

Rapid Risk assessment

for highly pathogenic avian influenza H5
(HPAI H5) clade 2.3.4.4b



Update for April based on the period
March (01 - 31 March) 2024

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Situation in Germany

Between 1 and 31 March 2024, only HPAIV H5 cases were detected in wild birds in Germany. The number of cases in wild birds decreased to 20 and is spread across Schleswig-Holstein (n=10), Saxony (n=4), Bavaria and Lower Saxony (2 cases each) as well as Brandenburg and Hamburg (1 case each) (Fig.1, Tab.1). The main species affected were barnacle geese in the area of the Wadden Sea and occasionally other bird species. The H5N1 subtype was confirmed in all but one case. H5N8 was detected in a red knot in North Friesland (Tab.1).

A total of 11 HPAI genotypes have been characterised in Germany since November 2023. Two genotypes (DE-23-11-N1.3_euDG and DE-23-11N1.2_euAB) dominated events in poultry farms and wild birds in January and February. In February and March, further genotypes were detected in Germany with varying regional distributions. The DE-24-01-N1.1_euDJ genotype, which was already detected in January, was detected in barnacle geese along the North Sea coast in February and March. Another genotype DE-24-03-N1.1_euDI, which is also widespread in Eastern Europe, was detected in Brandenburg. On the North Sea coast in the districts of Dithmarschen and Nordfriesland, two further genotypes were detected in barnacle geese (DE-24-02-N1.2_euDR and DE-24-02-N8.1_euDS). These both carry a new segment combination and, in the case of DE-24-02-N8.1_euDS, a new NA8 segment (see above).

In Germany, an HPAIV H5N1 infection was reported in March in a raccoon (11 March) and a fox (26 March) from Kassel (Hesse) and in a fox (19 March) from Bautzen (Saxony).

Table 1: Number of reported HPAIV H5 cases in wild birds, affected bird groups and locations in the period 1 to 31 March 2024 per federal state. Data source: TSN, FLI. Data status: 04/04/2024

Federal state (February/March)	County	Municipality	Wild birds (number of HPAIV notifications)	Period Determination
Bavaria (0/2)	Straubing	Straubing City	Common buzzard (1)	15.03.
	Regensburg	Beratzhausen	Wild goose (1)	27.03.
Brandenburg (0/1)	Spree-Neisse	Groß Schacksdorf-Simmersdorf	Common buzzard (1)	11.03.
Hamburg (1/1)	Hamburg	Hamburg City	Common buzzard (1)	08.03.
Lower Saxony (3/2)	Aurich	Norderney	Barnacle goose (1)	15.03.
	Friesland	Wangerooge	Herring gull (1)	26.03.
Schleswig-Holstein (44/10)	Dithmarschen	Elpersbüttel	Dunlin (1)	14.03.
		Büsum	Red Knot (2)	26.03.
	Neumünster	Neumünster City	Seagull (1)	14.03.
	North Friesland	Langenhorn	Red Knot (1, H5N8)	19.03.
		Reußenköge	Red Knot (1)	19.03.
		North beach	Red Knot (1)	19.03.
	Pinneberg	Wedel	Barnacle goose (1)	14.03.
	Steinburg	Heart horn	Barnacle goose (1)	14.03.
		Wewelsfleth	Barnacle goose (1)	26.03.
	Saxony (0/4)	Leipzig	Leipzig City	Greylag goose (2)
Markkleeberg			Greylag goose (2)	11.; 20.03.

