

# Rapid Risk Assessment

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



Update for the period  
May (1–31) 2023

## Rapid risk assessment on highly pathogenic avian influenza H5 (HPAI H5) clade 2.3.4.4b

### Situation in Germany

Between 1 and 31 May 2023, 2 HPAI outbreaks were detected in poultry in Germany (Table 1). In one case, the outbreaks affected a broiler farm in the district of Regensburg (Bavaria) with 61,000 birds and a holding with just under 5,000 chickens in the district of Vorpommern-Greifswald (Mecklenburg-Western Pomerania; Fig. 1). These outbreaks were caused by the HPAIV subtype H5N1.

After a decline in the number of cases in wild birds last month, the total number of HPAIV H5 cases reported in wild birds increased again during the reporting period to 193 (n=100 in the previous month). Most cases continued to be reported from Bavaria (Tab. 1, Fig. 1). Similar to the previous months, the most frequent cases were reported in gulls (162), followed by birds of prey (14), wild geese (8), terns (5) and one each in swans, white storks, wild ducks and corvids (Table 1).

Reports of outbreaks and greatly increased mortalities of shorebirds and gulls in breeding colonies suggest local, distinctly epizootic events, which are presumably interconnected by bird movements and corresponding contacts. Since not all dead birds at a site can be tested for HPAIV, the total number of HPAIV-infected birds is estimated to be many times higher. Unfortunately, current mortality figures from the geographic position of the HPAIV cases (Tab.1) are not available in a centralised way. HPAIV subtype H5N1 was detected exclusively. Recent reports indicate a dramatic event in guillemots on the island of Helgoland, where several hundred young and old birds were recovered dead. It is expected that outbreaks will continue to manifest at sites with higher bird density (seabird colonies) during the breeding season (June).

While cases were reported in mammals in Germany in March 2023 and April 2023 (Fig.1), there were no further reports in May 2023.

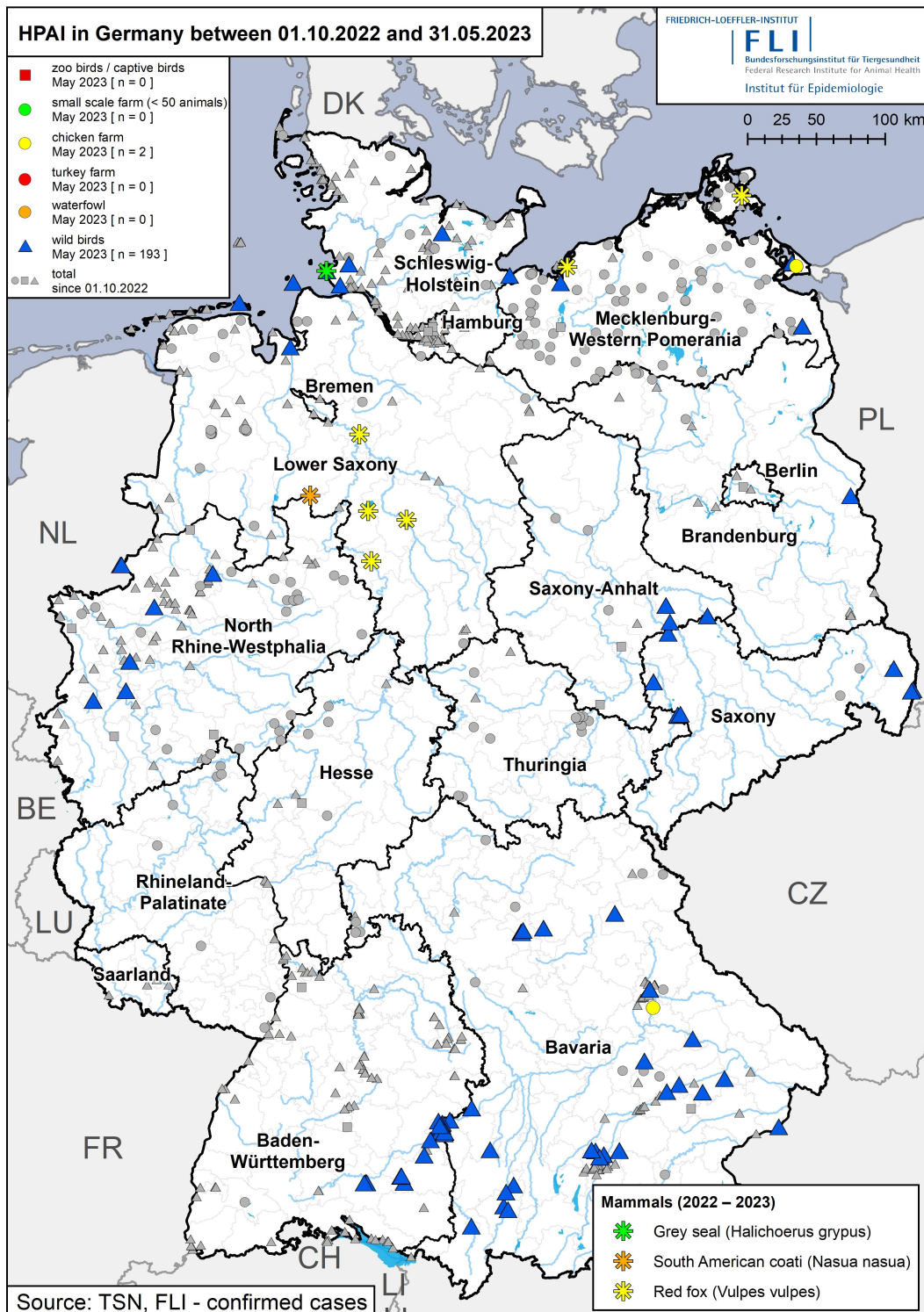
*Table 1: Number of reported HPAIV H5 wild bird cases, affected bird groups and locations for the period 01–31 May 2023 by federal state. Data source: TSN, FLI.*

