FRIEDRICH-LOEFFLER-INSTITUT
FLI
Bundesforschungsinstitut für Tiergesundheit
Federal Research Institute for Animal Health

Rapid Risk Assessment

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

Update for the period
June (1—30) 2023

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

Situation in Germany

No further HPAI outbreaks in poultry or kept birds were detected in Germany between 1 and 30 June 2023.

Case numbers in wild birds remain high, with a total of 151 HPAIV H5 cases recorded in wild birds in June (193 in the previous month). Most cases were reported from Schleswig-Holstein (n=34), followed by Lower Saxony (n=26), Bavaria (n=24), Mecklenburg-Western Pomerania (n=22), and Brandenburg (n=20) (Tab. 1, Fig. 1). Similar to previous months, the reports most frequently concerned gulls (n=63) followed by terns (n=48), guillemots (n=23), and only occasionally birds of prey (n=4), owls (n=2), ducks (n=4), geese (n=5) and gannets (n=2) (Tab.1).

Reports of outbreaks and greatly increased mortalities in shorebirds and gulls in their German breeding colonies suggest local, markedly epizootic events, which are presumably interconnected by bird movements and corresponding contacts. Since not all dead birds from 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 localities of the positive finds (Tab.1) are not available in a centralised way. Only the HPAIV subtype H5N1 was detected. Reports of mass mortalities in shorebirds and seabirds include the bird cliffs on Helgoland (>600 juvenile guillemots; black-legged kittiwakes and herring gulls) and hundreds of black-headed gulls in various breeding colonies (e.g. Eider barrage, Schleswig-Holstein with over 700 dead birds).

In June 2023, a fox tested positive for HPAIV H5N1 at a zoo in Schleswig-Holstein.

***Table 1**: Number of reported HPAIV H5 wild bird cases, affected bird groups and locations for the period 01—30 June 2023 by federal state. Data source: TSN, FLI.*

Federal State (June/*May*)	District	Site	Wild birds (n° of HPAIV-reports)	Detection Period
Baden-Wuerttemberg (1/*27*)	Alb-Donau-Kreis	Südwestliche Ehingen (Donau)	Owl (1)	12/06
Bavaria (24/*59*)	München	Stadt	Geese (5), ducks (3)	15—16/06
	Neu-Ulm	Wullenstettener Natursee	Terns (1)	29/06
		Senden		
	Neuburg-Schr.hausen	Kochheimer See Karlshuld	Terns (5)	23/06
	Rosenheim	Inn-Ufer Griesstätt	Terns (7)	28/06
		Chiemsee bei Prien	Gulls (1)	06/06
	Unterallgäu	Hasberger Weiher, Pfaffenhauser Moow	Terns (2)	23—26/06
Brandenburg (20/*1*)	Potsdam-Mittelmark	Havelsee	Gulls (8), Terns (2), birds of prey (1)	06/06—23/06
	Dahme-Spreewald	Bhylener See	Terns (1)	23/06
	Havelland	Gülper See	Gulls (4), Terns (4)	06/06
Mecklenburg-Western Pomerania (22/*15*)	Vorpommern-Greifswald	Insel Böhmke / Usedom	Gulls (2)	07/06
		Altwarp	Gulls (1)	28/06
		Dargen, Penkun	Gulls (4)	07/06
	Vorpommern-Rügen	Richtenberger See	Gulls (6)	21/06
		Strand Thiessow, Rügen	Gulls (1), Ducks (1)	16/06
	Nordwest-mecklenburg	Teichgut Wismar-Kluss	Gulls (6)	01/06
		Strand Boltenhagen	Gulls (1)	29/06
Lower Saxony (26/2)	Aurich	Baltrum	Guillemots (2)	09/06
		Juist	Guillemots (1)	09/06
		Norderney	Guillemots (1)	16/06
	Leer	Borkum	Gannets (1)	09/06
	Wittmund	Langeoog	Guillemots (4)	06 & 15/06
	Friesland	Wangerooge	Guillemots (9)	09 & 23/06
	Wilhelmshaven	Banter See	Terns (8)	27—28/06
North Rhine-Westphalia (11/*25*)	Wesel	Auesee Wesel	Gulls (2), Terns (1)	29/06
	Viersen	Viersen Stadt	Birds of prey (2)	06/06
	Herford	Enger Stadt	Gulls (1)	30/06
	Münster	Rieselfelder Münster	Gulls (1)	26/06
	Minden-Lübbecke	Weseraue Petershagen	Gulls (3), Terns (1)	09/06
Rhineland-Palatinate (1/*0*)	Altenkirchen (Westw)	Elkenroth	Gulls (1)	02/06
Saxony (10/*32*)	Bautzen	Talsperre Bautzen	Terns (9)	23/06
	Leipzig	Thallwitz	Owl (1)	02/06
Saxony-Anhalt (2/*10*)	Stendal	Havel, Havelberg	Terns (1)	29/06
	Harz	Falkenstein	Birds of prey (1)	02/06
Schleswig-Holstein (34/*6*)	Dithmarschen	Neufeld	Gulls (3), Terns (1)	06/06
		Neufelder Koog	Terns (4)	08—23/06
		Nordermeldorf	Gulls (3)	06 & 23/06
		Eider Sperrwerk	Gulls (3)	23/06
	Nordfriesland	Fr.-Wilhelm-Lübke-Koog	Gulls (2)	30/06
		Hallig Hooge	Terns (1)	16/06
		Langeneß	Gulls (1)	06/06
	Pinneberg	Helgoland	Guillemots (6), gannets (1), gulls (9)	07—30/06