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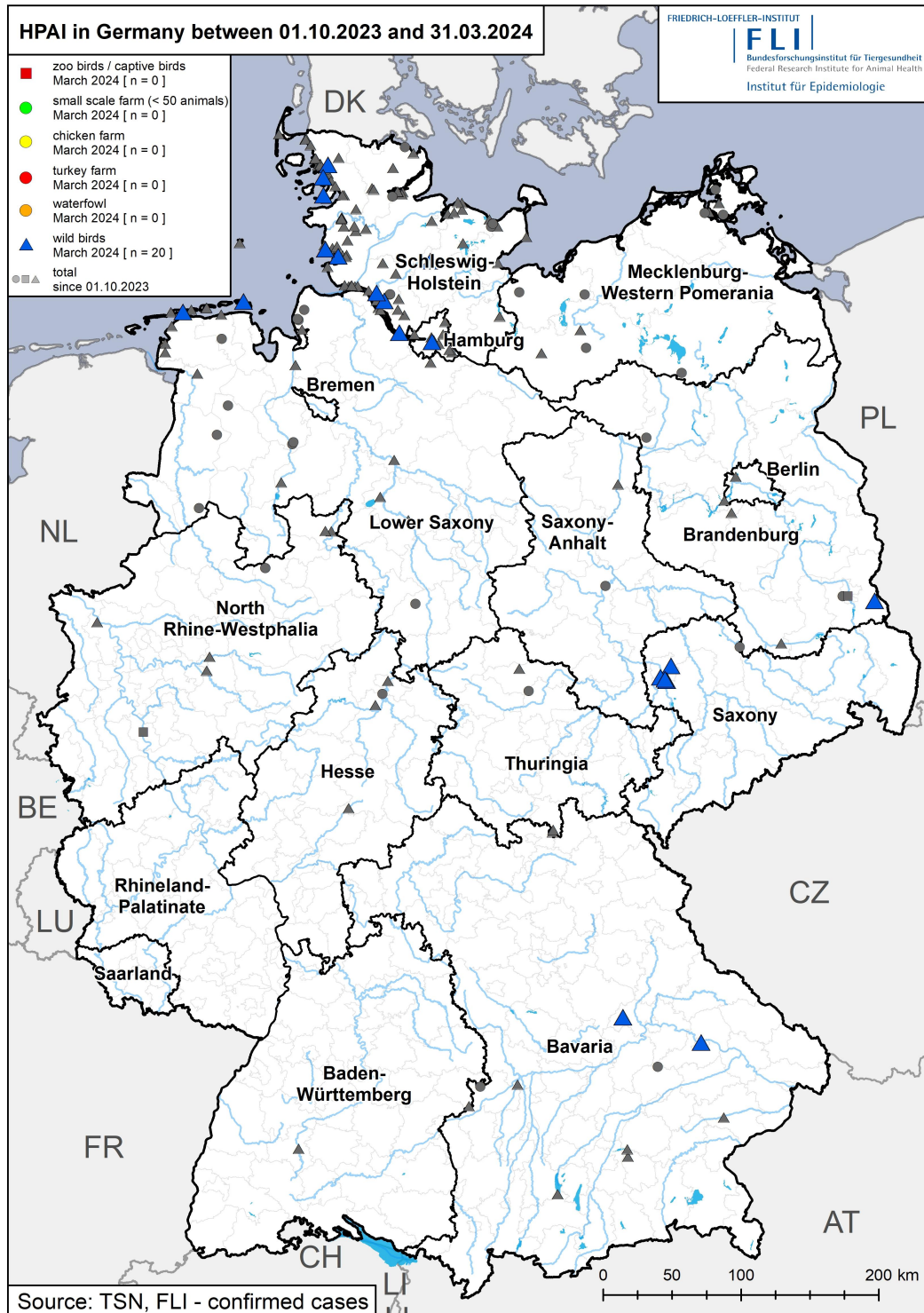


Figure 1: Outbreaks of HPAIV H5 in Germany in domestic poultry (dots), other captive birds (zoo/wildlife sanctuary; squares) and cases in wild birds (triangles) since 01.10.2023. In colour current outbreaks and cases for the period 01.-31.03.2024. Different colours: see legend. Data source: TSN, FLI; data status: 04/04/2024.

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Situation in Europe

The number of HPAIV H5 outbreaks in **domestic poultry** in Europe fell sharply in March. Bulgaria (n=2), Poland (n=2), Sweden and Romania (n=1 each) reported outbreaks (Fig. 3). Various sectors of poultry production were affected; in Bulgaria laying hens and waterfowl; in Poland fattening turkeys; in Sweden a pheasant farm with over 200 pheasants and in Romania and the Czech Republic one non-commercial small flock each.

The number of cases in **wild birds** in Europe also fell sharply in March, with a total of 54 reports. In addition to Germany (see above), a total of 11 European countries reported sporadic cases in wild birds, with waterfowl and birds of prey being the most frequently affected bird groups (Fig. 2).

Apart from the one HPAIV H5N8 case from Germany (see above), only the **H5N1 subtype** has been identified in the rest of Europe.

