Research Article

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The Republic of Guinea and Ebola hemorrhagic fever outbreak

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ABSTRACT

Background: The authors analysed the Ebola Virus Disease (EVD) outbreak in Guinea. They summarised the epidemic impact on the country's health care system, its economy, education, domestic policies and its international cooperation.

Methods: This was a descriptive study based on statistics, published by the World Health Organization (WHO) in the Ebola Situation Reports in response to the Ebola Hemorrhagic Fever (EHF) outbreak in West Africa.

Results: It was found that of November 21st 2015, Guinea had 3351 confirmed cases of EVD and 453 probable cases, the disease had claimed the life of 2536 people with a fatality rate of 66.6%. The epidemic had an important impact on the country's economy, education, domestic policies and international cooperation.

Conclusions: The EVD outbreak in Guinea was one of the longest Ebola outbreaks in the world. It pointed out the weakness of the Guinean health system. This should be an opportunity to ensure that the country's health system is strengthened. A robust surveillance measure to ensure the rapid detection of any reintroduction or re-emergence of EVD or other diseases of obligatory declaration should be reinforced.

Keywords: Guinea, Ebola, Outbreak

INTRODUCTION

The Republic of Guinea has faced one of the most serious epidemics in this modern time. The first cases occurred in the prefecture of Quéckédou in the Forest region at the end of 2013. Patients suffered from fever, vomiting, diarrhea, aching muscles or joints, difficulty swallowing, breathing difficulties, diffuse bleeding, noble organs failure and death followed. The local press had echoed it as a mysterious disease since the syndrome was not well known in the region. It was only after months of investigation by the public health team that the diagnosis of Ebola hemorrhagic fever (EHF) was selected and

confirmed by the Pasteur Institute in Lyon, France. The contagiousness of the Ebola Virus Disease (EVD) with high morbidity and high fatality among health care professional was noted and the government made an official announcement in early March 2014 that Guinea is facing an EVD outbreak. In April 16, 2014 the Ministry of Health of Guinea stated a cumulative number of 197 cases with 122 deaths from the disease, and the disease had already claimed the lives of 23 health care workers.¹

In April 2014, Sierra Leone enhanced its surveillance and prevention activities for viral hemorrhagic fevers (VHF) following the death of 2 probable cases of EVD in one

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family who died in Guinea and their bodies repatriated to Sierra Leone. This was the beginning of the spread of the outbreak to neighboring countries as in Sierra Leone and Liberia, as well as to several prefectures of Guinea including Conakry, the capital city. Afterwards, several tropical disease research institutes turned their attention to the epidemic. We can mention among others the Pasteur Institute in Lyon, Paris, Dakar; the research institute of tropical diseases, in Russia; the Pasteur Institute of Kindia, in Guinea; the Center for Disease Control and prevention (CDC) in the US; and the Research Laboratory of Tropical Diseases in Winnipeg, Canada. In addition, several national, international organizations and countries started supporting Guinea for a global response to Ebola outbreak.

On March 25th, 2014 the WHO Global Emergency Management Team graded the outbreak as a Level 2 emergency and mobilised international resources to support the response. Accordingly, all 3 levels of WHO activated their Strategic Health Operations Centres (Emergency Operations Centres).² The goals of this paper are as follows: (i) illustrate the epidemiological the Ebola outbreak trend in this West African country; (ii) recapitulate the response to the outbreak; (iii) summarize the impact of the epidemic on the Guinean Republic; and (iv) recommend the best strategies for the future.

Presentation of guinea and its health system

The Republic of Guinea, a country in West Africa, sharing borders with: Ivory Coast (610 km), Guinea-Bissau (386 km), Liberia (563Km), Mali (858 km), Senegal (330 km) and Sierra Leone (652 km); and has a coastline on the Atlantic Ocean (320 km). The Guinean population was estimated in July 2002 at 7,775,065 inhabitants³ and as of 2014 is now estimated at 12.1 million inhabitants.⁴ Administratively, the country is divided into 33 prefectures and the special zone of Conakry the capital city with 5 urban communes. Its perfectures are: Beyla, Boffa, Boke, Coyah, Dabola, Dalaba, Dinguiraye, Dubreka, Faranah, Forecariah, Fria, Gaoual, Gueckedou, Kankan, Kerouane, Kindia, Kissidougou, Koubia, Koundara, Kouroussa, Labe, Lelouma, Lola, Macenta, Mali, Mamou, Mandiana, Nzerekore, Pita, Siguiri, Telimele, Tougue and Yomou.

