

TECHNICAL REPORT

EU/EEA country survey on measures applied to protect exposed people during outbreaks of highly pathogenic avian influenza

December 2023

Summary

ECDC initiated a survey of EU/EEA countries to evaluate preparedness planning and risk mitigation initiatives implemented at the country level for people exposed to highly pathogenic avian influenza virus A(H5N1). Responses from 18 countries were collected from National Focal Points and Operational Contact Points for influenza from 1 March 2023 to 14 April 2023 and covered the following areas:

- Risk assessment practices at the national level
- Protection measures implemented during A(H5N1) outbreaks
- Identification and risk classification for human exposures
- Active versus passive follow-up approaches for exposed people
- Testing practices
- Antiviral prophylaxis and vaccination recommendations
- Communication with laboratories, primary and secondary healthcare, and ECDC
- Follow-up studies, including enhanced surveillance and serosurveys.

Almost all responding countries reported having guidelines in place for the management of highly pathogenic avian influenza outbreaks in poultry or detections in wild birds for farmers, cullers, veterinarians and members of the public with direct exposure to dead wild birds. There was broad alignment in terms of personal protective equipment recommendations in the context of poultry outbreaks, as well as testing of those reporting respiratory symptoms following highly pathogenic avian influenza exposure.

However, countries showed divergence in the following areas:

- Personal protective equipment recommendations in the context of wild bird and mammal exposures
- Definitions for levels of exposure risk, which inform decisions on active versus passive follow-up
- Availability of data on the number of people who were exposed (aggregated by risk level) and subsequently tested
- Recommendations for antiviral prophylaxis and seasonal influenza vaccination
- Requirements for testing in the context of non-respiratory symptoms
- Availability of guidelines for healthcare workers treating avian influenza patients
- One Health communication between laboratories and primary and secondary care providers
- Implementation of follow-up studies, such as enhanced surveillance, serosurveys and after-action reviews.

This survey identified commonalities and differences in measures applied to protect exposed people during outbreaks of highly pathogenic avian influenza in the EU/EEA, thereby highlighting key areas where additional guidance is needed to support countries.

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Background and rationale

Influenza A viruses circulate in a wide range of host species. Between 2021 and 2023, high levels of avian influenza infection have been detected globally among wild birds, with subsequent spillover into domestic poultry, as well as wild, domestic and farmed mammals. Highly pathogenic avian influenza strains in the A(H5Nx) family have resulted in over 200 million bird deaths globally since 2021, either directly via infection or as part of containment procedures in affected poultry farms [1-4].

Zoonotic, animal-to-human avian influenza virus infections can occur sporadically through direct contact with infected animals or their contaminated enclosures, resulting in symptoms that range from mild illness to death. However, they rarely transmit successfully between humans. Nonetheless, influenza viruses can mutate or reassort, and owing to limited prior exposure in the human population, zoonotic influenza viruses pose a pandemic threat if they acquire genetic changes that facilitate sustainable infection and transmission between humans [5].

In the EU/EEA, surveillance for avian influenza is compulsory and, in accordance with Regulation (EU) 2020/690, subject to EU surveillance programmes [6]. Human infections with avian influenza viruses are notifiable through the Early Warning and Response System (EWRS) in accordance with Regulation (EU) 2022/2371 [7]. Reporting is also required through the World Health Organization International Health Regulations (IHR) notification system, which requires immediate reporting of any laboratory-confirmed case of human infection—irrespective of symptoms—caused by an influenza A virus with the potential to cause a pandemic [8].

As of 30 November 2023, 970 human cases of avian influenza A(H5N1) (882 cases) and A(H5N6) (88 cases) have been reported worldwide since the first reported case in 2003. Between 2021 and 2023, 79 cases were reported (A(H5N1): 20 cases; A(H5N6): 59 cases), predominantly of the clade 2.3.4.4b. Although the majority of cases were reported from China and South East Asia, sporadic human cases and detections have also been reported in North America, South America and Europe [1-3].

