

Study quantifies effectiveness of closing live poultry markets to control spread of bird flu virus

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Closure of LPMs in four cities in China in the spring of 2013 reduced the daily number of human H7N9 infections by more than 97%, according to new research published in *The Lancet*.

"Our findings confirm that LPM closure is a highly effective intervention to prevent [human disease](#) and protect public health", explains lead author Dr Benjamin J Cowling from HKU. "Without this robust evidence, policymakers would struggle to justify further closures of LPMs because of the millennia-old culture of trading live birds and the potential huge economic loss on the poultry industry in China."

Some have already estimated the economic loss of LPM closures at more than 57 billion yuan (about US\$8 billion).

At the beginning of April 2013, soon after the initial avian influenza A H7N9 virus outbreak, 780 LPMs in the four major Chinese cities of Shanghai, Hangzhou, Huzhou, and Nanjing (where most human cases of infection had occurred) were closed, and pet bird trade was also suspended, as a precautionary public health measure.

The researchers collected information on every laboratory-confirmed human case of H7N9 infection reported in the four cities up to June 7, 2013. Data on the age, sex, location, residence (urban/rural) and dates of illness onset of laboratory-confirmed cases were entered into a Bayesian

model which not only quantified the before-and-after effect of LPM closure on the number of human cases of H7N9 infection, but also determined whether incidence patterns could be explained by seasonal effects.

Results showed that closure of LPMs reduced the average daily number of infections by 99% in Shanghai, 99% in Hangzhou, 97% in Huzhou, and 97% in Nanjing. Moreover, the rapid drop in cases after LPM closure allowed the researchers to estimate that the average incubation time was about 3 days.

Absolute humidity, the only common climatic factor known to have a strong affect on influenza transmission, could not explain the sudden drop in cases in each city shortly after LPM closure.

According to Dr Cowling, "Two new cases of influenza A (H7N9) virus have been identified in Zhejiang Province, China on October 14 and October 23, 2013. These are the first laboratory-confirmed cases of H7N9 this autumn, 5 months after the outbreak earlier in 2013. This is of great concern because it reveals that the H7N9 virus has continued to circulate and now has the potential to re-emerge in a new outbreak of human disease this winter."*

Based on these findings the authors conclude that the best course of action to minimise the spread of the virus ahead of the expected surge in infections in the autumn would be sustained LPM closure in areas of high risk of disease spread and immediate LPM closure in areas where the virus appears in the future.

Writing in a linked Comment, Guillaume Fournié and Dirk U Pfeiffer from the Royal Veterinary College, London, UK say, "Although LPM closure in specific circumstances can effectively interrupt human exposure to avian influenza A H7N9 virus, if applied alone this measure

is unlikely to eliminate the zoonotic threat...The focus should move beyond detection of human cases and emergency response towards prevention at the [infection](#) source. A multisectoral approach would be needed first to identify and then target the inter-related social, economic, cultural, biological, and environmental drivers underlying disease emergence and spread...The motivation behind adoption of some trading practices and factors affecting purchasing behaviour of consumers needs to be considered...A multisectoral approach leading to restructuring rather than destabilisation of the LPM system would be more likely to result in a sustainable reduction in the risk of disease spread while also protecting livelihoods and food security."

More information: www.thelancet.com/journals/lan...
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