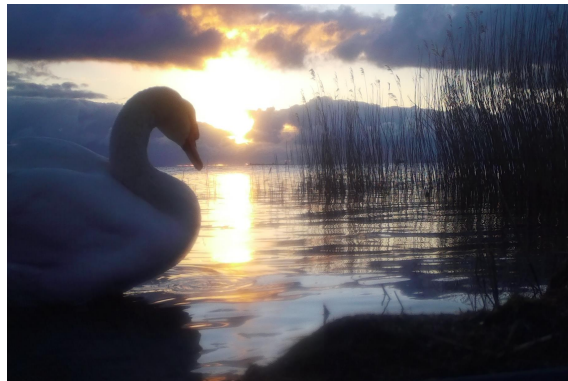


Rapid Risk assessment

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



Update for March based on the period
February (01-29 February) 2024

Situation in Germany

Between 1 and 29 February 2024, six HPAIV H5 outbreaks were detected in domestic poultry in Germany. The outbreaks affected laying hen farms (2), private chicken farms (2) and two turkey fattening flocks in relation to each other (Table 1, Fig. 1).

HPAIV H5N1 was detected in two "wild turkeys" at Cologne Zoo on 12 February 2024.

Overall, there was an increase in the number of cases in wild birds (n=63) in February, although the reporting frequency decreased from mid-February onwards. In addition to Schleswig-Holstein (n=44), seven other federal states reported a small number of cases in wild birds (Fig. 1, Table 2). The main species affected were barnacle geese in the Wadden Sea area and occasionally other bird species. The H5N1 subtype was confirmed in all but two cases. H5N5 was detected in a herring gull that died on Sylt and an unidentified gull in Norden (Tab. 2).

A total of six HPAI genotypes have been characterized in Germany since November 2023. Two genotypes (Ger-11-23-N1.3_euDG and Ger-11-23-N1.2_euAB) dominate the situation in poultry farms and wild birds in Germany. Two genotypes (Ger-11-23-N1.1_euDB and Ger-11-23-N1.4_euDA) were only detected in November/December, while two others (Ger-01-24 N1.1_euDJ and Ger-01-24-N1.2_euDO) were only detected once each in January in a wild bird in Schleswig-Holstein and a fox in Baden-Württemberg (see [January issue](#)).

No HPAIV H5N1 infections in mammals were reported from Germany for the month of February.

Table 1: Confirmed HPAIV H5 outbreaks in domestic poultry, including captive birds, for the period from 1 to 29 February 2024 in Germany. Data source: TSN, FLI. Data status: 05.03.2024

Federal state	County	Poultry species affected	Direction of use	Number of birds kept on the farm affected	Date Confirmation
Bavaria (1)	Landshut	Chicken	Private	<50	14.02.
Mecklenburg-Western Pomerania (1)	Western Pomerania-Rügen	Chicken	Egg production	73.000	04.02.
Hesse (1)	Schwalm-Eder district	Chicken	Egg production	14.000	01.02.
Schleswig-Holstein (2)	Steinburg	Turkey	Mast	>11.000	03.02.
	Steinburg	Turkey	Mast	3.300	07.02.
Saxony (1)	North Saxony	Chicken	Private	<50	29.02.

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

Table 2: Number of reported HPAIV H5 cases in wild birds, affected bird groups and locations in the period 1 to 29 February 2024 per federal state. Data source: TSN, FLI. Data status: 05/03/2024

