Wild birds and the epidemiology of avian influenza

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Although wild aquatic birds are the recognized source and reservoir for all subtypes of avian influenza viruses, the complex interactions between these diverse host and virus populations has not received adequate attention. Although a general concept of AIV epidemiology in wild birds exists, the presence of HPAI H5N1 viruses in wild birds has reinforced the need for a much more detailed understanding of AIV natural history.

Worldwide, the wild avian reservoirs for AIV are incompletely defined, even within well studied groups such as the Anseriformes and Charadriiformes. This lack of clarity not only applies to avian host species, but also to the various subtypes of AIV that are present within these populations. Even with the extensive number of AIV isolations that have been previously reported from wild birds, the reservoir species and global distribution for many of these AIV subtypes are not completely understood.

To date, studies related to AIV epidemiology in wild birds have primarily focused on the agent. To move forward, we need to apply this same level of scrutiny and detailed understanding to the natural host populations and the environments which they utilize. Research to date, has clearly demonstrated that species and population structure are important in AIV maintenance, transmission, and possibly long-distance movement.

Species-related differences, related to host biology and behavior, spatial and temporal distribution, habitat utilization, migration behavior, population age structure, and individual species susceptibility, all potentially influence a species’ role in AIV epidemiology. The unprecedented mortality associated with HPAI H5N1 infection in wild birds has provided a new window from which to view the potential for exchange of AIV between wild and domestic birds and mammals, and further demonstrates and expands the varied roles that wild birds may play in AIV epidemiology. These roles must be clearly defined if we are going understand the full implications of current HPAI virus introduction into the wild bird populations, and most importantly, prevent the next one.

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