Federal State	District	Site	Wild birds (n° of HPAIV-reports)	Detection Period
Baden-Wuerttemberg (27)	Ulm	Friedrichsau	Gulls (1), birds of prey (3)	15–26/05
	Biberach	Federsee, Bad Buchau	Gulls (9), geese (1), swan (1)	08–16/05
		Kiesgrube, Bad Schussenried	Gulls (3)	08/05
	Sigmaringen	Zielfinger Seen Mengen/Krauchenwies	Gulls (8)	16/05
	Alb-Donau-Kreis	Donau Dellmensingen	Gulls (1)	12/05
Bavaria (59)	Dachau	Karlsfeld	Canada geese (1)	31/05
	Dillingen a.d. Donau	Wasserflächen Gundelfinger Moos	Terns (4)	26/05
	Dingolfing-Landau	Eichendorf, Marklkofen	Birds of prey (1), gulls (1)	03–09/05

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	Erlangen-Höchstadt	Weihergebiet bei Mohrhof	Black-headed gulls (12)	25–30/05
	Forchheim	Kersbach Ort	Birds of prey (3)	17/05
	Günzburg	Balzhausen	Mallards (1)	08/05
	Kaufbeuren	Kaufbeuren Stadt	Gulls (1)	17/05
	Kelheim	Langquaid	Birds of prey (1)	12/05
	Kempten i. Allgäu	Schwabensberger Weiher, Kempten	Gulls (1)	17/05
	Landshut	Essenbach, Wörth a.d. Isar	Gulls (2)	05–10/05
	Munich	Stadt	Grey-lag geese (2), birds of prey (1)	11–17/05
		Speichersee Ismaning	Black-headed gulls (5)	12/05
	Neustadt a.d. Waldnaab	Rußweiher Eschenbach i.d.OPf.	Gulls (2)	18–25/05
	Neu-Ulm	Plessenteich, Donau Neu-Ulm	Gulls (7), stork (1), geese (1), corvids (1)	05–19/05
		Donau Glockerau	Gulls (4)	08/05.
	Ostallgäu	Jengen, Biessenhofen	Gulls (2)	17–23/05
	Passau	Innufer Obernberg am Inn	Black-headed gulls (1)	05/05
	Schwandorf	Weihergebiet Katzdorf	Gulls (2)	17/05
	Straubing-Bogen	Donau Obermotzing	Gulls (1)	04/05
	Unterallgäu	Schlingener See, Rieden	Gulls (1)	23/05
Brandenburg	Märkisch-Oderland	Wulkow	Gulls (1)	23/05
Hamburg (16)	Hamburg	Insel Neuwerk	Black-headed gulls (16)	25/05
Mecklenburg-Western Pomerania (15)	Vorpommern-Greifswald	Insel Böhmkje / Usedom	Black-headed gulls (10)	30/05
		Krugsdorf	Black-headed gulls (4)	23–30/05
	Nordwestmecklenburg	Wismar	Black-headed gulls (1)	15/05
Lower Saxony (2)	Wesermarsch	Nordenham	Gulls (1)	16/05
	Friesland	Wangerooge	Geese (1)	05/05
North Rhine-Westphalia (25)	Münster	Münster, Stadt	Gulls (12)	31/05
	Düsseldorf	Düsseldorf	Peregrine falcon (1)	27/05
	Mönchengladbach	Mönchengladbach	Peregrine falcon (2)	26/05
	Borken	Zwilbroek	Black-headed gulls (7), birds of prey (1)	04–16/05
