

# Rapid Risk Assessment

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



Update for the period  
1 March to 5 April 2023

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

### Situation in Germany

Between 1 March and 5 April 2023, seven HPAI outbreaks in poultry including non-commercial poultry holdings were reported in Germany (Tab. 1). The outbreaks affected three small mixed farms and two turkey fattening farms with approx. 20,000 birds each (Parchim district, Mecklenburg-Western Pomerania and Ansbach district, Bavaria) and two laying hen farms with 11,400 (Dithmarschen district, Schleswig-Holstein) and 800 hens (Cochem-Zell district, Rhineland-Palatinate; Tab. 1, Fig. 1). All outbreaks were caused by HPAIV subtype H5N1 and occurred between 1 and 19 March 2023; no further outbreaks have been reported in poultry in Germany since then.

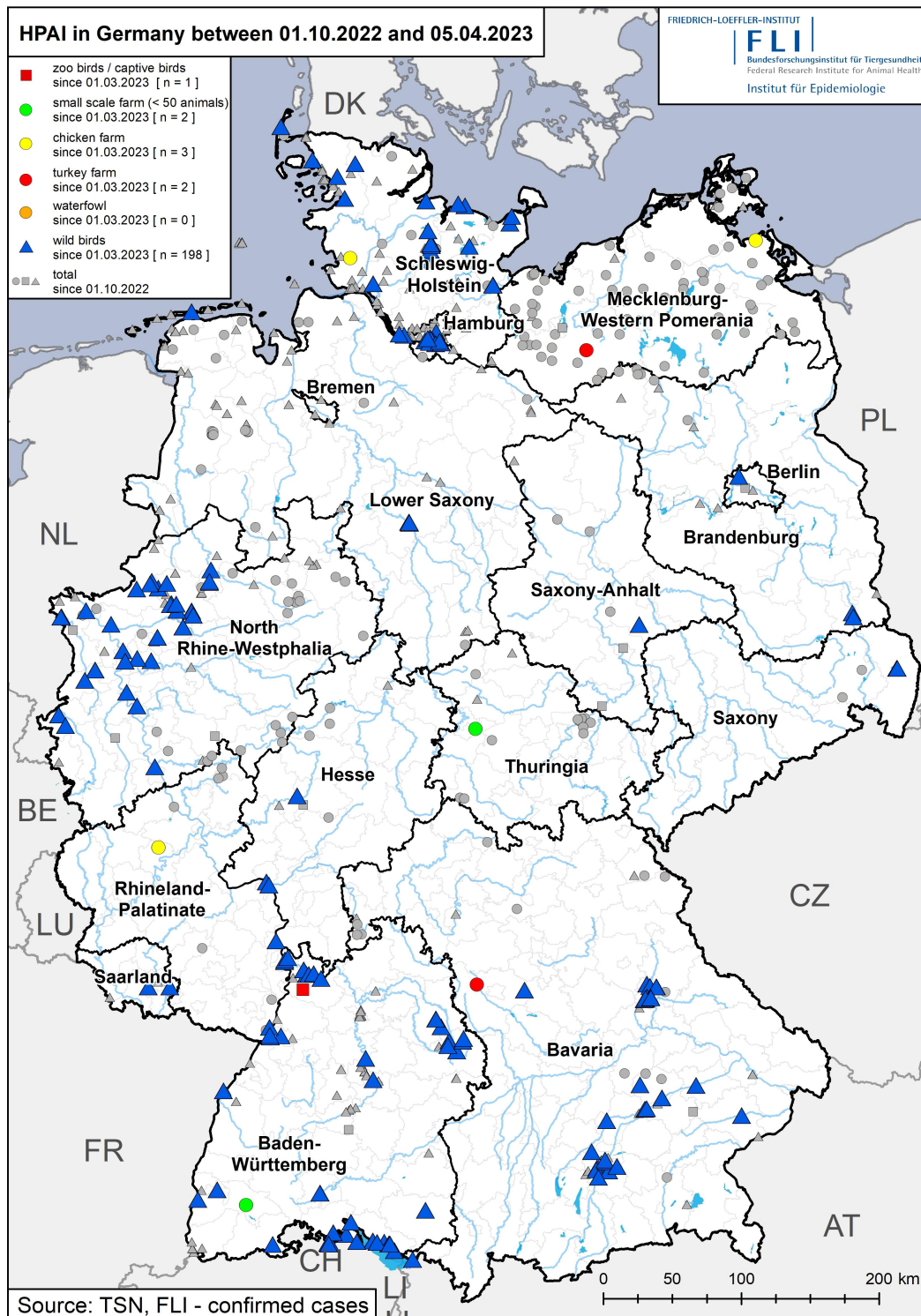
In Baden-Wuerttemberg, HPAIV H5N1 was detected on 6 Mar 2023 in two Nandus in the Walldorf Zoo, Rhein-Neckar district.

