

EBOLA RESPONSE IN WEST AFRICA

DISSERTATION SUBMITTED IN PARTIAL FULFILMENT TOWARD THE AWARD OF SPECIALIZED MASTER'S DEGREE IN HUMANITARIAN WASH (WATER, SANITATION AND HYGIENE)

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Quotation

May be one day history will tell us that Ebola never won,

But rather Governments failed to act, and that Ebola just simply walked in and meet no resistance. Barring a few brave souls that fought the virus on their own and never relied on the Government coming to help, the victor always write the history what Ebola write about mankind.

"Paul Gilbert"

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This Dissertation is especially dedicated

То

The Almighty GOD and Jesus Christ My family My friends and relatives

ABSTRACT

The 2014 Ebola epidemic in West Africa has been the first in history and is caused by the Ebola virus. It is the most severe outbreak of Ebola since the discovery of the virus in 1976. EVD outbreaks have a case fatality rate of up to 90%. Since the start of the outbreak there have been a total of 28 476 reported confirmed, probable, and suspected cases of EVD in Guinea, Liberia, and Sierra Leone up to 18 October, with 11 298 reported deaths. Liberia and Sierra Leone have demonstrated a great performance in fighting this epidemic, but Guinea is still under process. Despite of the virulence of Ebola virus, there have been many factors which complicated the situation. Behaviours related to socio-cultural, such as traditional burial ceremonies and caring for the sick, political instability, economic situation of the affected states, weak Health system and inadequate WASH infrastructures have not only contributed to the widespread of Ebola but also have complicated to the rapid response of Humanitarian operations. The epidemic was extremely dangerous and the affected governments should not be able to deal with it themselves. United Nations and the whole Humanitarian community have been intervene and by now the affected countries they improving.

Key Words:

- 1 Ebola Virus Disease
- 2 West Africa
- 3 Water Sanitation and Hygiene
- 4-World Health Organization

RESUME

L'épidémie d'Ebola de 2014 en Afrique de l'ouest fut le premier dans l'histoire est causé par le Virus d'Ebola. Ce fut l'explosion la plus sévère de la maladie depuis la découverte du Virus en 1976. L'explosion de la maladie à virus d'Ebola a eu un taux de mortalité maximal de 90%. Depuis le commencement de l'explosion il y'a un total de 20 476 cas probables et suspectés de la maladie à virus Ebola reportés en Guinée, au Liberia et au Sierra Leone jusqu'au 18 Octobre, avec 11 298 décès reportés. Le Liberia et la Sierra Leone ont démontré une grande performance dans la lutte contre cette épidémie mais la Guinée est encore en lutte. Malgré la virulence du Virus Ébola, il y'a eu plusieurs facteurs qui ont compliqué la situation. Les comportements Socio-culturaux comme les cérémonies d'incinération traditionnels et la garde des personnes malades, l'instabilité politique, la situation économique des Etats affectés, un faible système de santé et des infrastructures WASH inadéquats n'ont pas seulement contribué à la propagation d'Ebola mais ont également compliqué la réponse rapide des opérations humanitaires. L'épidémie fut extrêmement dangereuse et les gouvernements affectés ne peuvent s'en occuper seuls. Les nations unies et toute la communauté Humanitaire ont du intervenir et à présent la situation s'est améliorée dans les pays affectés.

Mots clés:

- 1 Maladie à Virus d'Ebola
- 2 Afrique de l'Ouest
- 3 Eau assainissement et hygiène
- 4 Organisation Mondiale de la Santé

LIST OF ABBREVIATIONS

2iE	:	International Institute for Water and Environmental Engineering
WASH	:	Water, Sanitation and Hygiene
EVD	:	Ebola Virus Disease
ED	:	Emergency Department
PPE	:	Personal Protective Equipment
CDC	:	Centre for Disease Control and Protection
WHO	:	World Health Organization
MSF	:	Médecins Sans Frontières
ETC	:	Ebola Treatment Centre
DBM	:	Dead Body Management
ECC	:	Ebola Care Centre
ORS	:	Oral Rehydration Solution
IPC	:	Infection Prevention and Control
UNICE	CF:	United Nation Children's Fund
WFP	:	World Food Program
UNME	ER:	United Nation Mission for

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I. INTRODUCTION

Ebola Virus Disease (EVD) is a severe, often fatal illness in humans. EVD outbreaks have a case fatality rate of up to 90%. West Africa is currently facing the largest and most complex Ebola epidemic on record (CDC, 2014). Guinea, Liberia and Sierra Leone are the countries where the virus has taken the heaviest toll on life (WHO, 2014). Beyond the human tragedy, the disease has had devastating effects on the security, economies and health care systems of the whole region. Poor and rural communities in those countries bore the brunt of the epidemic; their populations have been more likely to fall sick and less likely to recover (MSF, 2014). Due to the low economic situation of the affected countries, weak national health systems and the complexity of the Ebola epidemic, the affected countries have declared a state of emergency response to this outbreak. The situation was not quite simple thus, response to the outbreak require a global solidarity, The urgent and strong responses in multiple areas of intervention are needed to stop the spread of the disease and to support those most affected.

Thus, United Nations has created a United Nation Mission for Ebola Emergency Response (UNMEER) to control and follow up the ongoing outbreak. The UN also through the WHO has been implemented the global road map against Ebola, but without the support of foreign governments, affected governments, international NGOs, UN Agencies and affected community as well, there is no hope of effective response for fighting Ebola (MSF, 2014).

The urgent area of intervention of the humanitarian responses to the EVD outbreak, including emergency medical services, community education and outreach, food, water, sanitation, and hygiene (WASH), as well as logistical support and relief commodities have been deployed in the affected states to support vulnerable communities. Even if we still have a long way to go we cannot ignore a hard work which has been done by various relevant stakeholders to fight against EVD outbreak, but there is still more to be done so as to achieve a total eradication of the disease. It is against this background that this study is focus on examining the various response strategies especially of the affected countries. However, more emphases will be laid on WASH response intervention and its integration with other strategies mentioned above.

