

Study offers efficient alternative for Ebola screening program for travelers

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The Ebola virus, isolated in November 2014 from patient blood samples obtained in Mali. The virus was isolated on Vero cells in a BSL-4 suite at Rocky Mountain Laboratories. Credit: NIAID

As of January 31, 2016, a total of 28,639 cases and 11,316 deaths have been attributed to Ebola, figures that are assumed to significantly

underestimate the actual scope of the 2014 Ebola Hemorrhagic Fever outbreak in West Africa. In the United States, there were also two imported cases and two locally acquired cases reported in September/October 2014.

"This outbreak stimulated high-level discussions about how to prevent the global transmission and spread of Ebola," explained Sheldon H. Jacobson, a professor of computer science at the University of Illinois at Urbana-Champaign. "One strategy recommended by the World Health Organization required exit screening at airports for [passengers](#) who depart from countries with Ebola. Passengers with a high-risk exposure to or symptoms of Ebola are denied boarding under this approach.

"With exit screening from such countries, out of approximately 80,000 departing travelers from August to November 2014, none were reported as symptomatic with Ebola. However, since the physical condition of a passenger can deteriorate during a long international flight, entry screening at destination countries was also instituted as an auxiliary precaution to prevent the entry of passengers with Ebola into their country."

In a recent study, published in *Preventive Medicine*, Jacobson and his colleagues provide an alternative policy for Ebola entry screening at airports in the United States.

"Security measures implemented after 9/11 taught us a lot about what not to do," Jacobson added. "We learned that finding the one person who intends to do harm out of several million passengers is akin to finding a needle in a haystack.

"This alternative policy in regards to Ebola transmission incorporates a [social contact](#) tracing risk level, in addition to the current health risk level used by the CDC. It requires additional passenger input data, taking

into account not only a passenger's exposure to Ebola, but also the potential to conduct social contact tracing if they are not initially monitored or their movements are not initially restricted yet later become ill with Ebola."

The performances of both the CDC policy and the alternative policy were compared and analyzed using a scenario-cost-based sensitivity analysis and an expected-cost-based optimization model analysis.

"Indeed, using a secondary risk level such as the potential footprint for social contact tracing level may be a useful consideration when the current CDC policy is evaluated," said Jacobson, who has conducted research on aviation security for more than 20 years. "Although the implementation of the secondary [risk level](#) requires additional data collection costs and time, the potential societal and public health benefits may justify such expenditures and efforts."

According to the authors, the United States initiated entry screening in August 2014 and enhanced its entry screening program after the first imported Ebola case was diagnosed. The majority of passengers entering the United States from the affected West African countries (94%) arrived at one of five major international airports (New York - JFK, Washington-Dulles, Newark, Chicago-O'Hare, and Atlanta-Hartsfield; note that beginning in late October 2014, all such passengers were required to flying into these five airports). Through November 2014, approximately 12,000 such passengers arrived in the United States, but no confirmed cases were reported among these passengers based on entry screening.

The results presented in the study provide information and guidance for public health decision-makers to enhance the current CDC policy, by using additional information that may impact and influence monitoring and movement restriction decisions.

More information: Sheldon H. Jacobson et al, A Double-risk Monitoring and Movement Restriction Policy for Ebola Entry Screening at Airports in the United States, *Preventive Medicine* (2016). [DOI: 10.1016/j.ypmed.2016.03.018](https://doi.org/10.1016/j.ypmed.2016.03.018)

Provided by University of Illinois at Urbana-Champaign

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