

# Environmental Health Officer Emergency Preparedness and Response on Ebola Outbreak (Case of Environmentalist at Ijebu-Ode, Ikenne, Odogbolu and Sagamu L.G.A) Ogun State

Agboola H.O  
agboolahabib@gmail.com

<sup>1</sup>Department of Health Promotion and Education  
Ogun State College of Health Technology Ilese-Ijebu, via Ijebu Ode  
P.M.B 2081, Ijebu Ode

Rosiji C.O.  
comfortseyi@yahoo.com

<sup>2</sup>Department of Environmental Health and Disease Control  
Ogun State College of Health Technology Ilese-Ijebu, via Ijebu Ode  
P.M.B 2081, Ijebu Ode

## Abstract

*Ebola Virus Disease (EVD; also known as Ebola Haemorrhagic Fever (EHF)) is a disease of humans and other primates caused by Ebola Viruses. This study is to determine the emergency preparedness and response in Ebola Viral Disease outbreak by Environmental Health Officers in selected Local Government Areas of Ogun State (Odogbolu, Ijebu- Ode, Sagamu, and Ikenne Local Government Areas). Two Hundred (200) Environmental Health Officers present in the population area were selected using simple random sampling technique. Descriptive statistics of frequency count and percentage table was used to show the demographic aspect of the data while inferential statistics of chi-square was used to analyse the hypotheses stated in the study. The results of the findings made it clear that the respondents were prepared in responding and handling of Ebola Virus Disease outbreak in the study area. In conclusion, the researchers recognize the heroic efforts of Environmental Health Officers both national and international, who have sacrificed their lives in the effort to stem the spread of disease. It was recommended that there should not be a general ban on both local and international travel and trade; restrictions regarding the travel of EVD cases and contacts should be implemented. Also, International bodies should fully support the Governments of the countries and member states of the United Nations (UN) in coordinating with regard to international assistance in response to the Ebola crisis.*

## Introduction

Ebola virus disease (EVD; also referred to as Ebola Haemorrhagic Fever (EHF)) or simply Ebola is a disease of humans and other primates. It is a severe haemorrhagic illness caused by infection with one of several Ebola viruses. Ebola is an extremely virulent pathogen and represents a major public health threat in Africa (Choi & Croyle, 2013). Infection with Ebola virus causes profound immune suppression and a systemic inflammatory response that culminates in potentially fatal damage to the vascular, coagulation and immune systems (Feldmann & Geisbert, 2011). The case fatality rate of the disease is as high as 90%, leading to concern that Ebola virus could be used as an agent of biological warfare (Madrid, Chopra & Manger, 2013). Signs and symptoms typically start between two days and three weeks after contracting the virus, with a fever, sore throat, muscle pain and headaches. Then, vomiting, diarrhea and rash usually follow, along with decreased function of the liver and kidneys. At this time, generally, some people begin to bleed both internally and externally (WHO, 2014). Death, if it occurs, is typically six to sixteen days after symptoms appear and is often due to low blood pressure from fluid loss. (Ruzek & Daniel, 2014).

Ebola Haemorrhagic fever in Africa is a potential threat for global public health for several reasons. We now live in a globalized world where people and objects can travel quickly from one part of the globe to another, a disease as potentially contagious as Ebola could also travel rapidly. This is coupled with the fact that there is no cure, and once someone is infected with Ebola Hemorrhagic fever, there is a chance that it will spread and infect others.

Several outbreaks in humans and nonhuman primates have been registered in the decades since the virus was first identified in the mid-1970s, most recently in Uganda, the Democratic republic of Congo during the summer of 2012 (Mbonye, Wamala, Winyi-Kaboyo, Tugumizemo, Aceng & Makumbi, 2012), Guinea and Liberia in the spring of 2014 (Baize, Pannetier & Oestereich 2014). On July 20, 2014, an acutely ill traveller from Liberia arrived at the international airport in Lagos, Nigeria, and was confirmed to have Ebola virus disease (Ebola) after being admitted to a private hospital. This index patient potentially exposed 72 persons at the airport and the

hospital. The Federal Ministry of Health, with guidance from the Nigeria Centre for Disease Control (NCDC), declared an Ebola emergency. Lagos, (with a population of 21 million) is a regional hub for economic, industrial, and travel activities and a setting where communicable diseases can be easily spread and transmission sustained. Therefore, implementing a rapid response using all available public health assets was the highest priority (CDCP, 2014).