Teams of Humanitarian workers responding to the Ebola outbreak in West Africa often face the challenge of finding people and communities living in remote areas. Maps of these regions often do not exist, are not correct, or are outdated. Basic information location of houses, buildings, villages, and roads is not easily accessible, making contact tracing extremely difficult (CDC, 2015).

1.1. Transmission routes of Ebola

Ebola spreads in the community through human-to-human transmission, with infection resulting from direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids of infected people, and indirect contact with environments contaminated with such fluids (WHO, 2013). Ebola is only transmitted through touch, thus it is recommended to avoid touching our mouth, eyes and nose after being in busy public places like stores, airports without disinfecting our hands. Ebola is considered an enveloped virus, which means its outer covering protects itself as it waits to find a host, making it extremely difficult to kill. This enveloped status also helps the virus escape harm from the body's immune system, which is why most people's bodies cannot fight off the Ebola virus naturally. As the Ebola Virus progresses, the use of disinfectants on a regular basis will become more important. For everyday life, vigorous hand washing is good enough to remove most of the germs. However, neither CDC nor other scientific research institutions have proven an effective hand sanitizer which can kill Ebola, but the use of Alcohol Based Hand Sanitizer are still taken as an important precautionary measure. The use of Hand Sanitizers does not kill Ebola virus but will create a slightly inhospitable environment for the virus. In contrast Bleach and Chlorine they are very powerful and they are more effective to destroy Ebola (CDC, 2014).

1.2. General Objectives and Specific Objectives

1.2.1. General Objective

The aim of this work is to review various EVD response interventions and strategies for better understanding its prevention and control in West Africa.

1.2.2. Specific Objectives

Specific objectives are as follow:

- To study the current EVD response plan of affected countries in West Africa
- To highlight the role of water, sanitation and hygiene (WASH) in Ebola response
- To enumerate possible challenges in the EVD response

1.3. Methodology

All of my research has been done through secondary sources such as Books, Journals, medical documentation, and previous studies on the topic as well as reports from different Non-Governmental Organizations (NGOs). However, for the purpose of this review emphasis will be on WASH response in EVD prevention and control.

1.4. Scope of the Study

This study reflect on various EVD response and intervention and is focusing on three countries at the epicentre of the outbreak and which have been most affected by the epidemic, the countries in the case are Liberia, Sierra Leone and Guinea. There are many types of interventions in EVD response which have been done, but this study is only focused on three main responses: Health, WASH, and Logistic.

2.1. Historical Background of Ebola Virus Disease (EVD)

The EVD has discovered first in Democratic Republic of Congo in 1976. Since then, other isolated outbreaks have been reported, generally in the rural areas of Central Africa. Since that time those countries they have succeeded to manage that epidemic. Currently, the situation is not as usual, in 2014 EVD did not only face a single country as it used to be in the past, the epidemic has ravaged the whole region, and the most affected three countries (Guinea, Sierra Leone and Liberia) are still in the battle against the outbreak (Risse, G., 2014).

The great difference between this outbreaks from others is not only the geographical and demographic reach it has achieved nor the mortality rate, but a series of constraints that have stuck its containment. Some of these obstacles are due to the virulence of Ebola, while others are very particular to the region that has been most affected. These include socio-cultural, religious and economic obstacles, as well as others related to each country's infrastructure (Melissa, 2015).

2.2. Current Situation EVD in West Africa

Although there has been substantial progress in slowing Ebola in Guinea, Liberia and Sierra Leon, the epidemic is not over. Thus, the world must remain focused on getting to, and sustaining, zero case. Until they reach zero case in each affected country, the people and economies in the region and beyond will remain at risk. Different stakeholders including World Bank, UN, WHO, Bilateral civil society and private sector partners continue to work closely with the affected countries to restore basic health services, helping countries get all children back in school, farmers back planting in their fields, business back up and running, and investors back into the countries (World Bank Group, 2015).

Since the start of the outbreak there have been a total of 28 476 reported confirmed, probable, and suspected cases of EVD in Guinea, Liberia, and Sierra Leone up to 18 October, with 11 298 reported deaths (this total includes reported deaths among probable and suspected cases, although outcomes for many cases are unknown). Three new cases were reported in the week to 18 October, all of which were from Guinea.

No new health worker infections were reported in the week to 18 October. Since the start of the outbreak a total of 881 confirmed health worker infections have been reported in Guinea, Liberia, and Sierra Leone; there have been 513 reported deaths (WHO, 2015).

No new confirmed cases were reported from Sierra Leone in the week to 18 October. This is the fifth consecutive week that the country has recorded zero cases. Three confirmed cases were reported from Guinea during the week ending 18 October, 1 from the capital Conakry and 2 from the sub prefecture. Liberia was declared free of Ebola virus transmission in the human population on 3 September 2015, it is now 99 days since symptom onset of the last reported confirmed case. The country has now entered a 90-day period of intensified surveillance.

Seven countries (Italy, Mali, Nigeria, Senegal, Spain, the United Kingdom, and the United States of America) have previously reported a case or cases imported from a country with widespread and intense transmission. On 6 October 2015, a patient who was reported as a case in the United Kingdom on 29 December 2014, and who later recovered, was hospitalised in the United Kingdom after developing late EVD-related complications. As of 13 October, a total of 62 close contacts had been identified in the UK for follow-up, of whom 26 have received the vaccine (WHO, 2015).

2.3. Description and localisation of the affected countries

Guinea, Liberia and Sierra Leone are located on the west coast of Africa. They are known to be some of the poorest countries in the world, with extremely high unemployment rates 88% in Liberia and with the majority of the population living below the poverty line 76% in Liberia. The primary sources of subsistence for the general population in the region are agriculture, fishing and hunting (Melissa.W, *2015*).



Figure 1. Geographic Map of the region which is facing Ebola Outbreak

Source: MSF Report 2014: Push to the Limit and Beyond

One of the reasons Ebola had managed to spread so easily through three West African nations is because, families often live on both sides of the shallow, narrow river that divides Guinea from Sierra Leone and Liberia. People can easily shout across the muddy stream, and boatmen readily ferry travellers from one nation to another. If people can cross freely, so can Ebola (CDC, 2015).

