



## **Fact Sheet: New Modeling Tool for Response to Ebola Virus Disease**

### **Ebola Response Modeling Tool**

CDC has developed a dynamic modeling tool called Ebola Response that allows for estimations of projected cases over time in Liberia and Sierra Leone. The Ebola Response modeling tool was used to construct scenarios to illustrate how control and prevention interventions can slow and eventually stop the Ebola epidemic. Importantly, it can help planners make more informed decisions about emergency response resources to help bring the outbreak under control. It allows input of data reflective of the current situation on the ground in affected countries and communities. The Ebola Response modeling tool is intended to help local governments and international responders generate short-term estimates of the Ebola situations in countries, districts, and villages. The tool, in the form of a Microsoft Excel spreadsheet, will be freely available online.

### **Key Variables to Controlling the Outbreak**

Ebola Response makes case projections, but also models the impact of key elements essential to controlling the outbreak: the number of sick individuals who are effectively isolated and other actions to control for spread of infection, such as safe burial practices. Currently, many healthy individuals are contracting Ebola from non-isolated individuals with the disease. Others are contracting Ebola because traditional burial practices can involve multiple family members being exposed to the bodily fluids of the deceased body, which are highly contagious. Ebola Response modeling shows that with an increasing rate of isolation and measures to control the spread of infection, the rate of new Ebola cases declines rapidly.

### **Gaining Control, Ending the Ebola Epidemic**

As the Ebola Response modeling tool illustrates, the rate at which we are able to increase the number of patients who are isolated is essential to controlling and reversing the epidemic. President Obama has detailed a stepped-up, robust response, including additional resources from across the federal government. Critically, this involves a surge in isolation capacity by rapidly increasing the number of treatment beds in Ebola Treatment Units and providing resources to ensure isolation in other settings, such as community-based or home care.

The U.S. has more than 150 specialists from multiple U.S. departments and agencies in the affected countries, including from the CDC, State Department, HHS, USAID, and DoD, and we are growing that number to increase impact on the ground – more treatment facilities will be built, more supplies will be delivered, more health workers will be providing care, more training will be provided. Given the enormity of the challenge, we also need our partners to step up their efforts as well. The U.S. is working intensively on this effort with the United Nations, the World Health Organization, the governments of the affected countries, with partner countries including Great Britain, France, China and others, with humanitarian aid efforts on the ground, including Doctors Without Borders and Partners in Health, as well as other international collaborators.



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## **Projecting Ebola Case Estimates**

Published today in MMWR, CDC used the Ebola Response modeling tool to calculate Ebola cases through mid-January in Sierra Leone and Liberia, providing an example of how this tool can be used. The MMWR estimates a range of between 550,000 and 1.4 million cases by January 20, 2015. The top range of the case estimate, 1.4 million, is explained by the model's assumption that cases are significantly underreported by a factor of 2.5. It is essential to note that these numbers reflect a moment in time based on scientific and epidemiological data available in August, which did not account for the ongoing U.S. government Ebola relief effort. The numbers do not reflect current conditions. Modeling suggests that extensive, immediate actions – such as those already started – can bring the epidemic to a tipping point to start a rapid decline in cases.

The most important part of the report describes the potential effect of public health actions. The news is encouraging. If we do nothing, things could become much worse. If we take the actions that are planned, things will still be very hard, but we can stop Ebola. The United States and its partners are taking action every day.

Using the Ebola Response modeling tool, we see that the epidemic can begin to be controlled when individuals with Ebola are effectively isolated in Ebola treatment units (ETUs) or in isolation settings in which there is a reduced risk of Ebola transmission. The model also shows a benefit when safe burial practices are implemented that eliminate exposure of healthy individuals to the bodily fluids of the deceased, which often occurs with the use of traditional burial practices. The model indicates that once a tipping point is reached, cases will decline about as rapidly as they had increased. Of note, gains below such a tipping point can also significantly reduce cases.



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