected countries for both staff and cargo. They also provided services such as special charters for approved users. Their fleets were composed as follows:

UNHAS Fleet[6]:
- 1 medium helicopter based in James Spriggs Payne, Monrovia, Liberia
- 1 fixed wing B1900C aircraft with max 19 seats based in Conakry

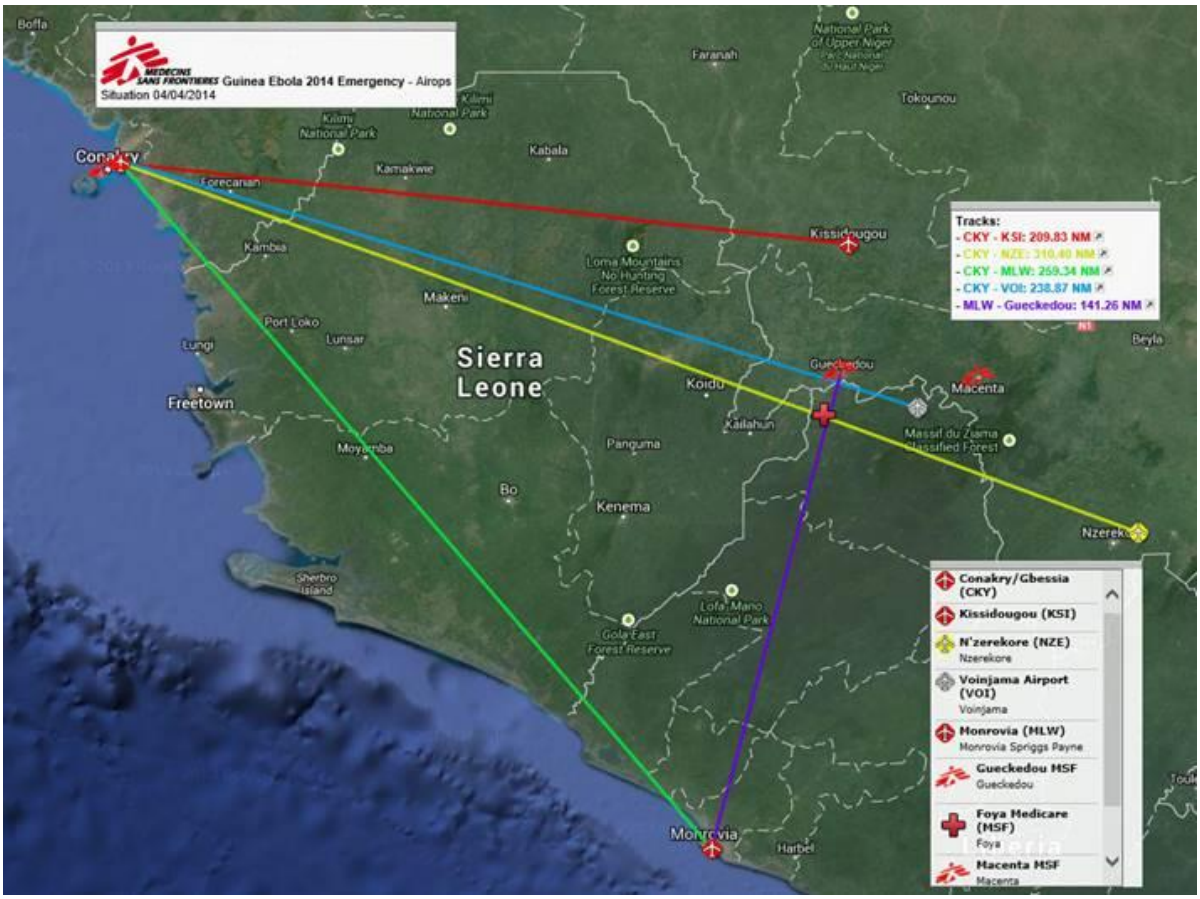
UNMIL Fleet:
- Mi-8 helicopter
- HCD-7 aircraft

2.1.3 MSF helicopter

In early September 2014 – during the height of the outbreak - MSF decided to charter its own helicopter to transfer staff to any capital city of the three affected countries (Liberia, Sierra Leone and Guinea). The helicopter was based in Freetown, Sierra Leone, and it eased operations. It facilitated security evacuations and non-Ebola medivacs, it solved critical supply issues and allowed for MSF-VIP

[6] Hand over report flyco May 2014

transportation. The helicopter was used inter-sectionally but it was managed by the OCB Ebola Task Force through a flight coordinator[7]. A strict protocol was developed for each country.



2.2 Ambulance services: not adapted and difficult to manage

Organization of call centres was a problem in the majority of the districts which was why MSF supported some areas with ambulances and teams but overall there was a big ambulance shortage (Red Cross did not have enough cars). The MSF car fleet consisted of more than 120 cars in the three countries. Indeed many teams required transportation during the outbreak response: for contact tracing, support to health structures, for case investigation and transport. Fleet management was challenging because cars did often not fit the needs and the control of the movements was not always possible with such a quantity of cars.