2.4. Regional, National and International Coordination against EVD

With an outbreak of nature and magnitude like Ebola, neither organization nor government state could meaningfully work and make impact working on its own. WHO envisages to work primarily within a partnerships framework. Neighbouring countries should focus on containing the spread of Ebola through active case surveillance and contact tracing. Cross-border surveillance is very important strategy of the region's fight against Ebola. In most affected countries, the multi-stakeholder border coordination groups, chaired by the Ministries of Health, are focused on coordinating the efforts of partners to prevent cross-border transmission of Ebola and build preparedness (WHO, 2014). In cooperation with the UN Agencies and International community, the affected countries are strengthening social mobilization EVD response especially at the district level. Volunteers have been mobilised to carry out awareness raising and house to house sensitisation session with a big focus on children and key hand washing messages. The house to house campaign, focus group discussion, massive sensitization in mosque and churches and radio discussion on Ebola prevention and hygiene promotion are ongoing in the affected countries to put EVD under control (IFRC, 2014).

2.5. FACTORS INFLUENCING EVD OUTBREAK

The following are the key factors which might be considered as the main cause and which worsened the recent Ebola outbreak in West Africa:

2.5.1. Environmental factors

Although there is still no conclusive evidence, it is believed that the virus originally came from a species of fruit bats found in Sub-Saharan Africa. It is believed that this bat is a natural host to the virus and can pass it to other wild animals such as monkeys and other mammals which can also spread it to humans. It is further believed that the virus originally came from a region of Liberia called Lofa, which borders with Guinea and Sierra Leone. It is a jungle region close to the Ebola River, which is where the deadly disease gets its name from (Vice News, 2014).

In Guinea, Liberia and Sierra Leone, Bush-meat is an important source of protein as well as a fancied delicacy. Bush-meat basically refers to any type of non-domesticated animal caught in the bush or jungle and may include monkey meat, snake, rodents, bats, etc. Lofa is an

important commercial zone where local hunters take their catches to sell. The meat ends up being sold and distributed throughout the entire region (Melissa, 2015).

Despite local government efforts to prohibit the sale of bush-meat, as well as small educational campaigns warning about the possible risks of handling and consuming bush-meat, this delicacy has continued to be sold in the black markets and has been still consumed regularly even after the start of the epidemic (Many small villages depend on bush-meat for subsistence as it is their only source of protein as well as a main source of income when sold). It is important to recognize that one of the main causes of the outbreak is thought to be the careless handling and consumption of bush-meat as well as direct contact with bats and other wild animals. The spread of the virus has been so extensive, in part due to the lack of attention the general population has given to the warnings on bush-meat consumption (WHO, 2015).

Further environment and geography related causes include the continuous land mass and porous border control between the three countries. While this may benefit individuals who carry out commercial activity between borders, it has allowed Ebola patients to flee from one country to another, bringing with them the deadly virus and promoting its spread.

2.5.2. Cultural and Religious factors

Liberia, Sierra Leone and Guinea are, densely populated countries with significant rural populations whose cultural, ethnic and religious composition is different. In this region most of ethnic groups, their religious beliefs have played an important role in the spreading of the Ebola virus. While each has its own particular culture and beliefs, what they have in common is that great importance is placed on funeral ceremonies and rituals as well as caring for the sick (CDC, 2014).

Majority of the community considered disease to be a punishment for something that the patient or community has done wrong. According to their beliefs, the patient must confess to the wrongdoing that made them deserving of the punishment of falling ill. Furthermore, the sick must pass away in their village or town in order to maintain the natural order of things. Generally their grave is dug inside of the house, behind it or in between two houses. The funeral ceremony is extremely important as it is thought to assure the wellbeing of the spirit of the deceased as well as that of the entire community. If the burial is not done properly, they believe that a curse will be thrown upon them and that this will bring more disease (Fairhead, 2014).

The ceremonies concerning the sick and the dead in some ethnic groups generally require direct contact with the sick or deceased, or with their clothing. Unfortunately, this facilitates the spread of Ebola, as direct contact with bodily fluids is the main form of transmission from human to human. Furthermore, not only does the entire village or town participate in said ceremonies, but neighbouring villages and communities do as well. Evidently, this is the ideal environment for the spread of the virus within and among communities (Fairhead, 2014).

These are some of the common cultural and religious practices that exist not only in the rural parts of these countries, but also in densely settled urban centres. Such beliefs and practices have provoked a rapid and widespread propagation of the virus. These beliefs have also caused resistance towards NGOs recommendations on anticipatory measures as well as towards local and foreign medical aid (CDC, 2014).

The lack of sensitivity to local beliefs has aggravated the situation and caused gaps in medical protocols and mistrust between medical workers and the community. Sadly, the nature of the virus and its spread makes it difficult to respect appropriate medical protocols and still maintain respect for certain beliefs, such as unsafe burials and care for the sickly, as even minimum contact can cause infection. The state of panic amongst population and the impotence of medical workers has frustrated said efforts and helped the spread of the virus. As a result of mistrust, many communities believe that the medical workers are sorcerers and that they themselves have brought the disease to their communities ((Melissa, 2015).

These factors have contributed to the spread of the Ebola virus throughout the region and within its largest cities. It has also created significant resistance to medical and humanitarian aid offered by NGOs.

2.5.3. Political and Economic factors

After all the political disorders Liberia, Sierra Leone and Guinea have faced over the past few decades, it is unfortunate that such a devastating epidemic developed at a time of relative progress. As mentioned later, the infrastructure in the three countries has been very damaged for a long time and not only were they not prepared for an outbreak of such a calamity, but these countries were not even properly equipped to care for patients of other diseases common to the region before the outbreak, such as malaria, AIDS, Cholera, Dysentery, etc (WHO, 2012).

In addition, the government measures taken in order to stop the spread of Ebola were ineffective. Businesses were closed down and massive quarantines were implemented. West Point, a low income sector of Monrovia, was completely quarantined, causing panic amongst its inhabitants, protests, violence, destruction of properties, as well as further tension between the population, the police and the government (Risse, 2014).

