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Ebola- A death sentence

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It has been nine months since the first case and the virus is still making headlines. Advancements in medical technology and science seem futile, as global experts declare that the Ebola epidemic in West Africa has spiraled out of control. With cases doubling almost every three weeks, the ghastly virus has threatened human existence. CDC experts have cautioned that before the outbreak subsides, another half a million could fall prey to it. While the condition in Africa seems staggering, Asia and America remain on alert. As scientists remain clueless about a vaccine or a therapy, Ebola sunders human bonds, killing 2,800 people so far.

Asian countries have been previously stung with deadly epidemics like SARS and H1N1 and are responding with decades of experience and expertise. Many countries have bolstered surveillance measures by deploying medical troops at international airports and preparing isolation wards. However, this virus poses an unprecedented challenge with its high rate of infection and fatality.

Effects of an Ebola epidemic on the already over-burdened healthcare system of Asia could be profound and the entry of the virus into Asia could endanger millions of lives.

The world, being connected as it is now, has a huge number of people travelling across countries for trade, business, and tourism. In continents like Asia, the chances of a pandemic outbreak remains substantial. Speaking to *Biospectrum*, Dr Poonam Khetrapal Singh, WHO regional director for Southeast Asia, highlights what lies ahead for Asia and the progress made in Ebola medical interventions.

1. How did Ebola grow to become a threat?

The current outbreak of Ebola virus disease in the four West African countries Guinea, Liberia, Nigeria, and Sierra Leone has been ongoing for months. It has caused the highest number of cases and deaths and the widest geographical spread ever known for an Ebola outbreak.
Ebola virus disease (formerly known as Ebola haemorrhagic fever) is a severe, often fatal illness, with a death rate of up to 90 percent. The virus moves from its natural reservoir to humans through exposure to infected wild animals.
This outbreak is thought to have started when the virus crossed over from infected wildlife into the human population. Burial-related procedures and ceremonies in which mourners have direct, unprotected contact with the body of a deceased, infected person have had an important role in the propagation of Ebola outbreak.

2. Any vaccinations or cure in sight?

There is currently no specific, approved treatment or cure for the disease. But if those showing symptoms can get to the hospital early, they can improve their chances of survival. Supportive care is available for severely ill patients, including blood pressure maintenance with intravenous fluids or oral rehydration with electrolyte solutions. Approximately 40-45 percent of the patients will recover with appropriate medical care.
While there is no treatment proven to work in humans, there are a number of experimental therapies under development. Two vaccines are currently under investigation to prevent infection, however none have been approved to date. These vaccines have not yet been tested for safety in human beings. Although safety studies are being set up now, vaccines are not expected to be approved for use before the end of 2014.

3. Have prominent vaccine and drug makers jumped into action? If not, why?

The R&D for the development of drugs and vaccines against EVD has been ongoing for many years and recent unprecedented epidemics have drawn the attention of the pharmaceutical companies. Investigators from the National Institute of Allergy and Infectious Diseases (NIAID), which is a WHO collaborating center, and the Thomas Jefferson University are collaborating to develop a candidate Ebola vaccine based on the established rabies virus vaccine that has demonstrated protection against rabies and Ebola infection in animals. The Vaccine Research Center (VRC) under NIAID has developed an Ebola vaccine candidate in collaboration with Okairos, a Swiss-Italian biotech company recently acquired by GSK. The VRC vaccine will enter into a phase 1 clinical trial, which could start enrollment as early as fall 2014, pending approval by the FDA. A candidate vaccine has been developed by Canadian institutes also.
NIAID is currently funding development of an optimized anti-Ebola monoclonal antibody product, Z Mapp, which has superior efficacy compared to earlier cocktails. The Z Mapp, which is partially derived from MB-2003, is a cocktail of three antibodies against Ebola. In addition, NIAID is funding BioCryst Pharmaceuticals to develop and test BCX4430, a novel nucleoside with broad spectrum antiviral activity including against the Ebola virus.

4. Does WHO endorse the use of experimental drugs on Ebola victims?

On 11 August, a WHO panel of medical ethicists, researchers, and patient advocates was convened to discuss the ethics of using experimental treatments. The conclusion of the meeting was that it is ethical to offer unproven treatments but only if full informed consent is given by the patient or family members.
Ethical criteria must guide the provision of such interventions. These include transparency about all aspects of care, informed consent, freedom of choice, confidentiality, and respect for the person, preservation of dignity and involvement of the community.

