



## Biosecurity and Biodefense: Lessons from Ebola Virus Outbreak

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### Editorial

Africa is a vast continent blessed with a young population as well as abundance of wildlife in many countries that constitute the continent. Most of the states are generally underdeveloped countries with fewer developing nations. The combination of poor health infrastructure, inadequate research facilities and poor or absent legislation against disease outbreaks puts most of the continent's populations at serious risk against deadly pathogens. In most African countries, tribes have been divided between one or more countries. This results in people of the same clan, tradition and culture being governed by two or more different states depending on which side of the fence they reside or were born. This in essence does allow for free movement of people across borders to interact with people of the same cultural understanding. The activities or interactions include marriages, exchange of dowries and general trade amongst peoples of the continent. These practices are beneficial for promotion of local economy but also allow for spread of contagious disease across borders without proper control.

The current outbreak of Ebola virus disease in West Africa has demonstrated the vulnerability of African states in general to a possible contagious disease outbreak. It further exposes African states to their level of unpreparedness in coordinating quarantine measures required during such an outbreak. Furthermore, the lack of infrastructure to deal with such an outbreak is glaring in this case. There are currently only two BSL 4 laboratories in the entire continent, one in South Africa (National Infectious and Communicable Diseases Laboratory) and the French sponsored mobile unit in Guinea. The lack of such infrastructure means that crucial and critical studies on viral pathogens existing in Africa are studied elsewhere instead of in Africa where the natural pathogen hosts and virus exist. This in itself is not cause for concern, since such studies are usually collaborative studies in which Africans may participate. It does however point to the overall poor preparedness and lack of focus within Africa.

The current Ebola outbreak should serve as a warning for Africa to organize itself in terms of three major points. Firstly, there needs to be a greater emphasis on developing a policy at regional or continental level to outline what the steps are, should a contagious outbreak be suspected. Such a policy would be adopted by regional member states since diseases such as Ebola respect no national boundaries. Secondly, research infrastructure including BSL 4 laboratories that address research on animal diseases, that currently have no cure and are endemic in Africa, should be prioritized. Ebola virus disease has shown us that an epicenter may be in Africa, but the spread can be global. Research and development should be strengthened with better collaboration and human capital development within African regions. If all the three spheres (policy, infrastructure and human capital development) are addressed, there would be a quick turnaround period in assay development to detect specific prioritized pathogens.

Additional benefits to a coordinated effort as described include discoveries in pathogen detection assays, surveillance studies and quarantine methods in both animals and humans alike. Research and related infrastructure development alone, although being the cornerstone to better preparedness cannot contain future outbreaks whether it is Ebola or another pathogen. Consolidated policy guidelines to encourage investment in biosecurity and biodefense research, if adopted by majority African states and implemented regionally, would be the first hurdle to clear towards African pathogen outbreak management. Additionally, global support and human capital development in biosecurity research would be critical to make sure these outbreaks are contained before they affect most of the world.

If the current Ebola virus disease outbreak does not spur Africa to create better solutions to improve biodefense and biosecurity, the next outbreak may be more devastating than the current one. It is yet to be determined what the human casualty rate will be in case of nefarious assault on an African population. This alone is a cause for concern for everyone involved in biosecurity in Africa