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FIRST HUMAN DEATH FROM H5N2 STRAIN

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "**FIRST HUMAN DEATH FROM H5N2 STRAIN**". THIS TOPIC IS RELEVANT IN THE "**SCIENCE AND TECHNOLOGY**" SECTION OF THE UPSC CSE EXAM.

Why in the News?

Recently, the World Health Organization (WHO) reported that a 59-year-old individual from Mexico had passed away from the first confirmed case of infection with the H5N2 strain of bird flu globally.

ABOUT H5N2 STRAIN OF BIRD FLU

- The H5N2 strain is a subtype of the avian influenza virus, also known as bird flu. This strain belongs to the larger group of H5 avian influenza viruses, which are identified by their hemagglutinin (H) and neuraminidase (N) proteins on the virus's surface. The "H5" denotes the type of hemagglutinin protein, while "N2" denotes the type of neuraminidase protein.
- H5N2 primarily infects birds, causing severe respiratory and systemic illnesses in poultry and wild birds. It has been responsible for significant outbreaks in poultry farms, leading to substantial economic losses due to the need to cull infected flocks to prevent the virus's spread.
- While H5N2 is primarily a bird virus, there have been occasional cases of human infection, usually involving individuals who have had close contact with infected birds or contaminated environments. The potential for H5N2 to mutate and infect humans more easily is a concern for public health officials, prompting ongoing surveillance and research to monitor and control its spread.

SUBTYPES OF BIRD FLU

- Avian influenza is caused by influenza viruses that primarily infect birds. The influenza A virus, which causes avian influenza, is divided into several subtypes based on two proteins: hemagglutinin (H) and neuraminidase (N).
- There are 18 known hemagglutinin (H1-H18) and 11 known neuraminidase (N1-N11) subtypes. These can combine to form various HN subtypes, many of which have been identified in birds. Some of the most notable subtypes include:

1. **H5N1:** Known for causing severe disease in birds and humans, this subtype has led to numerous outbreaks and fatalities since it was first detected in humans in 1997.
2. **H7N9:** First reported in humans in 2013, this subtype has caused serious illness and fatalities. It has been associated with poultry markets in China.
3. **H9N2:** Commonly found in birds and has occasionally infected humans, typically causing mild respiratory illness.
4. **H5N2**: This subtype is known for infecting birds and has caused significant outbreaks in poultry, though human infections are rare.
5. **H5N8:** This virus primarily affects birds and has led to several outbreaks worldwide. Human infections are rare but have been reported.
6. **H7N7:** Known to infect both birds and humans, this subtype has caused several outbreaks in poultry and occasional human cases.
7. **H5N6**: Has caused bird outbreaks and sporadic human infections, sometimes resulting in severe disease.
8. **H10N8**: A rare subtype detected in humans, causing severe respiratory illness and fatalities in a few cases.
9. **H6N: Mostly affects birds, but at least one reported human infection has been reported**.
10. **H7N2:** Primarily infects birds, with occasional human cases reported, typically resulting in mild illness.
11. **H7N3:** Known to infect birds and has caused mild to moderate illness in humans.
12. **H7N4:** Rarely infects humans, with few reported cases typically linked to exposure to infected birds.

SPREAD OF BIRD FLU

- **Direct Contact:** People can contract bird flu through close interaction with an animal's bodily fluids, such as saliva, respiratory droplets, or droppings. This transmission can happen by inhaling tiny dust particles in animal environments or by touching these fluids and then bringing them into contact with the eyes, nose, or mouth.
- **Indirect Contact:** Infection can also occur by touching contaminated surfaces and subsequently touching the face or mouth.
- **Wild Bird Migration:** The virus can spread across regions by migrating wild birds.
- **Contact Between Infected and Healthy Birds:** Transmission can happen when healthy birds come into direct contact with infected ones.
- **Human-to-Human Transmission:** Although rare, there have been instances of the virus spreading from person to person, typically among individuals with very close contact, such as a mother caring for her ill child.

NATIONAL PROGRAMMES TO CONTAIN BIRD FLU

1. SURVEILLANCE AND MONITORING

- **Integrated Disease Surveillance Programme (IDSP):** The government actively monitors the seasonal influenza situation across various states through the IDSP network, providing real-time data.
- **National Centre for Disease Control:** The NCDC oversees the surveillance of influenza-like illnesses (ILI) and severe acute respiratory infections (SARI) in health facilities' outpatient and inpatient departments.

2. CULLING AND RESTRICTION OF MOVEMENT

- **Culling of Infected Birds:** Authorities in Jharkhand have culled over 2,000 birds, including chickens and ducks, to control the virus's spread.
- **Restricting Movement:** Measures have been implemented to restrict the movement of infected birds and ensure that related data is publicly accessible to prevent further spread of the virus.

3. PUBLIC HEALTH MEASURES

- **Personal Protective Equipment:** Individuals handling sick or dead birds are advised to use personal protective equipment to reduce the risk of infection.
- **Quarantine:** Eight individuals, including two doctors who were exposed to infected birds, have been placed under quarantine.
- **Chemoprophylaxis:** People exposed to infected birds are provided with chemoprophylaxis (Oseltamivir 75 mg) once daily for 10 days as a preventive measure.