Federal state (January/February)	County	Municipality	Wild birds (number of HPAIV notifications)	Date of Confirmation
Baden- Wuerttemberg (0/1)	Heidenheim	Sontheim a.d. Brenz	Common buzzard (1)	14.02.
Berlin (0/1)	Berlin	Steglitz-Zehlendorf	Bean goose (1)	15.02.
Hamburg (1/1)	Hamburg	City	Red knot (1)	09.02.
Hesse (1/2)	Kassel	City	Swan (1)	24.02.
	Schwalm-Eder	Gudensberg	Grey heron (1)	15.02.
Mecklenburg- Western Pomerania (0/3)	Ludwigslust-	Crivitz	Bean goose (1)	14.02.
	Parchim	Hagenow	Herring gull (1)	01.02.
	WP-Rügen	Stralsund	Herring gull (1)	09.02.
Lower Saxony (2/3)	Aurich	Norden, Krummhörn	gull (H5N5,1), gull (1)	23.02.
	Wittmund	Neuharlingensiel	gull (1)	19.02.
North Rhine- Westphalia (0/7)	Minden-Lübecke	Minden	Common buzzard (1)	05.02.
	Unna	Holzwickede	Greylag goose (1), Swan (1)	05.02.
	Märkischer Kreis	Iserlohn	Canada goose (3)	05.02.
	Wesel	Xanten	Goose (1)	01.02.
Schleswig-Holstein (22/44)	Dithmarschen	Brunsbüttel	Barnacle goose(2),kestrel(1),buzzard (1)	01.;15.;23.02.
		Hennstedt	Grey goose (1)	07.02.
		Lehe	Barnacle goose (1)	07.02.
		Linden trees	Grey goose (1)	01.02.
		Lunden	Barnacle goose (2)	07.02.
		Melsdorf	White-fronted goose (2)	15.02.
		Pahlen	Barnacle goose (1)	07.02.
		Rehm-Flehde-Bargen	Barnacle goose (1)	01.02.
		Westerdeichstrich	Red knot (1)	23.02.
		Wöhrden	Barnacle goose (1)	23.02.
	North Friesland	Dagebüll	Barnacle Goose (7), Black-backed Gull	01.;07.02.
		Emmelsbüll-Horsbüll	Grey goose (1)	01.02.
		Enge-Sande	Barnacle goose (1)	01.02.
		Husum	Barnacle goose (1)	15.02.
		North beach	Barnacle goose (1)	07.02.
		Reußenköge	Barnacle goose (1)	15.02.
	Pinneberg	Sylt	Herring gull (H5N5,1)	27.02.
		Elmshorn	Barnacle goose (1)	23.02.
		Tornesch	Barnacle goose (1)	07.02.
	East Holstein	Scharbeutz	Black-headed Gull (1)	23.02.
	Plön	Wipe	Goose (1)	07.02.
		Probsteierhagen	Mallard (1)	07.02.
		Schönberg (Holst.)	Mallard (1), Cormorant (1)	07.02.
		Hohwacht (Baltic Sea)	Goose (1)	01.02.
	R.-Eckernf.	Melsdorf	Goose (1)	15.02.
	Schleswig- Flensburg	Middle fishing	Bird of prey (1)	01.02.
	Steinburg	Kollmar	Barnacle goose (1)	15.02.
		Glückstadt	Barnacle goose (1)	15.02.
		Borsfleth	Barnacle goose (1)	15.02.
		Horst (Holstein)	Barnacle goose (1)	15.02.
		Hohenlockstedt	Barnacle goose (1)	15.02.

