

Top Infectious Disease Threats to Watch in 2025

Description

The emergence of COVID-19 was abrupt; its rapid spread resulted in the tragic loss of millions of lives worldwide. In the aftermath, it is reasonable to assert that there exists a pervasive unease regarding the potential arrival of the next significant infectious disease, regardless of whether it manifests as a virus, bacterium, fungus, or parasite.

With COVID-19 gradually receding—thanks largely to highly effective vaccines—public health officials are increasingly concerned about three predominant infectious diseases: malaria (caused by a parasite), HIV (a virus), and tuberculosis (a bacterium). Collectively, these diseases account for the deaths of approximately [two million individuals annually](#).

Additionally, priority pathogen watchlists continue to grow, particularly highlighting those organisms that have developed resistance to conventional treatment methods, such as [antibiotics and antivirals](#).

Scientists are mandated to remain vigilant for potential threats. While pathogens may arise in various forms, certain families, such as influenza viruses, hold a higher propensity for swift outbreaks.

Influenza A virus particles viewed under a microscope

Colorized transmission electron micrograph of influenza A virus particles. ([NIAID/Flickr/CC-BY-SA 2.0](#))

Currently, one strain of influenza—specifically, subtype H5N1—raises significant alarm as it nears the threshold of becoming a serious health menace in 2025. Widely disseminated among both wild and domestic birds, including poultry, it has recently begun infecting dairy cattle in certain US states [and has been reported in horses in Mongolia](#).

A surge in influenza cases among avian species inevitably raises concerns about potential transmission to humans. This year alone, the US has recorded [61 cases](#), primarily involving farm workers who have come into contact with infected animals or have consumed [raw milk](#).

When juxtaposed against the mere two cases reported in the Americas over the preceding two years, this notable increase is concerning. Moreover, considering that infections in humans present a daunting [30 percent mortality rate](#), H5N1 bird flu is swiftly ascending the priority list for public health officials.

Fortunately, the H5N1 strain does not exhibit efficient human-to-human transmission, significantly mitigating the risk of a pandemic. The process of viral entry into host cells relies on specific molecular structures called sialic acid receptors, and while human-adapted influenza viruses bind effectively to these receptors, H5N1 shows a marked preference for avian receptor structures, resulting in limited human transmissibility.

Which Infectious Disease Could Be The Biggest Problem in 2025? An Expert Explains.

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Nevertheless, recent research indicates that a mere single mutation in the H5N1 genome could enhance its ability to transmit [between humans](#), potentially triggering a pandemic scenario.

Should this strain acquire the capacity for human transmission, swift and decisive governmental actions will be essential in curbing its proliferation. Global health authorities have proactively established [pandemic preparedness plans](#) targeting bird flu and other emergent diseases.



An example of this proactive approach is the UK's procurement of 5 million doses of H5 vaccine, aimed at enhancing [pandemic readiness](#) in anticipation of potential risks in 2025.

Even without imminent human transmission capabilities, H5N1 is poised to impact animal health significantly in 2025, leading to serious animal welfare implications and potential disruptions in food supply chains, alongside economic repercussions.

Interconnectedness of Health

This multifaceted approach aligns with the concept of "[One Health](#)," which emphasizes the interconnectedness of human, animal, and environmental health. By comprehensively understanding and addressing disease dynamics in our ecosystems and animal populations, we can enhance our preparedness against zoonotic diseases poised to enter human populations. Conversely, monitoring and mitigating infectious diseases among humans can safeguard animal and environmental health.

Nevertheless, it is crucial not to overlook the ongoing 'slow pandemics' affecting human populations, such as malaria, HIV, and tuberculosis. Addressing these diseases remains imperative, even as vigilance for novel pathogens continues.

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Vocabulary List:

1. **Pervasive** /pə'veɪ.sɪv/ (adjective): Widespread existing or being present everywhere.
2. **Manifest** /'mænɪfɛst/ (verb): To display or show a quality or feeling by one's acts or appearance.
3. **Propensity** /prə'pɛn.sɪ.ti/ (noun): An inclination or natural tendency to behave in a particular way.
4. **Severity** /sə'veɪ.rɪ.ti/ (noun): The quality of being serious or the intensity of a situation.
5. **Proactive** /prəʊ'æk.tɪv/ (adjective): Creating or controlling a situation by taking the initiative.
6. **Interconnectedness** /,ɪntər'kɒnɛktɪdnəs/ (noun): The state of being connected with each other or having mutual relationships.

Comprehension Questions

Multiple Choice

1. Which three predominant infectious diseases are public health officials increasingly concerned about?
Option: Malaria, HIV, Tuberculosis
Option: Ebola, Zika, Dengue
Option: Influenza, SARS, COVID-19
Option: Cholera, Yellow Fever, Typhoid

2. What is the primary reason for the gradual receding of COVID-19?
Option: Highly effective vaccines
Option: Improved hygiene practices
Option: Herd immunity
Option: Natural mutation of the virus

3. Which strain of influenza is currently raising significant alarm?
Option: H1N1
Option: H3N2
Option: H5N1
Option: H7N9

4. What is the primary factor that limits the human transmissibility of the H5N1 strain of influenza?
Option: Efficient human-to-human transmission
Option: Lack of airborne transmission
Option: Preference for avian receptor structures
Option: Low viral load in infected individuals

5. What recent development could potentially trigger a pandemic scenario involving the H5N1 strain?
Option: Global travel restrictions
Option: Enhanced human-to-human transmission
Option: Improved antiviral treatments
Option: Vaccination campaigns