Emergency preparedness is a programme of long-term development activities whose goals are to strengthen the overall capacity and capability of a country to manage efficiently all types of emergency and to bring about an orderly transition from relief through recovery and back to sustained development, hence outbreak control requires a coordinated series of medical services, along with a certain level of community engagement. The necessary medical services include rapid detection and contact tracing, quick access to appropriate laboratory services, proper management of those who are infected, and proper disposal of the dead through cremation or burial (WHO, 2014; CDC, 2014). Prevention includes decreasing the spread of disease from infected animals to humans (WHO, 2014). This may be done by only handling potentially infected bush meat while wearing protective clothing and by thoroughly cooking it before consumption. It also includes wearing proper protective clothing and washing hands when around a person with the disease. Samples of body fluids and tissues from people with the disease should be handled with special caution (WHO, 2014).

The Ebola haemorrhagic fever response activities to date have generated significant knowledge on the effectiveness and limitations of current approaches, highlighting key areas for course corrections. Environmental Health Officers have a great role to play in Disaster and Emergencies both before such situations arise and its long term management. Among all, a massively scaled and coordinated international response is needed to support affected and at risk communities in intensifying response activities and strengthening national capacities at all levels.

### **Objectives of the study**

#### **Broad Objective**

The objective of this study is to know how prepared the Environmental Officers in selected Local Government Areas of Ogun State are to EVD (Ebola Virus Disease) and how they would respond to EVD (Ebola Virus Disease) outbreak.

#### **Specific Objectives**

This study will specifically;

- Identify how the people respond to the spread of EVD through scaling up effective, evidence-based outbreak control measures,
- determine peoples' preparedness in preventing the spread of EVD (Ebola Virus Disease) to the communities,
- ascertain those at risk,
- determine the level of health education the community has about the disease.

### **Research hypotheses**

This research will test the following hypotheses at 0.05 level of significance:

- I. There is no significant difference in knowledge and level of awareness on causes and prevention of Ebola Haemorrhagic fever among Environmental Health Officers of Ogun State.
- II. There is no significant difference in safety measures taken by Environmental Health Officers towards prevention of Ebola Haemorrhagic fever outbreak in Ogun state.
- III. There is no significant difference in systematic approach towards clinical management of Ebola haemorrhagic fever among Environmental Health Officers of Ogun State.

### **Significance/Justification of study**

The Ebola haemorrhagic fever response activities to date have generated significant knowledge on the effectiveness and limitations of current approaches, highlighting key areas for course corrections. Environmental Health Officers are frontline health officers in preventing and managing emergency health situations. Among all, a massively scaled and coordinated international response is needed to support affected and at risk countries to intensify response activities and strengthening national capacities at all levels particularly the Environmental Health Officers.

### Research Methodology

This research involves a cross-sectional descriptive research design. Data were collected from environmental health officers in Ijebu- Ode, Odogbolu, Ikenne and Sagamu Local Government Areas of Ogun State on emergency preparedness and response to Ebola Outbreak.

### Sample and Sample Techniques

The sample for this study consists of two Hundred (200) Environmental Health Officer present in the area of study. The environmental health officers were chosen using random sampling techniques to select fifty (50) officers from each Local Government Area.

### Instrument for Data Collection

The source of data collection was distribution of well-prepared questionnaire for the purpose of this research to the respondents. The questionnaire consists of two sections, A and B section respectively. The section A, deals with the demographical data of the respondents and section B, of the questionnaire centered on eliciting facts in respect of the research hypotheses. The questionnaire was first validated by a team of Environmental Health scientists in the School of Environmental Health Sciences, Ogun State College of Health Technology Ilese-Ijebu.