4. RESEARCH AND DEVELOPMENT

- **Genomic Sequencing:** The National Institute of High-Security Animal Diseases (NIHSAD) is conducting genomic sequencing of avian influenza viruses in India, identifying subtypes such as H9N2, H5N1, and H5N8.
- **Vaccine Development:** Research is underway to develop vaccines against highly pathogenic avian influenza in birds and animals.

5. COORDINATION AND COMMUNICATION

- **Action Plan:** The Department of Animal Husbandry, Dairying, and Fisheries has established an action plan for the prevention, control, and containment of avian influenza.
- **Advisories:** States and union territories receive advisories to minimise bird-human interaction, use personal protective equipment, and provide chemoprophylaxis to those at risk.

Prelims Based Question

Q. Consider the following statements regarding Bird Flu:

1. People to People transmission of Bird Flu is not Possible.
2. Culling is the most common practice employed in India to contain Bird Flu.

Choose the correct answer using the codes given below:

(a). 1 Only

(b). 2 Only
(c). Both 1 and 2
(d). Neither 1 nor 2
ANSWER: B

Mains Based Question

Q. Time and over again Bird Flu has impacted the poultry industry in India in a very drastic way. What are the national strategies to contain the menace of Bird Flu?

Vikas

UNESCO'S 'STATE OF OCEAN REPORT, 2024

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "UNESCO'S 'STATE OF OCEAN REPORT, 2024". THIS TOPIC IS RELEVANT IN THE "ENVIRONMENT" SECTION OF THE UPSC CSE EXAM.

WHY IN THE NEWS?

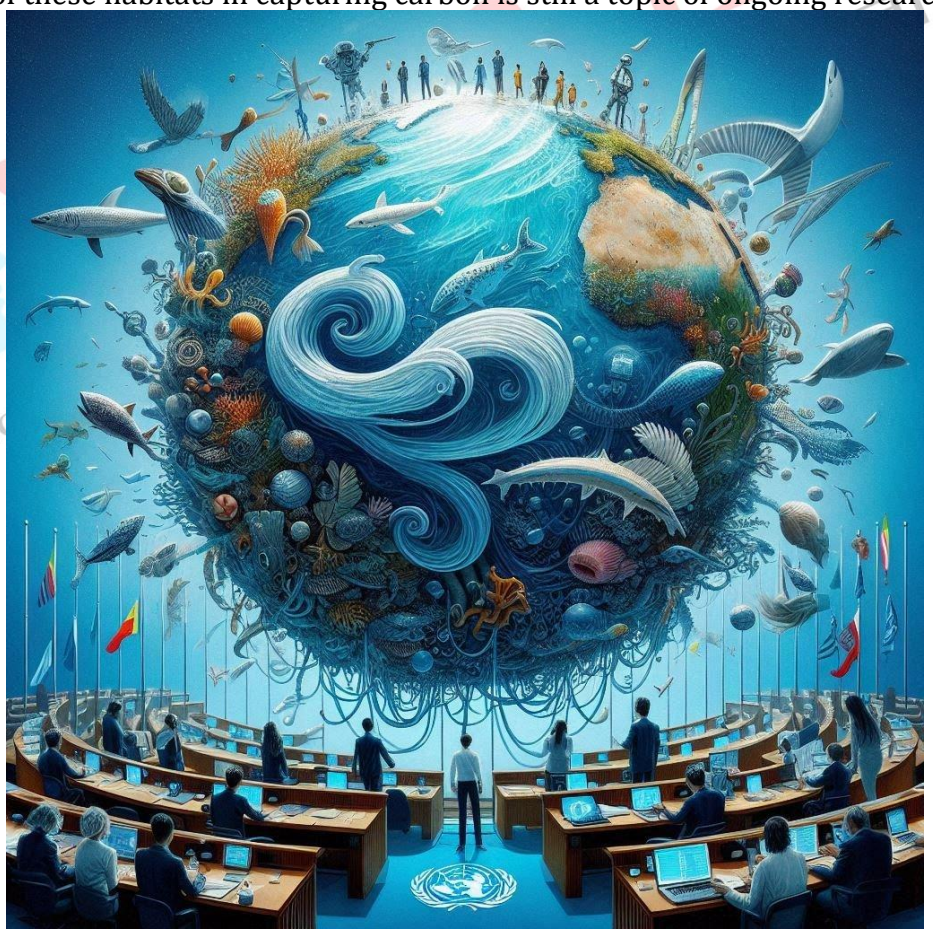
The 'State of Ocean Report, 2024' released by UNESCO delivers important information on the status of the world's oceans, highlighting the impact of climate change and human actions on these vital ecosystems.

The report emphasises the critical shortage of data necessary for effectively addressing ocean crises and advancing carbon dioxide removal technologies. Vidar Helgesen, the executive secretary of UNESCO's Intergovernmental Oceanographic Commission, highlights the urgent need to accelerate the research and data collection process.