After monthly case numbers in wild birds had more than doubled recently, the numbers have now remained at approximately the same high level (n=198). Most cases continued to be reported from Baden-Wuerttemberg and Bavaria (Tab. 1, Fig. 1). Similar to the previous month, the most frequent reports concerned gulls (102; previous month: 88), followed by wild geese (53; previous month: 71), birds of prey (28; previous month: 12), swans (8; previous month: 38), and occasionally wild ducks, herons and owls. The affected gulls came mainly from inland areas (Baden-Wuerttemberg including Lake Constance, North Rhine-Westphalia) and less from the coasts. Only the HPAIV subtype H5N1 was detected.

**Table 1:** Number of reported HPAI outbreaks in poultry flocks (includes non-commercial holdings), captive birds (zoos or wildlife sanctuaries) and wild birds for the period 1 March to 5 April 2023 by federal state. The number in brackets quantifies the number of outbreaks in the previous month (February 2023). Data source: TSN, FLI.

Federal State	Poultry	Captive Birds (Zoo)	Wild Birds
Baden-Wuerttemberg	1 (0)	1 (0)	62 (90)
Bavaria	1 (6)		32 (51)
Berlin			3 (1)
Brandenburg			2 (5)
Hamburg			11 (2)
Hesse			1 (2)
Mecklenburg-Western Pomerania	2 (1)		0 (5)
Lower Saxony	0 (5)		6 (17)
North Rhine-Westphalia	0 (1)		47 (15)
Rhineland-Palatinate	1 (1)		5 (5)
Saarland			2 (1)
Saxony			2 (0)
Saxony-Anhalt			1 (0)
Schleswig-Holstein	1 (1)		24 (22)
Thuringia	1 (1)		0 (1)
<b>Total</b>	<b>7 (16)</b>	<b>1 (0)</b>	<b>198 (217)</b>

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**Figure 1:** Outbreaks of HPAIV H5N1 in Germany in poultry (dots), other kept birds (zoo/wildlife sanctuary; squares) and cases in wild birds (triangles) since 1 October 2022. In colour current outbreaks and cases since 1 March 2023. Different colours: see legend. Data status: 5 April 2023; data source: TSN, FLI.

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At the beginning of March 2023, HPAIV H5N1 infection was confirmed in a grey seal that died at the Friedrichskoog seal station (Dithmarschen district, Schleswig-Holstein). On 21 March 2023, HPAIV H5N1 was confirmed in samples from two sick red foxes in the districts of Schaumburg and Verden and from two foxes found dead in the districts of Hanover and Hamelin.