2.2.1 Ambulances: No easy solutions.

For ambulances, no satisfactory solution was identified during the outbreak. MSF Supply was not able to provide the number of vehicles required. The delivery period was too long, as the conversion of hard tops into an ambulances took four weeks plus two additional months for transportation by ship. MSF decided instead to use a pickup to transport patients or dead bodies, but this solution posed problems of comfort, dust and space (solution like the "Tufport cell" can / should be part of the answer as the local conversion of "sanitary transport" vehicle by sending kits and technicians to install on the spot).

[7] Hand over report flyco October 2014

The bad road conditions were an additional challenge, especially if the trip to the ETC was very long. In Sierra Leone, transportation was said to take up to 7 hours.

Patients' dignity and security for staff was an issue in many places. In Conakry, people sometimes resorted to violence as a display of their disapproval. In rural areas transport by pickup was more accepted.

In Guinea, teams occasionally mixed suspected cases with confirmed cases, conscious patients with unconscious patients (the conscious had to look after the unconscious ones). In some cases drivers were afraid to help patients getting into the ambulance.

To ensure biosecurity, MSF logisticians inserted a plastic glass between driver and patient areas. However, this local transformation was not an ideal solution because chlorine is corrosive on metal. Some of the modifications differed from project to project and none of them was standardised. The logistics department proposed to go to China and buy 2000 tricycle ambulances, but transporting them by plane was considered impossible.

2.2.2 A difficult fleet management

The main challenges with fleet management were:

- The number of rental cars employed was very high but not always justified by the activities.
- The plan behind the various movements was not always efficient. In Monrovia, the coordination managed the fleet without having a good overview of all the needs. Renting cars is very expensive. For example, in Monrovia, thirty-eight of the fifty-two cars employed by MSF were rentals and cost approximately $3250 per day (excluding the drivers' salaries)[8]. In Liberia and Guinea many of the rental cars were in poor mechanical shape and maintenance was often a problem.
- In Gueckedou, some of the rental cars were coming from the capital city. Their drivers were not familiar with the areas and were difficult to manage.
- Fuel was difficult to manage (payment in cash, corruption, etc.).
- Procedures to follow fuel consumption were not always implemented,
- MSF tools were not used (in Gueckedou, the logbook was not enough for all the cars).

The fleet managers needed to have an overview of all operational needs. The importance of this position seems to have been partly underestimated.

[8] Car park Monrovia December 2014

CONCLUSIONS

OCB logistics had to adapt its tactic on a day-to-day basis. The task force played a key role in coordinating logistical activities, even if, due to the fact that several outbreaks had to be simultaneously managed, guidance was not always clear. Because of the high HR turn over and numerous gaps, the roles and tasks of logisticians in the field were not well defined; job descriptions were missing or incomplete.

Despite the various problems listed in this report, the logistics part of the response to the Ebola outbreak received positive feedback. The logistics department was able to adapt its response to the different locations, particularly in urban contexts where it needed to be innovative, adaptable and flexible in tackling operational challenges. Energy and resources were invested in research and development to improve the conditions of care and comfort of the patients. In order to gain an overview of all lessons learned, a capitalisation effort and an update of the Ebola guidelines with the input of all OCs are necessary.

The protection and disinfection kit distribution was an unconventional method to control the Ebola epidemic in an urban context. Organising this distribution in a big city was very challenging but successfully implemented because of the robust logistic capacity and a good crowd control without too much disturbance. The intervention benefitted three different and well targeted groups. The collaboration with the health promotion team was essential. There is no scientific evidence on the impact of the distribution, but it was perceived as having a very positive effect on the population.

Organising international medical evacuations was challenging because several factors were simultaneously at play: airplane availability, nationalities concerned and evacuation to the closest eligible hospital. The solutions to the medivac problems were more diplomatic than logistical. Fear and the reluctance on the side of authorities to facilitate medivacs, made it necessary for MSF to actively lobby and negotiate with governments and hospitals to allow the management of patients. At the onset of the outbreak, it was really difficult to include every possible scenario in a comprehensive strategy. The airlines' decisions to stop flights to Ebola affected countries were a new experience and impossible to anticipate. Developing and implementing a policy for each of MSFs home societies was complicated but MSF's network made it possible. The lesson identified is that relevant contacts with national health authorities should be proactively activated by each partner section in the MSF movement.

For international staff these difficulties meant that medical evacuations to their countries of origin could not be guaranteed. Volunteers had to accept the risk of falling ill and not being able to return home. The question whether national staff should have the possibility to be evacuated for better medical care remained unresolved.

The offer of transportation means is now more diversified than at the height of the outbreak and several airlines are able to handle Ebola cases. In addition, despite the predictable nature of public opinions, a higher number of countries is now ready to receive at least their citizens or other European patients (London, Hamburg, Rome, Paris and Brussels). However, nationality and delays in evacuating patients (especially if several medivacs are necessary at the same time) are still problematic aspects.

Despite the existence of several alternatives for the staff affected by Ebola from the field to the capital city, no MOU was ever formalised. With high HR turnover, formalised written agreements would have facilitated more secure and smooth medivacs.

