

Risk Assessment of introduction of a new exotic serotype of HPAI into Egypt via migratory birds as a tool to be applied in disease prevention

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Problem -The spread of highly pathogenic H5N1 avian influenza into Egypt has resulted in enormous impacts on the poultry industry and presents an important threat to human health. Egypt lies at the crossroads of major intercontinental avian flyways linking Africa, Europe, and Asia. Consequently, it represents a likely transmission pathway of HPAI between regions and it is important to examine the spillover and transmission of the avian influenza virus.

Objective: To assess the likelihood of introduction pathway of a new exotic serotype of HPAI Virus into Egypt via migratory birds as a tool to be applied in prevention.

Animals -A total of 1304 living migratory birds belonging to 19 different species (common tail,shovelar, pintail, quail, coot, Mallard, wigeon, Ergets, cormorant, others) were collected from nine different governorates in Egypt (Port said, Damietta, El Fayoum ,Al Arish, Sharm El Sheik,Rasheed ,AlSharqiyah, and Aswan) .

Procedures -A quantitative risk assessment was conducted by use of a stochastic simulation. Patterns of migratory birds' movement were ascertained through review of relevant governmental records and regulations. Parameters identified in the process were the probabilities of migratory birds' having H5N1 HPAI Virus and of HPAI infection going undetected during migration processes. Sensitivity analysis was performed to determine the effects that each parameter had on the model.An integrated data on phylogenetic relationships of virus isolates and migratory bird movements to determine the pathway for individual introduction events into a country and predict future spread.

Results-The simulation yielded an average consignment prevalence of (9.5 %) during the period from 2003- 2008, with highest rate during 2005-2006 (14%). Wigeon were the most common affected species (11.5 %). The highest positive samples were found during January (70%) followed by April & December (40 % & 25 % resp.,). The H5N1 virus isolated from teal was closely related to H5N1 viruses isolated from humans and poultry circulating in Egypt. Detection of HPAI H5N1 viruses in a Common Teal just before poultry outbreaks and human cases in Egypt in December 2005 suggested the involvement of migratory birds as possible vectors for virus introduction in Egypt.

Conclusion -The likelihood of introducing H5N1 HPAI virus into Egypt via migratory birds was moderate with varying levels of uncertainty. We have demonstrated that the sources of introduction can be many and no route should be underestimated.