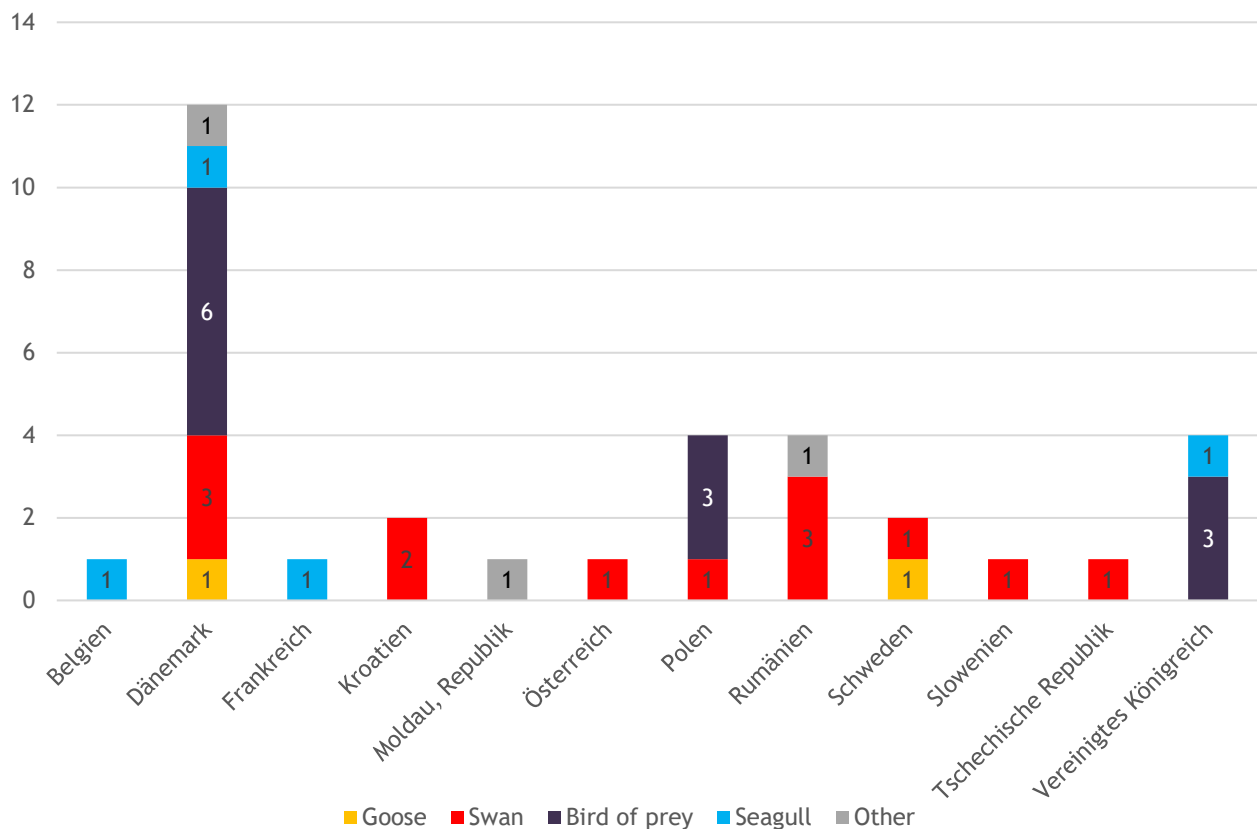


Figure 2: Number of different bird groups in the reported HPAIV cases in wild birds per country for March 2024. The figures are the number of individual reports of examined animals to ADIS, which often conceals a higher number of affected (dead) birds. ADIS, WOAHI; status of the data query: 02.04.2024.