In order to understand the safety and efficacy of these interventions, the group advised that, if and when they are used to treat patients, there is a moral obligation to collect and share all data generated, including from treatments provided for 'compassionate use' (access to an unapproved drug outside of a clinical trial).
The group explored how the use of these interventions can be evaluated scientifically to ensure timely and accurate information about the safety and efficacy of these investigational interventions. There was unanimous agreement that there is a moral duty to also evaluate these interventions (for treatment or prevention) in the best possible clinical trials under the circumstances in order to definitively prove their safety and efficacy or provide evidence to stop their utilization. Ongoing evaluation should guide future interventions.

It should be noted that while WHO has stated it is ethical to use certain experimental drugs in these extreme circumstances, no drug or therapy is formally recommended by WHO until it has gone through rigorous testing, evidence reviews and consideration of the quality of evidence of safety and effectiveness by committees composed of leading experts.

5. Ahead of Liberia doctor's death, are hopes for Z Mapp as a potential Ebola cure dying?

ZMapp is an experimental drug and its efficacy and safety are still unknown in humans. It consists of three monoclonal antibodies (specific antibodies made by identical immune cells) that react with the Ebola virus. It is thought that the antibodies neutralize ("kill") the Ebola virus. Each of the three antibodies binds to a different region of the Ebola virus envelope.

ZMapp has only been studied in non-human primates (monkeys) and shown to be effective in these monkeys when given within 3 days after exposure to the virus. It was administered to two Ebola patients under emergency conditions in the United States, who survived, but the sample size is quite small and tells us little about the widespread implications of the drug. There have been no clinical trials to test its safety or efficacy in humans.

Only a few doses of ZMapp exist (est. for maximum 10 people). Any use would be on a 'compassionate basis' Any use would require informed consent - an informed consent protocol has been developed by the company.
The manufacturer has been given a grant by the US government to accelerate production of ZMapp. It is expected that some more doses (possibly a few hundred) will be available before the end of 2014.

6. Can you please elaborate the screening procedures for Ebola followed at Asian airports? Can you please give the number of people screened so far?

WHO recommends that all countries provide information to airline and ground staff, health authorities and the general public about what to do and how to prevent infection in cases of suspected Ebola.

WHO does NOT recommend any ban on international travel or trade, in accordance with advice from the WHO Ebola emergency committee. The risk of transmission of Ebola virus disease during air travel remains low. On the small chance that someone on the plane is sick with Ebola, the likelihood of other passengers and crew having contact with their body fluids is even smaller. Usually when someone is sick with Ebola, they are so unwell that they cannot travel.

WHO, the International Civil Aviation Organization (ICAO), the World Tourism Organization (UNWTO), Airports Council International (ACI), International Air Transport Association (IATA) and the World Travel and Tourism Council (WTTC) have set up a Travel and Transport Task Force which will monitor the situation and provide timely information to the travel and tourism sector as well as to travellers.

7. Is there fear of Ebola spreading to Asia?

Despite rumors, there have been no confirmed cases of Ebola in Asia, and the risk of spread is currently thought to be very low. Moreover, WHO believes that countries with good health systems can quickly contain any imported cases. While Ebola is highly infectious, spread can be prevented using strict infection control measures.

8. What are the core measures that WHO is taking in curbing the spread of the disease across geographies?

â€¢ As per recommendation of the Emergency Committee of the International Health Regulations (IHR), all affected countries have been requested to restrict boarding of Ebola suspected patients in the civilian plane at the point of exit unless there is a special plane with proper infection prevention and control facilities for medical evacuation purpose. Medical evacuation has been done for Ebola patients to the USA, Germany, Spain and United Kingdom with prior arrangement for isolation and proper treatment of patients.
â€¢ WHO has been working closely with national authorities in West Africa and leading international response. WHO's director general visited West Africa and held discussions with Heads of Governments.
â€¢ Under Emergency Response Framework (ERF) of WHO, this event has been classified as at level 3 - the maximum level.
â€¢ WHO DG, on the recommendation of Emergency Committee, has declared this event as Public Health Emergency of International Concern as per International Health Regulation (2005) thus giving a call for internationally coordinated response to contain the event and prevent its spread without major impact on travel and trade.
â€¢ WHO has mobilized more than 400 experts and its own staff from all over the world to the epicenter of event in West Africa to assist efforts of national authorities.
â€¢ WHO has established a sub-regional operations center in Conakry, Guinea.
â€¢ WHO is sharing information on evolution of event with all member States along with technical guidelines on all aspects of disease
â€¢ Through its accredited laboratories network, and support to shipment of infectious material to these labs, WHO is assisting countries in establishing diagnosis of suspected cases.
â€¢ WHO has developed a Ebola Response Roadmap with accelerated and focused activities for next 6-9 months with