	Mühlheim a.d. Ruhr	Mühlheim a.d. Ruhr	Birds of prey (2)	05+12/05
Saxony (32)	Görlitz	Teilstaubacken Reichendorf	Gulls (3)	24/05
		Berzdorfer See	Gulls (12)	3–23/05
	Leipzig	Großer Teich Frohburg	Black-headed gulls (4)	15/05
		Stadtgebiet	Black-headed gulls (12), geese (1)	02/05+16/05
	Nordsachsen	Löbnitz	Black-headed gulls (1)	11/05
Saxony-Anhalt (10)	Anhalt-Bitterfeld	Muldestausee	Black-headed gulls (1)	15/05
	Wittenberg	Gremminer See	Black-headed gulls (4)	12/05
		Gräfenhainichen		
		Elbetal Prettin	Black-headed gulls (5)	04/05
Schleswig-Holstein (6)	Dithmarschen	Neufelder Koog	Black-headed gulls (1)	26/05
		Windbergen	Black-headed gulls (2)	23/05
		Friedrichskoog	Black-headed gulls (1)	12/05
	Lübeck	Lübeck	Gulls (1)	12/05
	Plön	Honigsee	Canada geese (1)	12/05

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**Figure 1:** Outbreaks of HPAIV H5N1 in Germany in poultry (dots), other captive birds (zoo/wildlife sanctuary; squares), cases in wild birds (triangles) since 1 October 2022; mammals for the period 2022-23. In colour: current outbreaks and cases since 1 May 2023. Different colours: see legend. Data status: 6 June 2023; data source: TSN, FLI.

### Situation in Europe

Across Europe, the number of **outbreaks in poultry** increased in May compared to the previous month. Between 1 and 31 May 2023, France reported the most outbreaks (84), while Hungary was able to contain outbreaks and none were reported to ADIS. The United Kingdom reported three (including two broiler parents in North Lincolnshire and one holding with free-ranging ducks), the Czech Republic two outbreaks and Poland one outbreak in poultry (Fig. 2).

In France, the outbreak is confined to the south-western region of the departments of Nouvelle Aquitaine and Occitanie, where large numbers of ducks and geese are kept for foie gras production. Apart from the majority of domestic waterfowl affected, only 13 chicken farms are affected. The majority are secondary outbreaks and due to movements from farm to farm. In total, a loss of more than half a million birds has been recorded.

**In captive birds**, outbreaks in small private holdings were reported in France (2) and the Czech Republic (1) in May 2023.