2.6. SITUATION OF HEALTH SECTOR IN THE AFFECTED COUNTRIES BEFORE EVD OUTBREAK

In the three affected countries the health systems had limited capacities and skills to identify as possible EVD, as they had never seen the disease before in their countries. In addition, their laboratory capacity were not able to confirm the disease quickly and had to send ill patients to the capital hospitals for diagnosis, which led to further avoidable delays in the confirmation and spread of the virus to the capital cities (MSF, 2014).

Even before the Ebola epidemic, their respective health care systems lacked many items that would have been necessary for the containment of the virus: medication, ambulances, facilities and clinics, properly trained human resources, even basic hygienic equipment such as protective gloves, robes and needles, etc.

This complete lack of medical resources greatly contributed to the rapid spread of the disease, not only amongst the general population but also amongst medical workers (MSF, 2014).

At the time the outbreak began, the lack of space in hospitals and clinics caused the patients to go freely in the streets and entrances waiting desperately for medical attention and with no other place to go. The capacity of the health systems in the affected countries, although improving for certain functions was still limited. The availability of health workers, facilities, equipment and other key health systems inputs were inadequate, and in some cases, the rural areas were hit the worst by these shortages. Several health system functions that are considered essential were not performing well and this prevented the sharing of information and the development of a suitable and rapid response to the outbreak (WHO, 2014).

2.7. SITUATION OF WASH SECTOR IN THE AFFECTED COUNTRIES BEFORE EVD OUTBREAK

Lack of access to water, sanitation, and poor hygiene practices were a serious issue of concern before Ebola, exacerbated the outbreak in the affected countries, and will remain problems after Ebola. Even before the Ebola outbreak, the intermittent or inexistent WASH services in both urban and rural areas was causing major hardships to vast swaths of populations (World Bank 2015).

As mentioned later, the decade long civil wars and political instability in most of the affected countries led to deterioration of and limited new investment in extending WASH systems. Guinea, Liberia and Sierra Leone are among the poorest countries in the world. High rates of new-born, child and maternal mortality plague all three countries, largely from causes that can be prevented in part with improved access to safe water, toilets, and hygiene practices. However, access to safe drinking water and sanitation is extremely low in all three countries, with only 18.9% access to toilets in Guinea, 16.8% in Liberia, and 13% in Sierra Leone. This leads to open defecation; poor management of faeces, and a range of preventable illnesses, including intestinal worms, trachoma (the leading cause of preventable blindness in the world), and diarrhea, the third leading cause of death for children aged one month to five years (Sarina Prabasi, 2014).

During a public health crisis, the consequences only get worse. Without access to WASH near homes, schools or health facilities, and a strong health system, people suffering from water related illnesses are left with no options as health care workers scramble to contain a deadly epidemic, it is expected that mortality from pneumonia, malaria, and diarrhea, easily prevented or treated with access to the health system, will increase in Ebola-affected countries, because basic health care is no longer the priority for health systems stretched beyond capacity (Sarina Prabasi, 2014). A plenty of good quality water, is very important in a Health centre for better protection of patients and Healthcare workers as well. Yet, across sub-Saharan Africa on which the affected countries belonged, only 57% of health facilities have access to an improved source of water (WaterAid America, 2014). This means health care workers are unable to wash their hands, clean bed sheets and clothing worn by themselves or by patients, or wash away bodily fluids and other infectious agents. As a result, health care acquired infections are thought to be up to twenty times higher in sub-Saharan (WaterAid America, 2014).

2.8. ROLE OF LOGISTIC IN HUMANITARIAN OPERATIONS

Humanitarian logistics represents a broad range of activities taking place within humanitarian organizations, the bulk of these activities are also components of a broader humanitarian supply chain, the network involved with providing physical aid to beneficiaries. Within humanitarian operations the core logistics activities are procurement, transportation, storage and distribution of supplies to the beneficiaries (WFP, 2015). In order to function effectively humanitarian logistics must coordinate with other actors and be considered throughout the lifespan of humanitarian operations. Humanitarian operations are most reliant on logistics during the emergency as they distribute food, medical supplies and other necessities of life to affected populations, and lives will be dependent on the speed of logistics activities (Michael Howden, 2009).

Implementing an effective rapid response is critical to limiting the magnitude and duration of Ebola outbreak. Lack of mobile telephone service, easy road access, basic infrastructures, remoteness and complexity of the outbreaks have posed challenges to rapid response, movement of personnel and supplies was greatly hindered by distance, river crossings, poor or non-existent roads, and limited communication options. However, by the intervention of international community logistic cluster has been put in place to deal with those all challenges (CDC, 2015).

During emergencies, coordination is necessary for the success of all relief operations. In 2005 after the United Nations reform, WFP has chosen to lead logistics operations whenever a humanitarian emergency requires a joint response from United Nations agencies and the humanitarian community. The logistics Cluster is a group of Humanitarian organisations who work together to ensure efficient and effective logistics in emergencies. As the global lead of this cluster, WFP is responsible for ensuring that each emergency has a well-coordinated, efficient and effective logistics response, not just for WFP and its food distributions, but also for the larger humanitarian community. In Ebola affected countries, the logistic cluster has been working to support the United Nations Mission for Ebola Emergency Response (UNMEER) and the whole humanitarian community.

Apart from providing food assistance, WFP has been working closely with medical, humanitarian and government partners across West Africa in delivering food, logistic support, planes, helicopters, ships and building treatment centres to fight the Ebola outbreak. (WFP, 2014). WFP has implemented five main strategies in order to facilitate and support humanitarian community's operations in West Africa.

2.8.1. Setting up a logistics infrastructure

As part of its Ebola response plan, logistics cluster established the supply network from main ports and international airports in the affected countries. This includes the setup of a regional logistics hub in Accra, as well as logistics bases in the three capital cities, to channel the flow of medical and humanitarian supplies to where they are needed most. Other bases have also been established in more remote areas of Guinea, Liberia, and Sierra Leone to better reach isolated communities affected by the Ebola Virus Disease outbreak. This infrastructure are supporting the humanitarian community in managing incoming cargo, storage and rapid dispatch of relief items (WFP, 2014)

2.8.2. Flying aid workers and medical supplies.

With very limited commercial flights connecting the affected region, WFP operates the United Nations Humanitarian Air Service (UNHAS) to transport Humanitarian workers and light cargo namely linking Dakar, Accra, Freetown, Monrovia and Conakry, and connecting these destinations with field locations. So far, WFP has also charted two fixed wing aircraft and one helicopter to transport health workers and other humanitarian staff from various organizations fighting the Ebola outbreak (WFP, 2014).

