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Avian influenza overview August – December 2020

European Food Safety Authority,
European Centre for Disease Prevention and Control and
European Union Reference Laboratory for Avian Influenza

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Abstract

Between 15 August and 7 December 2020, 561 highly pathogenic avian influenza (HPAI) virus detections were reported in 15 EU/EEA countries and UK in wild birds, poultry and captive birds, with Germany (n=370), Denmark (n=65), the Netherlands (n=57) being the most affected countries. The majority of the detections have been reported in wild birds (n=510), primarily in barnacle goose, greylag goose, and Eurasian wigeon. Raptors have also been detected infected, particularly common buzzard. The majority of the birds had been found dead or moribund, however, there are also reports of HPAI virus infection in apparently healthy ducks or geese. A total of 43 HPAI outbreaks were notified in poultry; with signs of avian influenza infection being observed in at least 33 outbreaks; the most likely source of infection was indirect contact with wild birds. Three HPAI virus subtypes, A(H5N8) (n=518), A(H5N5) (n=17) and A(H5N1) (n=6), and four different genotypes were identified, suggesting the occurrence of multiple virus introductions into Europe. The reassortant A(H5N1) virus identified in EU/EEA countries has acquired gene segments from low pathogenic viruses and is not related to A(H5N1) viruses of e.g. clade 2.3.2.1c causing human infections outside of Europe. As the autumn migration of wild waterbirds to their wintering areas in Europe continues, and given the expected local movements of these birds, there is still a high risk of introduction and further spread of HPAI A(H5) viruses within Europe. The risk of virus spread from wild birds to poultry is high and Member States should enforce in 'high risk areas' of their territories the measures provided for in Commission Implementing Decision (EU) 2018/1136. Detection of outbreaks in breeder farms in Denmark, the Netherlands and United Kingdom, highlight also the risk of introduction via contaminated materials (bedding/straw) and equipment. Maintaining high and sustainable surveillance and biosecurity particularly in high-risk areas is of utmost importance. Two human cases due to zoonotic A(H5N1) and A(H9N2) avian influenza virus infection were reported during the reporting period. The risk for the general population as well as travel-related imported human cases are assessed as very low.

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Keywords: avian influenza, HPAI/LPAI, monitoring, poultry, captive birds, wild birds, humans

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1. Introduction

This scientific report provides an overview of highly pathogenic avian influenza (HPAI) virus detections in poultry, captive and wild birds and noteworthy outbreaks of low pathogenic avian influenza (LPAI) virus in poultry and captive birds, as well as human cases due to avian influenza virus, reported in and outside Europe between 16 August and 7 December 2020, 18 pm. The background, terms of reference and their interpretation are described in Appendix A and the data and methodologies are reported in Appendix B.

2. Conclusions

Avian influenza outbreaks in European countries and in other countries of interest between 16 August and 7 December 2020, 10 am

2.1. Main observations

- One human infection due to A(H5N1) HPAI and A(H9N2) LPAI virus have been reported from Laos and China, respectively, during the period of the report.
- In Europe, between 16 August and 7 December 2020 18 pm (based on the Animal Disease Notification System (ADNS) and information provided by affected countries):
 - 561 HPAI A(H5) outbreaks were reported in poultry, other captive birds and wild birds: 510 detections in wild birds, predominantly in Germany (n=358), Denmark (n=64), and The Netherlands (n=44); 43 outbreaks in poultry, predominantly in Germany (n=12), France (n=8), the Netherlands (n=6), and the UK (n=7); and eight outbreaks in other captive birds, in the Netherlands (n=7) and the UK (n=1);
 - three LPAI outbreaks were reported by Germany, A(H5N8) in a zoo (not related to HPAI virus currently detected in Europe), Italy, A(H5N2) in poultry, and the UK, A(H5N2) in poultry.
- The HA gene of the currently circulating HPAI viruses of the A(H5N8), A(H5N1) and A(H5N5) subtypes form a single genetic group within clade 2.3.4.4b, and cluster with HPAI A(H5Nx) viruses that have been detected in Iraq, Russia and Kazakhstan since May 2020. Four different genotypes, generated through multiple reassortment events with LPAI viruses circulating in wild birds in Eurasia, were identified in Europe. This high genetic variability suggests multiple virus introductions into Europe.
- In comparison to the previous reporting period (EFSA et al., 2020a), an increasing number of outbreaks of HPAI A(H5N1), HPAI A(H5N5), HPAI A(H5N6) and particular HPAI A(H5N8) in poultry and wild birds were notified from a variety of Asian countries (China, Iran, Israel, Japan, Kazakhstan, Laos, Republic of Korea, Taiwan, Vietnam) and Russia. In contrast to the previous reporting period, no HPAI cases were reported from the African continent.
- Genetic analysis of HPAI A(H5N8) viruses identified in October-November in South Korea (wild mandarin ducks) and Japan (environmental sample) revealed that the viruses belong to clade 2.3.4.4b and all gene segments clustered together with the HPAI A(H5N8) viruses detected in west-central Europe in the first half of 2020 (Jeong et al., 2020), suggesting a persistent circulation of this virus strain, likely in wild birds in Asia.

