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Simulating the potential role of media coverage and infected bats in the 2014 Ebola outbreak

Qiang Li[1], Furong Lu[1], Chenxi Dai[1], Minjun Fan[2], Weiming Wang[3], Kaifa Wang[1*]

[1]School of Biomedical Engineering, Third Military Medical University, Chongqing 400038, P.R. China

[2]Department of Health, Academy of Military Science, PLA, Beijing 100091, P. R. China

[3]College of Mathematics and Information Science, Wenzhou University, Wenzhou 325035, P.R. China

[*]Corresponding author. kfwang72@163.com

Abstract

Multiple epidemiological models have been developed to model the transmission dynamics of Ebola virus (EBOV) disease in West Africa in 2014 because the severity of the epidemic is commonly overestimated. A compartmental model that incorporates the media impact and the effect of infected bats was constructed and calibrated using data reported until the end of 2014. The final cumulative number of deaths and confirmed cases were estimated to be 1.0921×10^4 (95% CI 9.7706×10^3-1.2072×10^4) and 1.5193×10^4 (95% CI 1.3593×10^4-1.6795×10^4), respectively. The epidemic was estimated to end on June 2015, which was similar to the data reported by the World Health Organization. A sensitivity analysis indicated that an increase of either the media impact or the number of infectious bats that are captured daily can increase the cumulative number of confirmed cases/deaths. Of the considered epidemiological parameters, only the media coverage can significantly reduce both the peak time and the value of the cumulative confirmed cases/deaths. Thus, we propose 'the cumulative confirmed cases and deaths' as another media mechanism. In conclusion, the media impact contributed to the control of the 2014 Ebola outbreak, and infectious bats