

# HPAI A(H5) Scenario-Based Human Health Risk Assessment



## HPAI A(H5) Scenario-Based Human Health Risk Assessment for the United States Center for Outbreak Response Innovation (CORI) Updated as of October 25, 2024

*In this update, the Center for Outbreak Response Innovation (CORI) has raised the risk level to between Scenarios 3 and 4. CORI may increase the risk level to Scenario 4 if human-to-human transmission is confirmed.*

|  | Risk to farm workers | Risk to other people in contact with affected workers and animal populations | Risk to healthcare workers | Risk to the US general public |
|--|----------------------|--|----------------------------|-------------------------------|
| <b>Scenario 3</b> – Increased potential for reassortment and human adaptation, still no human-to-human transmission  | Moderate-High        | Moderate   | Low                        | Low                           |
| <b>Scenario 4</b> – Increased potential for reassortment, Increasing reports of human infections, limited human-to-human transmission between close contacts | High                 | Moderate-High  | Moderate                   | Low-Moderate                  |

CORI has increased the risk level from Scenario 3 to between Scenario 3 and 4 due to 1) the increasing reports of human H5 cases across the United States and due to 2) the increased risk of reassortment and adaptation for human-to-human transmission from potential mixing of seasonal influenza virus and H5N1 in the 2024-2025 flu season. CORI may increase the risk level to Scenario 4 if human-to-human transmission is documented in the current outbreak, however, there has been no evidence of this type of transmission at this time.

Our **confidence** in these risk scores remains low, due to limited testing in cattle, humans and other animals, and limited information regarding the transmission route for the Missouri case.

**For a detailed analysis and recommendations, see the next page.**

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## Critical Epidemiological Updates

The following critical epidemiological updates since the last risk assessment have informed the increase in risk level to between Scenarios 3 and 4:

- The Centers for Disease Control and Prevention (CDC) has released serology information for the Missouri case, household contact, and healthcare contacts, and has determined there is [no evidence of human-to-human transmission](#) at this time.
- The [Washington Department of Health](#) has reported four presumptive positive avian influenza cases among workers in contact with infected poultry at a commercial egg farm. The state health department reports that the individuals have had mild symptoms. Only [two of these cases have been reported by CDC](#) and are therefore not fully represented in the maps or discussion below; information will be added as it becomes available.
- The CDC and the California Department of Health (CDPH) have reported seven more cases.
- According to CDC all 13 California cases have experienced mild symptoms such as eye redness (conjunctivitis) and none were hospitalized. CDC reports that all data for the CA cases indicate separate instances of animal-to-human spread of the virus. Sequencing for the CA cases is ongoing. For the six cases with sequencing information available, no amino acid changes have been identified that indicate increased infectivity or transmissibility between humans or impact on antiviral effectiveness
- The United States Department of Agriculture Animal and Plant Health Inspection Service ([USDA APHIS](#)) has reported 101 new infected herds (97 from California and 4 from Idaho) in the last 30 days, bringing the total for the outbreak to 339.

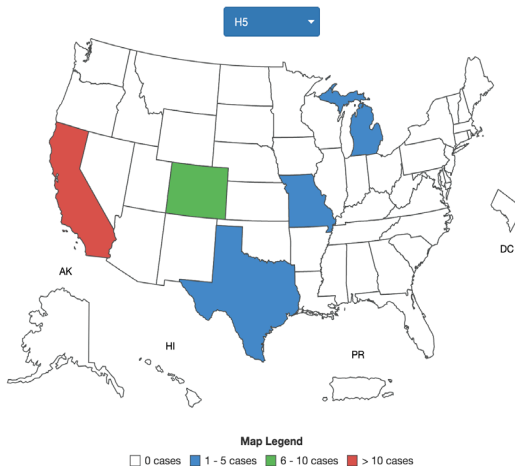


Figure 1: 2024 Map of Human H5 Infections ([available from CDC](#)). Note: Has not been updated by CDC to reflect the WA State cases.

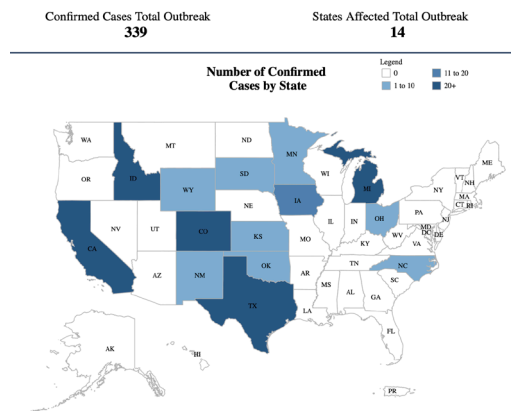


Figure 2: HPAI Confirmed Cases in Livestock Herds ([available from USDA APHIS](#))

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## Recommendations

In the current scenario, it is vital to 1) prevent reassortment opportunities, especially during the current flu season, 2) ensure timely, accurate surveillance and prevention of H5N1 in agricultural animals, 3) continue enhanced public health activities to prevent H5N1 transmission to and among humans, 4) continue enhanced, open communication about the current situation and potential risks, and 5) continue and consider strengthening political support for public health response. Specific recommended actions are included below:

### 1. Prevent reassortment opportunities, especially during the current flu season

- Farm workers diligently use personal protective equipment (PPE; including masks goggles, gloves, gowns, head covers, and boot covers) when working directly with or closely to cattle and poultry, other infected or potentially infected animals, and potentially infected environments.
- Farm workers receive the seasonal flu vaccine as early as possible in the current flu season.
- Individuals working with agricultural animals who are sick do not report to work, especially if they exhibit respiratory or flu-like symptoms, and seek medical care for diagnosis.
- Individuals working with agricultural animals who are sick and unable to stay home wear a KN95 mask when in contact with animals.