2.8.3. Rapidly dispatching emergency supplies

Moving cargo across the world is time-consuming. Since 2003, WFP has been working to reduce response time by establishing six strategic locations around the world for storing essential relief items for WFP and the wider humanitarian community (United Nation Humanitarian Response Depot network).

The depot are strategically located near disaster-prone area: Accra (Ghana), Dubai (UAE), Panama City (Panama), Las Palmas (Spain), Brindisi (Italy) and Malaysia. By prepositioning these items, UN agencies, NGOs and governments can respond faster and more efficiently to people in need and disasters (WPF, 2014).



Figure 2: United Nations Humanitarian Response Depot Network

Source: WHO, Strengthening logistics capacities for health in Emergency (2010)

Through the United Nations Humanitarian Response Depot (UNHRD), the humanitarian community can store their relief items and call upon their immediate dispatch when a disaster strikes within 48 hours. The depot hold emergency relief goods such as medical kits, shelter items, ready to use food, IT equipment and operational support assets which are all designed to support emergency preparedness and response. In the Ebola response, UNHRD warehouses dispatched items such as protective gear and health kits for partners to the affected countries. In addition, large amounts of operational support equipment such as generators and large storage tents have been dispatched from WFP to set-up logistics bases (WFP, 2014).

2.8.4. Coordinating logistics for the whole humanitarian community

Free transportation, storage, cargo consolidation and management of logistics information to partners who need assistance in getting their goods where they need to go is provided by the Logistics Cluster, a WFP led group of logisticians and logistics information managers from various UN agencies and NGOs who help the humanitarian community to coordinate logistics operations in large emergency responses. Transport and storage of medical supplies such as PPE kits, chlorine, beds and gloves have been facilitated for partners (WFP, 2014).

Logistics has played an invaluable role during the outbreak, they have been constructed four 100 bed Ebola Treatment Units (ETUs) in Liberia for WHO. To build these units, large mobile storage tents were procured by UNHRD and flown in from Oslo, Norway to Monrovia, Liberia. In Guinea, the construction of nine treatment units in key locations has been requested by the Government. Depending on the needs of partners, WFP has been also able to provide other assistance for instance, the procurement and delivery of ambulances and burial vehicle (WFP, 2014).

III. ANALYSIS AND DISCUSSION ON EVD RESPONSE STRATEGIES AND INTERVENTIONS

3.1. HEALTH CARE RESPONSE TO THE EBOLA OUTBREAK

The role of Health sector in fighting against Ebola since the beginning of the outbreak has been proved to be extremely important. The fact that this is a health problem does not mean that they can fight it all alone. It needs a collaborated effort for the interest of all. WHO has been monitoring the evolution of the Ebola outbreak since the start and engage with all actors from governments, technical partners, and field operation partners, donor partners at local, region, and global level. WHO and other partners have deployed experts in the affected countries and mobilized mobile laboratories and clinics to fight against EVD (WHO, 2014). Apart from medical supply and other clinical support, Médecins Sans Frontières (MSF) in partnership with World Health Organisation have set some key preventive measures to bring Ebola outbreak under control (MSF, 2014).

3.1.1. Isolation and care for patients

Patients of EVD cases are isolated in Ebola management centres which are fully staffed by trained medical personnel and provide supportive medical care and psychosocial support for patients and their families. Other suspected cases and other symptoms manifested are equally identified and managed by the trained personnel. All isolated patient are provided with the necessary facilities needed for their survival. All procedures and precautions of preventing transmission by direct or indirect contact are strictly followed. To minimize transmission risk, only authorized and designated staffs are allowed access into these facilities.

The above mechanisms are all under the protocol of WHO of patient and staff safety of which they provided appropriate Personal Protective Equipment (PPE) for healthcare worker (WHO, 2014). Other humanitarian partners are also supporting in the provision of PPEs (MSF, 2014).

3.1.2. Safe burials

Dead bodies of EVD patients are highly infectious. Safe burial practises prevent the risk of contamination for the communities. For patients who die of EVD, proper disinfection by the medical team is done then pass the corpse to the burial team (Infection, Prevention and Control (IPC)). The IPC team then performs the Dead Body Management (DBM) and the safe burial. During the process of disinfection, the body is disinfected with a 0.5% solution, put it

in the body bags and transfer the bags to the mortuary. The process of burial is then taking in collaboration with the psychosocial team who then liaise with the civil and religious authorities and with the families for burial. All procedures of burial is explained to the families so as to respect the traditional burial rites but in a medical manner to avoid cross contamination (WHO, 2014).

Furthermore, there is a special ambulance allocated to the burial team for the transportation of the corpse to the cemetery for burial. All these is done with maximum care and with the help of the PPEs. After burial, the ambulance is totally disinfected with all other materials in contact with the corpse. The whole process has to follow specific protocols for disinfection of the body and the body bag and for protection of the team and of the members of the community (WHO, 2014).

Figure 3. Safe burial



Source: MSF Briefing paper December, 2015

3.1.3. Disease surveillance

Establishment of effective surveillance strategy is recognized globally as the pillar for tackling the outbreaks of infectious diseases as well as elimination and eradication of diseases especially of public health importance. Conducting and promoting effective disease surveillance is a good way in tracing new cases and preventing further pathways of transmission. Surveillance was extended to all boarder post in each of the affected countries so as to avoid missing cases.

Thus surveillance response activities do not only require preparedness, planning and efficient coordination and management of resources, but increasing community awareness, mobilization and participation for further development of the response structure to stem out Ebola epidemic (MSF & WHO, 2014).