WHAT IS THE UNESCO STATE OF OCEAN REPORT 2024?

- The report highlights the lack of detailed, comprehensive data for in-depth ocean research and observation. There is a pressing need for consistent and comprehensive data collection to track ocean temperature changes and their effects, which is crucial for addressing the challenge of maintaining healthy and resilient oceans.

- Between 1960 and 2023, the top 2,000 meters of the world's oceans warmed at 32 ± 0.03 W/m^2. This rate has increased over the last twenty years to 0.66 ± 0.10 W/m^2. This warming pattern is anticipated to persist, leading to long-lasting alterations on timescales spanning centuries to millennia.
- Approximately 90% of the Earth's energy imbalance is absorbed by the oceans, leading to a rise in the ocean heat content (OHC) within the top 2,000 meters. This escalation in OHC restricts the mixing of ocean layers, resulting in deoxygenation that adversely affects marine life, ecosystems, and coastal communities that depend on these oceanic resources.
- The report highlights an average rise in ocean acidification worldwide, with ocean pH levels falling by 0.017-0.027 units per decade since the late 1980s, but monitoring is limited to only 638 stations, indicating a need for more comprehensive data.
- Between 1993 and 2023, the average global sea level increased by approximately 4 mm per year, with a margin of error of 0.3 mm. Improved surveillance technologies are urgently needed to accurately monitor the rise in sea levels across different regions.
- Since 2020, interest in mCDR technologies has increased due to research, startups, and funding from the U.S. and EU. These technologies focus on methods like changing seawater chemistry to boost plankton growth. However, their effectiveness and potential side effects remain uncertain.
- To improve carbon sequestration capabilities, there is growing interest in restoring coastal blue carbon ecosystems, including mangroves, seagrasses, and tidal marshes. However, the efficiency of these habitats in capturing carbon is still a topic of ongoing research.



ABOUT UNESCO:

1. UNESCO, which stands for the United Nations Educational, Scientific and Cultural Organization, is a distinct entity of the United Nations that aims to foster global peace through collaborative efforts in education, culture, and science. Founded in 1945, it comprises 193 member states and operates from its main office in Paris, France.
2. The organisation aims to build a peaceful culture, eradicate poverty, promote sustainable development, and foster intercultural dialogue through education, the sciences, culture, communication, and information.
3. UNESCO is committed to protecting cultural and natural heritage worldwide, which is considered an outstanding value to humanity. Improving the relationship between people and their environment.
4. It promotes quality education through collaboration among schools worldwide, fosters respect for all, builds a sense of belonging to common humanity and helps learners become responsible and active global citizens. Preserving valuable documentary heritage.
5. Since its inception, India has been a founding member of UNESCO, consistently securing its place on the Executive Board since 1946. Tasked with collaborating with UNESCO, the Indian National Commission for Cooperation with UNESCO (INCCU) operates within the Department of Secondary and Higher Education under the Ministry of Human Resource Development, Government of India.
6. UNESCO safeguards global cultural and natural heritage, which is valuable to humanity. It enhances the bond between communities and their surroundings while fostering superior education by encouraging cooperation among schools worldwide.

WAY FORWARD:

- **Reducing Greenhouse Gas Emissions:** Shifting from fossil fuels to renewable energy sources like wind, solar, and hydroelectric power. Enhancing energy efficiency in buildings, transportation, and industry to reduce overall energy consumption. Developing technologies to capture and store carbon dioxide emissions from power plants and other industrial sources.
- **Promoting Carbon Sequestration:** Planting trees to absorb carbon dioxide from the atmosphere. Protecting and restoring coastal and marine ecosystems such as mangroves, seagrasses, and salt marshes that capture and store significant amounts of carbon.
- **Reducing Other Climate Pollutants:** Reducing methane emissions from agriculture, waste management, and energy production. Reducing black carbon (soot) emissions from diesel engines, residential cooking, and agricultural burning.
- **Sustainable Fisheries Management:** Implementing policies to manage fish stocks sustainably, preventing overfishing, ensuring the resilience of marine species to temperature changes and establishing and enforcing MPAs to preserve vulnerable ecosystems and biodiversity, allowing them to adapt more naturally to changing temperatures.
- **Infrastructure Adaptation:** Building resilient infrastructure in coastal areas to withstand the impacts of rising sea temperatures and associated phenomena like sea level rise and increased storm intensity. Restoring coastal habitats such as coral reefs, mangroves, and wetlands can help buffer against the impacts of rising temperatures and sea levels.
- **Technological and Research Initiatives:** Exploring methods like solar radiation management and adding alkaline substances to oceans can mitigate climate change effects, requiring

research to ascertain their impact and improved monitoring of oceanic parameters to guide policy.

MAINS PRACTICE QUESTION:

Q. Discuss sea level rise due to climate change's impact on coastal communities and the marine environment. What role do oceans play in mitigating climate change?

Amit Pradhan