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

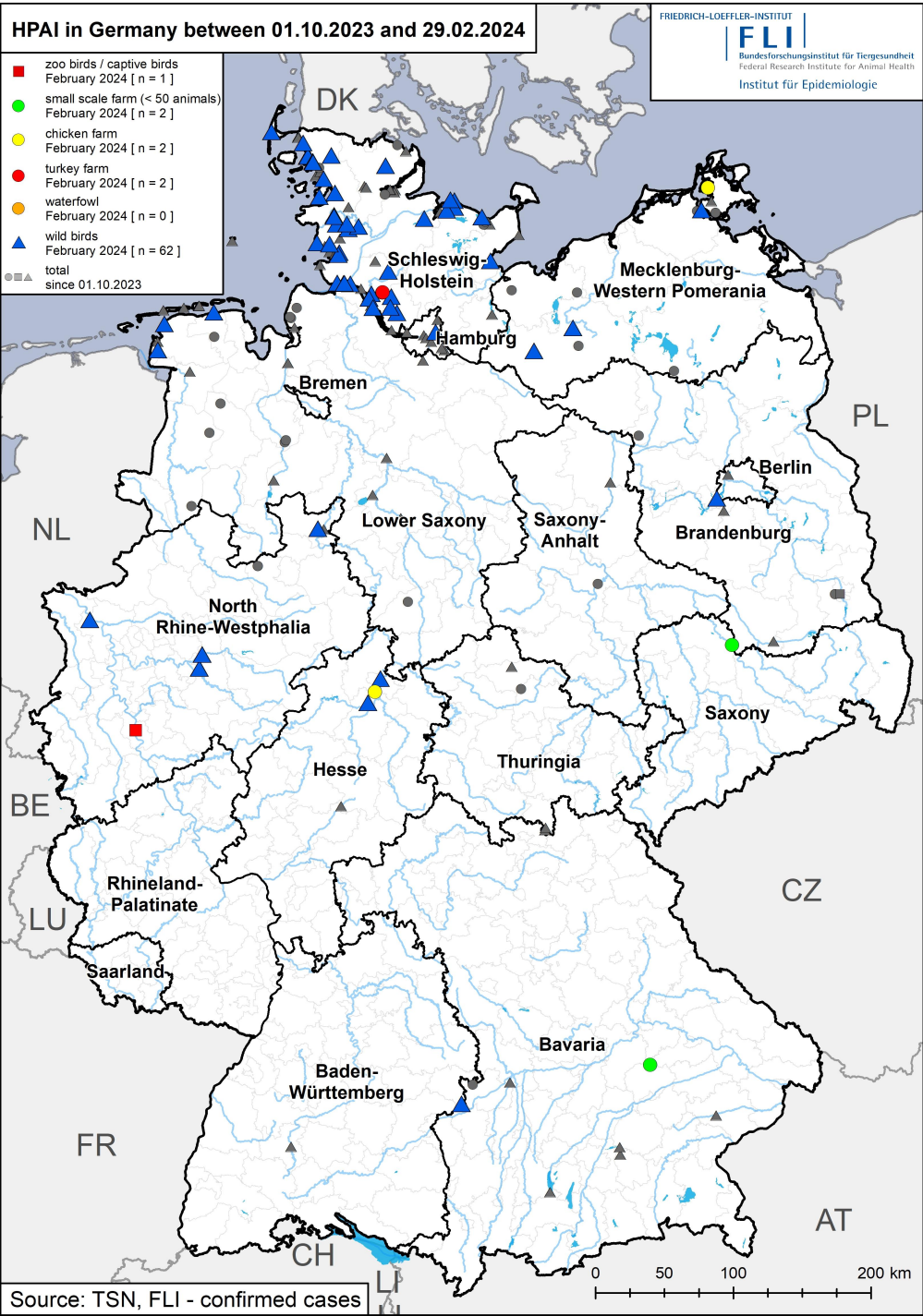


Figure 1: Outbreaks of HPAIV H5N1 in Germany in domestic poultry (dots), other captive birds (zoo/wildlife sanctuary; squares) and cases in wild birds (triangles) since 01.10.2023. In colour current outbreaks and cases for the period 01.-29.02.2024. Different colours: see legend. Data source: TSN, FLI; data status: 05/03/2024.

Situation in Europe

The number of HPAIV H5 outbreaks in **domestic poultry** in Europe (n=61; excluding Germany) was slightly higher in February than in the previous month. Various sectors of poultry production were affected (Fig. 2, 4). The Republic of Moldova was heavily affected with 27 outbreaks in private holdings (Fig. 2, 4). The outbreaks led to the loss of almost one million animals in February alone.

In February, the Czech Republic (n=9), Poland (n=3), Denmark, Austria and Ukraine (n=1 each) reported outbreaks in **captive birds** (here privately kept poultry; Fig. 2, 4).

The number of cases in **wild birds** in Europe also remained at a high level in December with 167 cases. In addition to Germany, a total of 18 European countries reported cases in wild birds, with waterfowl (swans and geese; n=114) most frequently affected (Fig. 3). In addition to the North Sea and Baltic coasts, south-east Europe is also particularly affected (Fig. 4).

The **H5N1 subtype** was identified in the majority of cases. In addition to Germany (see above), the United Kingdom also reported HPAIV **H5N5** in a buzzard and a sparrowhawk.

