
Are Travel Restrictions Useful in Controlling Pandemic Flu?¹

Planning for a possible influenza pandemic is an extremely high priority, as the social and economic effects could be devastating. A number of recent studies have examined the role of air travel in the 1968-1969 influenza epidemic and concluded that, with current travel patterns, a modern pandemic would spread much faster. Building on such previous studies, a new model suggests that the efficacy of international air travel restrictions in slowing the progression of a modern pandemic flu depend on seasonality, disease transmission rate, and vaccination rates.

Research

Consistent with previous work, this model suggests that international travel restrictions, alone, are not an effective way to contain an epidemic – a 95% restriction is required for any substantial reduction in incidence. Furthermore, the impact of travel restrictions depends substantially upon the season and country of origin. It is possible for restrictions to increase or decrease the epidemic peak depending on if the restrictions delay the local epidemic outbreak to a period of lower or higher seasonal transmission of the virus. In the short term, travel restrictions can delay the first passage time of the virus to the U.S. by 2 to 3 weeks. This delay, however, can increase the total number infected if the delay pushes the peak from a lower seasonal transmission period into a period of higher seasonal transmission.

Further, vaccination alone, even at low rates, reduces the total number of cases worldwide in the model. It does not, however, significantly alter first passage time. In conjunction with travel restrictions, vaccinations are shown to be more effective at reducing the number of cases – vaccinations can reduce the number of cases 3 to 5 times more than restrictions alone, depending on the particular scenario and time frame.

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¹ This Fact Sheet is adapted from Joshua M. Epstein et al., “Controlling Pandemic Flu: The Value of International Air Travel Restrictions,” *PLoS ONE*, May 2007.
Available at: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0000401>

In order to assess the economic feasibility of travel restrictions, it is necessary to consider briefly the potential costs to the U.S. economy of a one-year, all inclusive travel ban for international and domestic passenger flights. Extrapolating from the costs incurred during the travel ban immediately after 9/11, the cost to the U.S. economy is approximately \$100 billion (less than 1% of GNP). The addition of a government-funded severance package covering lost income to laborers raises this figure to \$106 billion.

Conclusion

Given the high potential benefits associated with air travel restrictions, and their relatively minimal cost to the U.S. economy, policymakers should not be too quick to rule out their implementation, especially in conjunction with vaccinations, in certain pandemic situations.

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