This was done through the participation and collaboration of both local and regional authorities. Some of the measures and mechanisms that have been implemented included but not limited to; boarder closure, roadblocks in highly infected areas or regions, restricted movement within and outside quarantine. The informative door to door campaigns have been organized by the countries' respective Ministries of Health. This was in line with the agreed protocol of CDC (Mellisa, 2015).

3.1.4. Contact-tracing

A person with Ebola virus disease can spread the disease to others as soon as he or she begins to have symptoms. Therefore, it is important to identify and isolate symptomatic persons immediately in order to stop the disease from spreading. Contact tracing is one of the tools to effectively break chains of transmission and control EVD outbreaks.

Contact tracing is the process of identifying, assessing and managing people who have been exposed to a disease to prevent onward transmission (MSF, 2014). Medical Staffs are actively asking every patient of their travel history especially within the last 21 days (the maximum incubation period for the disease) or have come in contact with an EVD patient. If contacts are not mapped and followed up, it undermines all the other activities and the disease will continue to spread (CDC, 2014).

3.1.5. Non-Ebola healthcare

Ensure that medical care remains available for people with illnesses and conditions other than Ebola (malaria, chronic diseases, obstetric care, etc.). It is also important to know that one is infected and the other is affected and therefore, the need for psychological treatment to all people. This includes implementing strict policies to protect health facilities and health workers, particularly in areas where they might come into contact with patients (MSF, 2014).

3.1.6. CURRENT EBOLA TREND IN THE AFFECTED COUNTRIES

Since the start of EVD outbreak up to October, 2015 a total of 28 476 reported confirmed, probable, and suspected cases of EVD and 11 298 of them have died (*WHO situation report, 21 October, 2015*). The epidemic was extremely dangerous during its first days, but as along as the interventions and strong strategic plans started the cases of EVD have been decreased remarkably. The diagram below highlight the statistics of cases and deaths of the three affected countries since the start of epidemic up to October, 2015.



Figure 4: Cumulative cases and death in the affected countries

Different international actors intervened to respond to the epidemic but also the efforts of the affected counties played a significant role in reducing and to stop the spread of the virus. Based on the diagram below it is clear that Liberia is performing better than it neighbours to recover from EVD. Since 19-July Liberia is free of EVD but Guinea and Sierra Leone are still facing the case even if the situation has declined. They are different factors which can justify the success of Liberia rather than other, but the main reason is the amount of money and professionals that have poured into the country, good strategic plan toward EVD, efforts of the government and the willingness of the population to slow the spread of EVD.



Figure 5: Situation of Ebola Cases in Guinea, Sierra Leone and Liberia in July- Oct, 2015

Actually, the U.S government has demonstrated great effort in helping Liberia in the battle against Ebola since the beginning of outbreak. Thousands of U.S military troops have been deployed on the ground in Liberia, where they were building a series of hospitals and treatment centers to help in the fight against the epidemic. Ebola treatment units, training of healthcare workers, and more rapid testing played an important role in Liberia's improving situation.

The U.S government also continue to put more effort in increasing local capacity in Liberia to ensure a complete recovery *(FACT SHEET: U.S. Response to the Ebola Epidemic in West Africa).* In contrast, weak efforts in Guinea and Sierra Leone have left the countries more vulnerable to the disease and permitted it to spread more quickly and efficiently. At the beginning of the outbreak, Sierra Leone and Guinea did not have enough resources, funding and people to roll out an effective, comprehensive and expensive relief apparatus, the problem of insufficient of beds for patients also complicated the situation. In addition to that, lack of clean water and ambulance also have negatively impacted Ebola cases in Sierra Leone and Guinea.

3.2. WASH INTERVENTIONS IN EVD RESPONSE

Safe drinking water, sanitation and toilets, and hygiene, collectively known as WASH, are vital for preventing the spread of disease and saving lives (UNICEF, 2014). In case of severe infectious disease outbreak like Ebola, Handwashing with soap especially after contact with someone who is or may be infected, is a potentially key tool in preventing further transmission. Culture and religious behaviours toward water, sanitation and hygiene practices in case of epidemic are the main factors which can influence and aggravate the resistance of a disease. Thus hygiene promotion is very important in this situation in order to cope with the outbreak.

As UNICEF released report mentioned, Hygiene campaigns are currently underway in the three Ebola affected countries, but much more work remains to be done to ensure that the adoption of hygiene behaviours is sustained beyond the current crisis. Safe drinking water, sanitation and toilets, and hygiene promotion and supplies are cornerstones of a healthy population and a health system capable of addressing long-term needs. WASH in health facilities is core to quality health care and critical to protecting health care workers, who are at especially high risk of acquiring Ebola, and are the very people the world is now depending on to contain the spread of a deadly disease (UNICEF, 2015).

3.2.1. Water Supply

Water is required for hydration, disinfection and disposal of waste in Ebola Treatment Centre, Provision and sustaining enough water supply of good quality in Ebola Care Centres and units is key factor in saving lives of healthcare workers and patients. UNICEF as a WASH Cluster lead and NGOs are doing all it takes to make sure these facilities are in place Ebola treatment centres and in the community as well (UNICEF, 2015).

Quarantined communities and isolation centres without access to water should cause a widespread of the disease in entire community. In most affected countries people do not have easy access to water. For example, in Sierra Leon, Freetown a city where accessing water is already a huge challenge for most of its residents (WHO, 2014). In responding to that, ACF (Action Contre la Faim) has designed an easier and suitable innovative solution to resolve the issues of limited access to water faced by quarantined communities.

The **Emergency Water Kiosks** takes lesser than one hour to install for twenty one days of continuous clean water supply. When households are quarantined an ACF team mobilizes by installing the kiosk just outside the perimeter of the households. The kiosk serve one to several households over the quarantine period, Water is refilled by water-trucks on average every two days (ACF, 2015).