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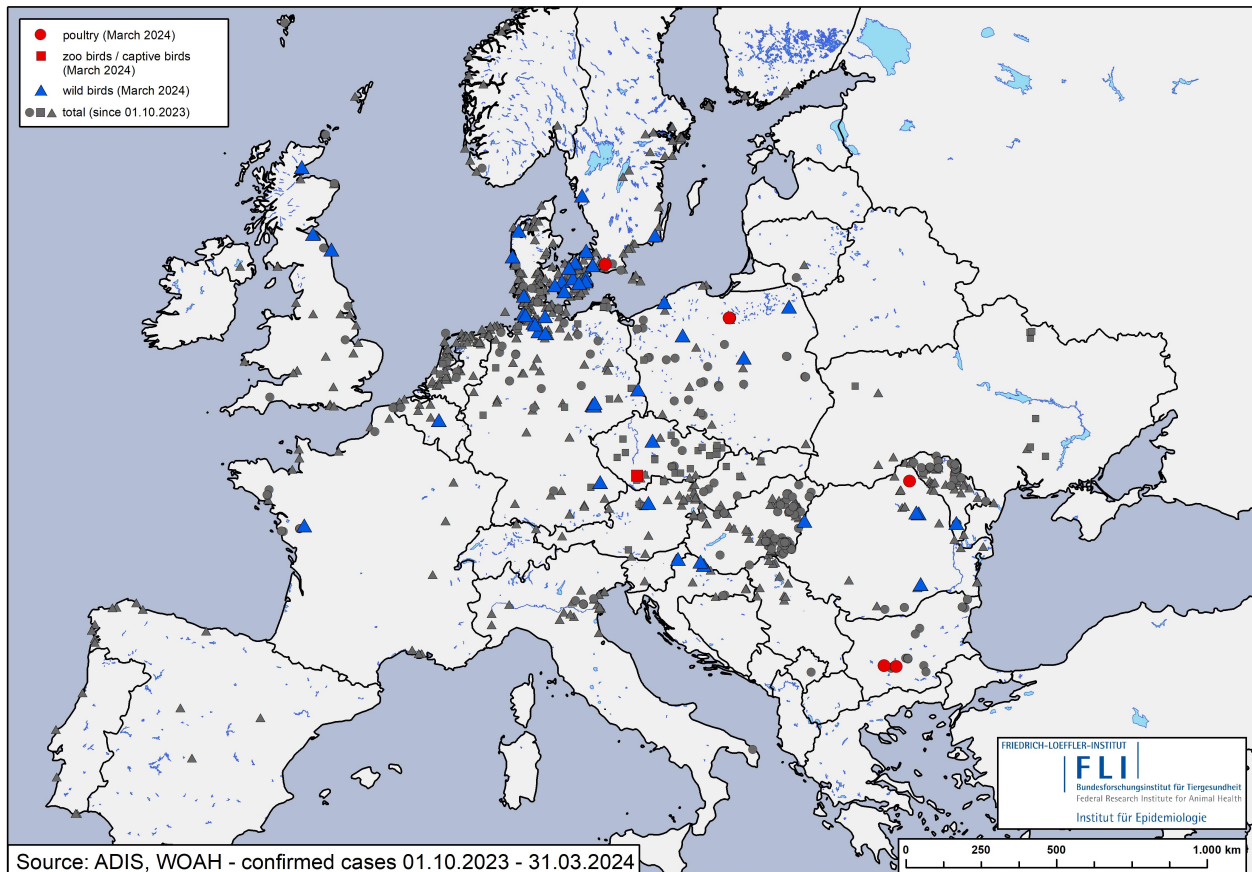


Figure 3: HPAI cases in poultry, captive birds and wild birds reported to ADIS and WOA from 01 October 2023 to 31 March 2024. Cases for March in red and blue; poultry = domestic poultry kept for commercial purposes; zoo/other privately kept birds = other captive birds. Data source: ADIS, WOA; status of data query: 02/04/2024.

The H5N1 HPAI viruses of clade 2.3.4.4.b characterised in Europe since October 2023 have new and different genotypes, which presumably arose through reassortment of circulating HPAI viruses with various local LPAI viruses. There is an increased number of new genotypes with a renewed trend towards more regionality.

Apart from the mammals reported by Germany, no other species were reported in March (Fig. 4).