2.2. Conclusions

- The risk of zoonotic transmission of avian influenza viruses to the general population in Europe remains very low. The evolution of the viruses and recent reassortment events need to be closely monitored in order to assess the ongoing risk of emerging reassorted viruses being transmitted to humans.
- Given the low zoonotic potential of these viruses, based on the genetic analysis and the strict control measures implemented in poultry holdings related to HPAI viruses (Council Directive

2005/94/EC¹), the risk of transmission to humans by eventually contaminated poultry products is considered negligible as also outlined in a previous EFSA assessment (EFSA AHAW Panel, 2017).

- As the southward and westward movements of some waterbird species towards their wintering area continues as part of the autumn migration, there is a high risk of further introduction of HPAI A(H5) viruses to European countries. The long-distance virus carriers are not known, but possible candidates include barnacle geese for the high frequency of infection and far eastern breeding range and Eurasian wigeons, given his breeding range, and high number of detections of the current HPAI viruses in many dead and apparently clinically healthy individuals (based on the reported data).
- The risk of further spread to unaffected areas via wild bird migrations (and by local movements of residential birds) is high and ongoing. Autumn migration from breeding and staging sites to wintering sites is ongoing and may depend on the weather conditions. The low temperatures of winter may increase the wild bird movements and facilitate the environmental survival of avian influenza viruses. Aggregation during autumn and winter migrations, as well as the mixing of wild birds from different geographic origins during migration, will increase the risk of the infection spreading and virus genetic reassortment of the virus. Residential infected wild birds (e.g. scavengers) are a sign of an already contaminated environment and may contribute to disease spread within their range.
- Once introduced into a European country, there is a high risk that HPAI A(H5) viruses can further spread in different directions due to shorter-distance movements of infected birds. Multiple species may be involved in this.
- The dynamic of the spread of influenza viruses in wild birds is extremely complex and may vary from country to country according to the arrival time of migrating birds, the composition and susceptibility of the species, and the immunity already acquired by migratory and resident wild birds by the time the HPAI virus is introduced by infected migratory birds.
- Given the high prevalence of infection in apparently healthy ducks and geese (based on limited active surveillance in Germany, Italy, and the Netherlands), HPAI virus may be present in wild bird populations despite the absence of wild bird mortality.
- Besides waterbirds, raptors and other carrion-eating birds are at risk of infection from preying sick birds or feeding on contaminated bird carcasses. These species, in particular peregrine falcons and Eurasian buzzards, may be sensitive sentinels for the presence of HPAI A(H5) virus in the environment even when the observed waterbird mortality is low.
- The risk of virus spread from wild birds to poultry is high; Member States should carefully evaluate, also by means of the assessment on avian influenza risk carried out at a national level, the option to enforce the measures provided for in Commission Implementing Decision (EU) 2018/1136² in 'high risk areas' within their territory.

3. Options for response

- Continued surveillance of avian influenza virus in wild birds and poultry in Europe, combined with timely generation and sharing of complete viral genome sequences, are crucial. This will enable the virus evolution to be followed and the prompt detection of the occurrence of new virus introductions, the emergence of novel reassortant viruses, or of genetic mutations, resulting in changes in viral properties that are relevant for animal and public health.
- Given that there have also been avian influenza introductions in breeder farms, which are considered to have high levels of biosecurity within the poultry value chain, it is of the utmost

¹ Council Directive 2005/94/EC of 20 December 2005 on Community measures for the control of avian influenza and repealing Directive 92/40/EEC.

² Commission Implementing Decision (EU) 2018/1136 of 10 August 2018 on risk mitigation and reinforced biosecurity measures and early detection systems in relation to the risks posed by wild birds for the transmission of highly pathogenic avian influenza viruses to poultry (notified under document C(2018) 5243). OJ L 205, 14.8.2018, p. 48–53.

importance to reinforce and maintain high and sustainable biosecurity and surveillance standards along the chain, with a focus on both commercial and rural poultry in high-risk areas. Poultry producers should review their biosecurity programmes taking full account of the risk of avian influenza introduction due to direct and indirect contact (contaminated material and equipment) with wild birds.

