Ebola outbreak surprising but not the 'Next Big One'

August 8 2014, by Linda Weiford, Wsu News

Guy Palmer, front, director of WSU's Paul G. Allen Center for Global Animal Health, and virologist Hector Aguilar-Carreno. Credit: Shelly Hanks, WSU Photo Services

As the Ebola virus continues its swift spread across four West Africa countries, including several major cities, two scientists at Washington State University are monitoring reports from afar with measured

concern.

It started out small, in a village, the way Ebola outbreaks have since the virus was named after a river in Congo 38 years ago. "This time, 'it surprised us," said Guy Palmer, director of WSU's Paul G. Allen Center for Global Animal Health.

"Previous outbreaks did their devastation in remote villages, got contained, and then burned themselves out. This is a different pattern," he said.

And it is a pattern that's defining the worst Ebola outbreak in history, hopping borders and killing close to 1,000 people, according to the World Health Organization's most recent figures.

As the virus carves a path through West Africa, it's highly unlikely we would see similar destruction here on American soil, said Palmer, whose work on zoonotic diseases—those that pass between animals and humans, which includes Ebola—often takes him to Africa.

Unlike that part of the world, the U.S. has a strong public health system, plenty of hospitals and standard infection-control protocols, he explained. Also, the Ebola virus is not highly contagious and transmission requires much closer contact than those viruses spread through air, such as influenza and measles.

"What's occurring is a reminder of how unpredictable viruses can be and the challenges of assessing their risk, particularly when they emerge in vulnerable communities and nations like those impacted by the current outbreak," he said.

In Ebola's recent spiral, the virus began infecting people in remote forest regions of Guinea, moving on to the nation's populous capital city of

Conakry. After that, it spread to Sierra Leone, Liberia, and more recently, Nigeria. This is the first time Ebola has been identified on the continent's western side.

"These are countries with fragile public health infrastructures and too few medical resources to adequately isolate and care for people who become infected," said Palmer. "They simply don't have the means to deal with it."
What's more, the virus has traveled to cities, probably aboard human hosts. Unlike in remote villages, "more crowded areas make it harder to identify infected persons so that they can be isolated and so the people who had contact with them can be tracked down," he said.

Two lethal viruses

Medical teams from WHO, the Centers for Disease Control and Prevention, Doctors without Borders and other agencies are being dispatched to the region to try to bring the virus under control. For Allen School virologist Hector Aguilar-Carreno, it's a scenario reminiscent of another destructive viral outbreak that strikes elsewhere on the planet almost each year.

Nipah virus, distantly related to Ebola, has been surfacing in rural areas of South Asia since it was first identified in 1999. It too, is lethal, killing more people than it spares. As with Ebola, each time it emerges, skilled medical teams donning protective gear must be brought in to help contain it.
Nipah is also zoonotic, carried by tropical fruit bats and believed to have spilled over to pigs and then humans. With instructions encoded in their RNA, both viruses infect by unleashing a firestorm inside the human body, said Aguilar-Carreno, whose Nipah research prompts him to monitor the day-to-day developments in West Africa.

"Another similarity is how Nipah and Ebola behave once they penetrate a human cell," he said. "Inside, they multiply very quickly and don't destroy the host cell. This is so they can produce as much 'progeny' viruses as possible."

Where Nipah is spread in the air by a cough or sneeze, Ebola requires closer contact, via bodily fluids. "Once infected with either of them, early symptoms of fever, headache and muscle aches can resemble other illnesses such as influenza and malaria," said Aguilar-Carreno. But as the pathogen becomes more entrenched, Ebola causes internal and sometimes external bleeding; Nipah assaults the respiratory system and often the brain.

No vaccine or cure exists for either of them, although scientists such as Aguilar-Carreno are conducting research that could lead to their developments.

International focus

Until this current outbreak, neither Ebola nor Nipah had ever been identified outside a remote setting, said Palmer, the Allen School director.

"The fact that Ebola has spread beyond its normal range makes it very important for us to watch," he said.

Palmer and Aguilar-Carreno agree, how Ebola's spread is handled—both in Africa and among outside nations—will help determine whether the outbreak becomes a grim chapter in the region's history or a downward shift of the region's future.

Provided by Washington State University