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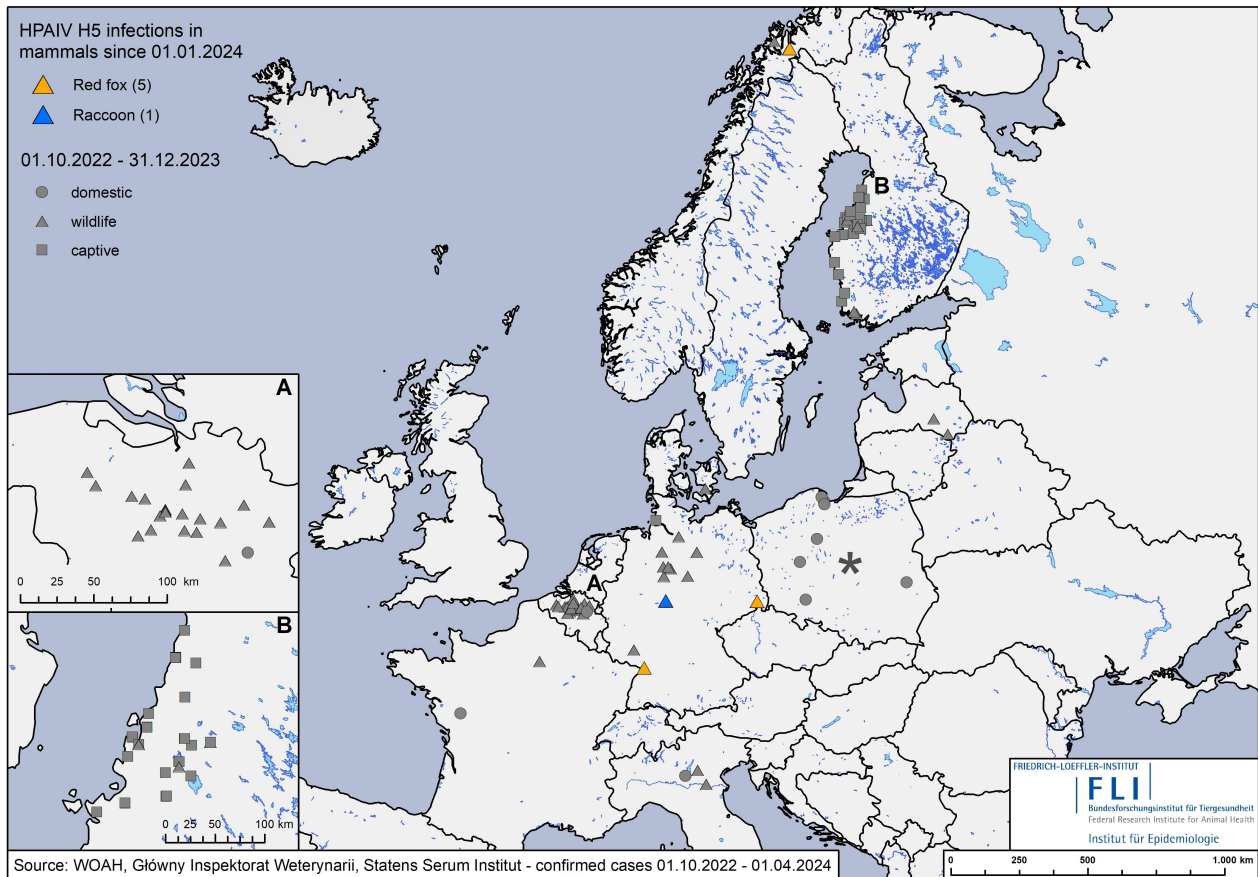


Figure 4: HPAIV H5 infections in mammals in Europe reported to WOA since 01.10.2022. In colour: cases since 01.01.2024. Triangles: wild mammals (wildlife); circles: Domestic mammals; squares: captive mammals (fur animals; captive). *Polish mammal cases involve 33 cats and one caracal and are described on the homepage of the "Main Veterinary Inspectorate" in Poland. Data query: 02/04/2024.

Situation in the world/Special events

Outbreaks in **domestic poultry** and **wild bird cases** caused by HPAIV H5 clade 2.3.4.4b were detected **worldwide** in March 2024, particularly in Asia and North America, and reported to the World Organisation for Animal Health (WOAH).

- **Africa:** The veterinary authorities in Burkina Faso have reported an outbreak of HPAIV H5N1 in domestic poultry in the capital Ouagadougou.
- **Southeast Asia:** Several HPAIV H5N1 outbreaks in domestic poultry and cases in wild birds have been detected in Vietnam, Japan, the Philippines and Taiwan. In addition to HPAIV H5N1, Japan also reported HPAIV H5N5 in a crow.
- **Antarctic region:** HPAIV H5 was detected in skuas, Antarctic cormorants and Adélie penguins in March. On South Georgia, the first HPAIV findings were discovered in five dead king penguins and five dead gentoo penguins. So far, however, no increased mortality has been detected in king penguin colonies. However, during a research expedition in March to assess the HPAI situation in the Antarctic, a high number of dead skuas and Adélie penguins were observed.
- **South America:** Brazil reported HPAIV H5N1 cases in terns. There were also reports of HPAIV H5 in skuas and gentoo penguins from the Falkland Islands.
- **North America:** In North America (USA), several outbreaks in poultry and cases in wild birds were reported in March:
 - o One outbreak in domestic poultry in South Dakota, 7 outbreaks in kept poultry (private farms) in 7 other US states.
 - o The distribution and increasing number of virus detections in wild birds found dead, but also in some healthy ducklings, indicates a worryingly widespread active virus circulation.

