



# H5N1- Avian Influenza

## Why in News?

Recent reports of [H5N1 \(subtype of avian influenza\)](#) being transmitted between **mammals** have raised concerns about its **potential to cause a human pandemic**.

- Scientists are investigating a **potential spillover event after a mass mortality event that killed over 700 seals along the [Caspian Sea](#) coast** where a H5N1 variant was detected in wild birds a few months ago.

## What is H5N1 Avian Influenza?

- **About:**
  - **Avian influenza** or bird flu refers to the disease caused by **infection with avian influenza Type A viruses**.
    - Infrequently, the **virus can infect mammals from birds**, a phenomenon called spillover, and rarely can spread between mammals.
  - **H5N1, a subtype of avian influenza**, has the potential to infect other mammals such as **minks, ferrets, seals, domestic cats**, and others through contact with infected **birds, their faeces, or infected bird carcasses**.
- **Symptoms in Humans:**
  - Range from mild to severe influenza-like illnesses such as **fever, cough, sore throat, muscle aches, nausea, abdominal pain, diarrhea, vomiting**.
  - People can also develop severe respiratory illness (e.g., **difficulty breathing, [pneumonia](#), acute respiratory distress, viral pneumonia**) and altered mental status, seizures etc.
- **Avian Influenza in India:**
  - In 2019, India has been declared free from **Avian Influenza (H5N1)**, which has also been notified to the [World Organization for Animal Health \(OIE\)](#).
    - **However**, in December 2020 and early 2021, **outbreaks of avian influenza H5N1 and H5N8** were reported in **poultry in 15 states in India**.
- **Treatment:**
  - Evidence suggests that some **antiviral drugs** can reduce the duration of viral replication and improve prospects of survival, however ongoing clinical studies are needed.
- **Concerns:**
  - The widespread H5N1 outbreaks have substantial economic impact, **resulting in significant losses to the [poultry industry](#)** and threatening **food and vaccine security**, apart from **raising animal welfare and environmental concerns**.

## Types of Influenza Virus

- There are four types of influenza viruses: **influenza A, B, C, and D**
- Influenza A and B are the two types of influenza that **cause epidemic seasonal infections nearly every year**.
- Influenza C mainly occurs in humans, but has been known to also occur in dogs and pigs.
- Influenza D is found mainly in cattle. It's not known to infect or cause illness in humans yet.

## Avian influenza Type A Viruses

- Type A viruses are classified based on two proteins on their surfaces - **Hemagglutinin (HA)** and **Neuraminidase (NA)**. There are about 18 HA subtypes and 11 NA subtypes.
- Several combinations of these two proteins are possible e.g., **H5N1, H7N2, H9N6, H17N10, H18N11 etc.**
- All known subtypes of influenza A viruses can infect birds, **except subtypes H17N10** and H18N11, which have only been found in bats.

| Types  | A Subtypes   | HPAI vs LPAI   |
|--|--|--|
| <b>Influenza A</b><br>(Infects a wide range of animals including birds)          | Avian<br>(Can infect humans)<br>H5N1<br>H7N3<br>H7N7<br>H7N9<br>H9N2<br>H10N8<br><br>Swine<br>(Can infect humans)<br>H1N1<br>H1N2<br>H3N2<br><br>Most common human<br>H1N1<br>H3N2 | HPAI H5N1<br>LPAI H5N1<br>HPAI H5N8<br>LPAI H5N8<br><br>Subtypes can be classified as high path or low path based on the ability of the specific virus strain to kill chickens in the lab setting. |
| <b>Influenza B</b><br>(Mainly infects humans)                                    |  |  |
| <b>Influenza C</b><br>(Infects humans and pigs but more rare than types A and B) |  |  |
| <b>Influenza D</b><br>(Infects cattle)   |  |  |

### UPSC Civil Services Examination, Previous Year Question (PYQ)

**Q. H1N1 virus is sometimes mentioned in the news with reference to which one of the following diseases? (2015)**

- (a) AIDS
- (b) Bird flu
- (c) Dengue
- (d) Swine flu

**Ans: (d)**

**Source: TH**

