H5N1 vs H5N2

Why in news?

Recently, World Health Organization (WHO) has confirmed the first-ever human death caused by the H5N2 strain of avian influenza.

What is an Avian influenza?

- **Bird flu-** It is a viral infection that primarily affects birds but can also infect mammals, including humans.

  Avian influenza is a zoonotic disease, meaning it can spread from animals to humans.

- **Transmission-** It spreads from infected birds to humans through close contact with birds or contaminated environments, such as in backyard poultry farm settings and at markets where birds are sold.
- **Symptoms-**
  - Respiratory symptoms- Cough, shortness of breath, difficulty breathing, and sore throat.
  - Non-respiratory symptoms- Fatigue, Muscle or body aches
- **Asymptomatic infection**- Some individuals may not show symptoms (asymptomatic) despite being infected, particularly those with exposure to infected animals or their environments.

What is a novel avian influenza A virus?

- **About-** It is a newly identified subtype of influenza A virus that originates in birds (avian species) but has undergone mutations allowing it to infect other species, including humans.
- **Novel viruses-** These viruses are termed "novel" because they possess unique genetic characteristics not previously identified in existing influenza strains.
- **Host-** It primarily infect birds, both wild and domestic (e.g., chickens, ducks, and turkeys), it can potentially infect other animals, including mammals like pigs and humans, especially if the virus adapts to these hosts.
- **Transmission-**

Types of transmission	About

Bird-to-Bird	Direct contact, contaminated water, or surfaces
Human infections	It usually occur through direct or close contact with infected birds or contaminated environments.
Human-to-human transmission	It is a potential concern as the virus acquires the ability to spread efficiently among people.

- **Health impact**- In humans, infections can range from mild respiratory symptoms to severe disease and even death, depending on the virus strain and individual health factors.
- **Public health concern**- Novel avian influenza viruses are closely monitored due to their potential to cause pandemics.
- **Examples**-
  - **H5N1-** First identified in 1997 in Hong Kong it has caused numerous outbreaks in birds and sporadic human infections with high mortality rates.
  - **H7N9-** Emerged in China in 2013, causing severe respiratory illness in humans.
  - **H5N2-** Recently noted for its first human infection case in Mexico
- **H5 viruses-** They are classified based on two types of protein on their surfaces: hemagglutinin, or H, which plays a crucial role in allowing the virus to infect cells, and neuraminidase, or N, which helps the virus spread.

People become infected with H5 viruses through direct contact with birds and poultry, not other humans.

What are the major differences between H5N1 vs H5N2?

Points of Difference	H5N1	H5N2
Origin	The goose/Guangdong-lineage of H5N1 avian influenza viruses first emerged in 1996 and has been causing outbreaks in birds since then.	H5 viruses have been circulating among poultry and wild birds in Mexico since the mid-1990s. Australia reported the first human infection with A(H5N1), with no evidence of transmission.
Meaning	H5N1 is one of several influenza viruses that causes a highly infectious respiratory disease in birds called avian influenza (or "bird flu").	H5 N2 is a subtype of the species Influenzavirus A (avian influenza virus or bird flu virus).
Spread	Infections in mammals, including humans, have also been documented. (Almost all cases of H5N1 virus infection in people have been associated with close contact with infected live or dead birds).	The subtype infects a wide variety of birds, including chickens, ducks, turkeys, falcons, and ostriches. Unlike other avian influenza strains that have caused outbreaks in humans such H1 and H3 viruses — H5 viruses rarely infect humans.

Human to Human transfer	The virus is yet to show any signs of transfer between humans.	A human infection due to novel influenza A virus subtype even has potential for high public health impact.
Vaccine	Currently, human infections of H5N1 are limited and vaccines are not recommended. (In China, inactivated H5N2 has been effectively used as a poultry vaccine for H5N1). There is also an mRNA vaccine targeting a specific subtype of the H5N1 virus.	There are no specific vaccines for preventing influenza A(H5) virus infection in humans.
Symptoms	The clinical signs of the disease are identified as a decrease in food consumption and a simultaneous decrease in rumination, a reduction in milk production, dehydration, fever, clear nasal discharge, tacky or loose faeces, lethargy and thicker, concentrated, colostrum-like milk.	Symptoms include fever, shortness of breath, diarrhea, nausea, and general discomfort.

References

1. Down to Earth | Avian flu H5N1 spreads to 40 cattle in Minnesota, US.
2. Down to Earth | WHO confirms first death from bird flu strain H5N2 in Mexico.
3. Indian Express | First human death from H5N2 bird flu.

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