Source: ACF, News from Mama Salone, Volume 1, Issue 1. February 2015



Figure 7: Water supply in Isolation centre: Moyamba District in Sierra Leon

Source: ACF, News from Mama Salone, Volume 1, Issue 1. February 2015

In order to put EVD under control, both water quality and quantity are key factors to consider. The following are UNICEF's recommendations for **water supply in Ebola Care Centres**:

- It is expected that 100- 400 litres, is the average of water supply needed per person per day for cleaning, laundry, chlorinated hand washing, chlorinated foot baths, disinfection material and bodies, drinking and preparing ORS (oral rehydration solution) in an Ebola Centre.
- Water for drinking, free residual chlorine should be between 0.3 and 0.5% at the tap and measures should be taken for safe storage.
- Water for washing purpose (laundry), footbath, spraying of foot, and disinfection, free residual chlorine should be 0.5 %. It is essential to consider space and drainage to soak ways in the construction of laundries and showers in the Ebola Care Centres.
- Water quality monitor should be done daily and clean storage containers regularly and ensure a two-day consumption buffer of storage. For the reason of preventing contamination, connections and water supply lines to facilities (including wards, laboratories, and storage tanks) should be separate from lines supplying water to staff. Any water line to facilities should have a non-return valve to prevent contamination of the system (UNICEF, 2014).

In Ebola treatment centre there are three types of water based on its quality which are used for different purposes

- Raw Water: for personal hygiene of patients, laundry, kitchen and washing floors
- **0.05% chlorinated water**: for bare skin disinfection, laundry and cleaning toilets in low risk and very low risk areas
- **0.5% chlorinated water**: for disinfection of the high risk area, disinfection of objects coming from the high risk area (e.g. Personal Protective Equipment PPE items), disinfection of ambulances, footbaths and sprayers (Angioletti et.2015).

3.2.2. Sanitation in Health Care Centers.

When patients are desperately ill with vomiting and diarrhea, good waste management especially keeping vomit, faeces and urine separate from drinking water and segregated from human contact is critical. This is especially true given the high EVD viral load contained in faeces. This involves basic latrines at minimum accessible to all patients and health care workers at each facility.

The use of flush latrines with septic tanks for wastewaters and incineration for solid waste (both regular and contaminated waste) (Angioletti et.2015). World Health Organization's recommendations are for a separate latrine or flush toilet for each individual with a confirmed case of EVD in order to maintain isolation.

Given sanitation access levels in the three countries currently affected by Ebola, it is clear that a strong commitment is needed to ensure that health facilities have sufficient toilets to accommodate their patients, safeguard health workers, and contain the spread of Ebola. Constructing accessible latrines now will help to ensure that health facilities are higher quality and safer in the future, contribute to the overall wellbeing of the population, even in absence of a public health crisis, because well-built latrines and their benefits will outlast this Ebola outbreak (WaterAid America, 2014).

Solid waste management

The approach to solid waste management is to reduce the risks and costs associated with handling and transportation by on site disposal and burning. The area designated for solid waste management should have controlled access to prevent entry by animals, untrained personnel or children. All solid wastes produced from the Ebola Care Centres/Units are potentially contaminated and must be securely collected, transported and disposed using different methods (UNICEF, 2014).

No material or waste should leave patients room, isolation and Care Centres or Units without spraying with or submersing in 0.5% chlorine solution. All Ebola treatment Centres or Units should have a separate waste management and disposal facility for both suspected cases and non-suspected cases (MSF, 2015).

Used bed mattresses of affected patients should be sprayed with 0.5% chlorine solution before burning. Also, biological waste material such as placenta and biopsy samples are to be contained in sealed, leak-proof cadaver bags (or double bags to ensure that there is no leakage) and either buried or burned (WHO, 2014).

All sharps (including syringes, needles, scalpel blades, cannulas and other sharps) are to be disposed of in puncture-resistant/leak-proof sealed disposable containers designed for sharp medical waste collection before incineration. Sharps not fully burnt should be buried in designated waste pits and covered with a layer of soil 10 -15 cm deep. It is also recommended to use pre-heated chamber that apply gas or oil fired incinerators. The puncture-resistant waste containers should be located as close as practical to the patient care area or laboratory where the items are used. It is essential to ensure that total incineration has taken place. Caution is also required when handling flammable material and when wearing gloves due to the risk of burn injuries if gloves are ignited (UNICEF, 2014).

All used disposable Personal Protective Equipment (PPE), non-sharps and other infectious medical waste need to be collected in leak-proof hazard waste bags and placed in covered waste containers. Pouring 0.5% chlorine solution on top of the waste bags prior to being securely sealed as pre-treatment disinfection is recommended. The procedure can create backsplash, so care should be taken to protect the eyes. Pre-treated contaminated medical waste can be transported for incineration in accordance with IFC unit guidelines, or locally incinerated in drums or small mobile incinerators (MSF, 2014).

All other waste generated in the centres (gloves, masks, surgical gowns) should be collected and enclosed in waste bags and cover bins. It is important not to carry the waste bags or cover bins against the body (e.g. on the shoulder). The outside of the sealed waste bag should be sprayed with 0.5% chlorine solution and placed in a designated pit of appropriate depth (2m or about 7 feet) and filled to a depth of 1–1.5 m (or about 3–5 feet) and burned. After burning each waste load, the residual waste should be covered with a layer of soil 10–15 cm deep (MSF, 2014).

When designing solid waste management pits in Ebola Care Centres/Units, it is imperative to consider the type of waste generated, wind direction, distance to Centre/Unit, type of geology and topography, distance to water source, availability and suitability of site and number of patient, staff and waste management technicians required (UNICEF, 2014).

Latrines and Wastewater Treatment

Liquid waste such as urine or vomit should be disinfected by pouring 0.5% chlorine solution and safely flushed into the sewer system if there is an adequate sewage system in place. Where there is no adequate sewage system, urine and vomit should be decontaminated with 0.5% chlorine solution or bleach prior to being flushed into a soak away pit (UNICEF, 2014).

Temporary pit latrines are acceptable and preferred if space and geology allow for site containment. Temporary pit latrines can fill up quickly so it is imperative to ensure you have enough space and resources to construct and decommission temporary latrines (dose the excreta with lime to rise the pH to around 12, cover with soil and compact). It is important to mark decommissioned sites with durable signs. Pour flush latrines connected to stabilization ponds should be considered if construction of temporary pit latrines are not an option and if space and geology allow. It is recommended to construct separate latrines for workers, confirmed cases and suspected cases based on the ratio of one latrine drop hole for each category of persons (UNICEF, 2014).

