

Detecting transmissibility of avian influenza virus in human households

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Recent outbreaks of emerging diseases such as SARS and H5N1 avian influenza have underlined the fact that animal pathogens may acquire the ability to spread efficiently in humans – but as yet have not.

Monitoring the transmissibility of pathogens from animals in humans is therefore key for early detection of epidemic spread, and for effective control. In a study published in PLoS Computational Biology, the authors from the Netherlands and the United Kingdom have used data from a small but well-defined study of H7N7 avian influenza virus transmission in human households to estimate this transmissibility in humans living in close contact.

Infection clusters in human households may arise from transmission from (i) animals (ii) humans who were infected by animals (primary human-to-human transmission), or (iii) humans who were infected by humans (secondary human-to-human transmission). It is efficient secondary human-to-human transmission that is a prerequisite for pandemic spread. In this paper, a method is developed of analyzing the extent of direct human-to-human transmission in a previous outbreak of a highly pathogenic H7N7 avian influenza virus in the Netherlands. There is evidence to show that secondary human-to-human transmission is indeed a plausible explanation for the Dutch infection data.

Based on the estimates of the within-household transmission, van Boven et al. concluded that less than half of the household infections could have been prevented with current antiviral drugs. It is important to

continuously monitor the transmissibility of animal pathogens to and between humans. “Obviously, for public health it is vital that such emerging secondary human-to-human transmission in the human population is detected as quickly as possible”, says van Boven. This paper provides a method of doing so, using data that are easily collected for most infectious diseases.

Citation: van Boven M, Koopmans M, Du Ry van Beest Holle M, Meijer A, Klinkenberg D, et al. (2007) Detecting emerging transmissibility of avian influenza virus in human households. PLoS Comput Biol 3(7): e145. doi:10.1371/journal.pcbi.0030145

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