

PUBLIC HEALTH REFERENCE SHEET

Novel and Variant Influenza



Name	Non-seasonal influenza A viruses
Reservoir & Transmission	Aquatic birds, domestic poultry, cattle, other mammals Human contact with infected animals; droplets
Incubation Period	Depends on type, but less than 7 days
Common Symptoms	Acute respiratory illness with fever and often indistinguishable from seasonal influenza
Gold Standard Diagnostic Test	RNA identification or RT-PCR are best for initial diagnosis. Culture is confirmatory but can delay diagnosis and identification of an outbreak.
Risk Groups	Occupations with or near birds or other animals associated with influenza A
Geographic Significance	Most common among poultry in Bangladesh, China, Egypt, India, Indonesia, and Vietnam

What is novel and variant influenza?

Novel and variant influenza is an acute respiratory illness with fever often indistinguishable from seasonal influenza. This case definition includes non-seasonal influenza A viruses. Influenza A viruses are divided into subtypes based on two proteins (“spike” proteins) on the surface of the virus: hemagglutinin (HA) and neuraminidase (NA). There are 18 known HA subtypes and 11 known NA subtypes. Many different combinations of HA and NA proteins are possible. For example, an “H7N2 virus” designates an influenza A virus subtype that has an HA 7 protein and an NA 2 protein. Similarly, an “H5N1” virus has an HA 5 protein and an NA 1 protein.

Novel and variant influenzas are not expected during the influenza season and are distinct from viruses typically seen in humans during the influenza season. Novel and variant influenza infections can progress to a pandemic when they gain the ability to spread easily from person-to-person and cause serious illness in humans. Whereas seasonal influenza includes influenza strains that are expected or commonly seen in humans during the influenza season (e.g., Influenza A H1N1 and H3N2, Influenza B).

What is the occurrence of novel and variant influenza?

Sporadic infections and localized outbreaks among people with variant influenza viruses may occur. All influenza viruses have the capacity to change, and it’s possible that variant viruses may change such that they gain the ability to infect people easily and spread easily from person-to-person. The CDC closely monitors for variant influenza virus infections and reports cases in FluView (<https://www.cdc.gov/flu/weekly/fluactivitysurv.htm>) and in the Novel Influenza A Virus Infections https://gis.cdc.gov/grasp/fluview/Novel_Influenza.html) section of FluView Interactive (<https://www.cdc.gov/flu/weekly/fluviewinteractive.htm>).

How is novel and variant influenza transmitted?

Human infections with variant flu viruses most commonly occur in people exposed to infected animals. Transmission to humans may be from droplet exposure or human contact with surfaces that has virus on it and then touching their nose or mouth. There are documented cases of limited spread of variant flu viruses from person-to-person.

Domestic poultry are likely the main source of human infections. Aquatic birds are natural reservoirs of influenza A subtypes. All known subtypes of influenza A viruses can infect birds, except subtypes H17N10 and H18N11, which have only been found in bats. Only two influenza

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A virus subtypes (i.e., H1N1 and H3N2) are currently in general circulation among people. For some avian influenza viruses and particularly A (H5N1), the range of mammals that can be infected with avian influenza viruses from aquatic birds has been wide (including pigs, whales, seals, horses, ferrets, cats, dogs, and tigers). Swine influenza viruses are endemic in pigs. Influenza infections are also known to occur in other animals besides birds and pigs, including horses and dogs. However, except for pigs, influenza viruses have not been shown to transmit from these mammals to humans.

Who is at risk for novel and variant influenza?

Individuals who travel to an area with known cases and have exposure to animals known to transmit novel or variant influenza (e.g., birds or pigs) may result in a probable case. Past variant flu infections have occurred among children and adults exposed to infected pigs at agricultural fairs, among people who raise pigs, and among swine workers. The groups of people at higher risk of developing serious variant flu complications are considered the same groups at higher risk for serious seasonal flu complications. These groups include children younger than 5 years, people 65 years and older, pregnant people, and people with certain chronic health conditions (e.g., asthma, diabetes, heart disease, weakened immune systems, and neurological or neurodevelopmental conditions).

What are the signs and symptoms of novel and variant influenza?

Suspicion of a human infection with zoonotic influenza A infection is heightened if illness has occurred after exposure to birds, pigs, or other animals that may be infected with influenza or exposure to their environments. For an influenza A (H5N1) infection associated with poultry exposure, incubation can be 7 days or less, and often 2–5 days. For infections with influenza viruses normally circulating in swine, an incubation of 2–7 days has been reported.

Symptoms include:

- Fever
- Cough
- Dyspnea
- Severe pneumonia
- Sore throat and coryza (present only sometimes)

What are potential complications of novel and variant influenza?

Like human seasonal flu viruses, infections with variant flu viruses can sometimes cause severe disease, even in healthy people. Complications such as pneumonia may require hospitalization and sometimes result in death.

How can novel and variant influenza be treated?

In the U.S., there are four different antiviral drugs that are recommended for the treatment of flu: oseltamivir, peramivir, zanamivir, and baloxavir.

How can novel and variant influenza be prevented?

Human seasonal flu vaccines are generally not expected to protect people from variant flu. General precautions include washing hands with soap and water after visiting areas with animals, and no eating, drinking, or putting items in one's mouth while in animal areas.

What are some public health considerations?

- Reporting includes hospitalized and non-hospitalized cases; this excludes seasonal influenza or influenza caused by current circulating influenza H1 and H3 viruses.

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- Document relevant travel and deployment history occurring within the incubation period (estimated to be 2–10 days).
- Document the circumstances under which the case patient was exposed including duty exposure, occupational activities, environmental exposures, or other high-risk activities.
- Document if the case patient works in, lives in, or attends a high-transmission setting such as food handling, daycare, school, group living, health care, training center, or ship.
- **NOTE:** Influenza A (H1N1)pdm09 is no longer reportable as novel influenza.

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<https://www.cdc.gov/flu/swineflu/variant.htm>

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