

# An Assessment of the Knowledge, Attitude, and Practice towards Ebola and Marburg Fever amongst Residents in Kailahun District, Sierra Leone

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## Abstract

**Background:** Ebola Virus Disease (EVD) and Marburg Virus Disease (MVD) belong to a group of febrile diseases classified as Viral Hemorrhagic Fevers (VHF) caused by distinct families of RNA viruses. This study which was conducted in October 2021 in Kailahun district in Sierra Leone employed Focus Group Discussion (FGD) tools to assess the Knowledge, Attitude and Practices (KAP) of residents of Kailahun district towards the prevention, control and management of EVD and MVD, and to identify their knowledge gaps for both diseases. **Methods:** Two hundred and eighty (male=140, female=140) mixed study participants with ages ranging between 18 years and above from four chiefdoms in Kailahun district were assessed for their KAP using tools developed from previous KAP studies on VHF that were conducted in Guinea and Sierra Leone. Twenty eight FGD sessions were conducted in this study; seven FGD sessions per chiefdom with each FGD session lasting for 45 minutes. **Results:** Overall knowledge about EVD was good among the FGD respondents but lacking for MVD. Majority (99%) of the study participants said one can become infected with EVD by touching an EVD infected person. **Conclusion:** We reported a high level of knowledge on EVD but low level for MVD by the study participants a consequence of the previous EVD outbreak in West Africa in 2013-2016.

**Keywords:** Ebola Virus Disease (EVD); Marburg Virus Disease (MVD); Viral Hemorrhagic Fevers (VHF); Focus Group Discussion (FGD)

## Introduction

Yellow fever, EVD, MVD, dengue fever, lassa fever, crimean-congo haemorrhagic fever and rift valley fever belong to a group of febrile diseases classified as VHF [1]. Transmission of EVD and MVD is primarily through coming in contact with the infected bodily fluids of human and the animal vectors such as bats and monkeys. VHF patients may present a wide range of symptoms such as high fever, gastrointestinal symptoms and hemorrhage [2].

An EVD outbreak in Guinea, Liberia and Sierra Leone in 2014 later spread to other countries prompted the World Health Organization (WHO) to declare such outbreak as a public health emergency of international concern [3,4]. Sierra Leone which recorded its first EVD case in May 2014 reportedly recorded more than 8,000 EVD cases and 3,000 EVD related deaths [4]. The WHO estimated that more than 28,000 cases and 11,000 EVD related deaths

occurred during the West African Ebola outbreak. Some authors [5-8], have published extensive details of the clinical, laboratory and epidemiological characteristics of EVD patients affected by the West African EVD outbreak. Some authors have claimed that children were relatively unaffected during EVD outbreaks [8,9]. Which reflects the variation in the epidemiology, clinical features and outcomes of pediatric EVD cases? VHFs are contagious even after the incubation period [11], rendering them to be associated with nosocomial and occupational infection [12]. Healthcare Workers (HCW) accounted for 3.9%

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of all EVD reported cases compares to 5% during the EVD outbreak in the Democratic Republic of the Congo in 2014 [13,14]. There has been no MVD outbreak in Sierra Leone so far but its pathogen has been isolated from 11 Egyptian rousette fruits bats in the country [15]. MVD presence in bats like EVD represents an elevated risk for people who depend on these bush meats as source of food source. Since HCWs are on the frontline of outbreaks, and coupled with the fact that most people depends on bush meats as sources of food and livelihood in many parts of Sierra Leone the KAP among these target groups invariable form a key pillar of VHF outbreak preparedness and Infection Prevention and Control (IPC). Few KAP studies have identified the misunderstandings, misconceptions and risk practices relating to EVD [16-18]. One KAP study reported low knowledge, negative attitudes and practices by HCWs towards EVD while another concluded that the KAP level by HCWs towards EVD suspect cases varies by region affected by an EVD outbreak. Our study was done to assess the KAP of residents of four chiefdoms in Kailahun District in Sierra Leone towards EVD and MVD outbreak prevention and control. We are unaware about any joint KAP study towards EVD and MVD amongst people with elevated risk in Sierra Leone neither has any KAP study done on MVD in Sierra Leone. Our study thus will fill these research gaps by assessing generally the joint KAP towards both EVD and MVD amongst people living in outbreak prone regions in Sierra Leone.