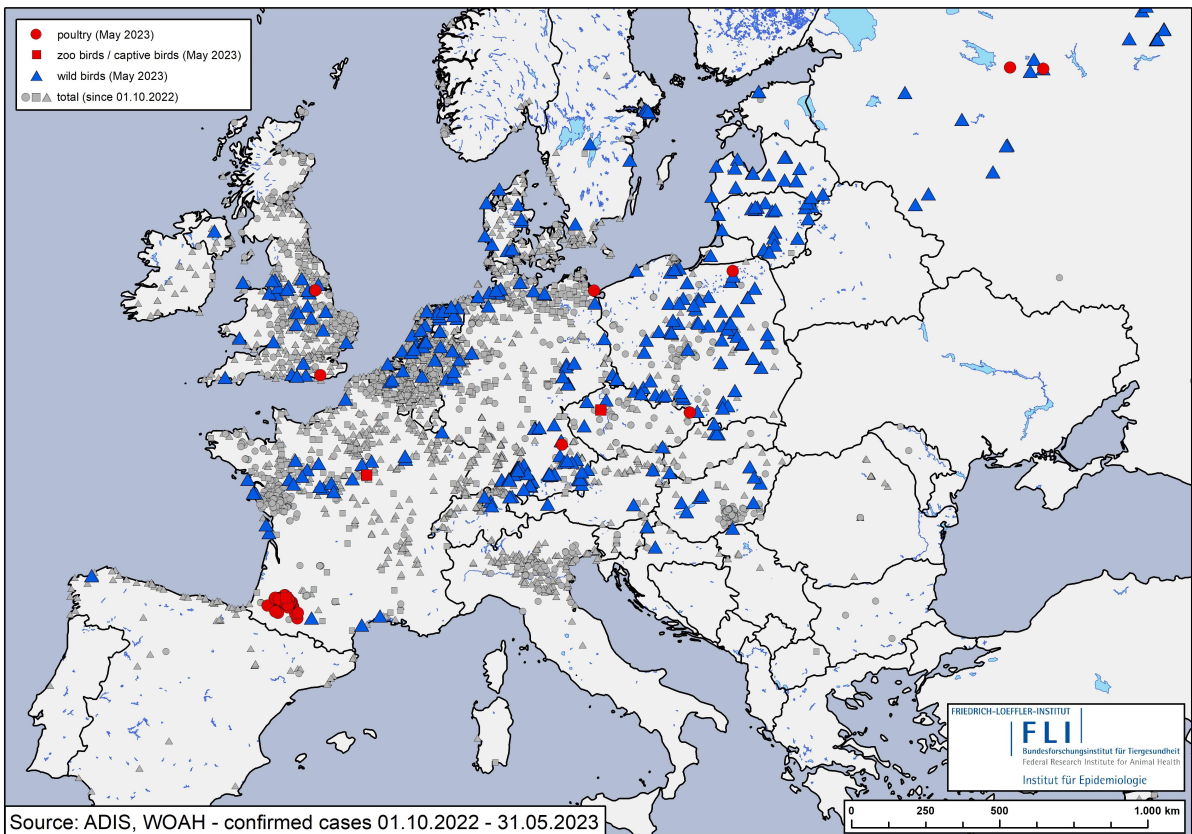
Not only in Germany, but also throughout Europe, deaths in breeding bird colonies have increased, sometimes to the extent of local mass mortalities. This is also reflected in the HPAIV H5N1 detections in wild birds investigated: almost 85% of all HPAIV H5N1-positive wild bird samples from 23 European countries come from gulls (Fig. 3), of which the majority are black-headed gulls, 6% from birds of prey, the most frequently affected being peregrine falcons, and 4% terns (currently common terns), while detections in swans, geese and ducks have declined sharply. The examination figures for gulls and terns do not represent the current mortality in gull-birds, as only a fraction of the dead animals per site are sampled and investigated. All infections so far are due to the H5N1 subtype.

The HPAI H5N1 viruses in gulls investigated in Europe so far belong almost exclusively to the genotype "gull-like BB" of clade 2.3.4.4b HPAIV H5, which emerged (presumably in France) from a reassortment event of H5N1 and a gull-adapted AIV of subtype H13 and has been spread across Europe since June 2022. This genotype was also responsible for HPAIV cases in mink in Spain.