### 2. Ensure timely, accurate surveillance and prevention of H5N1 in agricultural animals

- Increased diagnostic testing and genomic surveillance in cattle and poultry.
- Separation of infected cattle during convalescence.
- Enforced cattle import restrictions to limit the movement of infected cattle across state borders.
- Stringent control of potentially infected food products (removal of milk or other infected products).

### 3. Continue enhanced public health activities to prevent H5N1 transmission to and among humans

- Increased focus on sentinel surveillance, wastewater surveillance, and education of clinicians to consider H5N1 as a possible diagnosis for people who present with new respiratory illness.
- Implementation of and support for recommended isolation of human cases and quarantine of close contacts of cases through escalated case finding and contact tracing, antiviral (eg, Tamiflu) prophylaxis for those exposed, compensation for individuals who are isolated/quarantined and cannot report to work, and social support to provide for essential needs of those in isolation/quarantine.
- Continued development and widespread implementation of antigen and molecular testing in both hospital and outpatient healthcare settings.

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- Increased public health surveillance for H5N1 cases in local communities.
- 4. Continue enhanced, open communication about the current situation and potential risks**
- Information sharing between the agricultural and public health sectors to increase transparency and monitor for increases in animal-to-human or human-to-human transmission.
  - Enhanced communication with the public about the situation and the measures being taken to address it, as well as efforts to mitigate the spread of rumors and disinformation.
- 5. Continue and consider strengthening political support for public health response**
- Policy preparation for the possibility of a pandemic, including congressional deliberations about emergency funding and emergency planning by healthcare institutions, workplaces, and federal, state, territorial, local, and tribal public health agencies.
  - Increased investment and urgent development, testing, and production of vaccines and treatment options.

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## Appendix

### Scenarios

**\*Please note:** We are evaluating the risks to human health should each scenario occur, **not** the relative risk of any one scenario occurring.

Features that would characterize each scenario include:

**Scenario 1 – Minimal spread in cattle:** The virus is predominantly infecting cattle and there is minimal spread within herds and to other animals. Likelihood of widespread human infections is low. Population health consequences are low. Overall risk to human health in this scenario is low.

**Scenario 2 – Widespread transmission in cattle, few human infections, no human-to-human transmission:** The virus is predominantly infecting cattle but spreads widely within herds. There is also occasional cow-to-human transmission but no human-to-human transmission. Likelihood of widespread human infections is low. Population health consequences are low. Overall risk is low, but population-specific risk is increased for farm workers.

**Scenario 3 – Increased potential for reassortment and human adaptation, still no, or very limited, human-to-human transmission:** The virus begins to infect swine or other animal species that could facilitate the mixing and spreading of influenza viruses. This increases the likelihood that the virus reassorts with other influenza viruses and adapts to humans. In this scenario, we expect that some limited human-to-human transmission could be reported but only among farm workers or close contacts of those workers, and not among healthcare workers. Likelihood of widespread human infections is low. Population health consequences are low. Overall risk of widespread transmission in humans is low, but risk is increased for farm workers and close contacts of those workers. The relative risk of a future pandemic has increased, but the absolute risk remains low.

**Scenario 4 – Continued potential for reassortment, increasing reports of human infections, limited human-to-human transmission between close contacts:** There are more reports of human infections due to contact with infected animals like cattle, swine, and/or poultry. Limited human-to-human transmission is reported among close contacts of infected individuals, including healthcare workers, but there is no efficient human-to-human transmission. Likelihood of widespread human infections is moderate. Population health consequences are low. Overall risk of widespread transmission is low, but population-specific risk is increased for farm workers, close contacts of farm workers, and healthcare workers. The likelihood of a future pandemic is increased.

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**Scenario 5 – Efficient human-to-human transmission:** There are reports of efficient human-to-human transmission. Likelihood of human infections is high because the virus now transmits efficiently and will be very difficult to contain. Population health consequences are high. Overall risk is high for all populations. The likelihood of a pandemic is very high.

**H5N1 Human Health Risk Assessment Scenario Table**

|  | Risk to farm workers | Risk to other people in contact with affected workers and animal populations | Risk to healthcare workers | Risk to the US general public |
|--|----------------------|--|----------------------------|-------------------------------|
| <b>Scenario 1</b> – Minimal spread in cattle   | Low                  | Low  | Low                        | Low                           |
| <b>Scenario 2</b> – Widespread transmission in cattle, few human infections, no human-to-human transmission  | Moderate             | Low  | Low                        | Low                           |
| <b>Scenario 3</b> – Increased potential for reassortment and human adaptation, still no, or very limited, human-to-human transmission                        | Moderate-High        | Moderate   | Low                        | Low                           |
| <b>Scenario 4</b> – Increased potential for reassortment, increasing reports of human infections, limited human-to-human transmission between close contacts | High                 | Moderate-High  | Moderate                   | Low-Moderate                  |
| <b>Scenario 5</b> – Efficient human-to-human transmission  | High                 | High   | High                       | High                          |

For more information on how these scenarios were developed, the risk scores and the confidence levels assigned, see the HPAI A(H5) Risk Assessment Methodology document.



## References

- US Department of Agriculture Animal and Plant Health Inspection Service. Highly Pathogenic Avian Influenza (HPAI) Detections in Livestock. Updated October 24, 2024. Accessed October 25, 2024. <https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/hpai-confirmed-cases-livestock>
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