## Material and Methods

### Study setting and site

This study was conducted in October 2021 in Kailahun district in Sierra Leone. Kailahun district is located in the east and share borders with the Republics of Guinea and Liberia. The district has 12 community health centers, 31 community health posts, 11 maternal child health posts, one government hospital, and one government clinic. The district is subdivided into fourteen chiefdoms and includes other major towns like Segbwema, Koindu, Pendembu and Daru Jaluahun, Luawa, Upper Bambara and Jawei chiefdoms were selected for this study because of their location, cultural and sociodemographic diversity and large population size.

### FGD instruments and scoring system

The KAP questionnaires for our study were developed from previous KAP studies on EVD [19,20]. All questions on knowledge from previous KAP studies were adjusted for EVD only while we designed all KAP questions for MVD. Our questionnaire scoring system was such that if more than 75% of the responses to questions relating to a specific concept in the questionnaire are correct, the general response to that specific concept was scored as “good”. We also asked

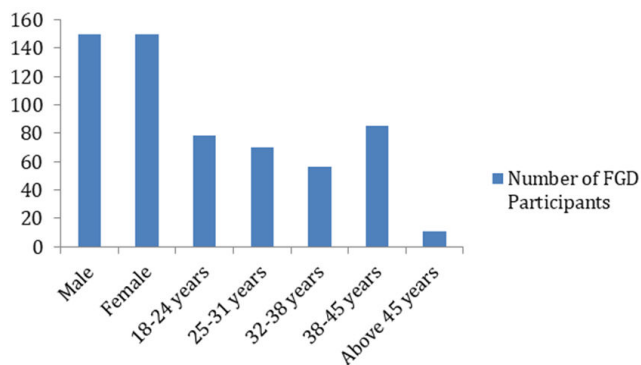
FGD respondents open-ended questions relating to the actions/steps to be taken if there is an EVD or MVD outbreak in their communities and changed the binary questioning structure of possible answers in the Guinea KAP study 20 to a five-point Likert scale to capture the frequency of practices towards EVD and MVD [21,22].

### Study design, data collection and sampling

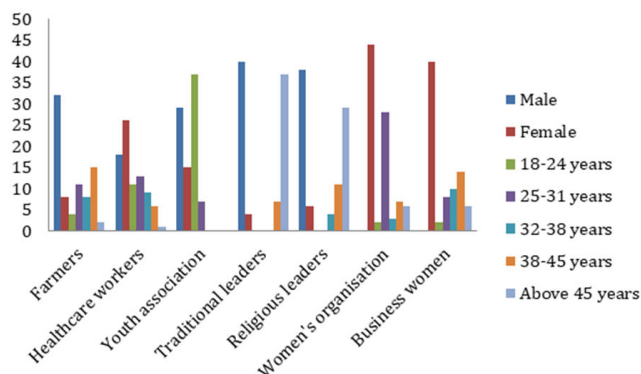
The study comprised of two phases: Phase One which was the pre-deployment phase included planning activities and preparing the FGD guide, recruitment and training of FGD participants, as well as informing the relevant authorities in Kailahun district about the time and places for the FGD sessions and phase two included the deployment of FGD surveyors and conducting the FGD sessions. Seven FGD surveyors were trained on the content and proper administration of the FGD questionnaires, each FGD surveyor pre-tested the FGD questionnaires before field deployment. A purposive non-probability sampling technique was used to select 280 FGD participants from our study sites. A purposive non-probability sampling technique was used because we want our study subjects to come from our already identified target groups, as well as for all participants within each FGD session to be identical in terms of their sociodemographic characteristics and the roles they play in society. A total of twenty eight FGD sessions (seven FGD sessions per chiefdom) were conducted in the various chiefdom headquarters towns for this study.

