Risk assessment of Avian Influenza and Newcastle disease viruses exposure from peridomestic wild birds in a conservation breeding site in the United Arab Emirates

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Abstract

Worldwide, wild birds are frequently suspected to be involved in the occurrence of outbreaks in captive-bred birds although proofs are lacking and most of the dedicated studies are insufficiently conclusive to confirm or characterize the roles of wild birds in such outbreaks. The aim of this study was to assess and compare, for the most prevalent peridomestic wild birds, the different exposure routes for Avian Influenza and Newcastle disease viruses in conservation breeding sites of Houbara bustards in the United Arab Emirates. To do so, we considered all of the potential pathways by which captive bustards could be exposed to Avian Influenza and Newcastle disease viruses by wild birds, and ran a comparative study of the likelihood of exposure via each of the pathways considered. We merged data from an ecological study dedicated to local wild bird communities with an analysis of the contacts between wild birds and captive bustards and with a prevalence survey of AIV and NDV in wild bird populations. We also extracted data from an extensive review of the scientific literature and by the elicitation of expert opinion. Overall, this analysis highlighted that captive bustards had a high risk of being exposed to pathogens by wild birds. This risk was higher for Newcastle disease virus than Avian influenza virus, and House sparrows represented the riskiest species for the transmission of both viruses through indirect exposure from consumption of water contaminated from the faeces of an infectious bird that got inside the aviary. Thus, this analysis reveals that wild peridomestic birds may play a role in the transmission of avian pathogens to captive bred birds. These results also reaffirm the need to implement sanitary measures to limit contacts between wild and captive birds and highlight priority targets for a thoughtful and efficient sanitary management strategy.

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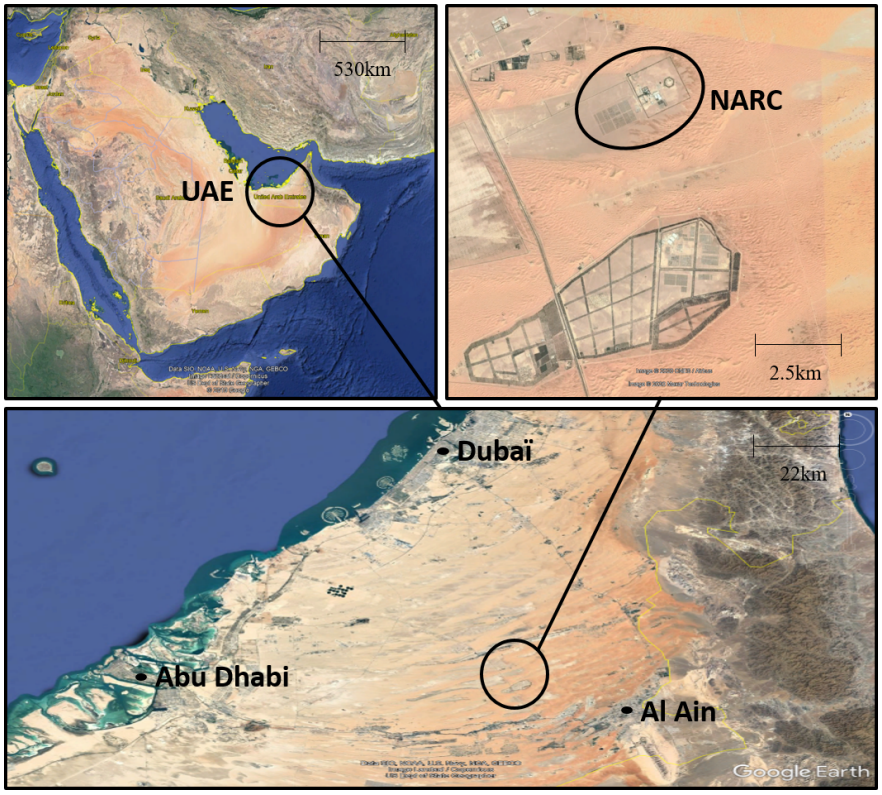

