

Sexual transmission and the probability of an end of the Ebola virus disease epidemic

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The criteria of zero Ebola cases defined by the World Health Organization did not explicitly account for the sexual transmission and led to multiple recrudescence events in West Africa from 2015–2016, partly indeed caused by sexual transmission from survivors. We devised a statistical model to compute the probability of the end of an Ebola virus disease epidemic, accounting for sexual transmission and under-ascertainment of cases. Analyzing the empirical data in Guinea, Liberia and Sierra Leone, the performance of the proposed model was compared with the existing criteria comprising a fixed waiting time of 42 days since the last case testing negative or burial. We showed that the waiting time can vary depending on the sexual behaviors of survivors and their adherence to refraining from unprotected sex is likely one of the key factors in determining the absence of additional cases after declaration. If the proportional weight of sexual transmission among all secondary transmission events was substantial, ascertaining the end could even require waiting 1 year from the purported last case. While our proposed method offers an objectively interpretable probability of the end of an epidemic, it highlights that the computation requires a good knowledge of sexual contact.

References

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