### Respondents

Three hundred (male=140, female=140) mixed study participants with ages ranging from 18 years and above from four chiefdoms in Kailahun district were recruited for this study. The 280 FGD participants took part in twenty eight FGD sessions that were conducted in Kailahun district, seven FGD sessions per chiefdom lasting for 45 minutes and specifically targeting individuals belonging to either women or youth associations, or are business women, farmers, religious or traditional leaders, or healthcare workers. These individuals were selected because we believed they were either at elevated risk for EVD and MVD infections or that they can play vital role in EVD and MVD risk communication. The number of FGD participants in each FGD session ranged from 10-11. Members for the various FGD sessions came from various. Only residents of the four selected chiefdoms who were 18 years and above were selected to take part in the various FGD sessions (Figures 1 and 2).



**Figure 1:** Distribution of FGD participants by sex and age group.



**Figure 2:** Distribution of study participants according to FGD sessions.

## Statistical analysis and ethical review

We used R software package version 3.3.1 [19], for all data analyses. We presented the various variables as either frequencies or percentages. The Sierra Leone Ethics and Scientific Review Committee (Opinion Date October 12, 2021) approved this study. Written informed consent was obtained from all respondents prior to the commencement of the focus group discussion.

## Results

### EVD and MVD knowledge and awareness

Overall knowledge about EVD among FGD respondents was high but lacking for MVD, all FGD participants have heard of EVD, whilst only 2% said they have heard about MVD. All FGD respondents said they witnessed, know someone who survived or died of EVD during the 2013-2016 West African EVD outbreak, majority (98%) of the FGD participants said they got the information about MVD in 2021 through social media or the radio, few (2%) participants said they heard about MVD from healthcare workers during a workshop or training.

### EVD and MVD mode of transmission, and risk groups

There was a high comprehensive knowledge about EVD transmission and prevention but such knowledge was sparse for MVD. Majority (99%) said one can become infected with EVD by touching an EVD patient as well as an EVD contaminated objects, or by eating Ebola Virus (EV) infected bush meat; few (1%) however said they don't believe someone can become infected with EVD from eating an EV infected bush meat since according to them the meat would have been boiled and hence killed the EV. Eating wildlife was mostly associated with the cause of EVD (84%) compared to 16% ( $p=0.001$ ) who linked the transmission of EVD by other means. Few (2%) respondents believed that both EVD and MVD are caused by the same pathogen, and have the same transmission mode. All FGD respondents said they would like to receive additionally information about the mode of transmission for both EVD and MVD. All FGD respondents successfully identified individuals (healthcare workers, traditional healers, business women, and hunters) who are at high risk for both infections, 2% of the FGD respondents believed that EVD and MVD share similar at risk individuals.

### Isolation of EVD and MVD suspect cases

There were considerable mixed responses on what the term 'isolation of EVD and MVD suspected cases meant. Majority (88%) defined the concept to include the removal from the community of a suspected EVD or MVD case to prevent the spread of the disease to other uninfected person scoring high ( $p<0.02$ ). Few (12%) defined the term as merely the removal of a suspected EVD and MVD case. Majority (96%) believed that the isolation of both EVD and MVD suspected cases is an important means of preventing the spread of both diseases to unaffected persons.

### EVD and MVD sign and symptoms

All FGD participants correctly identified the signs and symptoms of EVD as portrayed in the diagrams that were presented to them; all of them also understood from social media and radio messages, as well as from rumors that EVD and MVD have similar signs and symptoms. Majority of the FGD participants correctly identified hemorrhage (97%), diarrhoea (95%), fever (95%) and red eyes (93%) as symptoms of EVD ( $p<0.001$ ). Majority (87%) of the FGD participants doesn't know the incubation period of MVD; few (2%) said the incubation period for MVD is the same as that for EVD.

### Hand hygiene practice

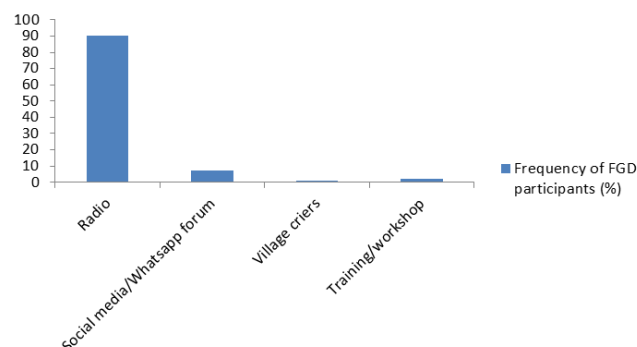
Majority (91%) of the FGD participants when asked do people in your community wash their hands regularly answered negative. All participants said hand hygiene practice died down after the EVD outbreak in 2013-2016 and immediately after the 2020 COVID-19 outbreak due to the reduction of the threats from the two pandemics. Few (9%)