### Data Collection and Data Analysis

The data for this study was distributed and collected on the spot from the Environmental Health Officers once they finished filling them. Frequency count, simple percentage and inferential statistic of chi-square analysis were adopted in analyzing data obtained in the field survey. Table shall also be prepared to present the responses of the respondents towards the hypotheses tested at a glance. The formula for the chi square ( $X^2$ ) is

$$X^2 = \frac{\sum (O-E)^2}{E}$$

Where O = the observed frequency, E = the expected frequency,  $\Sigma$  = summation

### Result, Presentation and Data Analysis

**Table I: Distribution of respondents to knowledge about Ebola Virus Disease**

Variable	Frequency (%)
<b>Have you heard about Ebola Virus Disease</b>	
Yes	192(96)
No	8 (4)
<b>Total</b>	200 (100)
<b>*Route of transmission of Ebola Virus Disease</b>	
<b>Ebola can transmitted through body fluid (such as Silva, sweat and blood)</b>	176(92)
<b>Eating or handling of bush meat and bats Through infected pet contact</b>	156 (81.25)
<b>Total</b>	192
<b>Ebola can mutate and become air borne</b>	
Yes	12(6)
No	188 (94)
<b>Total</b>	200 (100)
<b>Ebola Virus is less contagious than other infectious disease.</b>	
Yes	
No	156 (78)
<b>Total</b>	44 (22)
	200 (100)

\* Multiple Responses chi-square ( $x^2$ )= 60.88, df = 5,

**Table II: Safety Measures in prevention of Ebola Virus Disease**

Variables	Frequency (%)
<b>* Prevention of Ebola Virus Diseases outbreak</b>	
<b>Environmental Sanitation</b>	194 (97)
<b>Personnel Hygiene</b>	186 (93)

<b>Use of Personal Protective Equipment</b>	176 (88)
<b>Safe burial practices</b>	166 (83)
<b>* Government policy in preventing Ebola Virus Diseases</b>	
<b>Adequate</b>	144 (72)
<b>Fairly adequate</b>	32 (16)
<b>Not adequate</b>	24 (12)
<b>Total</b>	200 (100)
<b>Ebola Virus disease can be transmitted from patient with no symptom of the diseases</b>	
<b>Yes</b>	180 (90)
<b>No</b>	20 (10)
<b>Total</b>	200 (100)

\* Multiple responses chi-square ( $\chi^2$ )= 7.23, df = 4,

**Table III: Shows Systemic approach towards management of Ebola Virus Disease**

Variable	Frequency (%)
<b>Ebola Virus Disease can be managed</b>	
<b>Yes</b>	184 (92)
<b>No</b>	16 (8)
<b>Total</b>	200 (100)
<b>Ebola Virus Disease patients should be stigmatized and litigations taken against them</b>	
<b>Yes</b>	4 (2)
<b>No</b>	196 (98)
<b>Total</b>	200 (100)
<b>Ebola Virus Disease can only be managed in special facilities</b>	
<b>Yes</b>	152 (76)
<b>No</b>	48 (24)
<b>Total</b>	200 (100)

chi-square ( $\chi^2$ )= 1.03, df = 2,

## Testing of Hypotheses

### Test of Hypothesis I

- **H<sub>0</sub>**: There is no significant difference in knowledge and level of awareness on causes and prevention of Ebola Haemorrhagic fever among Environmental Health Officers of Ogun State.
- **H<sub>A</sub>**: There is significant difference in knowledge and level of awareness on causes and prevention of Ebola Haemorrhagic fever among Environmental Health Officers of Ogun State.

Table I shows the knowledge and awareness of the respondents to Ebola virus disease. The result shows that the Health Officers are aware of the existence and aetiology of Ebola virus disease; the means of transmission and possible mutation. The chi-square value is 60.88 with degree of freedom of 5, also agrees that majority of the respondents have high knowledge and level of awareness on causes and prevention of the disease, hence the Null Hypothesis is rejected in favour of the Alternate hypothesis which states that: 'there is significant difference in knowledge and level of awareness on prevention and causes of Ebola Haemorrhagic fever among Environmental Health Officers of Ogun State'.

### Test of Hypothesis II

- **H<sub>0</sub>**: There is no significant difference in safety measures taken by Environmental Health Officers towards prevention of Ebola Haemorrhagic fever outbreak in Ogun state.
- **H<sub>A</sub>**: There is significant difference in safety measures taken by Environmental Health Officers towards prevention of Ebola Haemorrhagic fever outbreak in Ogun state.

Table II shows safety measures in prevention of Ebola Virus Diseases. The result shows that the Health Officers are safety ready in a case of Ebola disease outbreak in the community. The chi-square value is 7.23 with degree of freedom of 4, hence the null hypothesis is accepted in favour of the Alternate hypothesis which states that: 'There

is no significant difference in safety measures taken by Environmental Health Officers towards prevention of Ebola Haemorrhagic fever outbreak in Ogun state’.