- To improve early detection of infections in poultry, enhanced awareness among farmers to monitor and report increases in daily mortality and drops in production parameters (EFSA et al., 2017b) such as egg production and food and water intake are recommended.
- People should avoid touching sick or dead birds or bird droppings unprotected. Wearing personal protection equipment when directly exposed to birds, their products or droppings, which may potentially be infected or contaminated with avian influenza viruses, will minimise any residual risk. National guidelines might detail the required level of protection and equipment.
- Characterised viruses have not so far shown markers for human adaptation and are assessed as having low risk for human transmission. However, the high genetic variability of the viruses identified and the multiple reassortment processes with local LPAI viruses, underlines the possibility of the emergence of viruses that might have increased potential to infect humans. Following the precautionary principle, people such as hunters, bird ringers, ornithologists or others handling wild birds or involved in processes like defeathering and preparing hunted wild birds should consider wearing personal protective equipment.
- People exposed unprotected to infected birds, e.g. during culling operations, should be actively monitored or at least self-monitor for respiratory symptoms or conjunctivitis for 10 days following exposure and immediately inform local health authorities to initiate testing and follow-up. Antiviral pre- or post-exposure prophylaxis should be considered for exposed people according to national recommendations.
- In local areas where avian influenza viruses have been widely detected in wild birds, human access should be regulated or restricted to avoid human exposure and further dispersal of the virus.
- The detection of HPAI A(H5) viruses in hunted wild waterfowl raises concern on the risk of avian influenza spreading to poultry associated with hunting activities and particularly with the use of live decoys. The prohibition of the use of decoy birds of the orders *Anseriformes* and *Charadriiformes* or the implementation of appropriate risk modulating measures related to their use should be thoroughly considered according to the level of risk of HPAI virus circulation in wild water birds.
- The removal of contaminated bird carcasses should be considered from those locations where high densities of wild birds congregate to feed or rest, or where there is a high risk of scavenging by raptors or other carrion-eating birds, in order to avoid extra risk of infection of wild birds. It is highly recommended to carry on this operation by implementing all the available measures to avoid further dispersal of the virus in the environment.
- It is highly recommended to strengthen avian influenza surveillance in wild birds to early detect HPAI A(H5) virus incursions in still non-affected areas and to monitor the evolution of avian influenza virus circulation in both migratory and non-migratory birds.
- To increase the sensitivity of the avian influenza detection system in wild birds, in the absence of mortality in wild birds, active surveillance should also be implemented as a valid tool for an effective early warning system. In addition to testing captured and hunted wild birds in strategically relevant wetlands, faecal droppings and plumage swabs might be collected in target areas. In particular, targeted observations and testing waterfowl (e.g. geese, wigeons, mallards) should be carried out in bird sanctuaries and rehabilitation/rescue centres to evaluate the local risk.
- Re-evaluation of risk assessments performed by Member States should take the local situation into account, particularly the presence and abundance of HPAI virus in wild birds in the area and other risk factors, such as the proximity to wetland sites of wintering birds, for the

introduction of HPAI viruses into establishments listed in the Commission Implementing Decision (EU) 2018/1136.

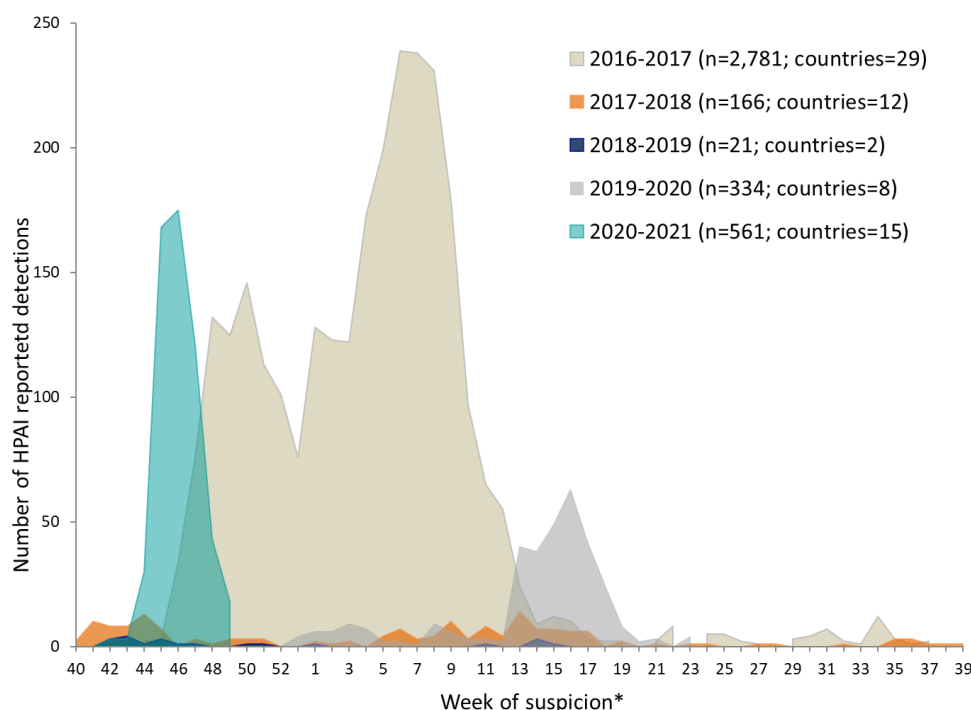
- (EFSA et al., 2017b)(EFSA et al., 2017b)(EFSA et al., 2017b)(EFSA et al., 2017b)Close cross-sectorial cooperation and communication between animal, public and occupational health authorities is recommended (One Health approach) to initiate rapid response, follow-up and control measures.