In October 2022, ECDC published 'Testing and detection of zoonotic influenza virus infections in humans in the EU/EEA, and occupational safety and health measures for those exposed at work' in collaboration with the European Food Safety Authority (EFSA), European Union Reference Laboratory for Avian Influenza (EURL) and European Agency for Safety and Health at Work (EU-OSHA) [9]. This guidance document provided advice for public health and laboratory experts on identifying human infections with animal influenza viruses to provide early warning notifications and inform timely risk assessment and implementation of public health measures.

In spring 2023, ECDC initiated a survey of EU/EEA countries to evaluate preparedness planning and risk mitigation initiatives implemented at the country level for people exposed to highly pathogenic avian influenza virus A(H5N1). Previous ECDC surveys were published in 2016 [10] and 2018 [11]. The current survey was distributed to National Focal Points and Operational Contact Points for influenza, with responses collected from 1 March 2023 to 4 April 2023.

Scope of this document

This document provides an overview of the survey responses. The survey aimed to describe commonalities and differences in measures applied to protect exposed people during outbreaks of highly pathogenic avian influenza in EU/EEA countries.

Target audience

The target audiences for this document are national public health institutes and ministries of health in the EU/EEA, public health experts and decision-makers at national and subnational levels, and the European Commission.

Results

Survey respondents

Eighteen countries responded to the survey: Austria, Czechia, Denmark, Finland, France, Germany, Ireland, Italy, Liechtenstein, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Slovenia, Spain and Sweden (Figure 1).

Figure 1. Survey respondents



Administrative boundaries: @ EuroGeographics @ UN-FAO. The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. Map produced on: 12 July 2023

Risk assessment practices at the national level

ECDC applies a qualitative assessment methodology to determine population-level risk for infectious disease outbreaks. Risk is calculated as a product of transmission probability and impact on populations, if infected [12]. As of September 2023, ECDC assesses the risk of infection with currently circulating avian influenza viruses of clade 2.3.4.4b in Europe as low for the general population and low-to-moderate for individuals exposed through occupation or other means [3].

Of the 18 responding countries, 13 countries (72%) reported that risk assessments have also been undertaken at the national level (Figure 2). Responses that described the results of these assessments broadly aligned with ECDC's EU-level risk assessment, with countries assessing risk to the general population at the national level as very low or low, and risk to occupationally exposed individuals as low or low-moderate.



Figure 2. Has a risk assessment of the national situation been performed for currently circulating avian influenza A(H5N1) viruses causing outbreaks in wild birds and poultry?

At the European level, ECDC updates its avian influenza risk assessment for the general population and exposed groups on a monthly basis, publishing findings as part of its Communicable Disease Threats Report [13] and publishes bimonthly (quarterly until December 2022) joint situation reports with the European Food Safety Authority (EFSA) and European Union Reference Laboratory for Avian Influenza (EURL) [3]. The majority of countries undertaking national risk assessments reported that these assessments are typically conducted as required or ad-hoc, depending on the epidemiological situation.

Local detections of highly pathogenic avian influenza in poultry and wild birds trigger downstream investigations and containment actions, including assessing the possibility of asymptomatic or symptomatic infection among humans in contact with infected animals or their enclosures. These actions may prompt a formal local risk assessment procedure. Of the 18 responding countries, 10 countries (56%) confirmed that a risk assessment of the local situation is performed during poultry outbreaks (Figure 3). The same 10 countries also undertook risk assessments of the local situation following detections in wild birds (Figures 4).









Protection measures implemented during A(H5N1) outbreaks

Guidelines for specific occupational groups

Almost all responding countries reported having guidelines in place for the management of avian influenza outbreaks in poultry or detections in wild birds specific to farmers (17/18 countries; 94%), cullers (18/18; 100%), veterinarians (18/18; 100%) and members of the public with direct exposure to dead wild birds (17/18; 94%) (Figure 5). Four countries (22%) described having guidelines in place for additional groups, including hunters, bird banders/ringers, taxidermists and public health staff required to access poultry sites.

Figure 5. For which groups do you have guidelines/recommendations when managing avian influenza outbreaks in poultry or detections in wild birds?



Personal protective equipment recommendations in the context of A(H5N1) detection – poultry outbreaks

With respect to personal protective equipment (PPE) recommendations in the context of A(H5N1) detection during poultry outbreaks, there were unanimous recommendations for the use of goggles (18/18 countries; 100%), a mask (18/18; 100%) and gloves (18/18; 100%) (Figure 6). Use of a body suit was recommended by 17/18 countries (94%). Nine countries (50%) reported other additional PPE recommendations, with the use of protective footwear and disposable aprons and head/hair coverings cited.