### **Test of Hypothesis III**

- **H<sub>0</sub>**: There is no significant difference in systematic approach towards clinical management of Ebola haemorrhagic fever among Environmental Health Officers of Ogun State.
- **H<sub>A</sub>**: There is significant difference in systematic approach towards clinical management of Ebola haemorrhagic fever among Environmental Health Officers of Ogun State.

Table III shows systemic approach towards management of Ebola Virus Diseases. The result shows that the majority (92%) Health Officers believe that Ebola disease outbreak can be managed even if though it is not curable. The chi-square value is 1.03 with degree of freedom of 2, hence the null hypothesis is accepted in favour of the Alternate hypothesis which states that: ‘There is no significant difference in systematic approach towards clinical management of Ebola haemorrhagic fever among Environmental Health Officers of Ogun State’.

### **Conclusion**

Ebola Haemorrhagic fever in Africa is a potential threat for global public health for several reasons. This is coupled with the fact that there is no cure, and once someone is infected with Ebola Haemorrhagic fever, there is a chance it will spread and infect others. The results obtained in this research shows that the Environmental Health Officers are fully aware of the menace caused by Ebola virus diseases, as the health workers are emergency ready to help maintain a cleaner and Ebola virus-free environment in the case of an outbreak. This research work recognizes the heroic roles/efforts of both national and international Environmental Health Officers, who will have to sacrifice their lives in an effort to stem the spread of the disease and this further underlines the importance of the preparedness these health officers/personnel in the case of an outbreak.

### **Recommendation**

Based on the above findings, the following recommendations were suggested:

1. The general public should maintain a healthy environment and prevent contact with infected human body fluids.
2. It is also recommended that there should not be a general ban on both local and international travel and trade but restrictions regarding the travel of EVD cases and contacts should be implemented, anyone who has stayed in areas where cases were recently reported should be aware of the symptoms of infection and seek medical attention at the first sign of illness.
3. Regular hands on training programmes (IEC: information, education and communication strategies like flow charts) on hospital safety practices, personal safety barriers, safe injection practices, safe disposal of hospital waste should be encouraged and practiced.
4. The implementation of massive and sustained public awareness programmes to increase the knowledge of the general populace, focusing on mode of transmission, context-specific preventive measures such as addressing myths and misconceptions; and promoting safe burial practices should be encouraged.
5. It was recognized that a united, coordinated and increased effort is needed in order to contain the outbreak and provide the necessary and appropriate assistance to the communities affected.
6. International bodies should fully support the Governments of various countries, and step down intervention strategies to states, and local councils concerned. The United Nations (UN) is step up coordination with regard to international assistance in response to the Ebola crisis.

### **References**

- Baize S., Pannetier D., & Oestereich L. (2014). Emergence of Zaire Ebola Virus Disease in Guinea-Preliminary report. *New Engl J Med Adv. Publication*.
- Centre for Diseases Control and Practice (2014). Ebola Virus Disease Outbreak — Nigeria, July–September 2014. *Morbidity and Mortality Weekly Report (MMWR) Weekly: 63(39); 867-872*
- Centre for Diseases Control and World Health Organization (2014). Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting (PDF). *Atlanta, Georgia, US: Centres for Disease Control and Prevention*.
- Choi J.H., & Croyle M.A. (2013). "Emerging targets, & novel approaches to Ebola virus prophylaxis and treatment". *BioDrugs 27 (6): 565–83*.
- Feldmann H., & Geisbert T.W. (2011). "Ebola haemorrhagic fever". *Lancet 377 (9768): 849–62*.

- Madrid P.B., Chopra S., & Manger I.D. (2013). A systematic screen of FDA-approved drugs for inhibitors of biological threat agents. *PLoS ONE*, 8(4): e60579.
- Mbonye A., Wamala J., Winyi-Kaboyo O., Tugumizemo V., Aceng J., & Makumbi, I. (2012) Repeated outbreaks of viral hemorrhagic fevers in Uganda. *Afr Health Sci*, 12(4): 579.
- Ruzek S.K., & Singh D. (2014). *Viral Haemorrhagic Fevers*. Boca Raton: CRC Press, Taylor & Francis Group. p. 444.
- World Health Organization (2014). Six months after the Ebola outbreak was declared: what happens when a deadly virus hits the destitute? *Geneva, Switzerland*: Available at <http://www.who.int/csr/disease/ebola/ebola-6-months/en>.