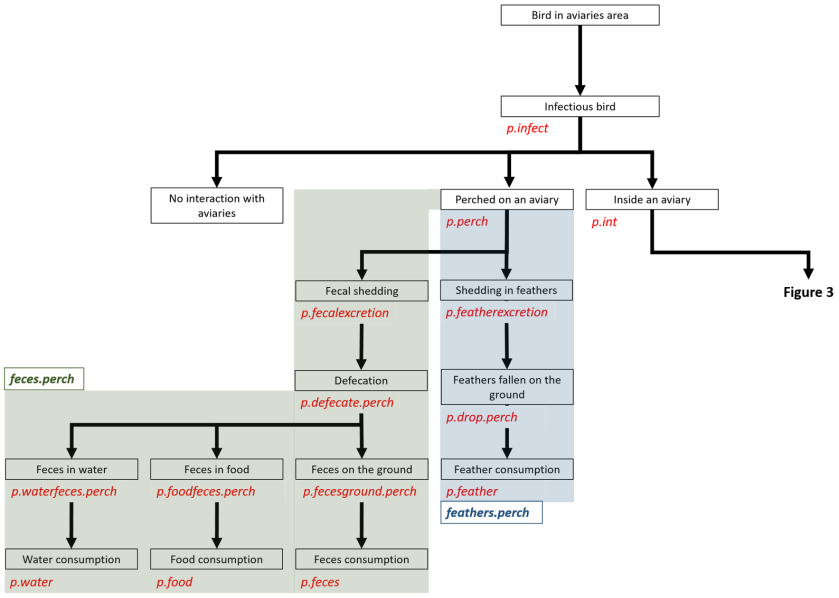

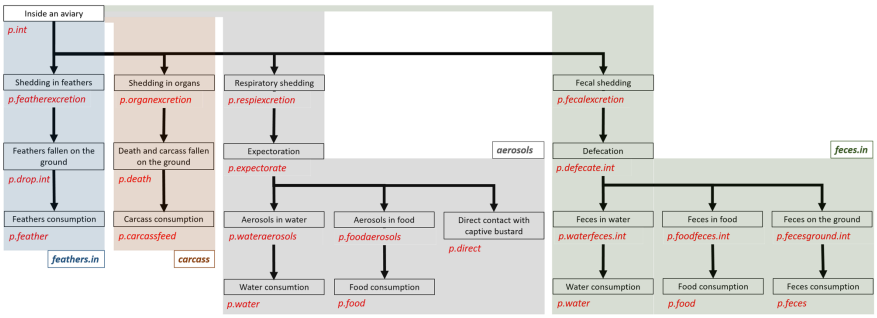

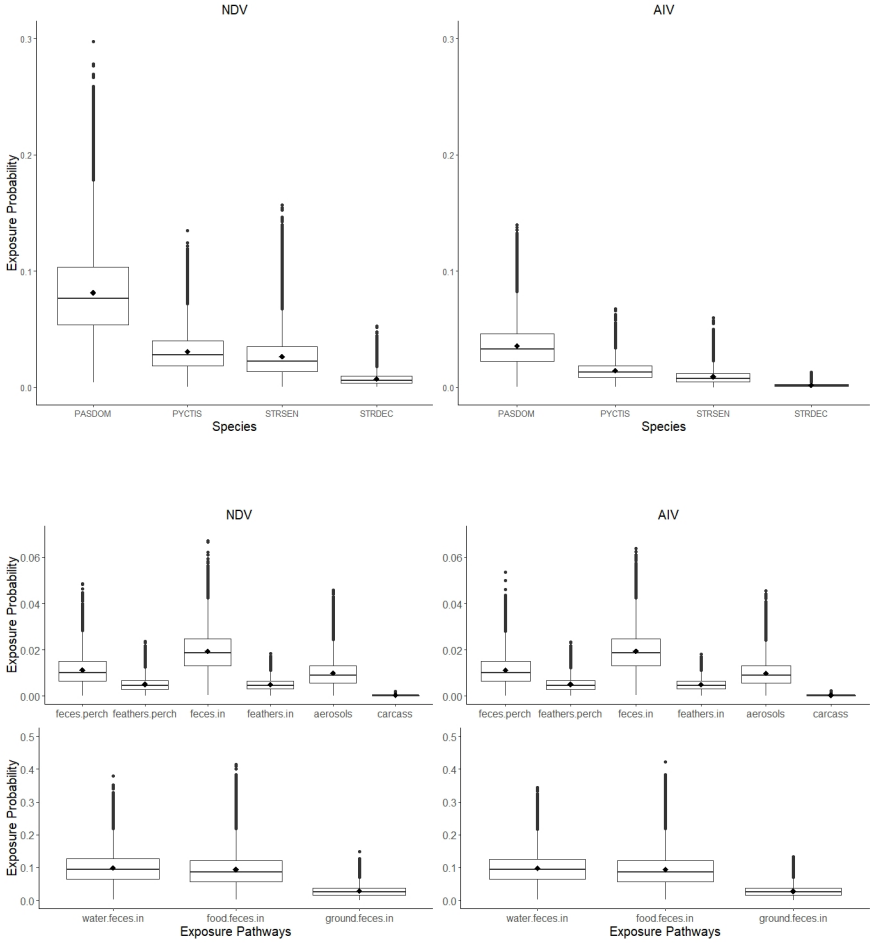

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