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ASIA EDITION

'Extraordinary measures needed to curb Ebola'

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Singapore: Death, confusion, poverty, hunger, and hysteria are the concerns Africa is currently grappling with. Everywhere across the country, burial teams are driving to collect bodies from homes. The current Ebola outbreak in West Africa is unprecedented, both in the number of people infected and the geographic scope. People living in close quarters and unhygienic conditions fueled the spread of the deadly virus. The virus, once neglected in the past, is now showering its fury over helpless nations. There are no proven drugs or vaccines for Ebola, a disease so rare that it has been hard to attract investments and to develop counter measures. However, the current outbreak propounds a global urgency and this has fueled new efforts to fast track the vaccine and drug development process. Speaking to *Biospectrum*, Dr Sanjaya Senayeke, assistant professor of Medicine and an infectious disease specialist, Australian National University, highlights that awareness about the disease and quarantine are the two best strategies to contain this outbreak.

1. **How did Ebola grow up to be a huge threat?**

There have been about twenty-five outbreaks of Ebola in the last forty years. Despite them being virulent and rapid in their nature, these outbreaks have been contained through good public health measures, namely by quarantining people with Ebola virus infection and contacts of those people till the epidemic burns out. This has not been achieved as yet in this outbreak which is the deadliest Ebola virus outbreak, to date in terms of geography and case numbers. Cultural practices and denial further fueled the spread. The introduction of Ebola virus into Lagos in Nigeria proved that an infected person could

spread Ebola virus to another country through air travel. Since about a billion people travel internationally every year, this is a concern for all nations.

2.What could be the mode of transmission and reservoir of the virus?

It is thought that bats are the natural reservoir of Ebola virus, like its equally virulent sibling, Marburg virus. Ebola virus outbreaks in the past have started with transmission from non-human primates like monkeys. But these non-human primates are not thought to be natural reservoirs of Ebola as they too fall prey to the blood borne virus.
Human-to-human transmission has been responsible for the ongoing epidemic. Nearly all body fluids like blood, diarrhea, and vomits are infectious. The virus has even been found in semen for many weeks after the infection has settled. There are two positives about Ebola transmission. Firstly, there hasn't been a proven case of air transmission. Interestingly, airborne spread of Ebola virus has been demonstrated in animals in experimental conditions, but not in humans. Effective airborne spread of Ebola virus would have made it harder to control. Secondly, people are contagious only after they contract the infection. This is in contrast to influenza, where people can spread the infection before they become sick. It would definitely be more challenging to arrest the epidemic if carriers could spread the disease.

3. What are the clinical symptoms of Ebola?

After an incubation period of 2-21 days, people develop a non-specific flu-like illness with fevers and muscle aches, which can easily be mistaken for other infections such as malaria or influenza. Then a variety of symptoms like difficulty in breathing, diarrhea, vomiting, red eyes, and rashes develop. At about days 6-11 of the illness, some people start to improve as they produce antibodies to the infection. This has happened in about 45 percent of cases in the current outbreak. Rest, however, develop multi-organ failure and an impaired ability of the body to stop bleeding, leading to death.

4. After many Ebola outbreaks previously, though relatively lesser in magnitude, the virus has no known cure or vaccine. Considering the high levels of medical technology available now, was the progress in Ebola control study relatively slow?

There are a number of experimental treatments and vaccines, nearly all of which have been restricted to trials in animals. One issue has been the fact that many of these would need to be tested during an outbreak. And unlike influenza, which we know will definitely happen during certain months, predicting when and where an Ebola virus outbreak will occur is impossible. Also, ethical issues would arise during a randomized controlled trial in an outbreak e.g is it fair to give placebo to some patients with an infection that has such a high mortality rate as Ebola virus when some patients could be given a lifesaving treatment? Presumably, there have also been prohibitive cost issues for some of these companies to make expensive drugs and vaccines for such an infrequently occurring infection. Due to such ethical complexities, it was a good idea for the World Health Organization to recently convene an international committee to discuss the ethics of using experimental medications during this outbreak.
In the current outbreak, a medication called ZMapp has been used in sick people. It contains three antibodies to Ebola. Given the small number of doses used, it is hard to know how effective it is. Canada has also donated a number of doses of an experimental vaccine (VSV-EBOV) for use in the outbreak.

5.What is the most useful strategy to curb an outbreak of this magnitude?

The best way to end this outbreak is to isolate people who are sick and those they came in contact. If this is effectively done, the outbreak will end. In the current large outbreak, this will involve using a lot of resources to enforce isolation. In addition, constant education of the local populace about Ebola virus is vital so that health authorities can regain the trust and educate the people about precautionary measures.

6. How are the affected countries coping with the outbreak?

The fact that this outbreak is continuing after so many months shows that they have not been coping well. But with the continued efforts of the international and local communities, along with increased funding to introduce and implement the correct interventions, we all hope that the outbreak will soon be controlled.