In March, extensive **infections with HPAIV H5** occurred in **mammals** in the USA. These were detected not only in wild carnivores (lynx, cougar, skunks in Washington, Idaho), but also surprisingly and for the first time worldwide in ruminants. Starting with the detection of HPAIV H5N1 in goat lambs in Minnesota, which were kept together with infected poultry, reports of HPAIV H5N1-infected dairy cow herds in Texas (n=7), Kansas (n=2), Michigan (n=1), New Mexico (n=1) and Idaho (n=1) were received in rapid succession from mid-March. The virus was primarily detected in milk samples from diseased cattle, in some cases with very high virus loads. The affected dairy farms appear to be epidemiologically linked and may be traced back to a source in Texas. Transmission, e.g. via contaminated milk dishes, is suspected. In one affected dairy farm in Texas, the virus was also detected in cats that had already been found dead in February and had presumably been infected via the milk. More precise epidemiological, clinical and virological data is still lacking for the outbreaks in cattle, making a detailed assessment difficult. There is currently no evidence of a similar outbreak in Europe.

A **human HPAIV H5N1 clade 2.3.4.4b infection** was also detected in this context. The person from Texas had direct contact with dairy cows infected with the virus and only developed

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conjunctivitis. Other human cases concern a young man from Vietnam who died in March as a result of an HPAIV H5N1 infection. It is unclear whether the virus belonged to clade 2.3.4.4 or another clade. Similar cases in Vietnam and Cambodia in recent months were due to HPAIV H5N1 of clade 2.3.2.1c.

Although sporadic infections in humans continue to occur, according to a recent assessment by the European Centre for Disease Prevention and Control (ECDC), the risk of zoonotic influenza transmission to the general population in the EU/EEA countries is classified as **low**. However, a low to **moderate** risk is assumed for occupationally exposed groups who have close contact with infected poultry ([source](#)).

Summary and risk assessment

Since mid-February 2024, outbreaks in domestic poultry and cases in wild birds have fallen sharply, although they have not completely subsided. No outbreaks in domestic poultry occurred in Germany in March. The range of affected wild bird species again includes more waterfowl and currently fewer gulls.

The HPAIV H5N1 of clade 2.3.4.4b characterised in Europe since October 2023 show further new and different genotypes, which presumably arose through reassortment of circulating HPAI viruses with various LPAI viruses.

Compared to previous years, the total number of HPAI H5 viruses detected in birds is still widespread, but significantly lower, which could be due to a certain immunity of previously affected wild bird species and thus has a corresponding effect on the prevalence in wild bird populations.

In general, fluctuations in waterbird movements are to be expected in Europe over the next few weeks due to the migration of birds to their breeding grounds. Small to medium-scale movements of waterfowl species and gulls to freshwater areas inland or to coastal areas for breeding will take place. Viruses can spread easily in bird populations and be carried over short distances to other populations. Overall, however, the dense waterfowl breeding populations will disappear. Colony-breeding birds (terns, gulls, gannets, cormorants, storks) will return from their wintering grounds in Africa and southern Europe to their breeding grounds on the coast in April at the latest and will congregate there in high densities. Warmer temperatures and stronger UV radiation can contribute to a reduction in the infectivity of influenza viruses.

The presence of H5 antibodies in adult wild birds after surviving infection in recent years could have a positive impact on the overall situation for affected wild birds, but could leave continued virus circulation unrecognised, as more birds could be at least partially protected from serious illness and death. This means that there may still be a risk of entry for poultry holdings, even if no conspicuous wild bird deaths have been observed in the region. Cases in carnivores are also an additional indicator of HPAIV H5 presence and should be given special attention.

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The risk of HPAI H5 viruses entering and spread in waterfowl populations within Germany remains **high**. This also includes a **high** risk of infection for colony-breeding seabirds returning from their wintering grounds. The "[Bird Flu Radar](#)" (EFSA) indicates a high probability of HPAIV H5 entering north-west and north-east Germany in mid-April.

The risk of HPAIV H5 entering German poultry farms and bird populations in zoological facilities through direct and indirect contact with wild birds is classified as **moderate** for April, as reports of wild bird cases are currently only sporadic, albeit spread throughout Germany.

It is currently assumed that there is a **low** risk of the virus spreading between holdings (secondary outbreaks) within the EU and also within Germany, as the biosecurity measures introduced remain high and outbreaks across Europe have currently fallen sharply.

The risk of introduction through the sale of live poultry in the travelling trade or at poultry exhibitions within Germany and Europe is estimated to be **low**.

The risk of unrecognised circulation of HPAI H5 viruses in waterfowl farms is classified as **moderate**.

