

Effectiveness of surveillance, prevention and control strategies of Avian Influenza in Switzerland – Poultry Holding Contact Networks.

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Key words

Poultry, Contact Networks, Avian Influenza, Switzerland

Aim of the study

Contribute to a future risk based AI surveillance system for Switzerland by investigating the sector's structural composition.

Material and methods

A comprehensive data base of all Swiss poultry keepers was developed from federal and cantonal databases as a sampling frame. Using a mixed methods research design, a countrywide cross-sectional survey was conducted proportional to the size of holdings among poultry keepers, complemented by interviews with experts from the poultry industry from 2007 to 2009 in Switzerland. Contact networks of Swiss poultry were analysed using contact network methods, which served as a basis for the generation of risk maps of contacts for Switzerland.

Results and significance

Firstly, insights were gained into poultry farmers' disease awareness and their access to information concerning HPAI. In general, the risks perceived by the poultry keepers well reflected the officially communicated risks of HPAI introduction. Mass media was the main source and, especially at non-commercial farms, often the only source of HPAI-related information accessed by poultry keepers. From a scoring system from 0 to 8 (with 8 as maximum), poultry keepers reached an average knowledge level of 3.1. Having a non-commercial poultry farm was significantly associated with low knowledge scores. Commercial poultry farms gained information mostly from established consultation with companies they were affiliated to. A clear need was identified to enhance information exchange between non-commercial poultry keepers and cantonal and federal authorities. Secondly, poultry farm topologically and epidemiologically relevant between-farm contacts were investigated and presented in maps. About 97% poultry farms had at least one neighbouring poultry farm within one 1km. Mapping poultry farm densities countrywide revealed areas with up to 8 poultry farms per square kilometer. Person movements and shared resources were identified in 78% of the 1,317 surveyed farms (93% commercial, 67% non-commercial). Poultry trading movements over extensive spatial ranges were reported in 65% of farms (79% commercial, 55% non-commercial). Movement frequencies depended on farm specialization and were higher for commercial than for non-commercial farms, except for poultry show visits. The involvement of both commercial and non-commercial farms with remote between-farm contacts was in contrast to commonly presumed small poultry movement ranges in the non-commercial sector.

Publications, posters and presentations

Fiebig, L.; Smieszek, T.; Saurina, J.; Hattendorf, J.; Zinsstag, J. Contacts between poultry farms, their spatial dimension and their relevance for avian influenza preparedness. *Geospat Health*. 2009 Nov;4(1):79-95.

Smieszek, T.; Fiebig, L.; Scholz, RW. Models of epidemics: when contact repetition and clustering should be included. *Theor Biol Med Model*. 2009 Jun 29;6:11.

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