### Situation in Europe

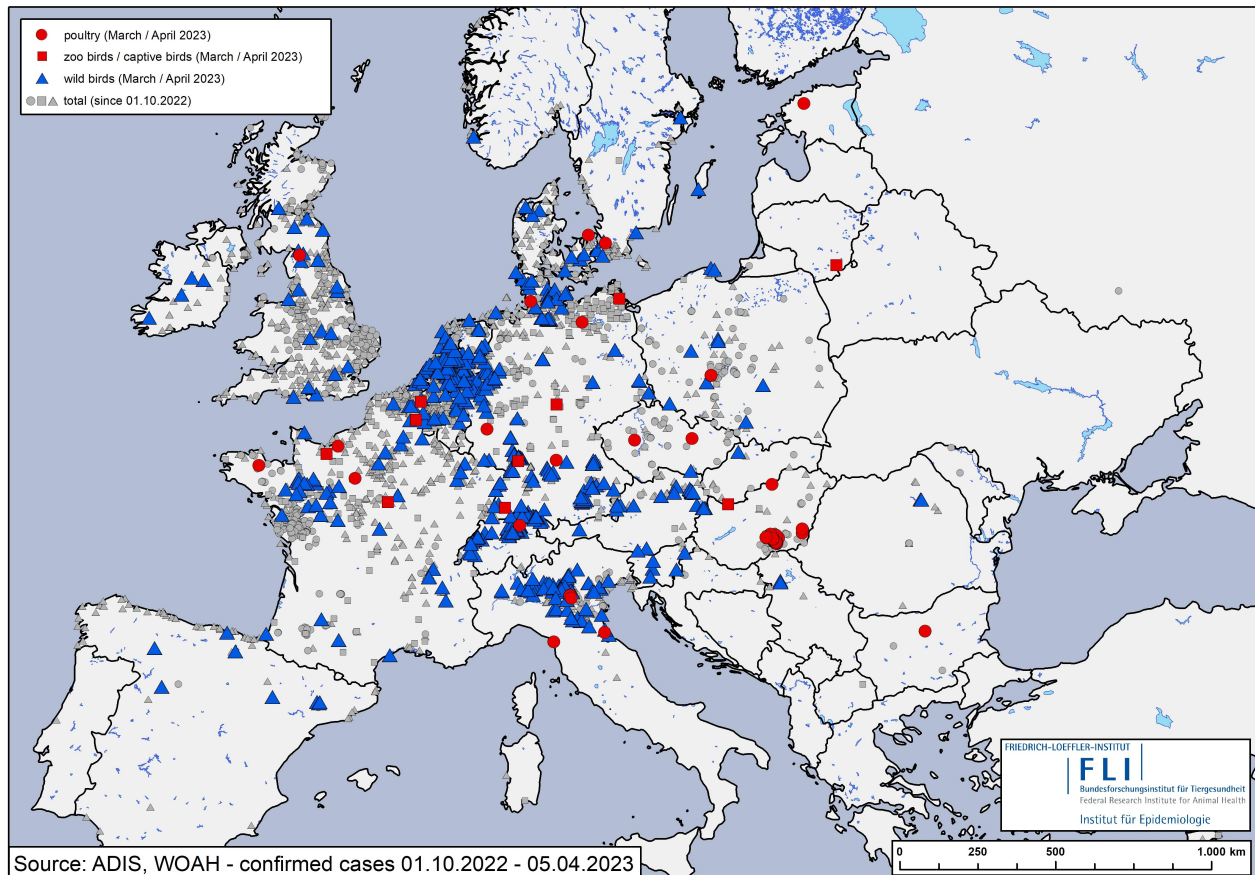
Across Europe, the number of outbreaks in **poultry** is decreasing. Between 1 March and 31 March 2023, Hungary reported the most outbreaks (24), while Italy (4), France (3), Poland (2), the Czech Republic (2) and Bulgaria, Estonia, Denmark, Sweden, the United Kingdom and Switzerland (1 each) reported individual outbreaks (Fig. 2). In Hungary, the outbreak is confined to the southern region of Bács-Kiskun, where large numbers of ducks and geese are kept for foie gras production.

In **captive birds**, a total of six outbreaks were reported in March 2023 from France (2), Belgium (2), Lithuania and Hungary (1 each).

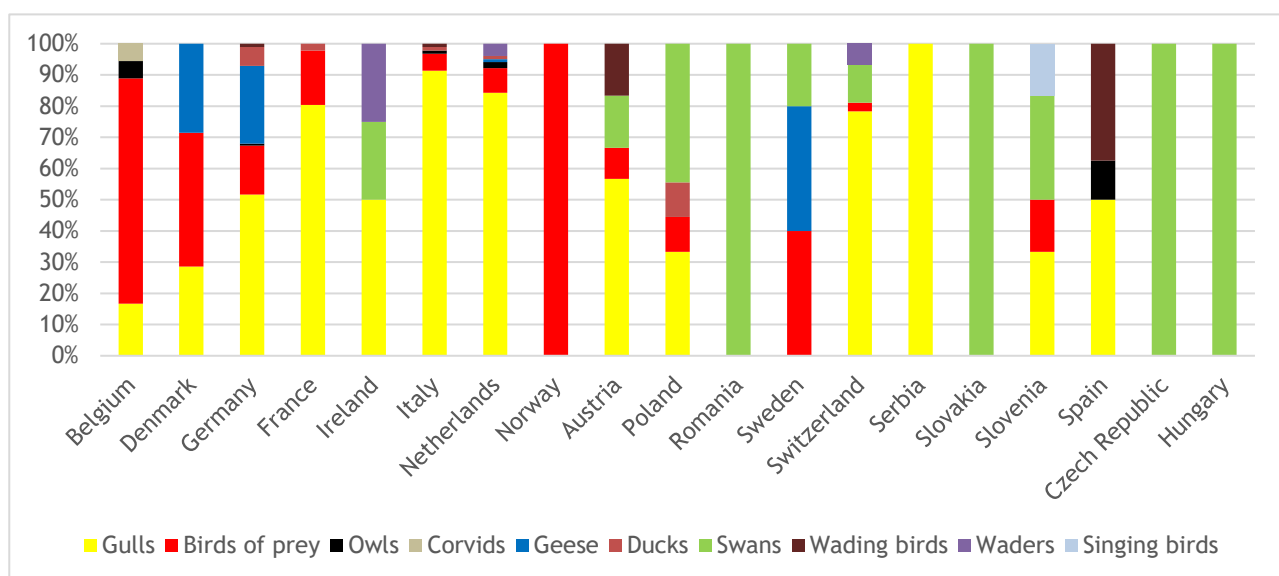
The number of cases in **wild birds** in March 2023 is over 600 for the EU (including Germany) and the UK. In addition to Germany (198), the following countries reported cases in wild birds: the Netherlands (101), Italy (94), Switzerland (74), France (46), Austria (30), the United Kingdom (22), Belgium (18) as well as Denmark, Poland, Sweden, Hungary, Norway, Slovenia, Spain, Ireland, Romania, the Czech Republic, Slovakia and Serbia under 10 each (Fig. 2). The large number of affected gulls is still striking, accounting for 50% of all positive findings, followed by birds of prey with a high number of peregrine falcons (almost half of all birds of prey), geese, swans, owls and sporadically herons, storks and waders (Fig. 3). Except for one case each in Sweden (Barnacle goose, HPAIV H5N5) and Norway (goshawk, HPAIV H5N5), all infections are due to the H5N1 subtype.