4. Results

4.1. Overview of HPAI outbreaks in Europe during the previous and current seasons

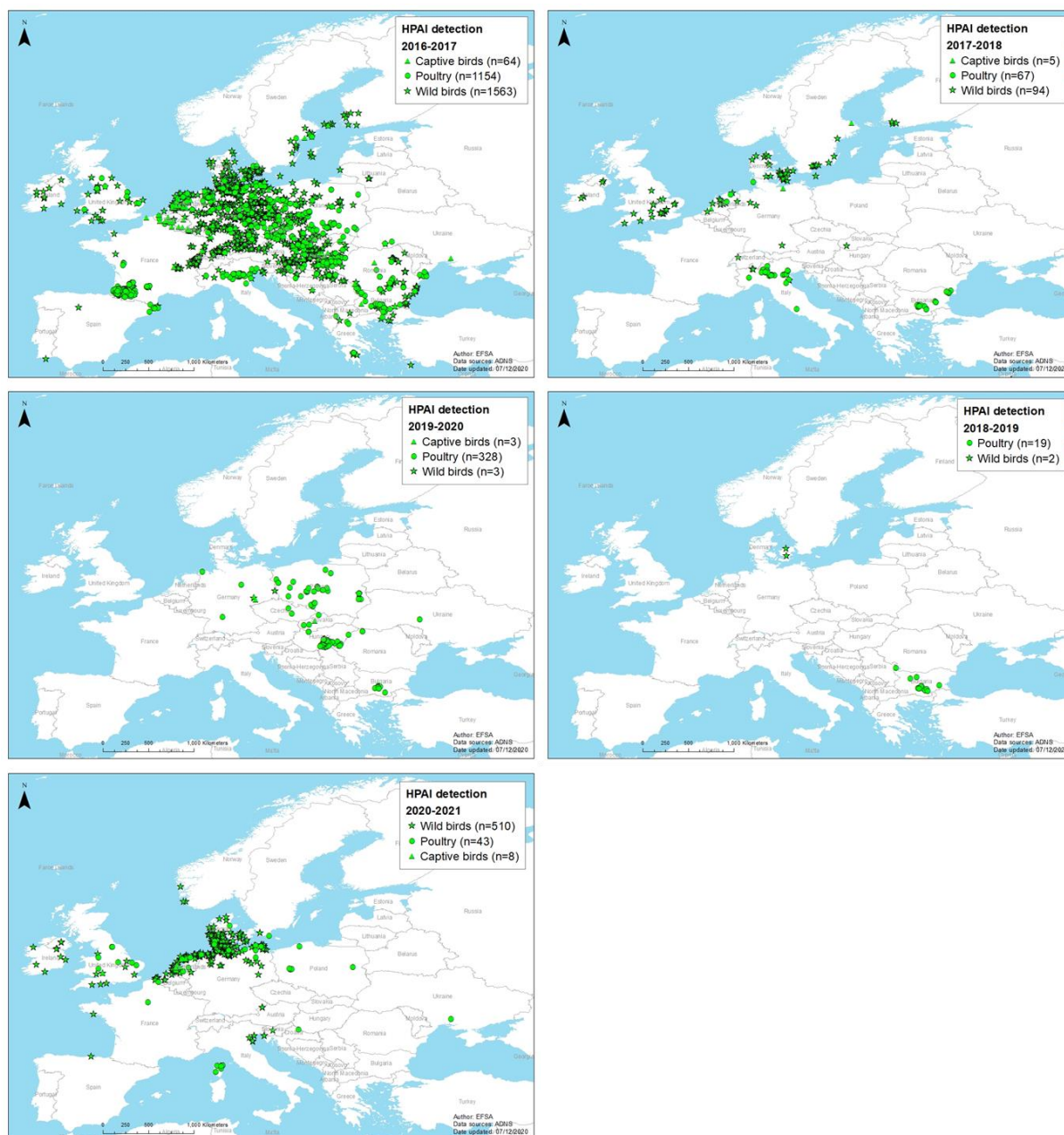
Figures 1 and 2 show the HPAI outbreaks detected in birds (poultry, wild and captive birds) in Europe and reported via ADNS for seasons 2016–2017, 2017–2018, 2018–2019, 2019–2020 and 2020–2021 by week of suspicion and geographical distribution, respectively. A season is the period that starts in week 40 (the beginning of October) and ends in week 39 (the end of September) of the following year. For the current season, 2020–2021, data reported are truncated at the beginning of week 50 (on 7 December 2020), as the season is still ongoing. A comparison among the geographical distribution of HPAI detections in the current 2020–2021 epidemic season and those recorded in 2016–2017 which was the largest recorded in the EU/EEA in terms of number of poultry outbreaks, geographical spread and number of dead wild birds, is shown in Figure 3 for the months of October and November. Figure 4 shows the further geographical evolution of the 2016–2017 epidemic from December 2016 to June 2017.

The analysis of the characteristics of the previous 2019–2020 and current 2020–2021 avian influenza seasons, from 7 October 2019 to 7 December 2020, are reported in Figure 4 and 5 by week of suspicion, virus subtype, affected host population and surveillance stream leading to the outbreak detection.