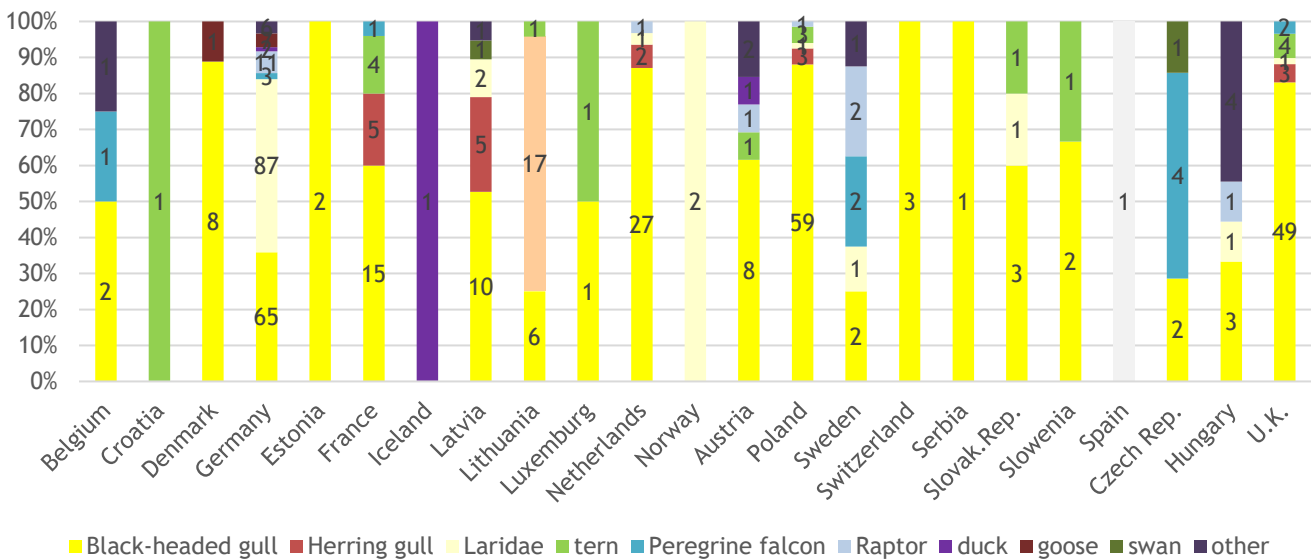
No other mammalian cases have been reported in Europe.



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**Figure 2:** HPAI cases in poultry, captive birds and wild birds reported in ADIS and to WOA from 1 October 2022 to 31 May 2023. Current cases as of 1 May 2023 in red and blue; poultry = (domestic) poultry kept for commercial purposes; zoo birds/other birds = other captive birds. Data query done on 6 June 2023.



**Figure 3:** Percentage shares of affected bird groups in the positively tested investigation material per country for May 2023. Source: ADIS.

### Situation in the world/special events

Worldwide, outbreaks of HPAIV H5 clade 2.3.4.4b are slowly declining, but detections continue to occur, e.g. in the European part of Russia (mainly gulls), in Asia (Nepal, India) and the Americas. At the beginning of May 2023, Brazil reported cases of HPAIV H5 in seabirds on the Brazilian coast for the first time. In Argentina and Paraguay, isolated outbreaks occurred in poultry and captive birds, respectively. After HPAIV H5N1 led to increased deaths in California condors (*Gymnogyps californianus*), the largest bird in North America, in the USA (Arizona), these rare wild birds are now to be vaccinated with an inactivated H5 antigen. This is the first time that vaccination of birds against HPAI has been approved in the USA.

In **terrestrial (carnivorous) and marine (ichthyovorous) mammals**, the number of reported cases is increasing worldwide in the course of the panzootic ("pandemic among animals"). The following reports of mammals newly affected by HPAIV H5 clade 2.3.4.4b were published in May 2023:

In South America, Uruguay reported a total of 16 South American coatis (*Nasua nasua*) deceased in a nature reserve, in which HPAIV H5 was detected. In Chile, Chilean dolphins (*Cephalorhynchus eutropia*) and a Burmeister's porpoise (*Phocoena spinipinnis*) were recovered dead and tested positive for HPAIV H5N1.

Two HPAIV H5N5-positive raccoons were reported from Canada, which were found dead on Prince Edwards Island.