Overall, the genetic diversity of HPAIV H5N1 in wild birds is high. New genotypes of clade H5 2.3.4.4b continue to be detected. The dominant genotype among the available sequences in Europe is the reassortant AB (EU AB, Ger-10-21-N1.5), which has been circulating since 2021. The HPAI H5N1 viruses in gulls studied so far in Europe belong predominantly to the genotype "gull-like BB" of clade 2.3.4.4b HPAIV H5, which emerged (presumably in France) from a reassortment of H5N1 and a gull-adapted H13 and has been spread across Europe since June 2022. This genotype had also caused HPAIV cases in mink in Spain.

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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 5 April 2023. Current cases as of 1 March 2023 in red and blue; poultry = (domestic) poultry kept for commercial purposes; zoo birds / other birds = other captive birds. Data query done on 5 April 2023.



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



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### Situation in the world/special events

Globally, a high number of reports of HPAI H5 clade 2.3.4.4b have continued to be received since October 2022. The virus has continued to spread in wild birds and poultry in the Americas from Canada to southern Argentina and Uruguay. Especially in Argentina, there have been a large number of outbreaks in small flocks since February. In Africa, HPAIV H5N1 was detected in March 2023 in a national park (Parc national de la Langue de Barbarie, Saint Louis) in Senegal in a large number of wild birds, including gulls, cormorants and terns, some of which migrate to northern Europe to breed. The virus also circulates in Asia and leads to devastating outbreaks with severe economic and ecological consequences, as experienced in Japan. A first outbreak in a small holding has now also been reported in Bhutan.

In **terrestrial and marine mammals**, the number of reported cases is increasing in the course of the panzootic ("pandemic among animals"). In addition to the above-mentioned foxes in Germany, the following reports of mammals newly affected by HPAIV H5N1 clade 2.3.4.4b were published in March 2023:

In France, near Paris, a fox tested positive for H5N1.

In the United Kingdom, HPAIV H5N1 has been retrospectively detected in the samples of ten Wood dogs that had already died in a zoo in November 2022 during investigations to clarify the cause of death. In addition, two dead dolphins and one dead harbour porpoise (*Phocoena phocoena*) tested positive for HPAIV H5N1 on Devon, Pembrokeshire and East Yorkshire beaches in mid-March 2023.

Sweden also reported retrospectively on a young porpoise that was already neurologically conspicuous in June 2022 and tested positive for HPAIV H5N1 after its death. The route of infection is unclear, but infected wild birds were found in the vicinity at the same time.

In early April 2023, the province of Ontario in Canada reported the fatal infection of a dog that had chewed on a dead goose. The HPAI H5N1 viruses found in the dog and the goose were identical in sequence.

In the USA, a total of 4 mountain lions, 9 striped skunks and one raccoon have tested HPAIV H5 positive in the states of Montana, California, Colorado, Texas, Kansas and Wyoming since 1 March 2023.