Personal protective equipment recommendations in the context of A(H5N1) detection – wild bird detections

With respect to PPE recommendations in the context of A(H5N1) detection in wild birds, there was greater variation between countries: goggles (11/18 countries; 61%), a mask (15/18; 83%), gloves (16/18; 89%) and a body suit (12/18; 67%) (Figure 7). Seven countries (39%) reported other additional PPE recommendations, with protective footwear and disposable aprons and head/hair coverings again cited.

Figure 7. What are the recommendations for personal protective equipment when A(H5N1) is detected in wild birds?



Personal protective equipment recommendations in the context of A(H5N1) detection – mammal detections

There was also variation between countries in terms of PPE recommendations in the context of A(H5N1) detection in mammals: goggles (13/18 countries; 72%), a mask (14/18; 78%), gloves (16/18; 89%) and a body suit (12/18; 67%) (Figure 8). Seven countries (39%) reported other additional PPE recommendations, with protective footwear and disposable aprons and head/hair coverings again cited.





Presence of clinical guidelines

The presence or absence of clinical guidelines has implications for how consistently PPE recommendations and patient management plans are adhered to in healthcare settings. Of the 18 responding countries, 10 countries (56%) reported having clinical guidelines in place for healthcare workers treating avian influenza patients, while 5/18 countries (28%) reported that they have no guidance in place (Figure 9).

Figure 9. Do you have clinical guidelines for healthcare workers treating avian influenza patients?



Personal protective equipment recommendations in the context of A(H5N1) detection – human cases

The following PPE recommendations were reported for healthcare settings treating possible or confirmed human cases of avian influenza A(H5N1): a face shield (12/18 countries; 67%), goggles (14/18; 78%), an FFP2 mask (17/18; 94%), gloves (16/18; 89%) and a body suit (13/18; 72%) (Figure 10). Six countries (33%) reported other additional PPE recommendations, with protective footwear, disposable aprons and head/hair coverings, and FFP3 masks cited. Some countries highlighted possible variation within the country, depending on local or regional policies.

Figure 10. What are the recommendations for personal protective equipment while treating possible or confirmed human cases of A(H5N1) in healthcare settings?



Identification and risk classification for human exposures

Identification of exposed individuals

Countries were asked to elaborate on how exposed individuals are identified via free text answers. Epidemiological investigation to identify those directly exposed to an infected animal or its enclosure (farmers, veterinarians, cullers or members of the public) was commonly reported, as well as maintaining registries of farm workers, staff involved in culling and the areas they work in to facilitate exposure tracing. Of note, there appear to be differences between which regulatory authority (human, veterinary) is responsible for identifying, tracking and reporting exposure statistics.

Collating and reporting data on human exposures

With respect to the availability of data on the number of individuals exposed to avian influenza A(H5N1), 2/18 countries (11%) reported that such data is available for all exposures (to both poultry outbreaks and dead wild birds) and 9/18 countries (50%) reported that data is only available for exposures linked to poultry outbreaks (Figure 11). Two countries (11%) reported that data is only partially available and five countries (28%) reported that data on the number of exposed individuals is not collected or available.

Figure 11. Is information about the number of people exposed to avian influenza A(H5N1) collected or available?



Defining exposure risk levels

Of the 18 responding countries, 9 countries (50%) reported that definitions are in place to categorise levels of risk based on exposure (Figure 12). Evaluation of free-text responses by these countries revealed a range of risk categorisation approaches. However, exposure risk levels could be broadly defined by:

- duration/intensity of direct contact with infected animals or laboratory specimens;
- duration/intensity of contact with enclosures of infected animals or known infected people; and
- vulnerability to exposure owing to presence/absence of PPE.

Figure 12. Are different levels of exposure defined?