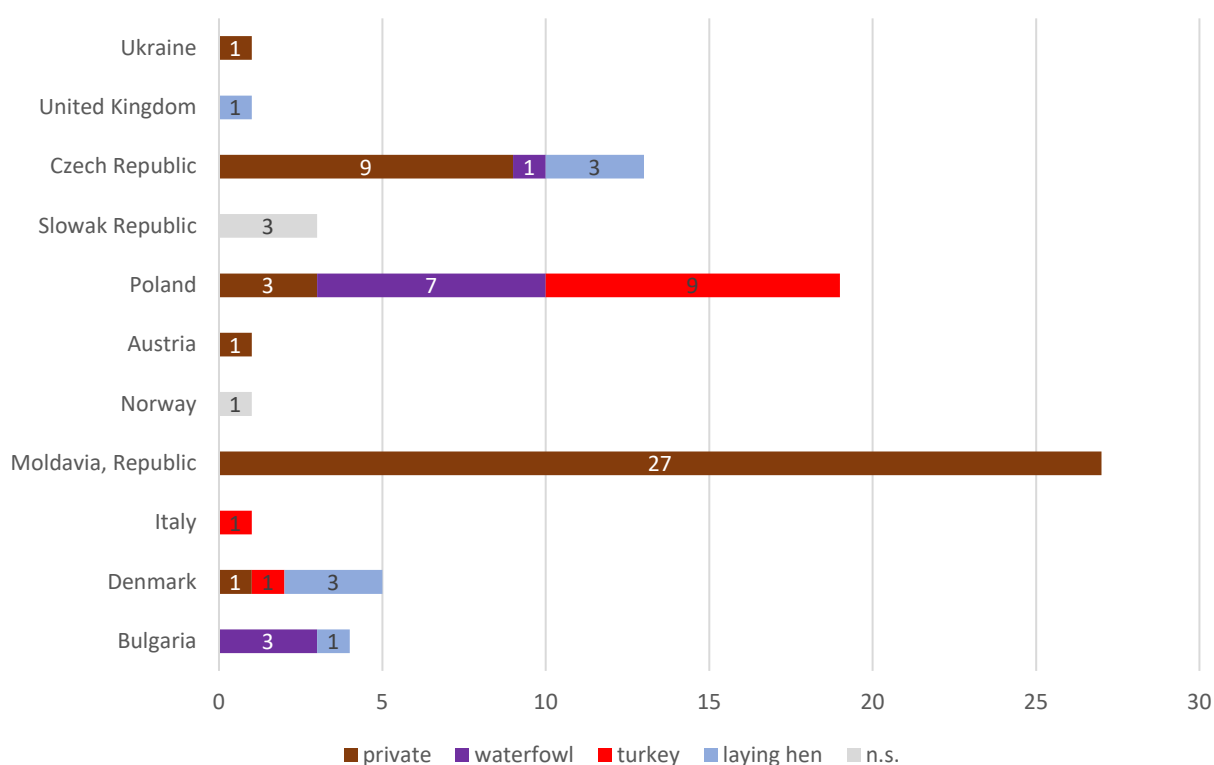


Figure 2: Notifications of HPAIV H5 outbreaks in poultry for February 2024 in Europe (Germany not included); n.s.=not specified. Data source: ADIS; data status: 04/03/2024.

