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Mass media coverage helps slow down disease spread in an epidemic

Reports should focus on changing behavior, say researchers

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Amsterdam, January 26, 2016 - Mass media coverage about an epidemic can help slow the spread of the disease, according to a new study published in the *Journal of Theoretical Biology*. The authors of the study, from Shaanxi Normal University in China and York University in Canada, say to maximize this effect media reports should focus on changing people's behavior in an epidemic.

During a disease outbreak, like the A/H1N1 influenza pandemic of 2009, news reports keep us updated on the disease - how it is spreading and how many people are affected. But scientists have also shown that mass media coverage - including television, radio, newspapers, billboards and booklets - can have an effect on our behavior.

In the new study, researchers studied the effect of mass media coverage on the H1N1 epidemic in the city of Xi'an in the Shaanxi province of China. They compared the number of hospital visits with the number and duration of news reports about the epidemic.

Their results show that more news reports resulted in fewer hospital visits and vice versa. This, say the researchers, shows that media coverage is a powerful tool to help halt the spread of disease during an epidemic.

Professor Sanyi Tang, corresponding author of the study from Shaanxi Normal University in China, explained the idea behind the research:

"During the A/H1N1 outbreak in Xi'an, I came down with a bad cold and stayed in the university hospital for treatment. Because of the large number of patients with A/H1N1 and the limited number of beds, I was given medicine and released from the hospital. This process made me and my team members begin to think about how we could use mathematical modelling and statistical methods to study the outbreak. We started studying interventions used to control the outbreak, most recently looking at the effect of media coverage."

In the first part of the study, Dr. Tang and his team collected media coverage that contained the key word "A/H1N1" in the title from eight major news websites between 3 September and 16 November 2009. They also obtained the number of newly reported cases from the province's dedicated influenza hospital, the 8th Hospital.

They found that the average number of daily news items was linked to the number of newly reported cases, with a time lag of about four days. At some stages of the epidemic the number of reported cases had an effect on news coverage, while at others the news coverage had an effect on the number of cases.

They then developed a mathematical model to help them study the dynamics of the media coverage: news items, coverage duration and the response of media to the number of cases.

The model confirmed that when there is an increase in news items, there is a decrease in newly reported cases. This is likely due to a change in people's behavior: they avoid contact with others, so fewer people are infected.

The model also showed that the duration of coverage matters. When the coverage lasts longer, there are more news items and a bigger impact on the public awareness of the epidemic, resulting in further behavior changes and fewer new infections.

"The success of any comprehensive prevention and control strategy of the emerging infectious diseases relies on the confidence - and action - of the public in the strategy, and media plays a substantial role in building this confidence," said Professor Sandra Gabriele, a co-author from York University's School of the Arts, Media, Performance & Design.

"In order to help reduce the accumulated number of new notifications, the media should have been more persistent in their reporting of number of infections, hospitalizations and deaths. In addition, news reports needed to be timely and continue for longer periods," added Prof. Tang.

The researchers now plan to take the time lag between the media coverage and changes in newly reported cases into account, to find out how this factor affects epidemics.

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Article details: "Media coverage and hospital notifications: Correlation analysis and optimal media impact duration to manage a pandemic" by Qinling Yan, Sanyi Tang, Sandra Gabriele and Jianhong Wu (doi: 10.1016/j.jtbi.2015.11.002). The article appears in *Journal of Theoretical Biology*, Volume 390 (February 2016), published by Elsevier.

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