Active versus passive follow-up approaches

Recommendations for active versus passive follow-up

Countries were asked to elaborate on which groups are recommended for active versus passive follow-up. 'Active' follow-up is defined here as proactive contact (e.g. daily calls to assess symptoms) with possibly exposed individuals by public health teams following avian influenza detection in an infected animal or human. 'Passive' follow-up is defined here as instructing individuals with a possible exposure to self-monitor for symptoms and, should they develop symptoms, to isolate and notify health authorities to initiate testing. While responses broadly indicated that active follow-up was recommended for those with the highest exposure risk (i.e. frequent, direct contact with confirmed avian influenza infected animals or humans, particularly in the context of absent PPE or PPE breech), the use of active versus passive follow-up was less clearly or consistently specified for individuals with moderate or lower exposure risk, such as household contacts.

Cross-border follow-up in the EU/EEA

No responding countries reported following up individuals with possible avian influenza exposure across national borders (Figure 13). However, it should be noted that given possible differences in exposure risk classification and active versus passive follow-up procedures, responses to this question were likely limited to cross-border follow-up for those with the highest exposure risk (i.e. frequent, direct contact with confirmed avian influenza infected animals or humans, particularly in the context of absent PPE or PPE breech).





Testing practices

Given differences in how exposure risk levels are defined, as well as differences in the application of active versus passive follow-up, it is difficult to assess the proportion of exposed individuals undergoing follow-up and subsequent testing across the EU/EEA, or to make direct comparisons between countries. Nonetheless, understanding why and how testing is done is informative.

Application of testing algorithms

When assessing individuals with possible avian influenza exposure, testing algorithms—such as those graded by exposure risk level—can help standardise investigation and management pathways, ensuring resources are applied cost-effectively on a gradient of risk. Of the 18 responding countries, 6 countries (33%) reported routine use of such testing algorithms (Figure 14).

Figure 14. Did you apply testing algorithms for exposed people with respiratory symptoms according to exposure risk level or other criteria?



Symptom criteria required to trigger laboratory testing

Individuals with an epidemiological link to an avian influenza outbreak or probable/confirmed case who shortly afterwards present with clinical symptoms should undergo confirmatory laboratory testing. Individuals may present with a range of mild to severe clinical symptoms. Countries reported broad consensus for symptom criteria required to trigger laboratory testing: influenza-like illness (15/18 countries; 83%), acute respiratory infection (16/18; 89%) and severe acute respiratory infection (16/18; 89%) (Figure 15). Fewer countries reported initiating laboratory testing for isolated conjunctivitis (11/18; 61%) or neurological symptoms (7/18; 39%), and nearly half of the countries (8/18; 44%) reported additional clinical criteria, including gastrointestinal symptoms, headache and any unexplained acute symptoms following highly pathogenic avian influenza exposure.





Testing of asymptomatic individuals

Symptomatic avian influenza infection in humans is associated with clinical symptoms that range from mild to severe. However, laboratory testing of nasopharyngeal swabs taken from asymptomatic individuals with possible exposure may identify early-stage infections. Testing practices for asymptomatic individuals during avian influenza outbreaks are divergent across countries. While 3/18 countries (17%) reported testing all asymptomatic individuals involved in an outbreak, only 1/18 countries (6%) reported randomised testing among asymptomatic individuals and 2/18 countries (11%) reported that asymptomatic testing is sometimes carried out (Figure 16). Eleven countries (61%) reported that no testing is performed for asymptomatic individuals.

Figure 16. Are you testing asymptomatic people exposed to A(H5N1) during outbreaks (e.g. cullers)?



Antiviral prophylaxis and vaccination

National antiviral prophylaxis guidelines

The majority of currently circulating avian influenza viruses are susceptible to antivirals, which can be used as preor post-exposure prophylaxis and as a treatment option [3]. Countries were asked to provide free-text descriptions of national public health or clinical recommendations for antiviral prophylaxis or treatment related to avian influenza. Although several countries reported having national guidelines, a number of countries also reported that guidelines specific to avian influenza were either not available or still under development. In terms of implementing such guidelines, it is not fully clear whether access to prophylaxis is at the discretion of clinicians acting locally or on the basis of national public health guidelines.