following objectives:
o Full geographic coverage with Ebola response activities in countries with widespread transmission
o Ensuring emergency application of Ebola response interventions in newly affected countries
o Strengthening global preparedness
â€¢ The estimated financial requirement for the implementation of this roadmap is around USD 430 million
9. WHO has declared the outbreak as an international health emergency. What does this really mean?
The declaration of an outbreak as a "Public Health Emergency of International Concern" is based on clear criteria, which were unanimously agreed upon by The Emergency Committee convened. These criteria are as follows:
â€¢ The inability of the affected countries to control the outbreak on their own and their need for international support
â€¢ Ebola is more contagious and deadlier than MERS
â€¢ Lack of infection control, which is key to stopping transmission, in affected countries
The aim of this declaration is to serve as an international alert, so that countries can prepare for possible cases. It will ramp up political commitment in the countries affected to get the high level attention needed. It will help mobilize foreign aid and action to fight Ebola in affected countries. The overarching goal is to contain existing outbreaks and prevent the further spread of Ebola through an internationally coordinated response.

9. How well is Asia prepared to face an outbreak in case Ebola enters the continent's borders?

While Ebola is highly infectious, spread can be prevented using strict infection control measures. WHO believes that countries with good health systems can quickly contain any imported cases, making a widespread outbreak very unlikely.
India has an effective mechanism through its Integrated Disease Surveillance project (IDSP) that is very vigilant in detecting and responding to this event. Diagnostic facilities are also available within country. Facilities with good infection control practices have been designated to manage suspected cases. As of 29 August 2014, a cumulative number of 887 passengers are being tracked by IDSP. Most of them are in the States of Maharashtra, Kerala and Tamil Nadu.
All countries in Asia have subsequently intensified surveillance, and some have implemented entry screening procedures. It includes appropriate measures at point of entry for screening of passengers coming from Ebola affected countries of Africa including designation of quarantine and isolation facilities. International airline crew members have been given orientation on handling suspected or contact cases and reporting to national authorities at final destination. There are nine WHO Collaborating Centers around the world to provide lab. Diagnostic services for Ebola WHO is providing technical support in international transfer of diagnostic samples and guidance for infection prevention and control.

10. Any specific measures to safeguard healthcare workers from the deadly infection?

Ebola is a highly contagious disease, but with proper infection control practices, spread can be prevented, even for healthcare workers on the front lines. Continued, diligent, and proper use of Personal Protective Equipment (PPE) is essential. WHO is helping to supply health workers with protective gear and training them on infection prevention and control practices, although there is a need for more equipment and training.

A major challenge is a serious shortage of health workers. This puts the limited number of health workers who are available and responding to this outbreak at risk -- when people are tired, they are more likely to make mistakes in infection control. Many of these health workers have not seen Ebola cases before. Hospitals and clinics simply don't have enough people to provide the level of care needed. They are working with partners, including WHO, to get more hands on deck. It is vital that all international staff who will work closely with Ebola patients receive proper training in infection control. There is a shortage of qualified people worldwide with experience in Ebola.

11. When does WHO anticipate the infection to subside?

We can't predict how long this outbreak will last. It is a complex outbreak involving multiple locations with a lot of cross-border movement among the communities. The large number of cases in peri-urban and rural settings makes this one of the most challenging Ebola outbreaks ever. The Ebola epidemic trend remains precarious, with infection transmissions continuing to occur in the community and in health facilities.
The outbreak will be considered over in a country after 42 days (2 incubation periods) have passed without a confirmed case. It may take 6 - 9 months to stamp out the disease entirely. WHO is mobilizing international resources to combat Ebola outbreak in affected countries.