

Commentary

The resurgence of Ebola disease outbreak in North-Kivu: viewpoint of the health system in the aftermath of the outbreak in the Democratic Republic of Congo

 **Bives Mutume Vivalya, Astride Lina Piripiri, Jean Bosco Kahindo Mbeva**

Corresponding author: Bives Mutume Vivalya, Department of Psychiatry, Kampala International University Western Campus Bushenyi, Bushenyi, Uganda. drmutume@gmail.com

Received: 13 Feb 2021 - **Accepted:** 11 May 2021 - **Published:** 12 May 2021

Keywords: Ebola virus outbreak, repetitive outbreaks, Democratic Republic of Congo

Copyright: Bives Mutume Vivalya et al. PAMJ - One Health (ISSN: 2707-2800). This is an Open Access article distributed under the terms of the Creative Commons Attribution International 4.0 License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article: Bives Mutume Vivalya et al. The resurgence of Ebola disease outbreak in North-Kivu: viewpoint of the health system in the aftermath of the outbreak in the Democratic Republic of Congo. PAMJ - One Health. 2021;5(5). 10.11604/pamj-oh.2021.5.5.28372

Available online at: <https://www.one-health.panafrican-med-journal.com/content/article/5/5/full>

The resurgence of Ebola disease outbreak in North-Kivu: viewpoint of the health system in the aftermath of the outbreak in the Democratic Republic of Congo

Bives Mutume Vivalya^{1,2,&}, Astride Lina Piripiri³, Jean Bosco Kahindo Mbeva⁴

¹Department of Psychiatry, Kampala International University Western Campus Bushenyi, Bushenyi, Uganda, ²Department of Internal Medicine, Masereka General Hospital, North-Kivu, Democratic Republic of the Congo, ³Kinshasa School of Public Health, Faculty of Medicine

University of Kinshasa, Kinshasa, Democratic Republic of Congo, ⁴Department of Public Health, Official University of Ruwenzori, North-Kivu, Democratic Republic of Congo

&Corresponding author

Bives Mutume Vivalya, Department of Psychiatry, Kampala International University Western Campus Bushenyi, Bushenyi, Uganda

Abstract

Ebola disease outbreak is a threatening killer that occurred at unpredictable locations and times. The horror of the 26 recorded outbreaks since 1976 had led to numerous skills centered on fighting the Ebola virus including the development of vaccines and drugs. To date, the Democratic Republic of Congo has been affected by twelve Ebola disease outbreaks. The index case of the twelfth Ebola outbreak declared on February 6, 2021, in North-Kivu province brings out a potential link between the twelfth Ebola outbreak and the tenth; the transmission of the Ebola virus from a survivor to his wife who received the vaccine against the Ebola virus and the disruptive infection and prevention control measures in the aftermath of an outbreak. This commentary highlights the importance of the application of the One Health approach, the implementation of long-term infection and prevention control surveillance, and the integration of the Ebola disease outbreak response into the existing health system. These measures should allow the early detection of infectious diseases and should minimize the occurrence of the next outbreaks in the previously affected region.

Commentary

Ebola disease outbreak (EDO) is a threatening killer that occurred at unpredictable locations and times. The horror of the 26 recorded outbreaks since 1976 had led to numerous knowledge centered on fighting the Ebola virus disease [1]. Although the high-risk areas of EDO are well identified, the recurrent coming back of outbreak is far from being controlled in these regions [2]. In response to the tenth EDO in the Democratic Republic of Congo (DRC), the clinical use of approved drugs by the Food Drug Administration (FDA) has been endorsed by international organizations [3]. Even with these updates on fighting EDO, the occurrence of the twelfth EDO in a previously affected region on February 6, 2021 [4], calls for the rethinking of specific public health measures to prevent the repetitive EDO.