Risk group recommendations for antiviral prophylaxis

Here we define 'occupationally exposed' individuals as those handling sick or dead poultry and wild birds. For occupationally exposed individuals wearing PPE, 8/18 countries (44%) reported the use of pre-, post- or a combination of pre- and post-exposure prophylaxis in an outbreak context (Figure 17). For occupationally exposed individuals not wearing PPE or experiencing a PPE breach, 11/18 countries (61%) reported use of post- or a combination of pre- and post-exposure prophylaxis. Of the 18 responding countries, 6 countries (33%) reported use of pre-, post- or a combination of pre- and post-exposure prophylaxis. Of the 18 responding countries, 6 countries (33%) reported use of pre-, post- or a combination of pre- and post-exposure prophylaxis to those in direct contact with occupationally exposed individuals and 8 countries (44%) identified other exposed groups as being eligible for post- or a combination of pre- and post-exposure prophylaxis. This group includes healthcare professionals managing probable or confirmed avian influenza cases and non-occupational exposures such as members of the public inadvertently handling sick or dead animals. Five countries (44%) identified additional groups as being eligible for post- or a combination of pre- and post-exposure prophylaxis. This includes household contacts of occupationally exposed individuals or household contacts of individuals with probable or confirmed avian influenza. Notably, the application of pre- versus post-exposure prophylaxis varies between countries and across all groups.

Figure 17. Is antiviral prophylaxis during the current A(H5N1) outbreaks recommended and offered for the following groups?



Risk group recommendations for seasonal influenza vaccination

Seasonal influenza vaccines can reduce the risk for co-infection and reassortment between seasonal and avian influenza viruses but are not effective against avian influenza viruses. Of the 18 responding countries, 13 countries (72%) reported that seasonal influenza vaccination is specifically recommended for poultry workers (Figure 18) and 8 countries (44%) reported that seasonal influenza vaccination is specifically recommended for other individuals exposed to potentially infected animals (Figure 19).



Figure 18. Is seasonal influenza vaccination recommended for poultry workers?

Figure 19. Is seasonal influenza vaccination recommended for other people exposed to potentially infected animals (i.e. beyond poultry workers)?



Communication

Laboratory collaboration

Collaboration between animal and public health laboratories plays a critical role in managing pathogen threats at the human-animal interface. Sharing of virus isolates facilitates efficient characterisation of virus antigenic properties, while collaborative sequence analysis is needed to monitor temporal and geographical trends in virus evolution. Furthermore, sharing of sequence data supports diagnostics and vaccine development. At the national level, 12/18 countries (67%) reported that there is collaboration between animal and public health laboratories (Figure 20).





Communication to primary and secondary care

Not all individuals with possible exposure to avian influenza can be identified and monitored via active follow-up. Passive follow-up requires that individuals with a possible exposure isolate and notify health authorities to initiate testing should they develop symptoms within a specified time frame. In the event of an avian influenza outbreak, notifying surrounding primary and secondary care facilities to raise awareness about an evolving threat ensures that symptomatic individuals are managed appropriately. Notifications can be used to share up-to-date investigation and management procedures, such as testing algorithms, PPE or isolation requirements, prophylaxis guidelines and necessary public health notification protocols. Notifications also ensure that healthcare facilities can activate their own preparedness plans if required. Of the 18 responding countries, 8 countries (44%) reported that information about avian influenza outbreaks is shared with local primary care practitioners (Figure 21) and 9 countries (50%) indicated that information is shared with local secondary care facilities (Figure 22).

Figure 21. Has information about avian influenza outbreaks been shared with local primary care practitioners to raise awareness?



Figure 22. Has information about avian influenza outbreaks been shared with local secondary care facilities to raise awareness?



Communication from ECDC

Countries reported high readership and value of ECDC risk assessments on avian influenza (Figure 23), as well as the joint situation reports (Figure 24) and breakfast seminars (Figure 25) produced in collaboration with the European Food Safety Authority (EFSA) and the European Union Reference Laboratory for Avian Influenza (EURL).

Figure 23. Did you use elements of ECDC risk assessments on A(H5N1) and other avian influenza viruses published in the quarterly situation reports in your national or local communication or guidance?



Figure 24. Do you find the joint EFSA/ECDC/EURL situation reports useful?



Figure 25. Did you join one of the new breakfast seminars on avian influenza held by ECDC together with EFSA and EURL?