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

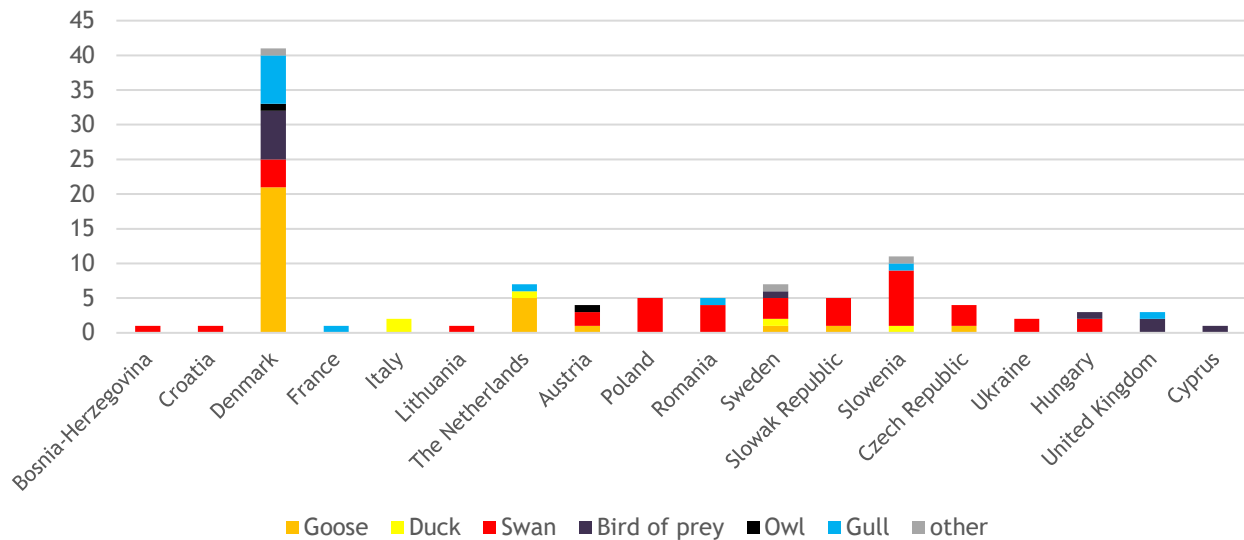


Figure 3: Numbers of confirmed HPAIV H5-cases in different wild birds per country for the month of February 2024. The figures are the number of individual reports of examined animals to ADIS, which often conceals a higher number of affected (dead) birds. ADIS, WOA; status of the data query: 04/03/2024.