To tackle the restriction of commercial flights, chartering a Dakar-based plane could have represented a suitable solution. The fact that it was never implemented does not undermine or diminish the value and validity of the proposition but was simply due to contextual developments.

Fleet management was a particular challenge with the ambulance requirements during the Ebola response. The importance of the position of fleet manager in order to maintain an overview of the operation, the needs, and to anticipate, organise and rationalise the movements was underestimated. Better fleet management and improved planning from all coordinators could significantly lower the costs associated with MSF movements and vehicles.

RECOMMENDATIONS

⇒ Strengthening the logistical input to the e-cell (decisional and tactical input) could allow a more adapted emergency response with better quality. It could also to help the operations to mitigate risks about the organization and follow up of logistic activities

⇒ Adapt/adjust Tools & Procedures to the emergency (report/tactic monitoring, car fuel movement follow-up, maintenance, supply, finance, etc.)

⇒ Identify a suitable technical solution for ambulances in a highly contentious disease outbreak (MSF intersection Logistic department in order to share ideas, investment / risks etc)

⇒ Revise the international protocol for medical evacuations based on the Ebola experiences and prospectively search for alternative future solutions (SHU)

ANNEXES

ANNEX I: TERMS OF REFERENCE

http://cdn.evaluation.msf.org/sites/evaluation/files/attachments/logistics.pdf

ANNEX II: LIST OF INTERVIEWEES

Name	Position
Logistics Department	
Anibal Ordenes	Ex log Task Force
Maria Christina Ruggery	Fieldco Nongo and Architect HQ
Jean-Eric Shaefer	Ex responsible front office
Jean Pletinckx	Logistic Director
Frances Lopez	Responsible Back office
Alberto Zerboni	Ex responsible front office
Andreas Spaett	Actual responsible Front office
Andre Sardo	Ex log Task Force
Ludovic Kamer	Responsible transport
OCB Cellule	
Thierry Boucher	Log E cell
Gilles Riguelle	Log cell
Rosa Crestani	ARP E-cell
Marie Christine Ferrir	Responsible E-cell
SHU	
Françoise Saive	Responsible of SHU
Watsan Deparment	
Peter Maes	Responsble watsan department
Francis Cathelain	Flying watsan
OCB representative	
Edouard Rodier	
MSF International	
Antoine Bieler	
OCG	
Antoine Gauge	Intersection
Naoufel Dridi	Log cellule
Marc Blumet	Responsible front office
Expatriates from the field	
Thibault Malzieu	Log construction
Pascal Piguet	Fielco/watsan/log
Frank Peters	Log Base
Cristina Bruxeres	LogSan
Sadiq Muhammad	Logco
Laurence Sailly	E-coordinator
Pietro Maria Curtaz	Log construction
Phillipe de Saint Georges	Fly co

Cheik Oumar Toure	Deputy logco
Henry Grey	E-coordinator
Anna Halford	Fieldco distribution
Emilian Grenier	Log Base
Eric de Miniac	Log
Andrius Salvakis	Log construction
Marcello Mazzotta	Log distribution
MoHammed Camara	HP distribution

ANNEX III: INFORMATION SOURCES

OCB Vision Log 2014
OCB Logistic department folder 2015
MSF VHF Guidelines 2008
Lessons Learned VHF OCBA 2014
OCB Survey Lessons Learned oct 2015
International Working Group Meeting / Construction & Sheltering
Year Ebola report 2014
Annual Result progress report 2014 Rosa Crestani
Angelo Narative report
Ebola interdesk report
Final report Magburaka 2014
Guinea visit report 08.14
OCA Ebola reflection international staff survey
Rapport visite Guekedou 04.04.2015
Call center data analysis for kit distribution nov 2014
Concept note on kit distribution At community level
Item list Household protection kit
Final version of kit distribution report
Distribution Detailled telephone survey analysis
Strategy and tactic kit distribution
Web article kit distribution FINAL
Kit distribution survey result
Ebola push the limit 2014
Liesbeth Fivez Lessons learned CMC Bo 2014
Car park Monrovia dec 2014
Ambulance cleaning and desinfection
Medevac advocacy August 2014
Medevac perspectives per country oct 2014
SOP international medical evacuation of confirmed case Ebola in Sierra Leone Draft
Summary and lessons learned from Kenema and Monrovia incidents and attempts of Medevac.
End mission report flyco Dakar may 2015
Philippe De St Georges End mission report flyco avril 2015
Fligth co hand over oct 2014
Bo base hand over 2015
Community perception in Kailahun
Security rules Sierra Leone 2014
Rapport de visite ECOTL à Gueckedou avril 2015
Informations logistique Guinée Mai 2015
14.12.01 COTL Handover report
15.01.02 COTL Handover report
15.02.25 COTL Handover report
Handover watsanco 15.02.15

Liberia information
Liberia OCB Annual Report 2014 Final
Sitrep Foya Version Finale july 2014
Sitrep OCB Monrovia week 42

Stockholm Evaluation Unit
Médecins Sans Frontières
http://evaluation.msf.org