Current recommendation

POULTRY

The top priority is to protect poultry from the introduction and possible further spread of HPAIV infections. To this end, the relevant recommended biosecurity measures and monitoring and clarification tests must be reviewed and strictly adhered to. Poultry farmers are **legally** obliged to comply with the basic rules of biosecurity. The reporting of deaths in poultry farming to the veterinary authorities, followed by an official investigation, is considered a measure for the early detection of the fatal disease in chickens and turkeys.

Prevention and [biosecurity measures](#) in poultry farms, animal parks and zoos, especially those with outdoor and free-range systems, should be urgently reviewed and, if necessary, optimised. Livestock farmers can check the biosecurity of their farms anonymously and free of charge using the so-called "AI risk traffic light" (<https://risikoampel.uni-vechta.de/>). In particular, it should be possible to prove that keepers have already taken effective measures to prevent the entry and spread of HPAIV *before* an HPAIV case occurs. The British authorities have published a photo book with examples of biosecurity in poultry flocks ([photo book, in English](#)).

In addition, containment orders remain an effective measure to minimise the exposure of poultry holdings. On the basis of local risk assessments, small-scale and short-phase containment orders can also make a useful contribution. The use of TSIS to view wild bird cases in the districts ([TSIS query](#)) is publicly available.

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Poultry or bird exhibitions or the sale of live poultry (travelling trade), including trans-regional trade, should be effectively monitored when they take place. Bringing together (pedigree) poultry of different origins and keeping them at the exhibition venue for several days should be avoided at all costs.

Increased vigilance for the rapid detection of suspected cases in poultry and the immediate initiation of diagnostic clarification with regard to HPAIV would also include the early testing of sick birds in waterfowl holdings and fallen stock for AIV in order to detect the circulation of HPAI at an early stage.

Due to the H5N1 cases in dairy cows in the USA, livestock farmers are advised to remain vigilant and be aware of the risks if their animals come into contact with areas to which waterfowl also have access. In addition, further investigations should be initiated in the event of unclear and frequent cases of illness, which should then also include HPAIV H5. Similarly, dogs, cats and pigs kept on farms with poultry with HPAIV outbreaks should be included in the environmental investigations (swab and serum samples).

Even though EU Regulation 2023/361 has made it possible to vaccinate poultry against HPAI since February 2023, there is still a lack of suitable commercial vaccines authorised for use throughout Europe. In this respect, [considerations](#) of vaccination as a further preventive protective measure in addition to the known biosecurity precautions must remain largely theoretical. Vaccination of poultry would also be linked to considerable monitoring requirements, which are financially costly and would also place a heavy burden on the personnel capacities of veterinary offices and testing facilities.

Persons exposed to potentially infected poultry or captive birds, e.g. during killing or evacuation, or who have come into contact with infected wild birds, must be adequately protected and actively monitored or self-monitored for at least 10 days after exposure for respiratory symptoms or conjunctivitis and immediately inform local health and occupational health services to initiate testing and follow-up. Antiviral pre- or post-exposure prophylaxis should be considered and stocked for exposed individuals in accordance with national recommendations. At the end of February, the European Medicines Agency (EMA) endorsed the authorisation of two adjuvanted protein vaccines for the active immunisation of humans against influenza (H5N1): [Celldemic®](#) and [Incellipan®](#).

WILD BIRDS/WILD ANIMALS

It is virtually impossible to influence the course and spread of HPAIV infections in wild bird populations. The collection of carcasses has proven to be a useful measure against further food chain-related transmission (especially mammals and birds of prey such as white-tailed eagles). However, it can also mean a disturbance for sensitive bird species (especially during the breeding season) and lead to a further spatial spread of the virus if infected animals migrate and spread the virus to other colonies. The protection of colony-breeding rare bird species is a high priority. Nature conservationists, national park rangers, bird wardens, bird ringers etc. should be prepared

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to deal with sick and dead birds in cooperation with the relevant veterinary authorities, and the possible collection and disposal of dead birds should be planned in advance. The public is called upon to report dead birds and conspicuous cases of illness (neurological symptoms) to the veterinary authorities. Citizens have been able to report dead finds at [ornitho.de for a fortnight](https://www.ornitho.de). The registration of the number of dead birds found and the associated communication between environmental and veterinary authorities should be intensified. Correct species identification of dead birds is required and, in addition to information on the total number of non-investigated dead finds, must be reported via TSN. This is the only way to ensure that the extent of the incident can be realistically assessed and documented. A detailed document with instructions for action and background information can be found on the "[Wadden Sea World Heritage](https://www.waddensea.nl/)" website.

