

Poultry movement in the south of Vietnam, 2009 - 2010

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Purpose:

While complete enumeration of poultry movement networks allows animal health authorities to identify nodes (physical locations) that are major sources and destinations of traded birds and therefore a risk in terms of receiving and distributing infectious diseases such as highly pathogenic avian influenza, these activities are expensive in terms of time and cost, particularly for developing countries. A more practical approach is to conduct a cross-sectional study of poultry movements, allowing node characteristics that render them more likely to receive or distribute poultry to be identified.

Methods:

A cross-sectional study to document commune-to-commune poultry movement events in 19 provinces in the south of Vietnam was carried out between September 2009 and June 2010. The data were analysed as a social network and an exponential-family random graph model developed to quantify the influence of commune-level characteristics on the probability of a movement connection existing between two communes.

Results:

A total of 26,490 commune-to-commune movement events via roads were recorded over the 10 month study period. This involved a total of 3.15 million chickens and 18.14 million ducks. Communes were more likely to be connected if they were urban. As the number of humans per commune increased the odds of a commune-to-commune connection decreased. Increases in the number of poultry-owning households per commune increased the odds of a commune-to-commune connection.

Conclusions:

The number of duck movements and the total number of individual ducks moved were 5 and 6 times greater (respectively) than that recorded for chickens. Poultry were more likely to be moved between communes with relatively large numbers of poultry-owning households. In contrast, communes with large numbers of people were less likely to be connected by poultry movement events.

Relevance:

Assuming a causal relationship exists between a commune's connectivity within a poultry movement network and HPAI H5N1 risk, communes identified as being likely to be connected within a network should be targeted for HPAI H5N1 control and surveillance.