Follow-up studies

Enhanced surveillance studies

Enhanced surveillance studies may provide valuable information about transmission risk at sites where avian influenza detections have occurred. In such studies, all individuals exposed to infected birds—irrespective of symptoms— undergo nasopharyngeal virological sampling and laboratory testing. The aim is to better understand whether transmission from birds to humans occurs and, if so, how often. Of the 18 responding countries, 1 (6%) reported that studies to evaluate the transmission risk of exposed people have been performed or are planned (Figure 26).



Figure 26. Are studies to evaluate the transmission risk of exposed people planned or performed?

Serosurveys

Sero-epidemiological studies can provide retrospective confirmation of animal-to-human transmission events and are particularly useful when environmental contamination is the suspected cause of positive nasal or throat swabs among individuals with possible exposure to avian influenza. Of the 18 responding countries, 3 countries (17%) reported that serosurveys of exposed people are planned to identify transmission events (Figure 27).

Figure 27. Are serosurveys as follow-up of exposed people planned to identify transmission events?



After-action reviews

An integral part of improving preparedness and response plans is learning from past public health emergencies. Conducting in- or after-action reviews (AARs) is a way of critically appraising the guidelines in place for the management of avian influenza outbreaks and their real-world implementation [14]. Of the 18 responding countries, 7 countries (39%) reported that they have undertaken or are planning to undertake an evaluation of avian influenza response measures via in- or after-action reviews (Figure 28).





Discussion

Key findings

Almost all responding countries reported having guidelines in place for the management of highly pathogenic avian influenza outbreaks in poultry or detections in wild birds for farmers, cullers, veterinarians and members of the public with direct exposure to dead wild birds. There was also broad alignment in terms of PPE recommendations in the context of poultry outbreaks, as well as testing of those reporting respiratory symptoms following highly pathogenic avian influenza exposure.

Responding countries showed divergent practices in the following areas:

- PPE recommendations in the context of wild bird and mammal exposures
- Definitions for levels of exposure risk, which inform decisions on active versus passive follow-up
- Availability of data on the number of people who were exposed (aggregated by risk level) and subsequently tested
- Recommendations for antiviral prophylaxis and seasonal influenza vaccination
- Requirements for testing in the context of non-respiratory symptoms
- Availability of guidelines for healthcare workers treating avian influenza patients
- One Health communication between laboratories and primary and secondary care providers
- Implementation of follow-up studies, such as enhanced surveillance, serosurveys and after-action reviews.

Summary

This survey identified commonalities and differences in measures applied to protect exposed people during outbreaks of highly pathogenic avian influenza in the EU/EEA, thereby highlighting key areas where additional guidance is needed to support countries. It builds upon survey results published in 2018, which highlighted the resource-intensive nature of following up exposed people, as well as the need for risk-based passive follow-up approaches with stronger collaboration between local, regional and national actors working in public health and veterinary health to improve data collection and reporting [11].

Countries reported high readership and value of ECDC risk assessments on avian influenza, as well as the joint situation reports and breakfast seminars held together with EFSA and EURL. ECDC will continue to engage with countries via such forums, in addition to sharing these survey findings and facilitating further sharing of experiences and best practice.

To support countries with the development of clinical guidelines, ECDC published <u>Enhanced surveillance of severe</u> <u>avian influenza virus infections in hospital settings in the EU/EEA</u>' in June 2023. The document provides information on how to strengthen surveillance in hospital settings to improve detection of sporadic, severe human infections with avian influenza virus that may present with respiratory or atypical symptoms. It was written with a focus on the 2023 summer period (weeks 21–39) [15].

In September 2023, ECDC also published '<u>Targeted surveillance to identify human infections with avian influenza virus</u> <u>during the influenza season 2023/24, EU/EEA</u>'. This updated document covers the seasonal epidemic period during winter 2023/24 (week 40, 2023–week 20, 2024) to address the change in the epidemiological situation linked to infected wild birds following autumn bird migration, the increase in season influenza infections and the related increase in specimens required for seasonal influenza virus testing. It describes a risk-based, targeted approach to identifying possible avian influenza virus infections through established routine respiratory virus surveillance systems during the winter season 2023/24 [16].

Consulted experts (in alphabetical order)

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