Vaccination of wild birds is ruled out for practical reasons, but may be considered as an [emergency measure](#) under special conditions.

Ringling activities have the potential to significantly exacerbate the impact of the current HPAI outbreak through two main mechanisms: i) by facilitating transmission from one location to another via clothing and equipment of the ringer interior and ii) by exacerbating symptoms and thus potentially increasing virus shedding due to the stress associated with handling in the ringed birds. Scientific bird ringing in colonies with a (high) incidence of deaths (with or without HPAI-positive findings) should be stopped immediately. Ringers who find dead birds in colonies that have not yet been affected should inform the relevant authorities (nature conservation and veterinary departments) and discuss the next steps. Further visits to other bird populations (including kept birds) should be avoided at all costs in order to prevent the virus from spreading.

Close personal and unprotected contact with dead or sick birds should be avoided; in general, if your own (even mild) symptoms of illness occur as a result of such contact, a doctor must be consulted immediately to clarify a possible HPAIV human infection.

The same precautions should be taken when finding dead wild carnivores (especially foxes). Carnivores found alive with neurological changes may also be infected with HPAIV H5N1. If foxes or other carnivores are examined at state testing centres as part of rabies screening, tissue samples from the CNS and lungs should always be tested for influenza virus RNA.

In times of high risk or when HPAIV cases or outbreaks are known in an area, consideration should be given to suspending hunting of waterfowl, both to reduce disturbance to wild bird populations and to reduce the possibility of spreading infection from the wild to the domestic environment when infected birds are transported. In addition, there is an increased risk of infection of humans or domestic animals (dogs, cats) when handling raw infected meat.

Abnormal behaviour and deaths of wild birds and mammals in connection with wild bird mortality should be reported immediately to the veterinary authorities for recovery and, if necessary, investigation.

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The FLI has compiled a [catalogue of recommendations](#) to provide an overview of further options for action.

Data sources: Animal Disease Notification System (TSN), Animal Disease Information System (ADIS), World Organisation for Animal Health (WOAH), Empres-I, European Food Safety agency (EFSA), [Scientific Committee on Antarctic Research](#); [Canadian Food Inspection Agency](#); [USDA APHIS Livestock USA](#)

Query period: 01.-31.03.2024;

Query date: 02/04/2024 (ADIS, WOAH); 04/04/2024 TSN

Further information

The data situation in the databases is dynamic and changes daily. Therefore, there are shifts in the figures if they are queried at different times.

The European Food Safety Authority (EFSA) provides an updated edition of the scientific assessment of the situation in Europe: [Avian influenza overview December 2023 - March 2024](#).

EFSA has also produced a review article on HPAIV [mammalian](#) infections.

In addition to weekly updated [maps of the outbreaks](#), the FLI also provides information on molecular-virological investigations of HPAI viruses in Germany ([HPAIV genotypes in Germany](#)) and a catalogue of questions ([FAQ](#)).

The [Radar Bulletin Germany is published](#) at monthly intervals on the FLI website.

The magazine for the poultry industry (DGS) has set up an [avian influenza radar](#) in which avian influenza outbreaks are listed chronologically with details of species, numbers and locations.

The European Reference Laboratory for Avian Influenza has launched a new [HPAI dashboard](#) regarding HPAI detections in the EU.

The EFSA has also set up an [HPAI dashboard](#) in which the figures in Europe can be displayed in real time.

EFSA has developed a [Bird Flu Radar](#) e together with Euring, Eurobird Portal and Ausvet.

The European Centre for Disease Prevention and Control publishes weekly [overviews](#), including on HPAI in public health. The WHO published a [risk assessment](#) on 21 December 2022.

The British Trust of Ornithology (BTO) has published helpful [tips](#) for bird ringers.

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Meanwhile, the FAO's Scientific Task Force on Avian Influenza in Wild Birds and others are calling on authorities to recognise HPAI as a problem for the conservation of biodiversity and to focus their [surveillance and control measures](#) on the protection of wild fauna.

"[Offlu](#)" published in December a overview of HPAI cases in wild birds and mammals in South America and the Antarctic region with an assessment of the risk of entry into Oceania and the Antarctic penguin population . The document also refers to options for action. Furthermore, a [current press release](#) provides information about the research visit to the Antarctic in March.

The One Health High-Level Expert Panel (OHHLEP) is urging a [holistic approach to panzootic highly pathogenic avian influenza](#).