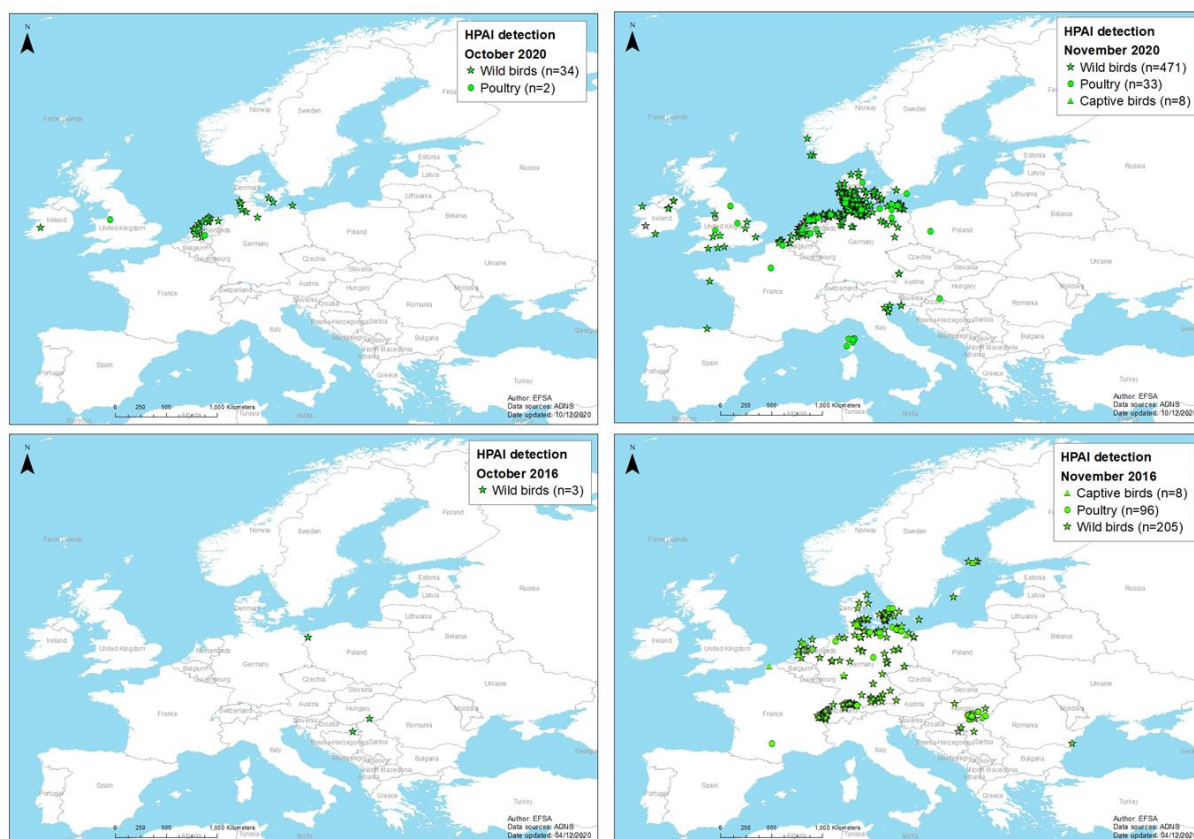
* When the date of suspicion is not available then the date of confirmation is used to assign the week of suspicion.
Data source: ADNS (7.12.2020), EFSA.

Figure 1: Distribution of total number of HPAI virus detections reported in Europe in the seasons 2016–2017 (green), 2017–2018 (orange), 2018–2019 (blue), 2019–2020 (grey), and 2020–2021 (turquoise) by week of suspicion, 28 September 2016 – 7 December 2020 (n=3,863)



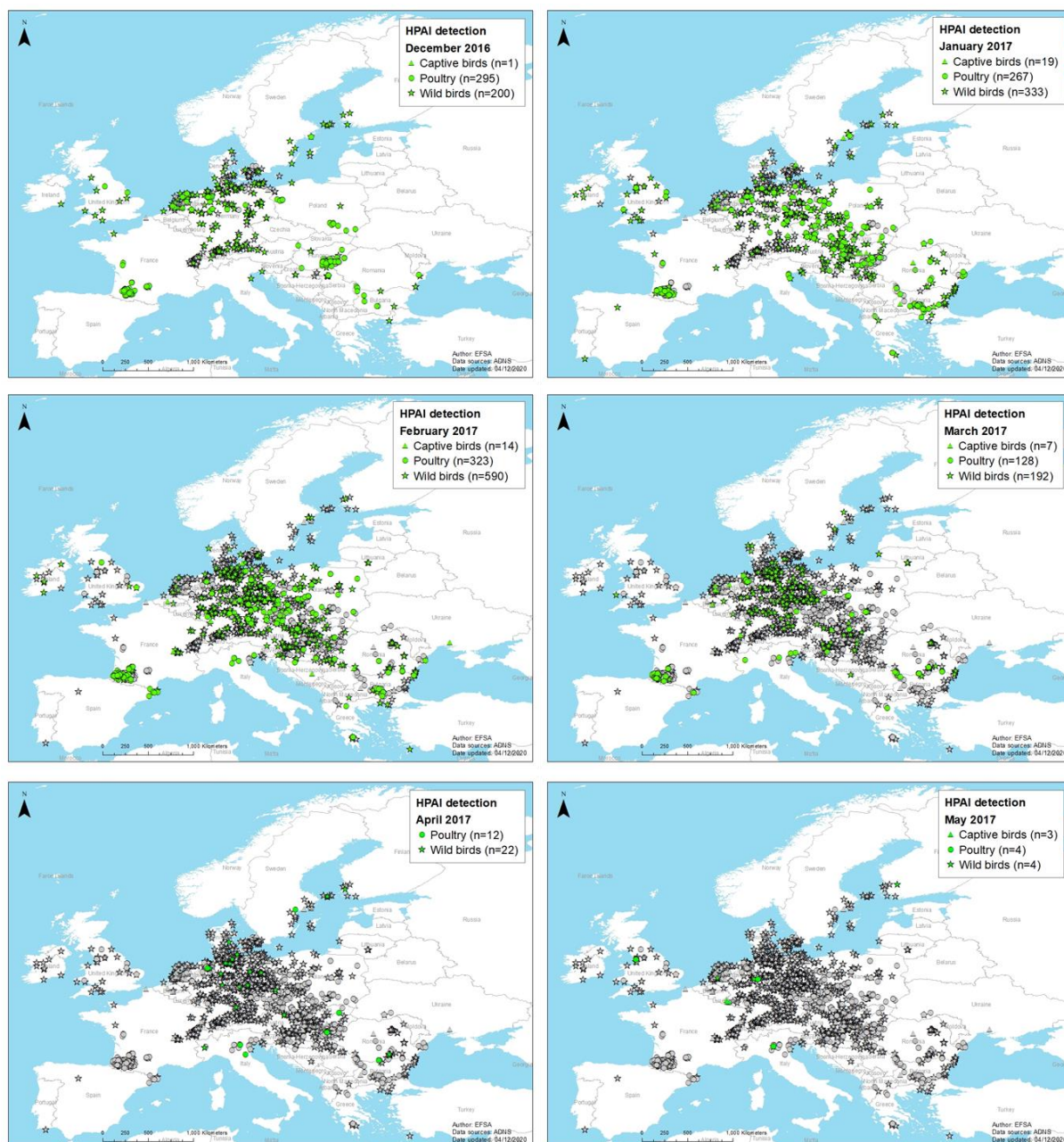
* This designation is without prejudice to positions on status and is in line with United Nations Security Council Resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