Guinea has a pyramidal health system based on Alma Ata Primary Care system; with 410 primary health centers in neighborhoods and villages, followed by 9 communal health centers and ameliorate secondary health centers in the 5 communes of Conakry and 4 rural municipalities, then come the 33 prefectural level hospitals which represent the health districts level, and the 7 regional hospitals at the regional level. Finally, at the top of thy pyramid, there are three national hospitals (Donka, Ignace Deen and the Sino-Guinean) that consist of the three University Teaching Hospitals in Conakry. Guinea has seen blooming private health care services and a few universities with schools of medicine.

The country has been a pioneer country in implementing the Alma-Ata Primary Care in the 80s and the country thought it had a good health care system. This Ebola outbreak highlighted the weakness of the Guinean health care system. It is recognized that health resources are not equally shared in the country. This discrepancy is becoming worse. A report underlined that health resources have been poorly shared since 48% of resources went to 20% of the wealthier population; but, only 4% went to 20% of the poorest population. Additionally, health workers are concentrated in Conakry with 60% serving only 20% of the country population.⁵ The structures were expecting to work well. It is in Guinea that the Ebola outbreak started, unfortunately the country was not well prepared for public health surveillance, and consequently the epidemic lasted longer.

METHODS

This study is descriptive and covers the period from January 2014 to November 21st 2015. It is based on the compilation of statistics published by the World Health Organization (WHO) as Ebola Situation Reports in response to the EHF outbreak in West Africa.⁶ In the reports three forms of diagnosis are reported (confirmed, probable and suspect), in this paper we will be referring to the definitions suggested by the WHO. WHO, classified Ebola cases as suspected, probable, or confirmed depending on whether they meet some criteria as follows:7 (i) Suspected case is any person, alive or dead, who has (or had) sudden onset of high fever and had contact with a suspected, probable or confirmed Ebola case, or a dead or sick animal or any person with sudden onset of high fever and at least three of the following symptoms: headache, vomiting, anorexia/ loss of appetite, diarrhoea, lethargy, stomach pain, aching muscles or joints, difficulty swallowing, breathing difficulties, or hiccup; or any person with unexplained bleeding or any sudden, unexplained death.; (ii) A probable case is any suspected case evaluated by a clinician or any person who died from 'suspected' Ebola and had an epidemiological link to a confirmed case but was not tested and did not have laboratory confirmation of the disease; and (iii) A confirmed case is a probable or suspected case that is classified as confirmed when a sample from that person tests positive for Ebola virus in the laboratory. In this paper, we will focus on probable and confirmed Ebola cases. The suspected Ebola cases are excluded because this diagnosis is often transitory until confirmation.

RESULTS

The Figure 1, presents the Chart of Cumulative Ebola Confirmed and Death Cases in Guinea as we can see, the fatality rate of this disease was very high at the beginning of the outbreak but as soon as the epidemic was on going, the fatality rate decreased. The fatality rate varied from 55% to 70%, with an average of 66.6%. The Figure 2, the

Pie showed that most of the cases with 88.1 % were lab confirmed cases; only 11.9% were classified as probable cases. It should be noted that most of the probable cases were classified retrospectively post-mortem or before the availability of Ebola lab diagnosis in some prefectures.

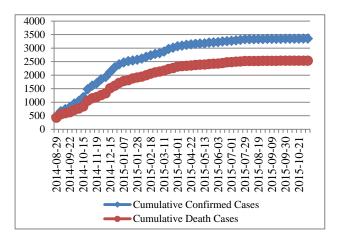


Figure 1: Cumulative Ebola confirmed and death cases in guinea.

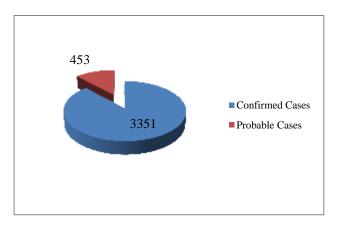


Figure 2: Pie of confirmed and probable cases of Ebola in guinea on November 4th 2015.

DISCUSSION

What was done?

This section describes the EVD outbreak management in Guinea. It should be mentioned that EVD was well known in some countries particularly, in Africa and a lot of partners had some experiences for its management. As recommended by Feldmann and Geishert, and WHO case management was essential and base on: (i) isolation of patients and use of strict barrier nursing procedures, personal protection devices, (ii) ban of traditional burial and promotion of security burial with dignity, (iii) a good waste disposal by a good ring infection prevention control (IPC) in all public and private health care services, (iv) training health care staff, educating population through various social mobilization strategies, and (v) various researches.

