

# **Correlations In Avian Influenza Prevalence Between Commercial Poultry Farms, Backyard Poultry, And Wild Birds As A Hallmark Of Failing Farm Biosecurity In Bangladesh**

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## **Body of the Abstract**

**Introduction:** Over the past decade, highly pathogenic avian influenza (HPAI), notably H5N1, has inflicted substantial economic losses on the poultry sector in southeast Asia, notably Bangladesh, where it has been endemic and sporadically epidemic since 2007. Frequent interaction and transmission of avian influenza viruses (AIV) among commercial poultry, backyard flocks, and wild birds are key contributors to the persistence and exacerbation of this issue.

**Methods:** To investigate the exchange of viral material, we examined correlations of avian influenza viruses (AIV) and AIV antibodies among three bird groups in Dhaka, Sylhet, and Chittagong districts of Bangladesh. Samples included oro-pharyngeal and cloacal swabs for AIV and blood serum for AIV antibodies. To maximize variance, half the samples were from 29 farms with suspected AIV outbreaks, while the rest were from 24 non-outbreak farms. We employed one-step rt-PCR for AIV M-gene and subtypes H5, H7, H9 detection. AIV antibody detection utilized c-ELISA, and Hemagglutination Inhibition (HI) tested antibodies against AIV subtypes H5, H7, and H9.

**Results:** As expected, higher prevalence levels of avian influenza viruses (AIV) and AIV antibodies were observed in commercial poultry on outbreak farms (69.15% and 47.29%) compared to non-outbreak ones (60.71% and 49.98%). Similar patterns were noted in backyard poultry (30.85% and 32.43%) and nearby wild birds (0.00% and 20.72%) in the outbreak area. Additionally, significant correlations in AIV and AIV antibody prevalence were found among commercial poultry, backyard poultry, and wild birds residing in close proximity to the farms experiencing outbreaks.

**Conclusions:** Our data indicate a substantial exchange of avian influenza viruses (AIV) among commercial poultry, backyard poultry, and wild birds, likely perpetuating the high AIV prevalence. Enhanced biosecurity measures, particularly minimizing direct and indirect interactions among these bird groups, are crucial to mitigate AIV transmission and the spread of highly pathogenic avian influenza (HPAI).