Figure 2: Geographical distribution, based on available geocoordinates, of HPAI detections in Europe in seasons 2016-2017 (n=2,781), 2017-2018 (n=166), 2018-2019 (n=21), 2019-2020 (n=334) and 2020-2021 (n=561) in poultry (circles), wild birds (stars) and captive birds (triangles) (1 October 2016 – 7 December 2020)



* This designation is without prejudice to positions on status and is in line with United Nations Security Council Resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

Figure 3: Geographical distribution, based on available geocoordinates, of HPAI detections in Europe in October 2020 (n=36), November 2020 (n=512), October 2016 (n=3), November 2016 (n=309); grey symbols indicate detections reported in the previous month (e.g. grey symbols in the November 2020 map indicated HPAI detections that occurred in October 2020)



* This designation is without prejudice to positions on status and is in line with United Nations Security Council Resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

Figure 4: Geographical distribution, based on available geocoordinates, of HPAI detections in Europe for season 2016-2017 in December 2016 (n=496), January 2017 (n=619), February 2017 (n=927), March 2017 (n=327), April (n=34) and May (n=11), in poultry (circles), wild birds (triangles) and captive birds (stars); grey symbols indicate detections reported in previous months (e.g. grey symbols in the December 2016 map indicated HPAI detections that occurred in October and November 2016)