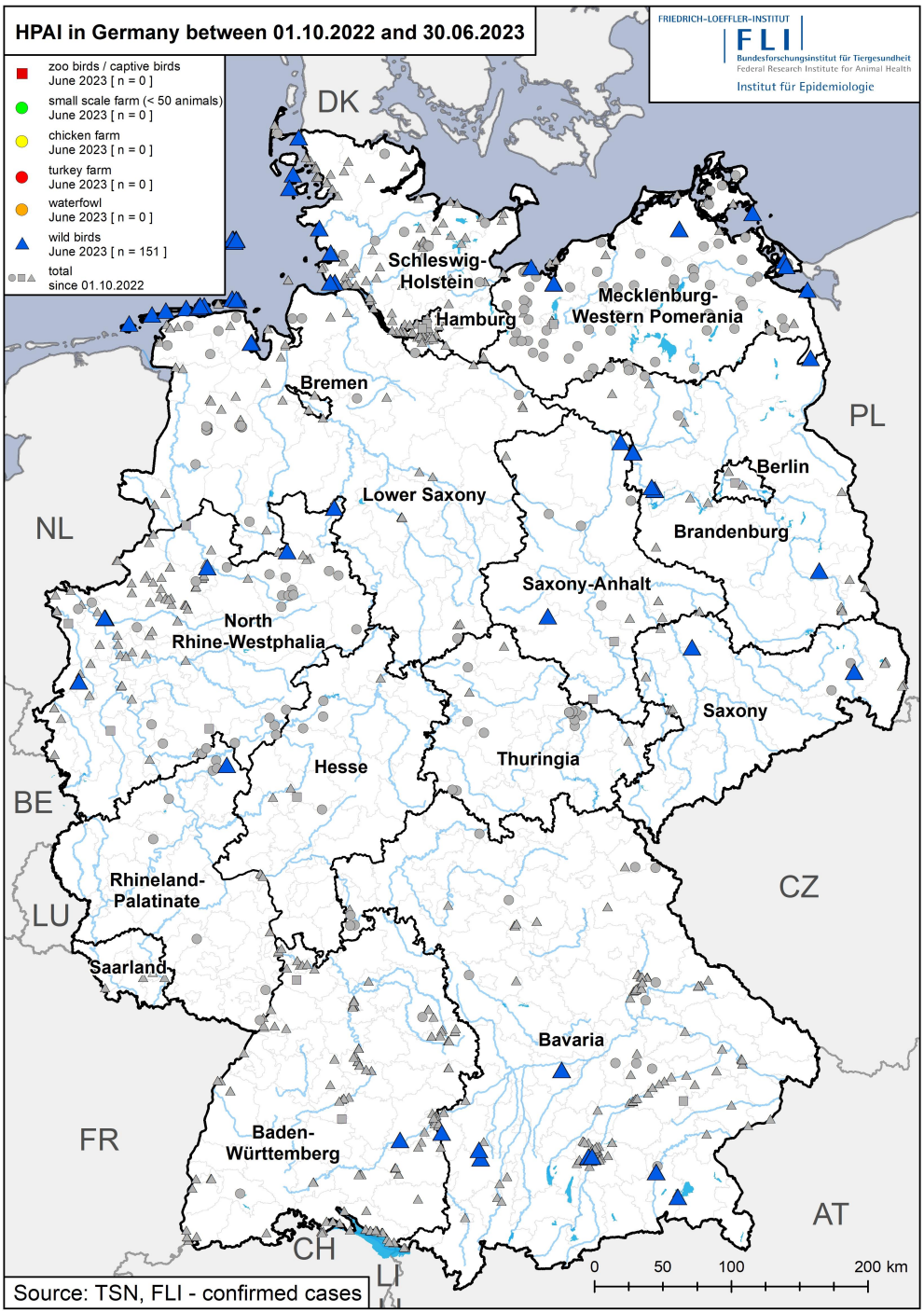

***Figure 1**: Outbreaks of HPAIV H5N1 in Germany in poultry (dots), other captive birds (zoo/wildlife sanctuary; squares), cases in wild birds (triangles) since 1 October 2022. In colour: current outbreaks and cases since June 2023. Different colours: see legend. Data status: 10 July 2023; data source: TSN, FLI.*

Situation in Europe

Across Europe, the number of **outbreaks in poultry** fell sharply in June. Between 1 and 30 June 2023, only France reported three outbreaks and the United Kingdom and Sweden reported one outbreak each (Fig. 2).

In **captive birds**, two outbreaks each were reported in France and the United Kingdom in June, and one outbreak was reported in Poland.

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 80% of all HPAIV H5N1-positive wild bird samples from 20 European countries come from gulls (Fig. 3), of which the majority are black-headed gulls, approx. 14% from terns (river and Sandwich tern colonies in the Netherlands, Belgium and the United Kingdom in particular are affected with high mortality), while detections in raptors, 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 can be investigated. All infections detected 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 a mink farm in Spain in autumn 2022 and currently dominates events in Germany and Europe.

In June 2023, Poland reported an unusual occurrence of dozens of deaths in domestic cats. Of these, 24 of the 45 samples investigated, tested positive for HPAIV H5N1 by 06/07/2023. The cats suffered from neurological and respiratory symptoms. The sequences generated so far from these cases could be assigned to a genotype that is clearly different from the currently dominant "gull-like BB".