In the USA, a total of 6 red foxes, 1 mountain lion, 1 black bear, 1 striped skunk and 1 raccoon have tested HPAIV H5N1-positive in the states of Minnesota, California, New York, Pennsylvania, Utah, Oregon, Maine and Colorado since 1 May 2023.

Despite the very high number of outbreaks in poultry worldwide and an assumed multiple contact between humans and infected birds, **infections with HPAIV clade 2.3.4.4b in humans** remain very rare events, but are closely monitored and documented. In addition to a few cases of human infections with a mild course in Europe and North America, two severe courses have been reported in two persons from Ecuador and Chile after infection with clade 2.3.4.4b-HPAIV H5.

In May, asymptomatic human infections with HPAIV H5N1 were reported in two people from the United Kingdom, who had been in close contact with poultry. Whether it was a true infection or a contamination could not be determined with certainty, at least for one person.

According to an assessment by the European Centre for Disease Prevention and Control (ECDC), the risk of zoonotic transmission of HPAIV H5N1 clade 2.3.4.4b and the associated public health impact is still considered low. However, a moderate risk is assumed for occupationally exposed groups, who have close contact with infected poultry ([Source](#)).

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### Summary and risk assessment

The current global HPAI H5N1 epidemic is highly dynamic despite the warm season. The virus is also spreading in the Americas from Canada to southern Chile and Argentina and continues to infect mammals.

Genetic analyses of the circulating virus strain of subtype H5N1 show that the virus persisted year-round in domestic wild birds in Europe in 2022. The number of outbreaks in poultry has decreased sharply in the EU between December 2022 and May 2023 compared to the peak in November 2022. In wild birds, there is currently an increased reporting of case numbers again, especially in gulls and seabirds breeding in colonies. The black-headed gull is currently particularly affected, with thousands of birds dying in their breeding colonies across Europe, depending on high densities in the breeding colonies. Recent reports of dramatic mass mortality of guillemots on Heligoland indicate that HPAIV may threaten the existence of rare bird species. It can be expected to further spread.

In the course of the upcoming moulting season in summer, waterfowl congregations at suitable water sites can be expected again. Colony-breeding birds (terns, gulls, boobies, cormorants) are in the process of rearing chicks and are together in the colonies in high density, which promotes the spread of the virus. Small- to medium-scale movements of waterbird species and gulls towards inland freshwater areas or coastal areas for breeding continue to occur and promote short-distance virus spread to other populations and breeding colonies. Rising outdoor temperatures and increased UV radiation may contribute to accelerated inactivation of influenza viruses.

The risk of HPAI H5 viruses entering breeding colonies of shorebirds and gulls within Germany is considered **high**, especially due to the continuing high infection rates, especially in black-headed gulls throughout Europe.

The risk of HPAIV H5 introduction into German poultry holdings and bird populations in zoological facilities through direct and indirect contacts with wild birds is considered **high**, among other things because black-headed gulls in particular are also found inland at all times of the year and their habitats may overlap with poultry production areas. Some gull species act as bridging species bringing poultry production sites and waterbird habitats into contact with each other.

The risk of entry through the sale of live poultry in the travel trade or poultry exhibitions within Germany and Europe is considered as **moderate**.

The number of outbreaks in poultry and captive birds in Europe is decreasing, however, it is locally high in certain regions and poultry production sectors (e.g. France's foie gras production in waterfowl). A **low** risk of introduction through spread of the virus between holdings (secondary outbreaks) within Germany is assumed.

For waterfowl farms in Germany, the risk of undetected circulation of HPAI H5 viruses and consequently of spread between poultry flocks is also estimated to be **moderate**.



### Current recommendations

**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 surveillance or clarification examinations must be checked and consistently adhered to.** Poultry farmers are legally obliged to comply with basic biosecurity rules. The reporting of deaths in poultry to the veterinary authority with subsequent official investigation is considered a measure for early detection of the disease, which is fatal in chickens and turkeys.

Poultry or bird exhibitions or the sale of live poultry (in travel trade) should only be allowed if high biosecurity rules are observed and, if necessary, subject to a coordinated regional risk assessment. Bringing together (pedigree) poultry of different origins and keeping them for several days at the exhibition site should be absolutely avoided.

