

Avian Influenza: General Concerns and its grasp on Pakistan's Poultry System

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ABSTRACT

This article aims to highlight Influenza Type A which is a highly contagious virus causing epidemic diseases in birds and mammals and a member of the Orthomyxoviridae family. It is a major cause of concern due to its potentially devastating effects upon the livestock industry and workers involved within.

Introduction:

Avian Influenza, commonly identified as bird flu, is a highly pathogenic disease which affects aquatic, poultry and wild bird species. This disease was first recorded in the UK and now holds its roots within Southeast Asia, reported in around 60 countries in the Eurasian region; it is responsible for several epidemics within this vast spread of land leading to severe economic repercussions [1].

Although the virus can be categorised based on pathogenesis as the following: HPAI (Highly Pathogenic Avian Influenza) and LPAI (Low Pathogenic Avian Influenza) with the former causing up to 100% morbidity and mortality and the latter causing mild or asymptomatic infections, it is crucial to note that the disease poses a risk only significantly at farm level with bird-to-human transmission as viral transmission human-to-human is extremely rare. This notion does not mean to in signify valid concerns of the possible development of highly pathogenic human strain due to the mutagenic nature of the virus. Avian Influenza is usually transmitted through the direct contact with an infected bird or through exposure to materials in contact with faecal matter or respiratory droplets or secretions, the fatality rate for humans being around 56% [2].

Bird Flu in Pakistan

LPAI Strains (H9N2, H7N3) and HPAI strains (H7N3, H5N1) have been regularly identified within commercial broiler and layer hen flocks in Pakistan. The initial strain to be found within poultry flocks is reported to be HPAI H7N3 in 1995 followed by H9N2 in 1998 [3]. Control of these outbreaks were carried out through ring vaccination but due to inefficient containing of virus in affected areas, subsequent reinfections and outbreaks of these strains have occurred. HPAI strain H5N1 was isolated in the year 2006 urging the involvement of government officials to overcome this epidemic. Despite infection of human workers within the poultry industry though H5N1 [4], it is concluded that the most prevalent strain within the country is actually the low pathogenic H9 strain [5].

This LPAI subtype is suggested to impact the industry to the highest degree as compared to other subtypes as it is responsible for disease related mortality with clinical signs that differ according to species such as: poor weight gain in broilers and reduced egg production in layer hens, respiratory symptoms such as coughing and sneezing, ruffled feathers, diarrhea and tremors. It is often for these signs to go unnoticed as LPAI outbreaks usually go undetected due to their mild nature [6].

The spread of different strains of Avian Influenza to not only neighboring countries but across several borders may be carried out through the migration of wild waterbirds. These birds carry the virus in their respiratory tract and are often asymptomatic, which along with the highly pathogenic nature of AI allows for outbreaks. It is suggested that migratory birds from Pakistan may be responsible for these outbreaks during the migratory season and is considered a priority area of surveillance [7].

Pakistan's Poultry Sector and how it is ultimately affected

Pakistan has four sectors of poultry industry which include Industrial integrated system with high levels of biosecurity, commercial poultry system with moderate to high biosecurity, commercial poultry system with low to minimal biosecurity and village or backyard production systems with minimal biosecurity. The country's poultry sector is responsible for an estimated 35% of livestock production and contributes around an estimated ~1.3% to the national GDP.

According to a study by the Department of Agricultural and Resource Economics, UC Berkeley, Avian Influenza affects animal production through three main pathways. First of all, the disease causes losses directly to poultry producers and those individuals connected to the production industry through mortality (resulting in direct losses). Then, animal diseases that are of concern

(such as HPAI) will be of concern to government officials, making it known to the public. This will cause losses to those poultry producers with otherwise healthy flocks due to decreased investment by the public. Lastly, the market will be affected due to severe market reactions which will decrease overall demand.

All these factors will ultimately lead to multiple economic consequences which include, but are not limited to; loss of jobs in the livestock sector, around 50% loss for personnel involved in the production of poultry and decreased tourism due to negative public opinion.

The implementation of Disease Control

The control methods (as outlined by World Organization for Animal Health, OIE) [8] states that firstly, the pathogen must be controlled at its animal source which is done by: keeping away domestic and poultry birds away from their wild counterparts, the provision of a sanitary environment to poultry birds and the reporting of suspicious deaths to veterinary officials.

Second, farmers must be encouraged to follow mandatory culling guidelines regarding infected birds and those in close contact through financial compensation. Lastly, vaccination is recommended under certain conditions but it is not the sole solution to this disease as it can hide inapparent infections and must be used along with other methods to ensure complete eradication.

Conclusion

To conclude, it is vital to realize the urgency of Avian Influenza especially regarding its increasing effect on not only domestic, but wild species and the health of humans and future prospects of pathogenicity. The government must be urged to take strict action to prevent further recurrences of HPAI strains.

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