6. What proactive step has the UK taken to enhance pandemic readiness in anticipation of potential risks in 2025?
Option: Stockpiling antibiotics
Option: Procurement of 5 million doses of H5 vaccine
Option: Implementation of nationwide lockdowns
Option: Establishment of field hospitals



True-False

- 7. H5N1 bird flu currently exhibits efficient human-to-human transmission.
- 8. The H5N1 strain of influenza is primarily transmitted via airborne particles.
- 9. A single mutation in the H5N1 genome could enhance its ability to transmit between humans.
- 10. H5N1 bird flu poses no risk to animal health in 2025.
- 11. Monitoring and mitigating infectious diseases among humans have no impact on animal and environmental health.
- 12. Addressing ongoing diseases like malaria, HIV, and tuberculosis is no longer imperative in light of emerging pathogens.

Gap-Fill

- 13. The cumulative number of confirmed human cases for avian influenza A(H5N1) reported to WHO from 2003 to 2024 shows a _____ percent mortality rate.
- 14. The H5N1 strain of influenza does not exhibit efficient _____ transmission, significantly mitigating the risk of a pandemic.
- 15. Recent research indicates that a mere single mutation in the H5N1 genome could enhance its ability to transmit _____ humans.
- 16. H5N1 is poised to impact _____ health significantly in 2025, leading to serious welfare implications and potential disruptions in food supply chains.
- 17. By comprehensively understanding and addressing disease dynamics in ecosystems and animal populations, we can enhance our preparedness against _____ diseases poised to enter



human populations.

18. The concept of "One Health" emphasizes the interconnectedness of human, animal, and

_____ health.

Answer

Multiple Choice: 1. Malaria, HIV, Tuberculosis 2. Highly effective vaccines 3. H5N1 4. Preference for avian receptor structures 5. Enhanced human-to-human transmission 6. Procurement of 5 million doses of H5 vaccine

True-False: 7. False 8. False 9. True 10. False 11. False 12. False

Gap-Fill: 13. 30 14. human-to-human 15. between 16. animal 17. zoonotic 18. environmental

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. Which term refers to the process of water falling to the ground from the atmosphere?

- Option: Phenomena
- Option: Anticipate
- Option: Exploit
- Option: Precipitation

2. What does the term "proximity" mean?

- Option: Trajectory
- Option: Pervasive
- Option: Proximity
- Option: Extravagant

3. Which term describes the ability to withstand prolonged stress or activity?

- Option: Manifest
- Option: Endurance
- Option: Severity
- Option: Propensity

4. Which term relates to mental processes such as thinking learning and remembering?

- Option: Cognitive
- Option: Plethora



Option: Acuity
Option: Interconnectedness

5. What is the enzyme responsible for maintaining the length of telomeres?

Option: Advocate
Option: Telomerase
Option: Self-healing
Option: Durability

6. Which term refers to the feeling of tiredness or exhaustion?

Option: Phenomenon
Option: Fatigue
Option: Microscopic
Option: Exploit

7. What does the term "severity" imply?

Option: Severity
Option: Anticipate
Option: Trajectory
Option: Proactive

8. To alleviate means to:

Option: Alleviate
Option: Advocate
Option: Extravagant
Option: Endurance

9. What does the term "propensity" refer to?

Option: Manifest
Option: Propensity
Option: Pervasive
Option: Proximity

10. Which term means to display or show clearly?

Option: Cognitive
Option: Manifest
Option: Interconnectedness
Option: Endurance

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)



11. This year has seen a _____ increase in online shopping due to the pandemic.
12. The theory of _____ suggests that everything is connected in some way.
13. She threw an _____ birthday party with fireworks and live music.
14. It is better to be _____ in preventing problems rather than dealing with them after they occur.
15. The buffet offered a _____ of options from salads to desserts.
16. Taking a pain reliever can help _____ headache symptoms.
17. The storm caused _____ damage to buildings and vehicles.
18. The organization works to _____ for animal rights and welfare.
19. Marathon runners need great _____ to complete a 26.2-mile race.
20. _____ is an enzyme that adds DNA sequence repeats to the ends of chromosomes.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. occur when one celestial body passes in front of another obscuring it from view.
22. Pilots need to perform quick and precise when flying in challenging conditions.
23. Being able to potential issues can help in avoiding last-minute problems.
24. The influence of social media is in modern society affecting people of all ages.
25. Certain materials have the ability to undergo processes to repair cracks and damage.
26. Products that are known for their are more likely to last longer and withstand wear and tear.
27. A solar eclipse is a natural that captivates people around the world.
28. organisms play a crucial role in various ecosystems despite their small size.
29. The of a rocket determines its path through space and back to Earth.



30. Some companies may try to legal loopholes for their benefit which can lead to ethical issues.

Answer

Multiple Choice: 1. Precipitation 2. Proximity 3. Endurance 4. Cognitive 5. Telomerase 6. Fatigue 7. Severity 8. Alleviate 9. Propensity 10. Manifest

Gap-Fill: 11. Phenomenal 12. Interconnectedness 13. Extravagant 14. Proactive 15. Plethora 16. Alleviate 17. Severe 18. Advocate 19. Endurance 20. Telomerase

Matching sentence: 1. Occultations 2. Maneuvers 3. Anticipate 4. Pervasive 5. Self-healing 6. Durability 7. Phenomenon 8. Microscopic 9. Trajectory 10. Exploit

CATEGORY

1. Sci/Tech - LEVEL5

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