Economic Effects during Outbreaks of Infectious Disease

Milan Brahmbhatt and Arindam Dutta

Outbreaks of infectious disease can lead to severe economic disruptions even when little illness or death ultimately occurs

Recent years have seen a growing interest in the economics of infectious diseases. This interest has come with the emergence of many new infectious diseases—more than 30 in the past 25 years, including HIV/AIDS and severe acute respiratory syndrome (SARS)—as well as the return of old threats such as pandemic human influenza.

Interest has also increased with fresh experience of the enormous human and economic costs that can arise from illness and death, as with HIV/AIDS in developing countries. But as with SARS in East Asia in 2003 and the plague in Surat, India, in 1994, outbreaks of infectious disease can create severe economic disruptions even when relatively little illness or death ultimately occurs. In a new paper Brahmbhatt and Dutta seek to improve the understanding of these "SARS type" effects and look at public information strategies that could help mitigate the costs they entail.

Brahmbhatt and Dutta begin with a narrative account of the Surat and SARS events. In Surat official estimates ultimately counted only 52 suspected plague-related deaths. But economic losses were estimated at up to $2 billion, a result of a massive and sudden flight of population from Surat, panic in other cities, a fall in tourism, and trade embargoes on Indian exports. In the four East Asian economies most affected by SARS—China, Hong Kong (China), Singapore, and Taiwan (China)—economic losses amounted to an estimated 0.5–1 percent of GDP in 2003, despite these economies' experiencing only about 700 SARS-related deaths.

The economic essence of such events thus appears to reside in costs of prevention in one form or another rather than in the standard costs due to illness and death. The main economic effects arise from the uncoordinated and sometimes panicky efforts by large numbers of individuals to avoid infection. These efforts, such as fleeing from the area of an outbreak or reducing contact with other people, lead to sharply reduced demand for many service sector activities, as occurred during the SARS outbreak.

Brahmbhatt and Dutta observe that recent work in economic epidemiology may provide a natural framework for analyzing SARS-type events. The key intuition of this approach is that self-interested, forward-looking individuals adapt their behavior to take account of the prevalence of a disease and the threat it poses to them. These changes in behavior will differ according to the disease. But they will generally have both economic and epidemiological consequences, leading, for example, to both negative demand shocks in the economy and lower rates of new infections and disease prevalence.

A critical question then is how people form their subjective probability judgments about the risk of disease. While the assumption of rational expectations provides a useful benchmark, research in psychology and behavioral economics in recent decades reveals substantial biases in probability judgments in many contexts. Recent theoretical work on information cascades and herding behavior suggests the possibility that in situations of imperfect information people may rationally look to the behavior of others as a source of information and yet arrive at erroneous conclusions. Under conditions of high uncertainty, poor information, and emotional stress during an outbreak of infectious disease, individuals could well arrive at significantly biased subjective assessments, at least for a time. That would lead to less than optimal decisions, resulting in the aggregate in an excessively high cost of private preventive actions.

Brahmbhatt and Dutta look at public opinion surveys taken during the SARS outbreak that provide suggestive (though not conclusive) evidence that people did indeed at times hold excessively high perceptions of the risk of becoming infected with SARS or, if infected, of dying from the disease. But some of the survey evidence also suggests that perceptions of the risk of disease are sensitive to new information and that people are constantly trying to update and improve their subjective probability assessments.

Finally, the authors consider whether public information strategies can help reduce unwarranted panic. A preliminary question is why governments often seem to have strong incentives to conceal information about outbreaks of infectious disease. The authors review recent game theory analysis that clarifies government incentives in the context of infectious disease. In the early stages of an outbreak, when there is much uncertainty about whether it will turn into an epidemic or fizzle out, the government has an incentive to simply "wait and see," especially if an announcement might itself start a panic or provoke severe trade and travel restrictions.

An important finding is that the more numerous are nonofficial sources of information about a possible outbreak of disease, the weaker are the government's incentives to conceal its own information. Thus honesty may indeed be the best public policy under modern conditions, where such technological innovations as cell phones and the Internet allow easy global mass communications.

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