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Avian Influenza in India: Why It Returns Every Winter and What Must Change

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INTRODUCTION

In February 2006, India notified its first outbreak of highly pathogenic avian influenza from Navapur, in the Nandurbar district of Maharashtra. In May 2026, culling teams returned to the same town. Nearly two lakh layer birds were destroyed across fourteen commercial farms after the National Institute of High Security Animal Diseases (NIHSAD), Bhopal, confirmed H5N1 in three of them. Two decades of experience, and the same place, the same virus, the same pits.

That is not a story of failure so much as a story of a disease we have learned to contain but not to prevent. India now produces about 149 billion eggs and 5.18 million tonnes of poultry meat a year, second in the world for eggs and with poultry supplying roughly half of all meat the country produces. An industry of that size cannot keep absorbing a winter emergency every year without asking harder questions than it has so far been willing to ask.

Eight segments, endless combinations

Avian influenza is caused by influenza A viruses of the family Orthomyxoviridae, classified by their surface haemagglutinin (H1 to H16) and neuraminidase (N1 to N9) proteins. The genome is single-stranded, negative-sense RNA in eight separate segments, and that segmentation is the heart of the problem. When two influenza viruses infect one cell, segments are swapped wholesale. This is reassortment, and it can produce a virus with new properties in a single step rather than by slow mutation.

Strains are divided into low pathogenic (LPAI) and highly pathogenic (HPAI) forms, a classification based on what the virus does in chickens, not on how it behaves in people. Only H5 and H7 subtypes have so far acquired the polybasic cleavage site in the haemagglutinin that allows systemic replication and the devastating mortality that defines HPAI. The virus of the current global panzootic is H5N1 of clade 2.3.4.4b, descended from the goose/Guangdong lineage that emerged in 1996. It appeared as H5N8 in 2014, shifted to H5N1 through reassortment in 2021, and has since produced a family of genotypes that differ by region.

India carries a second, quieter problem. Low pathogenic H9N2 is entrenched in Indian poultry, causing production losses and secondary infections rather than dramatic mortality, and therefore attracting little attention. Its significance lies elsewhere: H9N2 has repeatedly donated internal gene segments to zoonotic H5 and H7 viruses, and a human case has already been documented from eastern India. A subtype that circulates unnoticed in millions of birds is exactly the mixing vessel a new reassortant needs.

From the flyway to the farm gate

The reservoir is wild waterfowl, particularly ducks, geese and shore birds, in which these viruses have evolved to cause little or no disease. India sits under the Central Asian Flyway, and the seasonal pattern of Indian outbreaks, clustering from October to March, follows the arrival of migratory birds at our wetlands. Crows are often the first visible casualty; in Chennai in February 2026, more than 1,500 crows died before poultry anywhere nearby was implicated. Dead crows and dead wild birds are a surveillance signal that costs nothing to act on and is still too often ignored.

Once the virus reaches poultry, the vectors are ours. Movement of live birds, shared crates and vehicles, egg trays returning from the market, contaminated feed and litter, farm workers moving between units, and live bird markets where species mix daily are what turn a single infected shed into a district-wide emergency. Open-sided housing, backyard flocks ranging freely, and ducks reared alongside chickens complete the picture.

Sudden death and what the carcass shows

The classical presentation of HPAI is sudden, severe mortality that may reach 90 to 100 per cent within forty-eight hours, often with no preceding signs at all. Where birds survive long enough to show disease, the signs are cyanosis and oedema of the comb and wattles, subcutaneous haemorrhages on the unfeathered skin of the shanks, swelling of the head and periorbital region, greenish diarrhoea, respiratory distress, and nervous signs such as torticollis and incoordination. In layers, a sharp fall in egg production and a run of soft-shelled and misshapen eggs may precede the mortality.

At post-mortem, the lesions are those of a systemic vascular disease. Haemorrhagic tracheitis, petechiae on the proventricular mucosa and particularly at the proventriculus-gizzard junction, haemorrhages on the epicardium and in abdominal fat, necrotic foci in the pancreas and spleen, severe pulmonary congestion and oedema, haemorrhagic enteritis, and in layers ovarian regression with egg yolk peritonitis. None of this is pathognomonic. Velogenic Newcastle disease, acute fowl cholera and infectious laryngotracheitis each reproduce part of the picture, and in ducks so does duck plague.