participants claimed that hand hygiene practice frequency has reduced at community level because of the lack hygiene items such as soaps, detergents and hand sanitizers. The following are the results of EVD and MVD prevention and health seeking behavior attitude obtained from the FGD sessions:

- All of those who claimed to have heard about MVD agreed that the preventive action for EVD also works for MVD.
- All respondents agreed to avoid human bodily fluids in order to avoid becoming infected with EVD and MVD.
- All respondents agreed to avoid burial rituals of an EVD and MVD infected deceased person.
- Majority (98%) agreed that first point of call during EVD and MVD outbreaks is the local health authorities; few (2%) said their first point of contact is their traditional leaders.
- Majority (99%) agreed that early treatment seeking behavior for an EVD patient can improve the patient chances of survival.

### Mode of communicating EVD and MVD information

The following were believed to be the best means of disseminating EVD and MVD health information (Figure 3), radio (90%), social media especially Whatsapp (7%), workshops and community meetings (2%), and village criers (1%). Majority (92%) of the FGD participants said their main source of information about EVD and MVD are the local health authorities, 8% said it is their traditional leaders.



**Figure 3:** Distribution of FGD participant responses according to the sources of EVD and MVD information.

### Discussion

To our knowledge this is the first KAP study on EVD and MVD conducted in Sierra Leone. There is a generally high level of knowledge of EVD but low level for MVD as a result of the West Africa Ebola outbreak in 2013-2016. In our opinion the West Africa EVD outbreak in 2013-2016 heightened awareness for EVD. The low adherence to hand hygiene practice which was also reported in one study on Sierra Leone points to complacency among Sierra Leone towards many crucial health issues. The observed low adherence to hand hygiene practice has the tendency to heighten the risk towards EVD and MVD outbreak and also

make EVD and MVD outbreaks difficult to contain. Our reported large proportion of FGD participants who accurately identified hemorrhaged as EVD symptom presents a risk in missing out EVD index cases during outbreak since occult or no hemorrhaging was very prominent during the 2013-2016 West Africa EVD outbreak although the symptom was paramount in previous outbreaks. The speculation by FGD participants that EVD and MVD have similar clinical signs and symptoms indicates knowledge gap which may lead to the misdiagnosis of both EVD and MVD cases during the onset of an outbreak. This gap however does not seem translate into a lack of deficiency in prevention practices towards both diseases.

### Conclusion

Our KAP assessment study showed that while FGD participants possess good general knowledge of EVD such knowledge is however lacking for MVD. These FGD participants were able to identify all the clinical signs for EVD but accurately speculated those for MVD though there has never been an MVD outbreak in Sierra Leone. Such knowledge deficiencies about MVD warrant the need for more training and workshops on MVD transmission, prevention and control. Our study also hinted the danger of misdiagnosis of suspected EVD cases for that of MVD cases.

### Ethics Approval and Consent to Participate

The Sierra Leone Ethics and Scientific Review Committee (Opinion date 15<sup>th</sup> December 2021) and the Institutional Review Board at Njala University, Sierra Leone approved this study. The Sierra Leone Ethics and Scientific Review Committee provided ethical clearance for conducting this study.

### Competing Interests

All authors declared they have no competing interest.

### Funding

Funds for the conducting the FGD was provided for by the World Health Organization Country Office in Sierra Leone.

### Authors' Contribution

JBK, TS, and JJ conceived and designed this study as well as organized the conduct of this research in the research field. JBK, TS and JJ performed the statistical analysis. JBK, EOC and WHO Team drafted the manuscript. JBK, TS, EOC, WHO Team and JJ critically reviewed and revised the manuscript. JBK, EOC and WHO Team oversaw the collection and collating of the research data. EOC and WHO Team obtained ethical clearance.



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