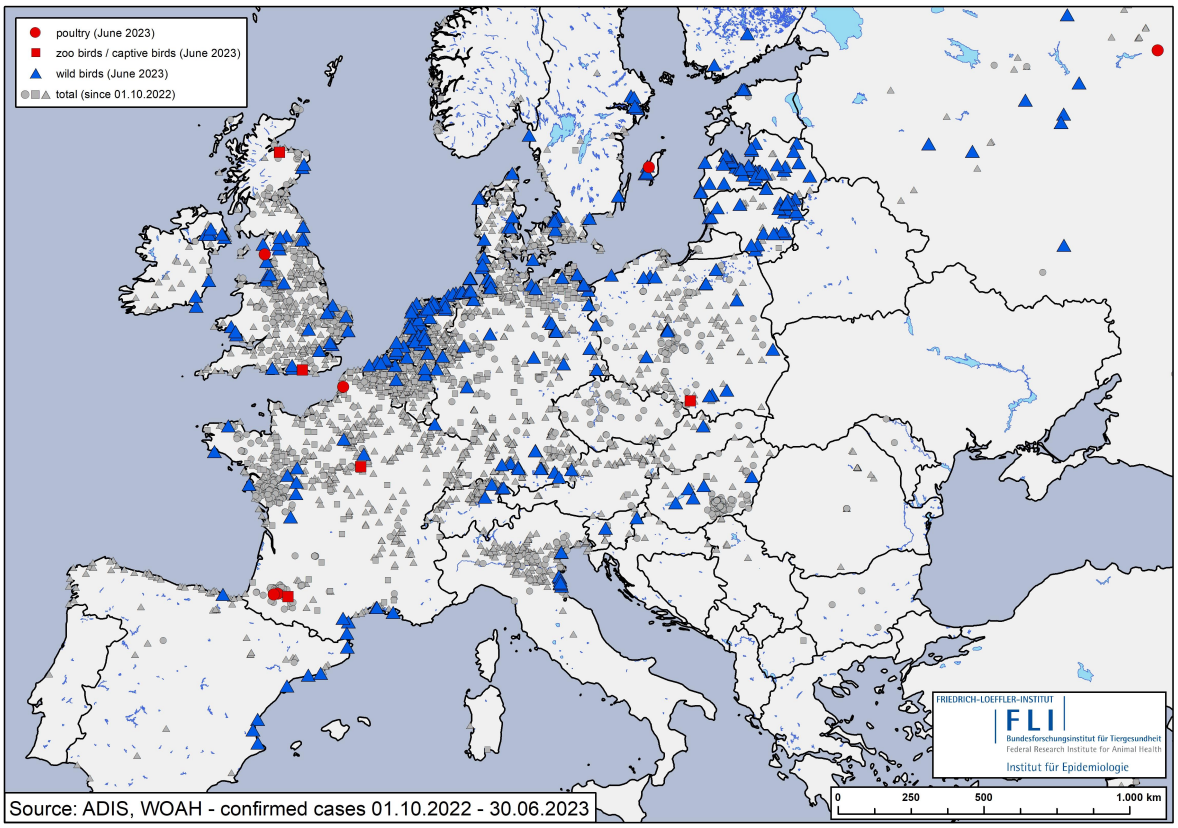

***Figure 2**: HPAI cases in poultry, captive birds and wild birds reported in ADIS and to WOAH from 1 October 2022 to 30 June 2023. Current cases as of June 2023 in red and blue; poultry = (domestic) poultry kept for commercial purposes; zoo birds/other birds = other captive birds. Data query done on 10 July 2023.*