The historical background of EDO: following the occurrence of two simultaneous outbreaks in the Nzara area, South Sudan, and in the Yambuku area, near the Ebola River, Democratic Republic of Congo (DRC); the EDO was found to be correlated to the animal outbreaks. Ebola virus is transmitted by direct contact with the blood or any secretions from any objects used by the infected animal or persons. To date, the DRC, Sudan, Ivory Coast, Gabon, Republic of Congo, Uganda, and South Africa are countries that have been affected by EDO. Also, five viral types were discovered namely Zaire, Sudan, Bundibudyo, Reston and Tai forest. EDO occurred in areas with similar geographic and meteorological components [5]. Three years after the first outbreak in Sudan, EDO occurred in the same region. In Mai 1995, EDO occurred in Kikwit. From 1994 to 2002, Gabon was affected by four EDO. In 2003, two outbreaks occurred in the Republic of Congo and were concerned by 143 infected people with 128 deaths. West Africa was disturbed by the deadliest EDO characterized by more than 11.000 deaths between 2014 and 2016. The DRC has been concerned by twelve EDO; the tenth EDO which occurred in an insecure region was characterized by more than two thousand deaths and took nearly two years [5,6]. While the eleventh occurred in Mbakanda, the twelfth occurred on February 6, 2021, in North-Kivu.

Lessons learned from repetitive EDO: the control of EDO-related burden has been a target of international health organizations since 1976. The recognition of viral agents and the means of transmission were early the target of researchers. Public health preventive measures were implemented through the involvement of epidemiologists, microbiologists, virologists, veterinary doctors, and medical doctors in the Ebola emergence response. Moreover, the West African EDO brought out the importance of community engagement, the treatment of infected patients in the Ebola treatment center, and the implementation of an inter-sectoral response team to handle the outbreak. The vaccines and drugs approved by the FDA were used during the tenth

EDO in DRC [3-7]. The urge to prevent the extension of the outbreak to the unaffected regions leads the national and international organizations to provide financial support, training, logistic provision, supervision during EDO. A parallel health system is usually installed in the short-term for close coordination of EDO response [7]. However, the resurgence of EDO sets out the need for further a rethinking of public health emergency response.

Index case records of the twelfth EDO in DRC:

numerous studies have revealed the impact of the existing health system on the aftermath of the EDO. A recent study showed that the healthcare workers needed training at the beginning of EDO [8]. The Ebola emergency response not only is conducted by international organizations but also stopped after the declaration of the end of the outbreak. The long lifespan of the Ebola virus in the sperm of Ebola survivors exposes to the occurrence of the next outbreak [9]. Moreover, there is a gap of knowledge for how long a person who had already received the vaccine is protected for Ebola disease. Therefore, there is a potential link between the twelfth EDO in DRC and the tenth given that these occurred in the same region in an interval of fewer than nine months. The clinical history of the index case records of the ongoing EDO in DRC highlights the gaps of preventing the recurrent outbreaks: a 42-Year old woman, who received the Ebola vaccine, married to an Ebola survivor during the tenth EDO, and who had a negative Polymerization Chain Reaction test control for Ebola in November 2020 attained the health center on February 1, 2021, with seven days history of chest pain and hematemesis. Ebola virus disease was suspected and the smear for testing was taken on February 2, 2021. The clinical disturbance of the index case motivated to be transferred to a tertiary health facility, located nearly 25 km from, and where the patient reached the same day using a bicycle without any personal protective equipment. One day after her admission, the patient died, her body spent two days in the mortuary, and her burial was carried out by her own family members on February 5, 2021.

On February 6, 2021, the lab findings revealed a positive Polymerization Chain Reaction test for Ebola virus disease [4]. This case evidences not only the potential transmission of the Ebola virus from a survivor to his wife but also the partial application of infection and prevention measures and the insecure bury by the family members of a suspected Ebola virus disease in a region recently affected by EDO. To date i.e. on February 14, 2021, two of the four cases had received the Ebola vaccine during the tenth EDO.