Confirmation in India is centralised for good reason. Samples go to NIHSAD, Bhopal, or a regional disease diagnostic laboratory, where real-time RT-PCR against the matrix gene is followed by H5 and H7 subtyping and pathotyping. No state laboratory declares an outbreak on its own. The field veterinarian's job is to suspect early, sample correctly, and get the consignment moving within twenty-four hours.

The panzootic has left the birds behind

What makes this wave different from every previous one is its host range. Clade 2.3.4.4b has been recorded in more than forty mammalian species across four continents, from farmed mink and fur animals to foxes, cats, dogs, seals and sea lions. In the United States, more than a thousand dairy herds across nineteen states have tested positive since 2024, with at least four separate introductions from birds into cattle. The virus has reached Antarctica. In February 2026 it was detected for the first time in northern elephant seals in California.

The human picture has shifted with it. In November 2025 a backyard flock owner in Washington State became the first person in the world known to be infected with H5N5, and died of respiratory failure. Between July 2025 and March 2026, further H5N1 infections were reported from Cambodia and Bangladesh, every one of them linked to contact with birds or a contaminated environment. The joint FAO, WOAH and WHO assessment of May 2026 holds that the risk to the general public remains low, and that the risk to those occupationally exposed is low to moderate. Critically, no sustained human-to-human transmission has been identified anywhere. These viruses are still avian viruses; they would need further genetic change to spread efficiently between people. The honest summary is neither complacency nor alarm, but vigilance.

India has recorded two fatal human H5N1 infections. The first, in 2021, was an eleven-year-old boy in Haryana. The second was a two-year-old girl from Palnadu district in Andhra Pradesh, who died in March 2025; no poultry outbreak had been reported in her area, and consumption of raw chicken was investigated as a possible source. Both cases are a reminder that the people most at risk are those in closest contact with sick birds, and that includes our own culling teams.

Zones, culls and compartments: India's machinery

India's response rests on the Action Plan for Prevention, Control and Containment of Avian Influenza, revised in 2021. On confirmation, an infected zone of 1 km radius is declared, extendable in steps to 3 km, with a surveillance zone from 1 to 10 km around it. All poultry and captive birds within the infected zone are culled from the periphery inwards, along with eggs, feed, litter and reusable material. Disinfection with 2 per cent sodium hypochlorite or 4 per cent formalin is followed by a sanitization certificate, three months of post-operation surveillance, and restocking only after ninety days from birds sourced in disease-free areas. Freedom is declared if nothing turns positive in that period. Compensation to farmers is shared equally between the Centre and the state under the ASCAD scheme.

That machinery works. India has repeatedly extinguished outbreaks and regained freedom, and under the compartmentalisation route forty-four poultry compartments across Tamil Nadu, Maharashtra, Uttar Pradesh, Chhattisgarh and Odisha held WOAH-recognised freedom from HPAI in 2025, sampled every thirty days and tested by ELISA and real-time RT-PCR. Export access depends on exactly this. But the same declaration records 486 HPAI-positive poultry samples nationally in 2024 and roughly four dozen outbreak epicentres during 2025, which is the measure of how far compartment freedom is from country freedom.

The questions we keep postponing

- **To vaccinate or not.** Vaccination against HPAI is not permitted in India, and the arguments against it are real: it can mask circulation, complicate serological surveillance, and jeopardise trade. The arguments for it are becoming harder to dismiss as the

panzootic persists and other countries move. Any Indian decision would need DIVA-compatible vaccines, matched strains, and a surveillance system capable of detecting infection in a vaccinated flock. The question deserves a considered national answer rather than an indefinite deferral.