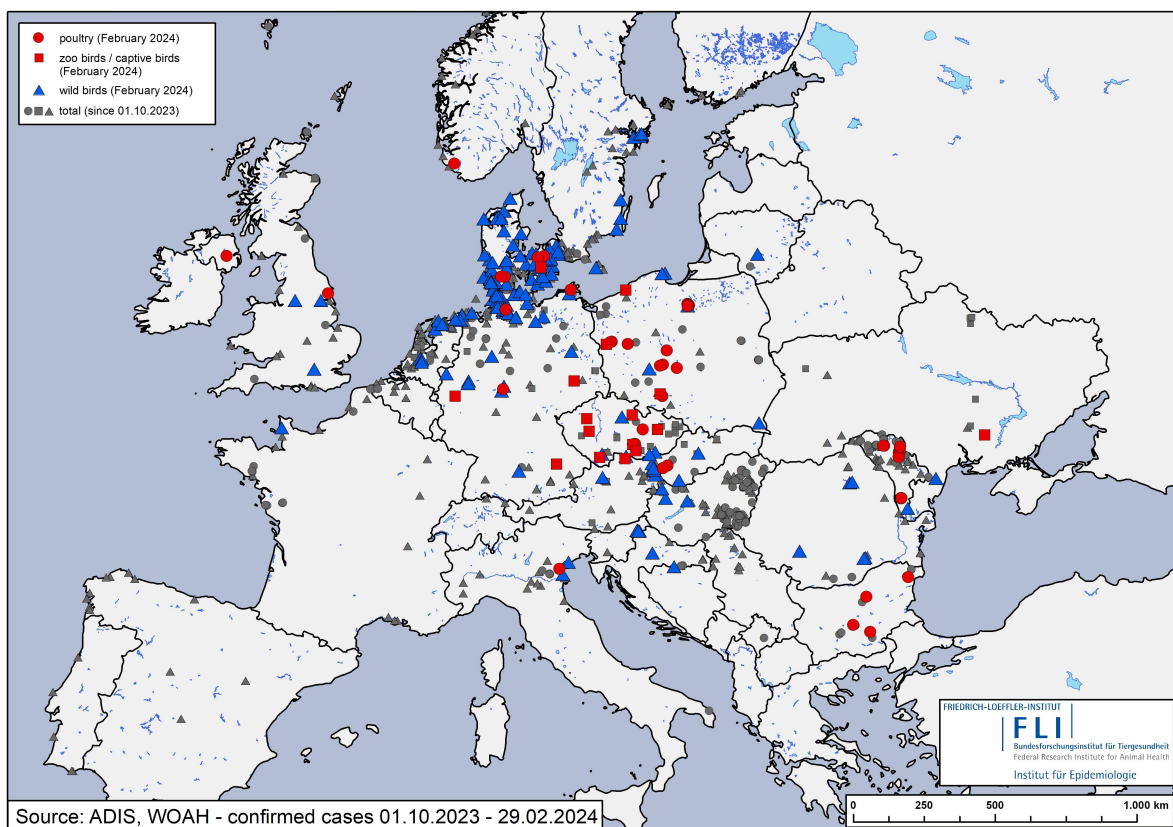


Figure 4: HPAI cases in poultry, captive birds and wild birds reported to ADIS and WOA from 01 October 2023 to 29 February 2024. Cases for February in red and blue; poultry = domestic poultry kept for commercial purposes; zoo/other privately kept birds = other captive birds. Data source: ADIS, WOA; status of data query: 04/03/2024.

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

The H5N1 HPAI viruses of clade 2.3.4.4.b characterized 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. The BB genotype, which has dominated since 2022 and was mainly found in gulls and various seabird species, has been displaced.

Since September, individual HPAIV H5N5 viruses have been detected in Norway, the UK, Germany and Iceland. The genotype underlying the viruses from Norway, the UK and Iceland was already characterised in 2021, but has not been found since the first quarter of 2022.

In February, Norway reported the detection of HPAIV H5 in a red fox from the north of the country (Fig. 5).

