## Ebola outbreak grows exponentially

David Brown 25 September 2014

Reports from the World Health Organization (WHO) and US Centers for Disease Control (CDC) point to a drastically worsening situation in the West Africa Ebola outbreak. The disease is spreading exponentially in Liberia, Sierra Leone, and Guinea, with the number of cases doubling roughly every 23 days.

The number of cases could reach 9,000 by the end of September according to the CDC, and the number of new cases each week could hit 10,000 by mid-November according to the WHO. If completely unchecked the CDC predicts that over 550,000 people could be infected, up to 1.4 million if the current number of cases is significantly underreported.

The fatality rate among cases with known outcomes has been 70.8 percent. The impact of that many deaths on these three countries, whose combined population is 20 million, would be immense. Currently the World Bank estimates that the GDP in Guinea will drop by 2.3 percent, Sierra Leone by 8.9 percent, and Liberia by 11.7 percent.

Even if the current outbreak ended today it would dwarf all previous known cases of Ebola combined. According to the latest situation report from the WHO, there are a total of 5,843 suspected, probable or confirmed cases in the three countries. All previous known cases since the virus was first recognized in 1976 only amount to 2,500, with no prior outbreaks larger than 500 cases.

According to the director of strategy at the WHO, Dr. Christopher Dye, "the present epidemic is exceptionally large, not primarily because of biologic characteristics of the virus, but in part because of the attributes of the affected populations, the condition of the health systems, and because control efforts have been insufficient to halt the spread of infection."

The three countries affected are among the poorest in the world with completely inadequate health care for routine needs like childbirth, let alone an epidemic. Sierra Leone, Liberia, and Guinea have less than two doctors for every 100,000 people. Combined with little running water and no widespread sanitation systems, these countries provide fertile ground for Ebola transmission.

This outbreak is the first time that the Ebola virus has spread at an exponential rate and the first time that it has spread into urban centers. The capitals of all three countries have seen significant numbers of cases, with the worst hit being Monrovia, Liberia. Both new developments are driven by immense poverty.

Ebola is traditionally a rural disease transmitted from its natural reservoir in wild animal populations. It can only be transmitted through direct contact with infected bodily fluids, so outbreaks have usually been limited to family members, caretakers and close contacts in isolated villages.

Adequate sanitation and health care can effectively remove the threat of infection on a large scale. It takes sizeable populations without any basic services to produce the large-scale infections seen in the current outbreak.

For example, the slum of West Point in Monrovia has 70,000 people with no sanitation, running water, or garbage collection. It was forcibly quarantined for 11 days in August. According to the WHO "the number of Ebola deaths in that slum will likely never be known, as bodies have simply been thrown into the two nearby rivers."

Within the Liberian capital as a whole the situation is not much better, with new cases overwhelming the limited international response. New treatment centers set up are overflowing the day they open.

By September 8 in Montserrado County, which contains Monrovia, there were 240 beds available for treating Ebola victims and only 260 more planned, while the WHO estimated an immediate need for 1,000 beds. Each patient turned away seeks treatment at

home, infecting others.

Lack of space in treatment centers also results in many victims never being diagnosed and reported, creating a significant underestimation of those affected. The CDC model estimates that for every reported case of Ebola there is 1.5 cases that go unreported.

According to the CDC model, in order to contain the disease at least 70 percent of those infected need to be treated and effectively quarantined. Every 30-day delay in reaching that goal would result in a tripling of the daily cases at the peak of the epidemic. Immediately beginning to improve the number of cases treated would result in a peak of 1,335 daily cases, 3,408 when corrected for underreporting.

The immense human toll of this outbreak highlights the stark inequality across the world. The combined yearly health care spending of the three affected countries amounts to just \$900 million, less than the wealth of any of the world's more than two thousand billionaires, who combined now own \$7.3 trillion—8,000 times the health care budgets of the West African nations.



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