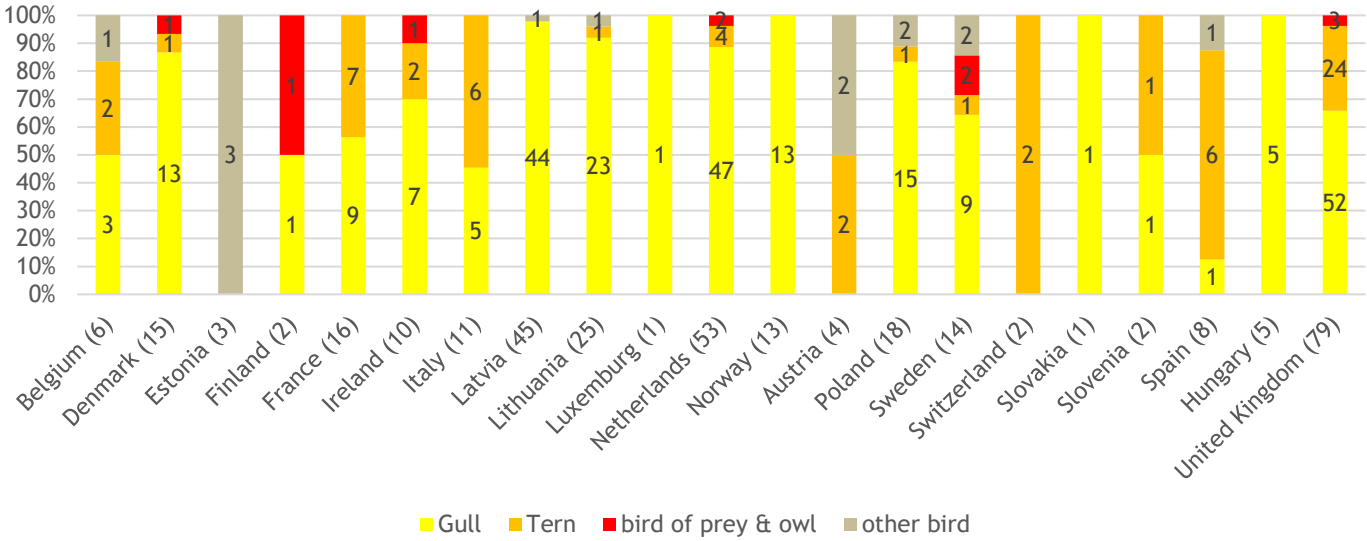

***Figure 3**: Percentage shares of affected bird groups in the positively tested investigation material per country for June 2023. Source: ADIS, TSN.*

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

Situation in the world/special events

Worldwide, reports of outbreaks caused by 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) and the Americas. After Brazil reported cases of HPAIV H5 in seabirds on the Brazilian coast for the first time at the beginning of May, more than 500 wild birds have now tested positive for HPAIV H5 there, mainly gulls and shorebirds. This was followed in June by a report of the first outbreak in small-scale poultry in Brazil.

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 monitored and documented. Since 2020, fewer than 10 human infections with mild or asymptomatic courses have occurred in Europe and North America, but two severe courses have been reported in two individuals from Ecuador and Chile after infection with clade 2.3.4.4b-HPAIV H5.

There were no further reports of human infections with HPAIV H5 in June.

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 to be low. However, a moderate risk is assumed for occupationally exposed groups, who have close contact with infected poultry (Source).

Summary and risk assessment

The current global HPAI H5N1 epidemic is highly dynamic despite the warm season and affects mainly seagulls and terns in their breeding colonies across Europe. The virus has continued to spread over the last few months, although a decrease in outbreaks in poultry has been noted. A particular event is the clustered deaths of cats in Poland, which (24 out of 45) are attributed to HPAIV H5N1.

Genetic analyses of the circulating virus strain of subtype H5N1 show that the virus has persisted year-round in domestic wild birds in Europe since 2022. The number of outbreaks in poultry has decreased sharply in the EU between December 2022 and June 2023 compared to the peak in November 2022. In wild birds, there is currently an increased reporting of cases again, especially in gulls and seabirds breeding in colonies. Black-headed gulls, guillemots, and (sandwich) terns are currently particularly affected across Europe with high mortality observed in breeding colonies. With the end of the breeding season, a decline in case numbers and mortalities is expected.