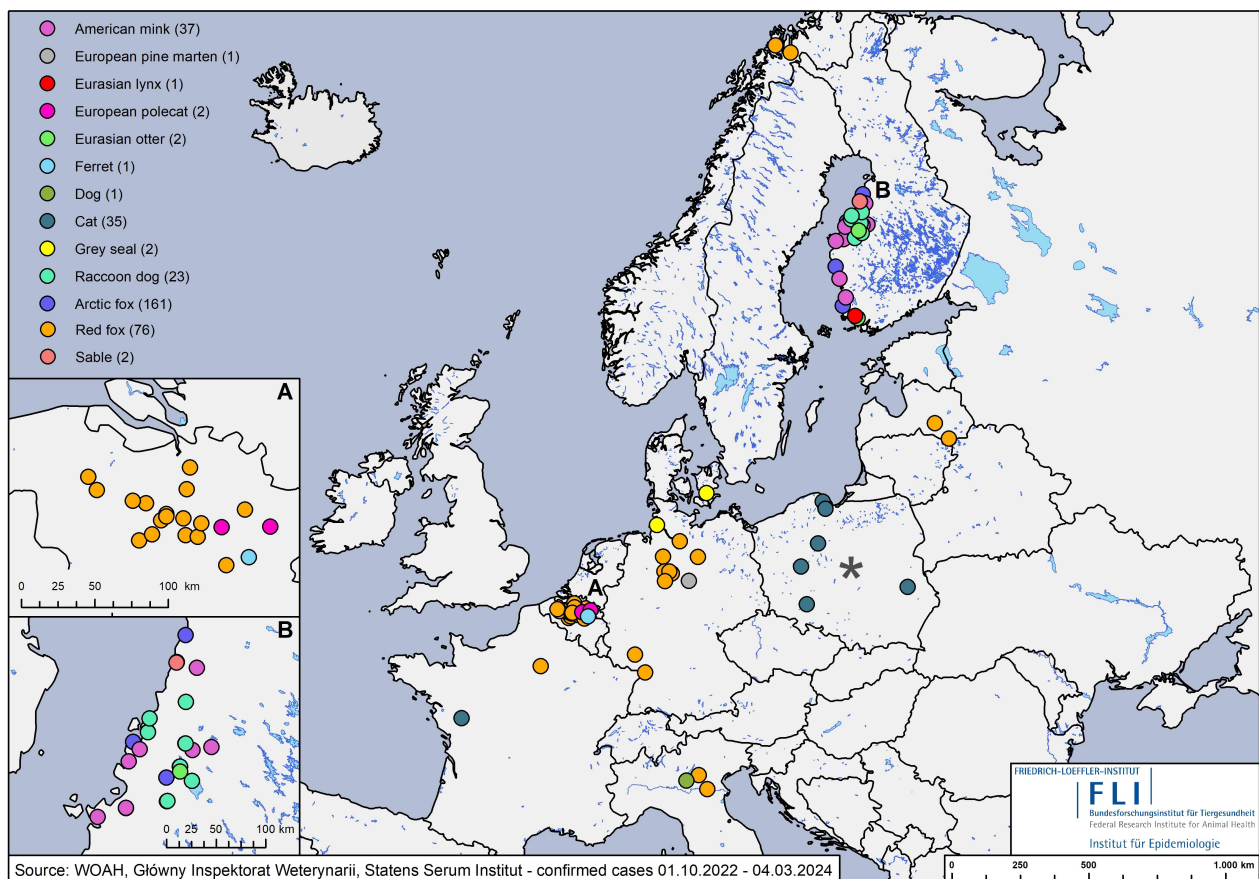


Figure 5: HPAIV H5 infections in mammals in Europe reported to WOA since 01.10.2022. *Polish mammal cases concern 33 cats and one caracal and are described on the homepage of the "Main Veterinary Inspectorate" in Poland. Data query: 04/03/2024.

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

Situation in the world/Special events

Outbreaks in **domestic poultry** and **wild bird cases** caused by HPAIV H5 of clade 2.3.4.4b were reported to the WOA **worldwide** in February, particularly in Asia and the American double continent.

- Russia: HPAIV reported an H5N1 outbreak in domestic poultry on an island in the east of the country in February.
- Africa: The veterinary authorities in Niger have reported an outbreak of HPAIV H5N1 in various birds in the capital Niamey.
- Southeast Asia: Dozens of H5N1 outbreaks in domestic poultry and cases in wild birds have been detected in India, Indonesia, Taiwan, Cambodia, Vietnam, Japan and South Korea. Japan and South Korea continued to report outbreaks of HPAIV H5N6 in domestic poultry and cases in wild birds.
- Antarctic region: In February, HPAIV H5 was also confirmed in skuas on the mainland.
- South America: Peru reported an outbreak of HPAIV H5 in domestic poultry. Brazil reported several cases of HPAIV H5N1 in terns and an ibis in the coastal area. An HPAIV H5-positive hawk was confirmed on the Falkland Islands.
- North America: In North America (USA and Canada), some outbreaks in poultry and cases in wild birds were reported for February:
 - o Canada: Four outbreaks in domestic poultry in Nova Scotia, Alberta and Quebec.
 - o USA, 17 states: Seven outbreaks in domestic poultry, 15 outbreaks in kept poultry (private farms). Dozens of wild birds tested positive in February, around a third of which were hunted ducks (teal, mallard, pintail, shoveler).

Infections with HPAIV H5 in mammals were not reported in February.

Despite the high number of outbreaks in poultry worldwide and an assumed multiple contact between humans and infected birds, **infections with HPAIV H5 clade 2.3.4.4b in humans** still appear to be very rare events that are closely monitored and documented. Since 2020, fewer than ten human infections with mild or asymptomatic courses have occurred in Europe and North America, although severe courses have been reported in two people from Ecuador and Chile following infection with HPAIV H5. In February 2024, two people in Cambodia contracted HPAIV H5N1, one of whom (a nine-year-old boy) died. This brings the total number of people diagnosed with HPAIV H5N1 in Cambodia in 2024 to four. The HPAIV H5N1 virus of the deceased person, presumably like that of the others, belonged to clade 2.3.2.1.c, which circulates in Vietnam but not in Europe.

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 October 2023, a considerable number of outbreaks in poultry (n=265) has been reported in Europe. From this period alone, the number of poultry losses across Europe amounts to six million animals.

Since then, the range of wild bird species affected has again increasingly included waterfowl. An increased number of mute swans and whooper swans have been reported from south-east Europe since December. An increased number of geese, especially barnacle geese, have also died on the North Sea and Baltic coasts since December.

The HPAIV H5N1 of clade 2.3.4.4.b characterized in Europe since October 2023 show new and different genotypes, which presumably arose through reassortment of circulating HPAI viruses with various LPAI viruses. A further subtype (H5N5) is circulating in northern Europe and has been detected sporadically in Norway, Iceland, England and northern Germany since November.