In order to minimise the volume of liquid undergoing treatment, it is advised to separate grey water from black water and dose the grey water with additional 0.5% chlorine solution before discharge into a soak away pit. If conditions of space and geology allow, construction of simple treatment unit or stabilization pond (with at least 1 hour retention time) with large volume sludge tanks with about two month capacity to maximise value can be suitable. If possible, it is recommended to decommission full sludge tanks on site and construct new ones to avoid high cost incineration of the sludge.

If on site de-commissioning is not possible, ensure sludge has a high pH to accelerate the destruction of the virus before considering off site transportation, digestion, treatment. Common methods and agents for disinfection include sodium hypochlorite (NaOCl), chlorine dioxide (ClO₂), Ozone (O₃) and ultraviolet (UV) light. In designing wastewater management units in Ebola Care Centres, it is important to take into consideration alternative off-site disposal and treatment, distance to Centre, type of geology and topography, distance to water source, viral load, availability and suitability of site and numbers of patient, staff and waste management technicians required (UNICEF, 2014).

3.2.3. Health Promotion and Education

Awareness-raising

Apart from medical intervention MSF, WHO and other relevant stakeholders implemented Health promotion and awareness-raising in the affected countries as one of the key to put EVD under control. Health promotion and raising awareness is the reinforcement of health related knowledge and skills to allow the patient and the community to take better health related decisions and actions.

Unpleasant and useless rumours can start not only because of belief in witchcraft or deliberate scaremongering, but also because of cultural incomprehension and lack of information. With effective health promotion, the population will understand how filovirus haemorrhagic fever (FHF) is transmitted, how to protect themselves from it, how to stop it spreading, what the different outbreak control activities are and who is organising them. This works best when efforts are made to understand the culture and traditions of local communities (WHO, 2014). A well informed population will be less likely to stigmatise survivors or the families of affected people.

Ebola is one of the world's deadliest viruses, with a fatality rate of up to 90%, as there is no known cure, and no vaccine yet, the best way to reduce the rate spread of outbreak is to educate people to recognise the symptoms early, as the risk of transmission is far lower in the early stage of the virus (WHO, 2015). Ebola virus can only be passed on by direct contact with bodily fluids of an affected person or animal (such as urine, sweat or blood), therefore simply raising awareness and health promotion can help in the reduction and prevention of the transmission of Ebola outbreak (WHO, 2014).

3.2.4. Promotion of Handwashing

One of the most important measures to inhibit transmission of EVD is to practice routine hand hygiene before and after every patient encounter. Hand hygiene is effective with soap and water or alcohol-based hand rub. These are preferred over hand washing with 0.05% chlorine which can be harmful to the skin and eventually lead to risk of lesions and infection (UNICEF, 2014).

However, it is recognized that there might be no alternative to chlorine at times. Health workers and patients in Ebola Care Centres should regularly wash their hands with soap and running water after visiting or taking care of Ebola patients. Hand washing with water and soap as a good practice for viral prevention, is part of other measures recommended by WHO and should be practiced in community, schools, health centers and other public places to help prevent the spread of Ebola virus. Hygiene education materials and messages should be displayed and visible in all areas of the Ebola Care Centre/Unit, and hand washing facilities should be checked on a regular based to ensure availability of water and soap and proper drainage for grey water (UNICEF, 2014).

Figure 8: Handwashing one of the ways of EVD prevention



Source: Interagency Collaboration on Ebola. Situation Report No. 8 October 2015

IV. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

Throughout this study we have seen that a number of socio-cultural factors, such as traditional burial ceremonies and caring for the sick, mistrust towards the government and overall political instability have not only contributed to the widespread of Ebola but also have complicated to the rapid response of Humanitarian works.

Humanitarian workers and health workers have risked their lives to support patients and help control the Ebola outbreak which led to the reduction of cases in the affected countries.

There is, however, still a lack of medical resources and space for proper treatment. Additionally, the persistence of cultural practices that contribute to the transmission of Ebola continues to be one of the hardest obstacles to overcome.

Overall, this epidemic has aggravated impacts especially in relation to poverty, health, WASH and education.

In addition to all of the factors that have been discussed later, the poor initial response of the affected countries, late response by local governments, and insufficient international aid, are important factors to consider. The local response was very weak and also the first alerts did not receive an efficient response immediately. Rather the international community gave the impression to wait until the situation was critical and their own population might be at risk.

Although the number of cases has declined as the statistics has been demonstrated, on the other hand the region is still very vulnerable and may continue to need international support into the future, until such time that the region is fully recovered from the Ebola outbreak and is able to start fresh.

4.2. Recommendations

- Health sector strengthening must be prioritised. In order for this to happen there must be strategic involvements that include well paid medical workers, improving an appropriate environment for patient treatment, environment friendly plans for disposal of medical equipment and improvements in institutional matters.
- The establishment of long term contingence plans to prevent future outbreaks and enhance capacity for risk. This should include awareness campaigns, health promotion and education as well as the construction of appropriate facilities for containing future cases.
- Efforts to wipe out certain social attitudes towards EVD, such as stigmatisation of the disease, its spread and patients. This can be done through projects in collaboration with survivors who can testify and provide information on the risks of infection.
- The affected countries still need more relief aids, grants and concessional loans to effectively stimulate full recovery.
- More resources are needed effectively in all aspects of Ebola control. This includes access to WASH related facilities, education, safe homes for orphans, counselling for patients, survivors and their relatives, testing and early warning systems, medical research centres.
- The tested vaccine for the cure of EVD should be released to the countries at an affordable price to help curbed the menace of EVD and its impact especially on economy.
- Above all, more research is needed in the epidemiology and anthropology nature of the disease so as to come up with sound and effective control and prevention measures

Limitation of the Study

The information provided by this study have been corrected through different reports and documentations already published on Ebola. In fact, I did not do a field work or conduct interview and due to the time constraint and wideness of the topic, I did not have enough time to do a deep research. Thus, information provided in this review is not a limitation on Ebola Outbreak response.

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