

# Getting to Zero Cases: How to End the Ebola Outbreak in West Africa

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(Dated: March 3, 2015)

## Abstract

The number of Ebola cases in Liberia has recently fallen to two, a triumph of community monitoring and response. Here we point to the community level policies that have been successful, as determined by a complex systems science analysis, and are crucial to stopping the continued outbreaks in Guinea and Sierra Leone. The Ebola outbreak has caused a lot of human suffering, life loss and disrupted local economies. It is time to bring it to a close.

The incidence of new Ebola cases in Liberia has steadily fallen, with just one new confirmed case reported in the week leading up to February 22 [1], and just two confirmed cases in Emergency Treatment Units (ETUs) as of February 27. In contrast, transmission is not yet fully controlled in Guinea and remains widespread in Sierra Leone. Emergency responders working to bring the entire West African outbreak to an end can learn much from Liberia's example [2].

The approach of Liberia was consistent with NECSI's recommendations, a multi-scale approach based upon a complex systems understanding of the problem.

Any areas with multiple cases should be screened by neighborhood-based going door-to-door, monitoring for symptoms, as has been proven effective in Liberia [2]. Even if a direct contact chain cannot be established, individuals with possible symptoms must be treated as infected until they can be proved otherwise. As the number of actual cases decreases, thinking that a particular case is no longer likely to be Ebola will lead to a new outbreak.

On a regional basis, isolation of affected areas must continue, including the 21 day observation for anyone who comes from an infected area, until no new cases are reported [3]. These restrictions must be maintained to end the epidemic; if transmission escapes affected regions, the outbreak can no longer be contained. Certainty about where the epidemic is and is not present makes it possible to have a clear strategy about getting to zero: Contract those areas till they are gone [3].

Certainty about the presence of the epidemic makes it possible to have a clear strategy about getting to zero: focus effort on the places it exists and contract those areas until they are gone. When disease is not present in an area, the area is protected from reinfection. Knowing what and how to do, what works, to end the epidemic is critical.

Once each region has been cleared, quick response teams are needed to apply the conventional approach of simple contact tracing if there are just a few cases. However, the mechanisms of response should not be dismantled completely even in cleared zones. If more cases arise, response teams must be quick to reinstate community tracing and isolation. Consistent efforts at the community level can contract and eliminate transmission in Sierra Leone and Guinea, as has been done in Liberia.

Using the approach in Liberia, the effectiveness of which is backed by a complex systems analysis, the outbreak in Guinea and Sierra Leone can be brought rapidly to an end.

## References

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