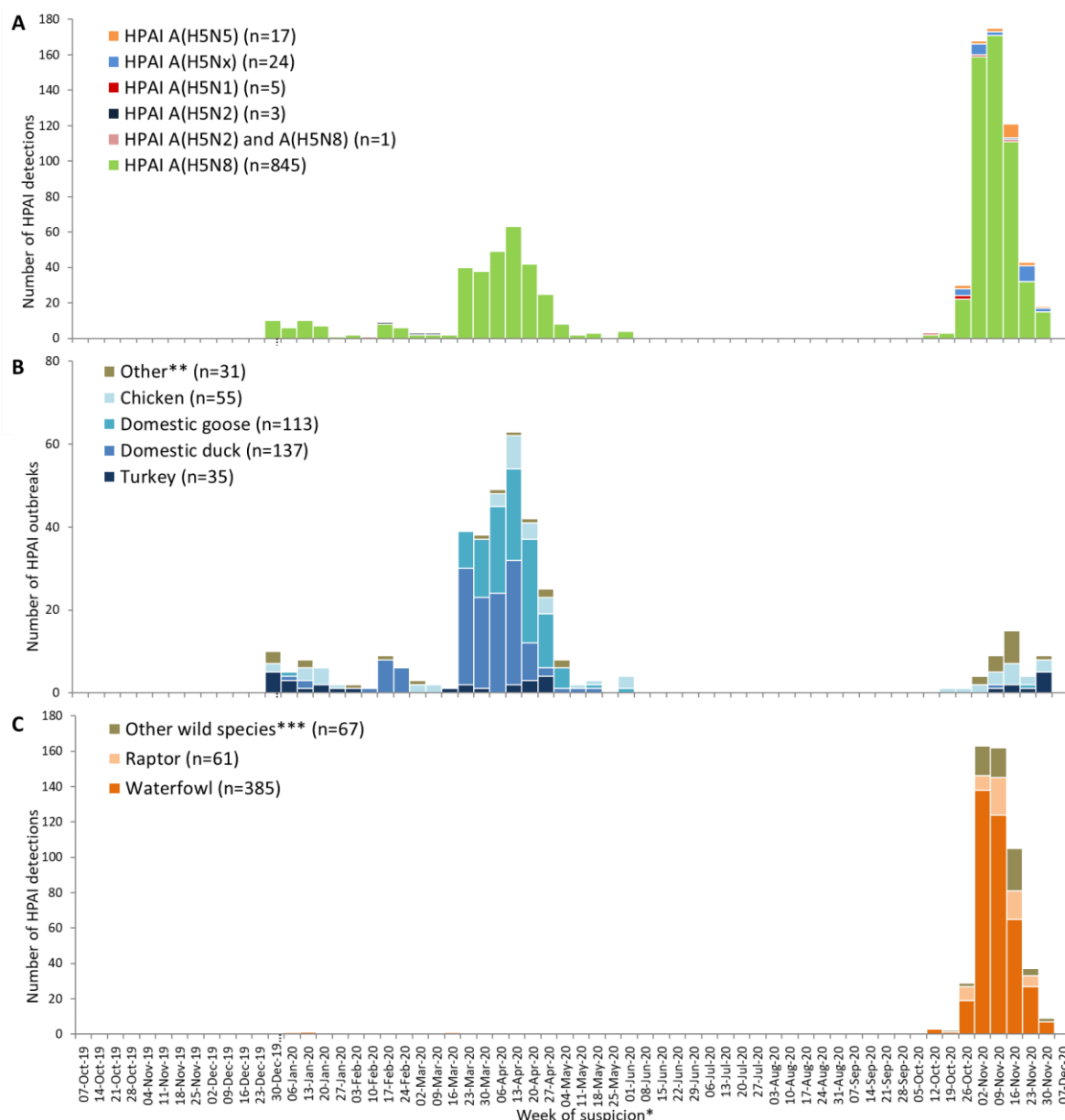
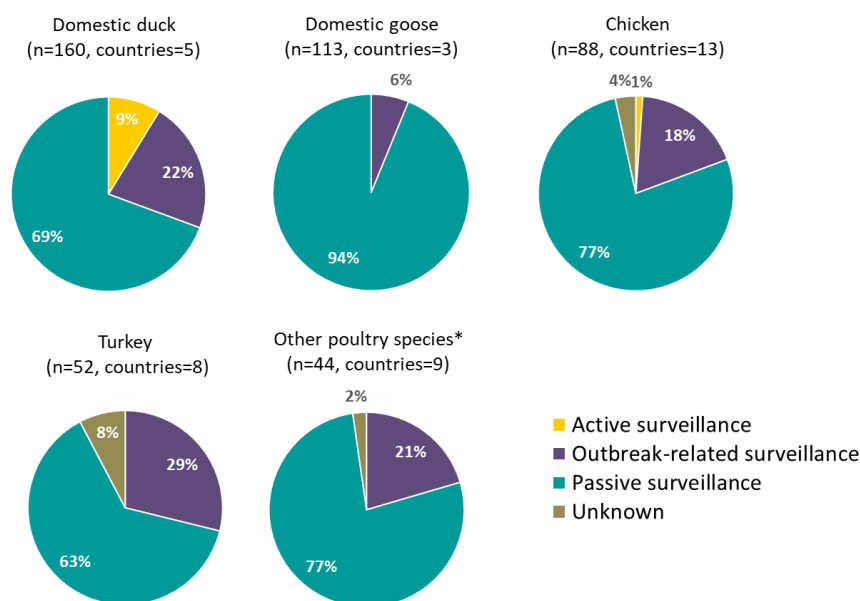


Figure 5: Distribution of total number of HPAI virus detections reported in Europe by week of suspicion (dates indicate the first day of the week) and (A) virus subtype (n=895), (B) affected poultry categories (n=371), (C) affected wild bird categories (n=513), 7 October 2019 – 7 December 2020



* 'Other poultry species' contains mixed, unknown, or bird species different from those displayed.
Data source: ADNS, EFSA.

Figure 6: Frequency distribution of HPAI outbreaks in poultry in Europe, by bird species (domestic goose, domestic duck, chicken, turkey and other poultry species) and sampling programme leading to the outbreak detection, in seasons 2017–2018, 2018–2019, 2019–2020 and 2020–2021 (2 October 2017 – 7 December 2020; n=457)

4.2. HPAI and LPAI detections in Europe, 16 August – 30 November 2020 (TOR 1 and TOR 2)

4.2.1. HPAI detections in poultry, other captive birds and wild birds

From 16 August to 7 December 2020, 18 pm, 561 HPAI A(H5) virus detections were notified in poultry, captive and wild birds in Europe, and were reported via the ADNS, as presented in Table 1. The timeline, starting from the first detection on 16 October, location and affected bird category of the avian influenza detections are presented in Figures 8 and 9. The characterisation of HPAI-affected poultry establishments³ is reported in Section 4.2.1.1; the description of the HPAI detections in wild birds is reported in section 4.2.1.2.

