Knowns and unknowns – avian influenza and wild birds

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In February 2004, FAO presented a thought provoking exposé on the needs and complications of understanding the role of wildlife as it relates to avian influenza virus strain H5N1 in Southeast Asia (FAO/OIE Regional Meeting held in Bangkok, February 2004). In the aftermath of the H5N1 incursion into Central Asia and Europe these same questions remain. No doubt that certain species of wild birds can carry the H5N1 virus to distant territories. Though it is recognised that there are controversies as to the events surrounding H5N1 in Central China, Siberia and neighbouring areas, or the Danube Delta/Black Sea in mid-2005, little disagreement existed when the virus was identified in migrating swans moving around in Eastern and Central Europe by early 2006: wild birds can introduce the virus to new areas.

One of the salient aspects of the identification of the H5N1 virus in wild bird species is that there is a poor understanding of its presence in various populations of wild birds (total census, denominator); virus identification has too frequently been documented in dead birds – little in healthy wild bird populations. The difficulties in surveillance of avian influenza viruses in wild birds stem, in part, from the limited financial resources and local expertise required to conduct such investigations, and the logistics associated with capturing and sampling wildlife further complicated by the millions upon billions of migrating or native wild birds where classical sampling methodologies that meet accepted international livestock (including poultry) epidemiological methods are often based on opportunity rather those that can be programmed. A secondary difficulty is interpretation of the results: positive antibody results mean exposure, but not necessarily carrier status and virus isolation in an individual does not necessarily mean reservoir status, either ante-mortem or post-mortem. There is an important role of pathology, epidemiological, and ecological investigations in addition to antibody screening and virus isolation.

The events of 2004 to date, with regard to H5N1 and wild bird implication in the dissemination of the strain, are complicated. Wild birds that are infected by H5N1 in resident poultry and then passage to distant areas are a logical possibility; but the contrary can also occur. Lamentably, resources channelled to understanding wild bird resident and migration patterns and infectious agents are few to nil. The advent of telemetry for use in wild birds is limited to those species that can physically carry such a device and is a costly enterprise. Highly pathogenic (virulence) is a term used internationally for certain avian influenza viruses that affect poultry – chickens; little is known on the true virulence factors for other avian or mammalian species. Such virulence understanding would be helpful in conservation efforts to protect, or at least provide, early warning that a particular virus could endanger certain wild bird species or sub-populations. Controlled laboratory studies to understand virus susceptibility, transmission, the timing of sero-conversion, and shedding parameters of key species would be needed, but these too are complicated in terms of obtaining sufficient numbers of the key wild birds as representatives of the species, adaptation to a laboratory environment, securing the required permits, and joining of multidisciplinary teams for proper interpretation of results to a wider population.

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