In the course of the upcoming moulting season in summer, waterfowl can again be expected to congregate at suitable water sites. Small- to medium-scale movements of waterbird species and gulls towards freshwater areas inland or to coastal areas continue and promote the spread of

viruses over short distances to other populations. In July, the departure of breeding species in Germany and the passage of northern wading bird and gull species begins, resulting in increased movement dynamics.

The risk of HPAI H5 spreading to breeding colonies of shorebirds and gulls in Germany is considered ***moderate***, especially as population densities in breeding colonies are declining.

The risk of HPAIV H5 introduction into German poultry production sites and bird populations in zoological facilities through direct and indirect contacts with wild birds is considered ***moderate***. Some gull species act as bridging species bringing poultry production sites and waterbird habitats into contact with each other. Based on observations to date and the clustering of HPAIV H5N1 detections in selected species, mainly black-headed gulls and other gull species, a limited risk is considered to exist.

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. 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.

Surveillance of wild mammals for HPAIV H5 infection (see below), but also of captive mammals (fur animals) should be strengthened following the accumulation of HPAIV findings in cats in Poland. Similarly, dogs, cats, and pigs kept on farms with poultry with HPAI outbreaks should be included in the environmental testing (swab and serum samples).

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.

Ringing 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 and lungs 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 is required and, in addition to the total number of non-investigated dead birds, 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 is available here.

Data sources: TSN, ADIS, WOAH
Query period 01/06/2023-30/06/2023
Query date: 10/07/2023

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 April – June 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.

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

Friedrich-Loeffler-Institut, Bundesforschungsinstitut für Tiergesundheit
Hauptsitz: Insel Riems, Südufer 10, D-17493 Greifswald-Insel Riems, www.fli.de
Photo/Source: private