In Europe, fluctuations in water bird movements are to be expected due to changing weather conditions, as a result of which water birds on the coasts migrate in south-westerly directions over small to medium distances during cold spells or return to their breeding areas in a north-easterly direction. Weather-related gatherings of waterfowl species mainly take place in coastal areas, viruses can spread easily in waterfowl populations and be carried over short distances to other populations, so that viruses can be exchanged within different resting populations. Overall, however, the dense waterfowl resting populations will gradually disappear.

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 unrecognized, 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 mortality has been observed in the region.

The risk of HPAI H5 viruses entering, spreading and spreading further in waterfowl populations within Germany remains **high**. The "[Bird Flu Radar](#)" (EFSA) indicates a **high** probability of HPAIV H5 entering north-west and north-east Germany in mid-March. However, the risk is generally elevated for the whole of Germany.

The risk of HPAIV H5 entering German domestic poultry holdings and bird populations in zoological facilities through direct and indirect contact with wild birds is still classified as **high** for March, as wild bird cases are still being reported. Outbreaks in domestic poultry and captive birds in Europe indicate a current risk potential that also affects small private holdings.

It is currently assumed that there is a **moderate** risk of the virus spreading between holdings (secondary outbreaks) within the EU and also within Germany, as the biosecurity measures in place remain high.

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

The risk of introduction through the sale of live poultry in the travelling trade and poultry exhibitions in Germany is estimated to be **moderate**.

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

Current recommendation

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 farmers 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 addition, containment orders remain a highly effective measure for minimising 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.

Direct or indirect contact between poultry and wild waterfowl or natural bodies of water should be completely avoided in order to prevent the introduction of the disease. A risk-based restriction of the free-range keeping of poultry (stabling) is recommended in the vicinity of frequent cases of HPAIV-infected wild birds. The use of TSIS to view wild bird cases in the districts (**TSIS query**) is publicly available.

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.

To avoid secondary outbreaks, at least the following precautions should be taken:

- No shared use of equipment, carcass bins and vehicles by several poultry farms.
- Restriction of vehicle and passenger traffic on poultry farms to an absolute minimum.
- Staff looking after poultry should only work on a single farm.

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

- Veterinarians or other persons visiting poultry flocks on a professional basis should break off their tour and observe a 48-hour waiting period if they have entered a flock in which clinical signs, including increased mortality, indicate HPAI.

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

Increased attention must also be paid to compliance with biosecurity measures for intra-Community movements of poultry, particularly to or from EU countries with a current outbreak. Careful cleaning and disinfection must be ensured for poultry transport vehicles returning from affected countries.

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 authorized 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. France, which has started vaccinating commercial duck farms under a national derogation, was immediately banned from trading poultry with countries including the USA and Japan. This also has consequences for the entire European trading area. 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®](#).

Surveillance of wild mammals for HPAIV H5 infection (see below), but also mammals kept in captivity (fur animals) should be intensified. Similarly, dogs, cats and pigs kept on farms with poultry with HPAIV outbreaks should be included in environmental testing (swab and serum samples).

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.

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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). Nature conservationists, national park rangers, bird wardens, bird ringers, etc. should be prepared 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 finds and conspicuous cases of illness (neurological symptoms) to the veterinary authorities. Citizens have been able to report dead finds at [ornitho.de](https://www.ornitho.de) for a fortnight. The registration of the number of dead birds found and the associated communication between environmental and veterinary authorities should be intensified. A detailed document with instructions and background information can be found [here](#).

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

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.

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.

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 estimated and documented.

For an overview of further options for action, a catalogue of recommendations can be [found here](#).

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](#)

Query period: 01.-29.02.2024;

Query date: 05/02/2024 for TSN; 04/03/2024 for ADIS and WOAH

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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 what is happening in Europe: [Avian influenza overview September-December 2023 | EFSA \(europa.eu\)](#).

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 | Zenodo](#)) 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.

Together with Euring, Eurobird Portal and Ausvet, EFSA has set up a [Bird Flu Radar](#).

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.

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

[Monitoring and control measures](#) should also be geared towards the protection of wild fauna.

"[Offlu](#)" published an overview of HPAI cases in wild birds and mammals in South America and the Antarctic region in December with an assessment of the risk of entry into Oceania and the Antarctic penguin population. The document also refers to options for action.

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