Greater attention should also be paid to compliance with biosecurity measures in the case of intra-Community movements of poultry, especially to or from EU countries where outbreaks are currently widespread. Careful cleaning and disinfection should be carried out on poultry transport vehicles returning from affected countries.

In the vicinity of HPAIV-infected wild birds (black-headed gull colonies), a risk-based restriction of free-range poultry (stabling) is recommended. The use of TSIS to view wild bird cases in the counties ([TSIS-Abfrage](#)) is possible.

In poultry farms, zoos and animal parks, especially those with open-air and free-range systems, prevention and biosecurity measures should be urgently reviewed and, if necessary, optimised. Livestock keepers 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/>), among other things. In particular, it should be possible to prove that farmers had already taken effective measures to prevent the entry and spread of HPAIV before an HPAIV case occurred.

It is hardly possible to influence the course and spread of HPAIV infections in wild bird populations. However, the collection of carcasses has proven to be useful, especially in affected breeding colonies. However, it may trigger a disturbance for sensitive bird species and lead to a spatial distribution 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. Conservationists, national park rangers, bird wardens, bird ringers, etc. should be prepared to handle sick and dead birds in cooperation with the competent veterinary authorities, and the possible collection and disposal of dead birds should be planned in advance. Communication between veterinary and environmental authorities should be strengthened. A detailed and newly published document on action advice and background information on the current situation can be found here:

[https://www.waddensea-worldheritage.org/sites/default/files/2023\\_Avian%20flu%20management%20guidelines\\_vers2.pdf](https://www.waddensea-worldheritage.org/sites/default/files/2023_Avian%20flu%20management%20guidelines_vers2.pdf).

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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 and ii) by worsening symptoms and thus possibly increasing virus shedding due to the stress associated with handling in ringed birds. Scientific bird ringing in colonies with (frequent) occurrence of deaths (with or without HPAI positive findings) should be stopped immediately. Ringers who find dead birds in previously unaffected colonies should inform the relevant authorities (nature conservation and veterinary sectors) and agree on the further course of action. Further visits to other bird populations (including captive birds) must be absolutely avoided in order to prevent the spread of the virus. After close personal contact with dead or sick birds, a doctor should be consulted immediately if one's own (even mild) symptoms of disease appear, in order to check for a possible HPAIV human infection.

Similar 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 facilities as part of rabies screening, tissue samples of the CNS should always also be tested for influenza virus RNA.

Abnormal behaviour and the occurrence of dead wild birds and mammals associated with wild bird mortalities should be reported immediately to the veterinary authorities for recovery and investigation if necessary. Correct species identification of dead birds should be made and reported, along with an indication of the total number of non-investigated dead animals.

For an overview of further options for action, a catalogue of recommendations is available [here](#).

*Data sources: TSN, ADIS, WOA*

*Query period 01.05.2023-31.05.2023.*

*Query date: 06.06.2023*

### Further references

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

The European Food Safety Authority (EFSA) offers an up-to-date edition of the scientific evaluation of the situation in Europe: [Avian influenza overview December 2022 - March 2023 | EFSA \(europa.eu\)](#).

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

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

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The European Reference Laboratory for Avian Influenza has launched a new HPAI Dashboard (<https://eurlaidata.izsvenezie.it/>) regarding the detection of HPAI in the EU.

EFSA has also set up an HPAI dashboard where the numbers in Europe can be viewed in real time. [EFSA HPAI dashboard \(aus.vet\)](#)

The WHO published a risk assessment on 21 December 2022. [Assessment of risk associated with recent influenza A\(H5N1\) clade 2.3.4.4b viruses \(who.int\)](#)

US authorities publish daily mammal cases on a website: [USDA APHIS | 2022-2023 Detections of Highly Pathogenic Avian Influenza in Mammals.](#)

For bird ringers, the British Trust of Ornithology (BTO) has published some helpful hints (in English): [https://www.bto.org/sites/default/files/bto\\_hpai\\_guidance\\_to\\_ringers\\_v04.pdf](https://www.bto.org/sites/default/files/bto_hpai_guidance_to_ringers_v04.pdf)

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