- **Compensation decides whether we hear about it.** Stamping out works only if farmers report. Where compensation is delayed, below market value, or unavailable to the unregistered backyard keeper, the rational response is to sell the flock quickly and say nothing. Prompt and fair payment is not welfare spending; it is the price of early detection.
- **The backyard and the market are the blind spot.** Commercial farms can be audited into compliance. The backyard sector and live bird markets, where chickens, ducks and occasionally other species are held together and slaughtered on demand, cannot. These are where reassortment is most likely and surveillance is weakest.
- **Protect the people doing the work.** Cullers, veterinarians and support staff work in the most contaminated environment that exists during an outbreak. N95 respirators, goggles, coveralls, gloves and boots, antiviral prophylaxis where indicated, and ten days of health monitoring afterwards must be arranged before the operation begins, not improvised on the day.
- **Watch the quiet subtype.** H9N2 is not notifiable in the way H5 and H7 are, and so it is largely invisible. Systematic subtyping of low pathogenic viruses in Indian poultry would tell us what is actually circulating and what it might combine with.

Habits that keep a flock off the cull list

- Keep poultry away from wild birds and standing water. Net the sheds, cover feed and water, and do not let ducks and chickens share space.
- Treat every incoming bird, crate, vehicle and visitor as a risk. Dedicated footwear and clothing, a functioning foot dip and a vehicle wash are cheap compared with a cull.
- Report unusual mortality within twenty-four hours. A sudden death spike, a drop in feed and water intake, or a cluster of dead crows is a notifiable event, not something to watch for a few more days.
- Never move birds, litter, manure or eggs out of a shed where mortality has risen sharply, and never sell a sick flock.
- Use personal protection during any handling of sick or dead birds, and see a doctor promptly if fever or respiratory symptoms follow; tell the doctor about the exposure.
- Cook poultry and eggs thoroughly. Properly cooked meat and eggs are safe, and saying so clearly is part of the veterinarian's job during an outbreak, when rumour does more economic damage than the virus.

Living with a virus that flies

Avian influenza will not be eradicated the way rinderpest was. Its reservoir flies, crosses borders without documents and cannot be vaccinated or culled. What can be changed is everything downstream of that reservoir: how quickly a dead crow becomes a laboratory sample, how well a shed keeps wild birds out, whether a farmer believes reporting will not ruin him, and whether the person doing the culling is wearing a respirator.

The strongest argument for doing this well is not poultry economics. It is that a virus capable of killing a backyard flock owner in

Washington, infecting a thousand dairy herds in nineteen American states, and killing a two-year-old in Andhra Pradesh is being given millions of opportunities each year to find the mutations it still lacks. India's poultry sector, veterinary services and public health system have built the response machinery. The task now is to use it earlier, extend it to the sectors it does not reach, and settle the policy questions while we still have the luxury of settling them calmly.

REFERENCES

Chrzastek, K., Lieber, C.M. and Plemper, R.K. (2025). H5N1 clade 2.3.4.4b: evolution, global spread, and host range expansion. Pathogens, 14(9): 929. doi:10.3390/pathogens14090929

DAHD (2021). Action Plan for Prevention, Control and Containment of Avian Influenza (Revised 2021). Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India, New Delhi.

DAHD (2025). Basic Animal Husbandry Statistics 2025. Department of Animal Husbandry and Dairying, Government of India, New Delhi.

FAO, WOAH and WHO (2026). Updated Joint FAO/WOAH/WHO Public Health Assessment of Recent Influenza A(H5) Virus Events in Animals and People, 18 May 2026. Rome, Paris and Geneva.

Kibiger, L., Oltean, H.N., Leitz, L. et al. (2026). Fatal human case of highly pathogenic avian influenza A(H5N5) in a backyard flock owner, Washington, November 2025. Morbidity and Mortality Weekly Report, 75(17): 221-225. doi:10.15585/mmwr.mm7517a2

Nguyen, T.-Q. et al. (2025). Emergence and interstate spread of highly pathogenic avian influenza A(H5N1) in dairy cattle in the United States. Science. doi:10.1126/science.adq0900

WHO (2025). Avian Influenza A(H5N5) - United States of America. Disease Outbreak News 2025-DON590. World Health Organization, Geneva.

WOAH (2025). Self-declaration of freedom from highly pathogenic avian influenza in 44 poultry compartments in India. World Organisation for Animal Health, Paris.

WOAH (2026). Avian Influenza Portal and WAHIS situation reports. World Organisation for Animal Health, Paris.