

Media can help slow spread of disease, study finds



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A mathematical study of how infectious diseases spread has demonstrated a surprising link between the progress of an outbreak and the way that outbreak is portrayed in the media.

The study suggests that when public health officials are speaking to reporters about an outbreak, they should include information about the rate at which a disease is spreading and not just the total number of cases in a population. The study's authors say that in a real-world situation, effective media communication could delay the peak of an outbreak by days or weeks, buying crucial time for health agencies to respond.

"It's a really interesting result," said Abba Gumel, a professor of mathematical biology at Arizona State University who was not involved in the study. "It shows that the quality of media coverage, especially during the early stages of an outbreak, is really important."

To quantify that importance, researchers led by Jianhong Wu, director of York University's Centre for Disease Modelling in Toronto, built a mathematical model based on a 2009 flu outbreak with data on case numbers from the Shaanxi province of China. In the model, the influence of the media has an effect on the number of individual contacts, which can spread the infection from one person to another.

"We know intuitively that the media can change population behaviour," Dr. Wu said. "What we're trying to do is find the functional relationship between the media and that change."

When the media influence was removed or altered in the model, the team was able to study the difference in the way the outbreak proceeded. They found that the media's impact was not uniform across the duration of the outbreak but was strongest during the initial stages, when the rate of new infections is changing most rapidly.

In contrast to previous studies, they found that media impact seems to switch off as an outbreak nears its peak, despite the fact that this is when the probability of getting infected is at its highest. In a discussion of their results, published Friday in the journal *Scientific Reports*, the team said that the way media influence switches on and off as a disease spreads through a population may account for why some outbreaks feature multiple peaks.

A key finding of the study is that by emphasizing the rate of change of case numbers rather than simply the total number of cases, officials may be able to significantly slow the growth of an outbreak. In the case of a deadly flu pandemic, that would increase the opportunity for health agencies to develop and produce antiviral medications.

“Every week you can delay, you’re one week closer to getting a vaccine. ... You want to drag [the peak] out, otherwise by the time you get your act together, everybody’s infected already,” said Michael Gardam, director of infection prevention and control at the University Health Network in Toronto.

He added that the York study should encourage health officials to think more strategically about the role of the media as an agent of disease control.

Dr. Gumel said the study adds to a growing body of scientific literature that employs mathematical tools in an effort to improve global response to outbreaks from SARS to Ebola.

In future studies, Dr. Wu said he and his team aim to use the model they developed as a test bed to refine how and when information about infectious disease is circulated through the media.

“Information should be transparent,” Dr. Wu said. “But there are different ways of interpreting that information to the public.”