Despite the very high number of outbreaks in poultry worldwide and presumed multiple contacts between humans and infected birds, **HPAIV H5 clade 2.3.4.4b infections in humans** remain very rare events, but are closely documented and monitored. In addition to four cases of human infection with a mild course in Europe and North America, a girl from Ecuador was diagnosed with HPAIV H5N1 clade 2.3.4.4b infection with a severe course in January. On 29 March 2023, the Chilean authorities reported a human case in a 53-year-old man from northern Chile who is severely ill.

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According to an assessment by the European Centre for Disease Prevention and Control (ECDC), the risk of zoonotic influenza virus transmission to humans with public health implications is still considered low, but a moderate risk is assumed for occupationally exposed groups having close contact with infected poultry ([Source](#)).

### Summary and risk assessment

The current global HPAI H5N1 epidemic continues to be very dynamic, although there has been no further increase in the number of cases in Europe beyond the already high level. The virus also continues to spread in the Americas from Canada to southern Chile and Argentina.

Genetic analyses of the circulating virus strain of subtype H5N1 show that the virus persisted throughout the year in domestic wild birds in Europe in 2022. The number of outbreaks in poultry decreased in the EU between December 2022 and March 2023 compared to the peak in November 2022. In wild birds, a shift of affected bird species towards gull birds is observed.

In general, fluctuations in waterbird movements are to be expected in Europe in the coming weeks due to the birds' migration home to their breeding grounds. Small- to medium-scale movements of waterbird species and gulls towards inland freshwater areas or coastal areas for breeding are taking place. Viruses can spread well in bird populations and be carried over short distances to other populations. Overall, however, dense waterbird resting populations will dissipate. Colony-breeding birds (terns, gulls, boobies, cormorants) return to their coastal breeding grounds from wintering areas in Africa and southern Europe during April. Warmer temperatures and stronger UV radiation can contribute to a reduction in infectivity in influenza viruses.

The risk of HPAI H5 viruses spreading in waterbird populations in connection with migration to breeding areas within Germany is considered **high**, especially due to the continuing high infection rates in gulls and ducks in particular. This also includes a **high** risk of infection for colony-breeding shorebirds returning from their wintering grounds.

The risk of HPAIV H5 introductions into German poultry farms and bird populations in zoological facilities through direct and indirect contacts with wild birds is considered **high**, among other things because gulls move inland away from the coasts in search of breeding sites and their habitats may overlap with poultry production areas. As bridge species, some gull species may bring poultry production sites and waterbird habitats into contact with each other.

The number of outbreaks in poultry and captive birds in Europe is decreasing. Therefore, a **low** risk of introduction through spread of the virus between holdings (secondary outbreaks) within Germany is assumed.

The risk of entry through the sale of live poultry in the travel trade or poultry exhibitions within Germany and Europe remains **high**.

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

A nationwide ban on poultry or bird shows or the sale of live poultry (in the travelling trade) should still be implemented or maintained to prevent the spread of HPAI infections, also in supra-regional traffic.

Staff caring for poultry should work exclusively on a single holding and be vaccinated against human influenza viruses.

Veterinarians and other persons visiting poultry flocks on a professional basis should stop their tour and observe a 48-hour grace period if they have entered a flock where clinical signs, including increased mortality, indicate HPAI.

Sharing of equipment, carcass bins and vehicles between multiple poultry holdings should be discontinued. The movement of vehicles and people on poultry farms should be restricted to the minimum necessary. Restocking bans after outbreaks should also be considered in regions with high poultry population density.

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, a risk-based restriction of free-range poultry (stabling) is recommended. The use of TSIS to view wild bird cases in the counties ([TSIS-query](#)) 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. The protection of colony-breeding rare bird species has a high priority. Conservationists,



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national park rangers, bird wardens, bird ringers, etc. should be prepared to deal with sick and dead birds in cooperation with the competent veterinary authorities, and the collection and disposal of dead birds should be planned in advance. Communication between veterinary and environmental authorities should be strengthened.

Conspicuous behaviour and deaths in wild birds and mammals in connection with wild bird mortalities should be reported immediately to the veterinary authorities for collection and, if necessary, investigation. Correct species identification of dead birds should be carried out and reported accordingly.

An overview of further options for action, i. e. a catalogue of recommendations is available [here](#).

*Data Sources: TSN, ADIS, WOA*

*Query period: 1 March 2023 to 5 April 2023*

*Query date: 5 April 2023*

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### 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 what is happening 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.

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](#)