



EBOLA OUTBREAK IN THE DRC COMMENTARY

Press Release

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Global Health Security Alliance

The Global Health Security Alliance is an independent network of international experts from policy, academics, security and private sectors, driven by the shared understanding that health and security issues have increasing and interrelated global impacts which require a transnational and multi-sectoral approach for mitigation. The GloHSA vision is for an effective, universal interconnection of diverse stakeholders dedicated to solving global health security challenges, particularly focused on protecting and strengthening health systems as a core function of society.

On November 6th, the United States Centers for Disease Control and Prevention suggested the current Ebola outbreak in North Kivu and Ituri Provinces of the Democratic Republic of the Congo might not be contained due to lack of cooperation from local communities and an unstable security situation.¹ While certainly not an optimal scenario that anyone in global health would care to entertain, it is certainly one possibility if public health experts are unable to engage. There are several things to keep in mind if Ebola is allowed to spread uncontrolled in the DRC:

1. The international media should be expected to hyperbolize the outcomes with proclamation of apocalyptic outcomes², where the oft-quoted 90% case fatality rate of the Zaire strain is referenced. The West Africa Ebola case fatality rate was as low as 28% in Sierra Leone (range 28-67% for Sierra Leone, Liberia, and Guinea).³ There is typically bias to report mortality over morbidity. Additionally, the case fatality rate improves with access to better healthcare. Typically, case fatality rates are worse in the beginning of an Ebola outbreak and improve over time as responders engage.
2. Public health authorities have a tendency to over-estimate Ebola case counts. For example, the US CDC was quoted as anticipating 1.4 million cases of Ebola in West Africa⁴ when less than 30,000 were documented⁵. This tendency to over-estimate often is due to attempts to appeal for funding from donors and convey a sense of urgency.

¹ https://www.washingtonpost.com/health/2018/11/05/cdc-director-warns-that-congos-ebola-outbreak-may-not-be-containable/?utm_term=.6990d2d69b90

² <https://www.thedailybeast.com/ebola-experts-warn-of-an-african-apocalypse>

³ <http://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease>

⁴ <https://www.nytimes.com/2014/09/24/health/ebola-cases-could-reach-14-million-in-4-months-cdc-estimates.html>

⁵ <http://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease>

3. Some studies suggest survivors of Ebola have protective antibodies that can last for decades.⁶ This implies that should Ebola spread uncontrolled, there is the potential to see the development of herd immunity. Herd immunity is protective against future outbreaks of Ebola.
4. Regarding the question of asymptomatic infection with Ebola, this remains a significant debate: it is unclear to what extent asymptomatic or subclinical Ebola infections exist.⁷ Hence, unless sound field assessment of population antibodies is performed, there is no reliable data to build upon the impact of asymptomatic infections on herd immunity.
5. In West Africa, Ebola showed genetic adaptation after passing through human hosts. These mutations were identified as increasing adaptive fitness to the human host.⁸ This raises questions of whether, in the process of host adaptation, Ebola transmission will become more efficient, mortality will decrease over time, or other clinical features will noticeably change.
6. There is a new tool in the fight: the Ebola vaccine. The Ugandans have indicated they have vaccinated their healthcare workers in anticipation

of seeing cases. One of the key issues in Ebola response has been loss of access to healthcare responders due to infection. If we assume the vaccine is indeed effective, then there is reason to hope for more effective medical response than we have seen in the past.

History has shown us that initial emergence of a novel pathogen often is associated with higher mortality and acute socio-economic disruption than subsequent waves of transmission. Examples of this include the 1918 Spanish influenza, the emergence of West Nile in the western hemisphere, and more recently the emergence of Zika in South and Central America. Once herd immunity is established, and the involved communities often witness less explosive transmission, more social habituation, and less socio-economic disruption. So, seen from the historic point of view there is reason to hope for a similar outcome in the DRC should Ebola be allowed to spread uncontrolled and become endemic.

The North Kivu-Itari area is home of 750,000 Congolese refugees who routinely cross borders into Burundi, Rwanda, South Sudan, and Uganda. The International Organization of Migration states they are heavily involved with monitoring these flows in support of the

⁶ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5853670/>

⁷ [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(17\)30110-X/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(17)30110-X/fulltext)

⁸ Dietzel E, Schudt G, Krähling V, Matrosovich M, Becker S. Functional Characterization of Adaptive Mutations during the

West African Ebola Virus Outbreak. *J Virol.* 2017 Jan 3;91(2). pii: e01913-16. doi: 10.1128/JVI.01913-16. Print 2017 Jan 15.

World Health Organization's Ebola response.⁹ Multiple border crossings in Uganda are being actively monitored.¹⁰ There is reason to be cautious about this assertion, as word from the ground suggests border monitoring is not 100% effective and infected individuals may pass during the incubation period unrecognized.

Notably, one border district in direct proximity to North Kivu, Bundabugyo, successfully contained an outbreak of Ebola in 2007.¹¹ Overall, Uganda has substantial experience detecting and rapidly responding to filovirus outbreaks involving both Ebola and Marburg.¹² Despite the fact that Kampala International Airport is nearly a 9 hour drive and almost 500 km distance, there is reason to consider border monitoring combined with Ugandan experience with filovirus outbreaks will mitigate uncontrolled expansion of the outbreak into Uganda. This prior experience, now coupled to availability of vaccinated Ugandan healthcare workers, portends a positive, strong response.

Summary Comments

1. Be wary of media hyperbole. Expect to see it but be aware that the full range of possible outcomes are often not discussed- typically

the worst case scenarios are emphasized, yet rarely validate.

2. Public health will likely use disease propagation models to estimate the outcomes. These models often have very short forecast windows and have a tendency to over-estimate case counts. Additionally, the involved localities often do not have robust public health surveillance systems and thus, poor data quality. Therefore, model outputs rarely validate yet are nevertheless conveyed to the media.
3. While there is reason to hope for the establishment of herd immunity, we urge caution given the paucity of peer-reviewed studies validating this. The first wave of transmission is expected to be maximally disruptive, with mitigation of impact over time with validation of protective herd immunity.
4. The question of whether asymptomatic Ebola infections exist remains controversial and unproven yet its influence on predictive models is key.
5. There is real risk of spread outside of Africa should the outbreak spread to Kampala, Gulu, or other Ugandan cities connected to the

⁹ <https://reliefweb.int/report/democratic-republic-congo/iom-supports-ebola-prevention-measures-across-east-africa-enhances>

¹⁰ <https://reliefweb.int/sites/reliefweb.int/files/resources/66608.pdf>

¹¹ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3294552/pdf/10-0627_finalD.pdf

¹² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3598306/>

international air traffic grid. Impact in developed countries is expected to be mitigated by higher standards of hygiene and healthcare.

6. Expect the possibility of Ebola host adaptation to occur if allowed to transmit unchecked. While some may present this as representing an apocalyptic scenario of “pandemic potential” due to enhanced transmission, it is quite possible decreased mortality over time may be observed in context with the establishment of herd immunity. These are unknown variables,

however with the caveat that public health experts often relay the worst case scenario without defining the better outcome potentials.

7. Ugandan response is expected to be more robust than seen previously in history, partly due to forewarning and availability of the vaccine.