

Business affiliation could increase potential risk of farm-to-farm transmission of avian influenza

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A new study by researchers at the Johns Hopkins Bloomberg School of Public Health examines the potential influence that the business connections between broiler chicken growers may have on the transmission of avian influenza, H5N1. According to the study, the risk of between-farm transmission is significantly greater among farms within the same company group than it is between farms with different company affiliation. The study is among the first to analyze the impact of company affiliation on the spread of diseases from farm to farm and it appears in the March 26 edition of *PLoS One*.

In 2007, U.S. growers produced more than 9 billion broiler chickens, according to a Department of Agriculture census. The [poultry industry](#) is vertically integrated with poultry companies contracting with growers to produce chickens for slaughter. These [broiler chickens](#) are grown in confined housing with defined feed in order to produce uniform and reliable meat.

"Our analysis indicates that company affiliation is a major driver of farm-based exposure risk to an infection like [avian influenza](#) in regions with high-density food animal production. Farms within the same integrator group as an infected farm may face as much as a five-fold increase in exposure risk compared to farms affiliated with a different group," said Jessica Leibler, a doctoral candidate in the Bloomberg School's Sommer Scholars program.

For the study, the Johns Hopkins researchers conducted a nationwide survey of broiler poultry growers to gather information on business practices and determine who visited the farm and how often. Typical contacts included farm workers, feed distributors, waste handlers and social contacts. The data from the survey were used to develop a model to approximate the nature and frequency of contact patterns among poultry farmers. The researchers used the model to analyze how an outbreak of H5N1 at a single farm on the Delaware-Maryland peninsula might spread through the poultry farm-dense region.

Overall, the study found company affiliation to be the greatest driver of farm-to-farm disease transmission risk. In the analysis, employment of part-time workers also contributed to significant increases in risk in most scenarios, most notably for farms that hired day laborers. Social visits to farms were significantly less of a factor in determining risk.

"H5N1 has never been detected in the U.S., but the absence of the disease does not in and of itself prove that current biosecurity measures have been effective," added Leibler. "Low pathogenic avian influenza is detected frequently in U.S. poultry."

"The economic structure of the poultry industry, specifically integrator-level groups and business practices, may be critically important in estimating the risk of outbreak in areas dominated by industrial-scale animal production," said Ellen Silbergeld, PhD, senior author of study and a professor in the Bloomberg School's Department of Environmental Health Sciences. "Models that focus solely on distance among farms as the primary risk factor for disease transmission may not capture the full dynamics of disease spread in settings where production is dominated by vertically integrated industrial food animal production methods."

Provided by Johns Hopkins University Bloomberg School of Public

Health

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