Propositions to reduce the repetitive outbreaks:

although it is difficult to disrupt the transmission of the Ebola virus from animals to human beings, numerous studies have proposed the implementation of the One health approach to stop the parallel human outbreaks to the animal ones on the ministry of health work-plan related to emergency response and preparedness [7,9]. To handle the morbidity and mortality linked to EDO, the development of Ebola vaccines could be followed by specific and independent studies to highlight the period during which the person who received Ebola vaccines is fully protected from the EDO. The integration of EDO response into the existing health system could strengthen the long-term infection and prevention control measures into the health facilities through the long-term training of healthcare providers and surveillance of infectious diseases with high epidemic potential [10]. Special programs and funding should be focused on the prevention, in the aftermath of an outbreak, of the occurrence of the next outbreak among the relatives of the survivor of EDO. A recent study showed that the end of an outbreak is followed by the disrupted provision of personal protective equipment, financial motivation, and the lack of close monitoring [7]. This may be the important factor of repetitive occurrence of EDO in the region previously affected by EDO, besides the ecological component.

Conclusion

The coexistence of Ebola outbreak's survivors and animals transmitting Ebola virus increases the risk of the next outbreak in an already affected region by Ebola disease outbreak. The integration of the emergency response into the existing health system and the close surveillance of epidemic disease can strengthen the infection and prevention control measures in the aftermath of the outbreaks, and then they can allow the early recognition of next outbreaks. Healthcare providers should be aware that the Ebola virus exists within the community either through the Ebola survivors and the animals. Further researches should be conducted to determine the period of protection by the Ebola vaccine.

Competing interests

The authors declare no competing interests.

Authors' contributions

All authors contributed equally to this commentary by reading and approving the final manuscript for its eventual publication.

Acknowledgments

We acknowledge the healthcare providers who were involved in the emergency response against the twelfth Ebola disease outbreak in the Democratic Republic of Congo.

References

1. Roca A, Afolabi MO, Saidu Y, Kampmann B. Ebola: a holistic approach is required to achieve effective management and control. *Journal of Allergy and Clinical Immunology*. 2015 Apr 1;135(4): 856-67. **PubMed** | **Google Scholar**
2. Petrosillo N. Ebola Virus Disease: a lesson in science and ethics. In *Ethics and Integrity in Health and Life Sciences Research* Emerald Publishing Limited. 2018 Dec 6. **Google Scholar**
3. Rohan H, McKay G. The Ebola outbreak in the Democratic Republic of the Congo: why there is no 'silver bullet'. *Nature immunology*. 2020 Jun;21(6): 591-4. **PubMed** | **Google Scholar**
4. CNBC. World health organization warns of potential for more Ebola cases after woman dies in DRC. Accessed on February 13, 2021.
5. Pourrut X, Kumulungui B, Wittmann T, Moussavou G, Délicat A, Yaba P *et al*. The natural history of Ebola virus in Africa. *Microbes and infection*. 2005 Jun 1;7(7-8): 1005-14. **PubMed** | **Google Scholar**
6. Kawuki J, Yu X, Musa TH. Bibliometric analysis of Ebola research indexed in web of science and scopus (2010-2020). *BioMed research international*. 2020 Sep 3;2020: 5476567. **PubMed** | **Google Scholar**
7. Nicastri E, Kobinger G, Vairo F, Montaldo C, Mboera LE, Ansunama R *et al*. Ebola virus disease: epidemiology, clinical features, management, and prevention. *Infectious Disease Clinics*. 2019 Dec 1;33(4): 953-76. **PubMed** | **Google Scholar**
8. Augustin MN, Mbeva JB. Knowledge, attitudes, and behaviors of healthcare professionals at the start of an Ebola virus epidemic. *Medecine et Maladies Infectieuses*. 2021 Feb;51(1): 50-54. **PubMed** | **Google Scholar**
9. Jacob ST, Crozier I, Fischer WA, Hewlett A, Kraft CS, de La Vega MA *et al*. Ebola virus disease. *Nature reviews Disease primers*. 2020 Feb 20;6(1): 1-31. **PubMed** | **Google Scholar**

10. Vivalya BM, Vagheni MM, Gumisiriza N, Kitoko GM, Piripiri AL, Kaputu-Kalala-Malu C. Implementing of mental health services in an area affected by prolonged war and Ebola disease outbreak: case of North-Kivu province, Democratic Republic of Congo. *PAMJ-One Health*. 2020 Apr 30;1(8). **Google Scholar**