To gain control of this Ebola outbreak in Guinea, several strategies were implemented:¹

- Response Coordination. It should be highlighted that WHO was coordinating the response in all affected countries and daily conferencing was occurring for risk assessment, operational planning and review. The Global Outbreak Alert and Response Network (GOARN) Operational Support Team was mobilizing international expertise in clinical case management, surveillance and epidemiology, data management, IPC, outbreak logistics, social mobilisation, risk communications and medical anthropology. It is in collaboration with GOARN that the Public Health Agency of Canada (PHAC) mobilised its staff for Ebola Response in West Africa.
- Several partners participated in the response in Guinea: Médecins Sans Frontières, Switzerland, Médecins Sans Frontières, France, the Centers for Diceases Controle and Prevention (CDC), USA, PHAC, etc. The UN agencies as UNICEF, International Migration Office, national and international NGOs. The support from bilateral cooperation as France, Russia, USAID, Cuba, Ivory Coast, Germany, Japan, Great Britain, etc.; and multilateral cooperation as: European Union, African Union, West African Economic Association, Francophonie, etc. Just to point out that several donations or support from countries, organizations and national and international NGOs are not listed here.
- The Guinean Virology Laboratory in Donka was supported by International reference laboratory (Institut Pasteur Dakar, Senegal; the Centre International de Recherche en Infectiologie (CIRI), Lyon, France., the European Union Mobile Laboratory team (comprising the Centre International de Recherche en Infectiologie (CIRI), France; the Bernhard-Nocht Institute of Tropical Medicine Hamburg, Germany; the National Institute for Infectious Diseases, Rome, Italy); and the Canadian Mobile Laboratory, from Winnipeg.
- Cross-border collaboration and cooperation were actively promoted among the affected countries and a good screening strategy was implemented at the Conakry airport.
- Prevention through risk and behaviour change using Information Education and Communication (IEC) and Social mobilisation. IEC strategies were put in place using the national radios, televisions, and opinion leaders (imams, priests, national artists and political leaders). Then, multimedia approaches were used to raise public awareness and support community mobilisation in fighting the outbreak.
- Safe case management was implemented in the Ebola Treatment Units (ETUs). The first one in Conakry was inside of the Donka National Hospital before moving in Nongo ETU. An ETU was created

in all affected prefectures (Queckedougou, Macenta, N'Zerekore, Forecariah, Boke, Dubreka).

- Surveillance and epidemiology strategy aim to contact tracing and active research in public and private health care services.
- IPC implementation in all health care settings and promoting good hand hygiene in the population daily life was challenging.
- The safe burials were a difficult strategy to implement because of reluctance Doctors without Borders staff have encountered in the field.
- logistics Response were reinforced implementation of a national Emergency Center (EOC) in the Ebola National Committee Coordination as well as the EOC for some partners as the CDC, which has decentralized its EOC in a few prefectures as Kissidougou, Kankan, Labe. Other logistical support included the provision of ambulances to almost all Guinean health services, the renovation of most health services and offices and provision of services with personal protective equipment (PPE) and other VHF response materials and equipment. These effective PPEs are recognized beneficial disaster management strategy for Ebola.⁹
- Multiples research was undertaken for behavioural change and understanding more about the Ebola virus. In the first months of Ebola outbreak in this region, researchers encouraged WHO in its practices and sharing data with all researchers who wish to lend their skills to help stop the tragedy.

Key points of the Ebola epidemic in Guinea can be summarized by following; the health burden and the impact on the health care system, education, tourism, economy and domestic policies.

Health burden and the impact of the epidemic on the health system

On November 21st, 2015, Guinea had 3351 confirmed cases of EVD and 453 probable cases, the disease had claimed the life of 2536 people with a fatality rate of 66.6%. At that date, the country was in its 23rd day without any Ebola confirmed case and on its 5th day of the rollback count to 42 days to declare the country of Ebola free. A study recognized that the case fatality rate in the Conakry capital city was lower than the rates reported in other prefectures.¹¹

The biggest impact on the Guinean health system has been the fact that the epidemic has claimed the lives of several health workers, nurses, stretcher-bearers, lab workers and physicians. In Guinea, there were 196 health workers infected with the Ebola virus and 100 died. These deaths installed a real psychosis in the medical community, and this psychosis was extended to the general population. Figure 1 and 2 provided the trends of disease in several months and the proportion of confirmed cases. We have noticed that the outbreak has remained in the country all the year without any

particular seasonal fluctuation as suggested by some studies as the ones reported by Pinzon and collaborators. ¹³

The epidemic has helped to understand the weakness of the Guinean health care system because it was understood that the system was unable to cope with this deadly epidemic. The health system's shortage of logistics services to support safe care for the sick people was noticed. There were no ambulance equipped for the disease, no adequate isolation centers, and inexperienced medical staff facing an unknown disease. That led to deficiencies in recognition of the disease epidemiological acquaintance and its poor management.

