

H5N1 avian influenza epizootic; situation at 06.05.2024

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Background: Every year, the avian influenza A virus naturally circulates on a seasonal basis, carried by migratory birds. Since 2020, **we have been witnessing the largest documented zoonotic epidemic** of highly pathogenic avian influenza (HPAI) H5N1, with the following features relative to 'classic' avian influenza epidemics:

- 1) an increase in the geographical area affected (all continents except Oceania - previously restricted to Asia, Europe and Africa).
- 2) a change in the bird species affected (enlargement of the populations affected, shift from migratory birds to local wild fauna), resulting in
- 3) a continuous perennial circulation of H5N1 avian viruses belonging to the same genetic sub-group (known as 'clade 2.3.4.4b') and, at the same time.
- 4) a progressive increase in the number of cases of highly pathogenic avian influenza in birds, and in mammals (more than 40 species of mammals affected, including sea lions, seals and mink).

In humans: sporadic infections, < 30 cases since 2021, half of which are linked to the new clade 2.3.4.4b.

Not 'highly pathogenic' for humans, the term 'highly pathogenic' mainly describes the symptomatology in poultry, which presents a disseminated infection with very high mortality. In humans, the clinical spectrum ranges from mildly symptomatic infection (flu-like illness) to severe pneumonia and even death (50% mortality).

Current situation in the United States:

Since March 2024, evidence of widespread circulation of the H5N1 HPAI virus in cattle (dairy cows) in the USA, in several (9) states. The virus has been detected in large quantities in the milk of infected cows. Pasteurisation is considered effective in inactivating the virus. Virus genomic material (not infectious virus) was found in pasteurised milk cartons found in shops in these 9 states.

This outbreak corresponds to a single introduction of an avian virus into dairy farms, dated December 2023, with transmission since then between cows (new element and never previously described on this scale). There was only one human case of transmission from cattle, in a farmer in April 2024, who presented with conjunctivitis. It should be noted that there is little surveillance and that human cases with few symptoms could go unnoticed.

This H5N1 virus is not currently adapted to humans - in order to be transmitted between humans, it must acquire certain mutations or reassort itself with another human influenza virus. In view of the increased circulation of this H5N1 virus in cattle, there is a greater chance of it passing to humans, as well as the possibility of mutations that could facilitate adaptation to humans. In addition, certain mammals, such as pigs and minks, are capable of being infected by both avian and human viruses, opening up the risk of adaptation.

In Switzerland: the last reported case of HPAI H5N1 avian influenza in a bird was confirmed in January 2024 (canton of ZH).

In Europe: regular evidence of infected birds, but a decrease in the number of cases since March 2024. Tests in Germany found no evidence of infection in cattle in Germany.

Treatment and prevention measures:

- Avian H5N1 vaccines exist for certain animals. H5Nx vaccines are under development for humans: candidate vaccines already exist. Difficulty: using the right 'combination' at the right time among the different H5s and N1s, since the virus continues to mutate over time.
- **This H5N1 virus is sensitive to existing flu treatments** authorised by Swissmedic for human use (oseltamivir Tamiflu® and baloxavir Xofluza®).

Risk to humans according to the WHO: the risk is considered **low for the general population**, but it is considered low to medium for people in contact with livestock.

Preparation:

At national level:

- Ensure the Confederation is prepared for testing (role of National Reference Centre for Influenza (CNRI) at the HUG virology laboratory): a suitable test is already available at the virology laboratory.
- "Pandemic plan" under review (national level): involvement of the Centre for Emerging Viral Diseases (CVED) and the CNRI.
- Share information with the Environment Department (OSAV), which is responsible for animal surveillance.
- Continuation of human surveillance through the Sentinela network (role of the CNRI, commissioned by the FOPH).
- Maintaining close links between the CVMP and the Institute of Virology and Immunology (IVI), which is the Swiss reference laboratory for the diagnosis, monitoring and control of viral zoonotic epidemics.

At the local level:

- Evaluate the PPE stocks and the possibility of obtaining more PPE (masks, goggles, +/- overblouse, etc., for respiratory isolation)
- Evaluate the stocks and availability (lead time, access, etc.) of influenza treatments (and antibiotics, given the known risk of bacterial superinfection) in the event of increased demand worldwide.
- Update of an institutional procedure in the event of a suspected case (Vigigerm®)
- Prepare for the repercussions in the event of a pandemic: 1) direct, linked to the susceptibility of the population in the absence of pre-existing immunity -> children, young adults in good health, the elderly and pre-existing illnesses, and 2) indirect for non-influenza-related care.
- Preparedness in terms of research/access to vaccines/ serology

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