The epidemic has also damaged the confidence of the population in the health care system. This led people to abandon frequenting all health care services. Consequently the rate of attendance in all health care services decreased by 50-70% in these 2 years (2014-2015) compared to the same period of 2013. This has been accompanied by lower hospital revenues throughout all the country.

The impact of the epidemic on the economy

The national economy has been seriously undermined by the epidemic. All economic sectors were affected from family economy through small and medium size enterprises to key sectors such as trade, agriculture, tourism, transport and mining. All airlines that use to fly or stop in Conakry's airport, except Air France and Air Morocco, decided to prohibit the destination. However, the epidemic started when investors began to make Conakry one of their preferred destinations, and stopped coming into the country leading others to leave. Most investors already in the country were eager to take the first available flight out to not risk being locked in Guinea, while those outside the country had major excuses for not visiting the country. Therefore; we saw several companies and organizations putting their activities and investments in slow motion, such as Rio Tinto, some airlines, and SAG (Société Aurifer de Guinée). Since the Ebola outbreak and especially with the declaration of State of Health Emergency all population gathering were prohibited, therefore art promoters, and artists also went through a lean period.

Impact of Ebola epidemic on international cooperation

This outbreak will not leave beautiful memories between Guinea and some of its historic allies. We have seen some countries like Senegal close its land, air and sea borders for a period of eight months. Canada has prohibited the issuance of visas to visitors leaving the country in the epidemic areas as Guinea since the last quarter of 2014. In several countries; especially in Africa, Europe and America, an outbreak of the Ebola prevention platform is in place. Screening strategy is in place in all airports, particularly at Morocco, France, Belgium,

Canada and the United States of America airports. The worst came from the issuance of the visa ban on the Hajj in 2014 and 2015 to Guinean, depriving more than 7,000 candidates every year rally Mecca in Saudi Arabia to perform their fifth pillar of Islam. Stigma deprived of the pilgrimage, to all Guineans events to those who had not visited the country for over 2 years. Consequently, the Guineans outside the country who wanted to go to Mecca with a Guinean passport were denied the visa. It has also been two years that the Guinean faculty from the Medicine, Odonto-Stomatology Pharmacy and Department at Conakry University are banned to participate to the CAMES competition. That is why some authors have urged health professionals and societies to challenge inappropriate political responses to public health crises. 14

On the other hand, several international organizations and governments have strengthened their cooperation by their actual presence with the Government and people of Guinea. We have provided a no exhaustive list above.

The impact of the Ebola epidemic on the national education

The National education was an unfortunate victim of this epidemic. The opening of classes that was expected on October 2nd, 2014 could not be done until on January 19th, 2015. The psychosis of the epidemic prevented thousands of pupils and students to be present the first weeks of opening. It took a great mobilization of school authorities and students' parents associations to overcome certain reluctance. Thus, in some prefectures the stocks of antiseptics and thermostats for Ebola preventions were vandalized as in Faranah, Mamou and Labé.

The impact of the Ebola outbreak on domestic policies

The celebration of national independence that is programmed cyclically in different regions of the country, was included in the administrative region of Mamou October 2, 2014 has been postponed until October 2, 2015. Soccer game is one of Guinean national sport that mobilizes all of the country regardless political divergence, but unfortunately, it has been 2 year that the the Guinean team has been obliged to relocate its soccer international competitions in Morocco far from its adepts.

CONCLUSION

To conclude this analysis, we appreciate the government and international community efforts which limited damages that could have been worse linked to this EVD. We cannot ignore the sacrifice taken by all respondents in this response. We recognize the stress they put themselves in and the risk they were taking in order to save the life of other people, the long hours worked and their professional commitment. We would like to highlight where we should go from here. This EVD outbreak in Guinea was one of the longest Ebola

outbreaks in the world, as it lasted almost 2 years. It is an opportunity to reorient Guinean health care system to make it more efficient in detecting and managing any future epidemic.

The first thing to do is to ensure that the country's health system will continue to function when the outbreak ends and all partners leave the country. A robust surveillance measure to ensure the rapid detection of any reintroduction or re-emergence of Ebola virus disease or other disease with obligatory declaration should be reinforced. The daily reporting of febrile diseases, the community death and safe burials after samples of swabs collected from dead bodies should continue at least for six months. The national EOC should extend its activities to the diseases with mandatory declaration in Guinea. The EOC activities should be fully integrated with the ministry of health operation. The office of the Ebola National Committee Coordination should also be fully integrated into the health department portfolio. It will only be with sustainable surveillance strategies that we can prevent and capture outbreaks earlier in the country for better outcomes. That is why WHO and other speakers at Hyogo Framework for Action meeting in Washington, implored the conference audience to work for the long term development of robust national medical teams that were specific to the region, country and disaster.15

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