³ According to Regulation (EU) 2016/429 'establishment' means any premises, structure, or, in the case of open-air farming, any environment or place, where animals or germinal products are kept, on a temporary or permanent basis, except for: (a) households where pet animals are kept; (b) veterinary practices or clinics. Regulation (EU) 2016/429 of the European Parliament and of the Council of 9 March 2016 on transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law'). OJ L 84, 31.3.2016, p. 1–208.

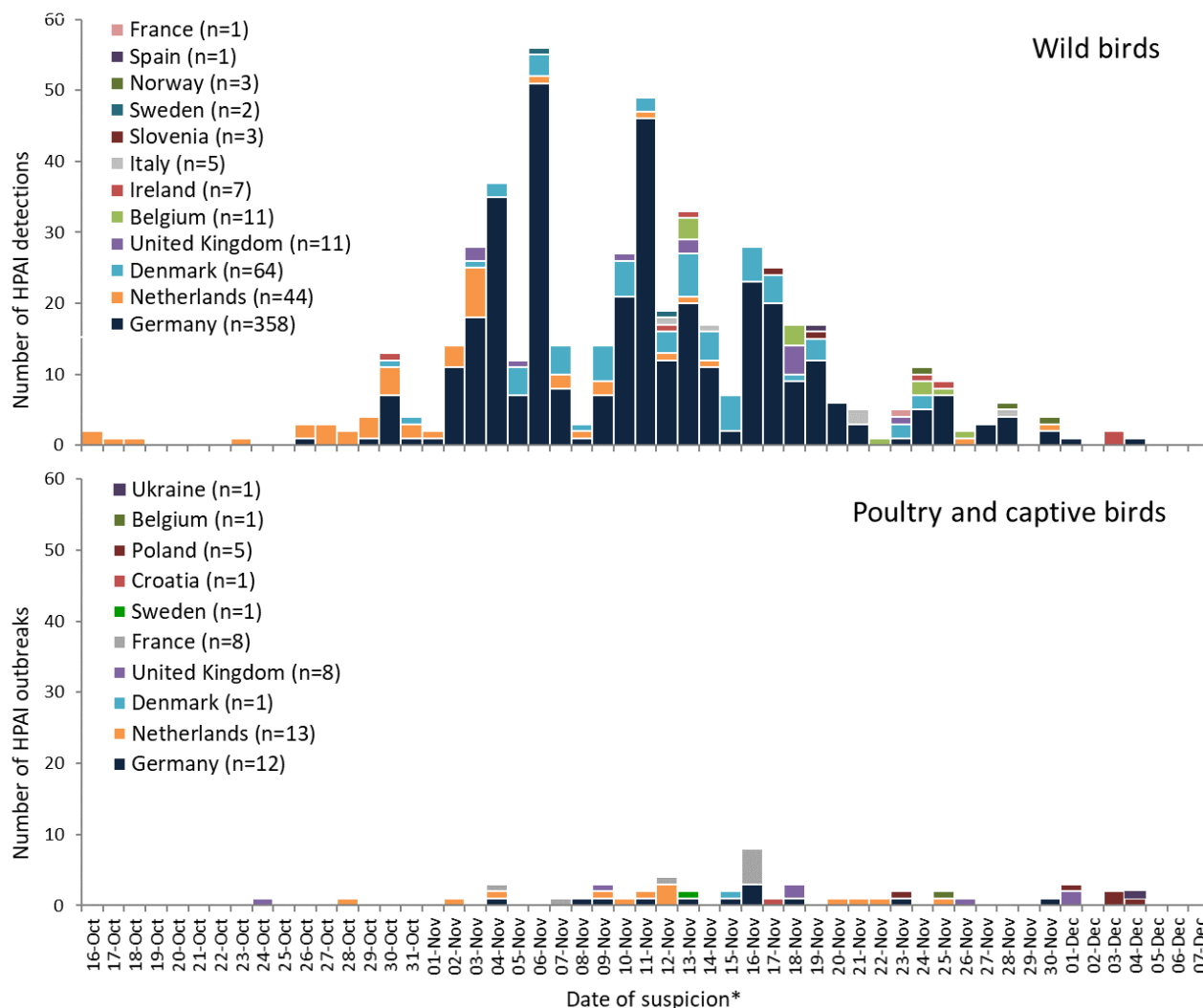
Table 1: Number of highly pathogenic avian influenza outbreaks in Europe, by country, virus subtype and affected sub-population, 16 August – 7 December 2020

Country	Captive birds (n=8)	Poultry (n=43)			Wild birds (n=510)				Total
		A(H5N8)	A(H5Nx)	A(H5N5)	A(H5N8)	A(H5Nx)	A(H5N1)	A(H5N5)	
Belgium			1		2			9	12
Croatia				1					1
Denmark				1	5		2	57	65
France				8	1				9
Germany			1	11	10	1	11	336	370
Ireland								7	7
Italy						1	1	3	5 ^(a)
Netherlands	7			6		4	1	39	57
Norway								3	3
Poland				5					5
Slovenia								3	3
Spain								1	1
Sweden				1				2	3
Ukraine		1							1
United Kingdom	1			7	1			10	19 ^(b)
Total	8	1	2	40	19	6	15	470	561

(a) Overall, 39 individual wild birds were found infected within the five detections reported to the ADNS.

(b) EFSA was informed by APHA that ADNS notification on HPAI A(H5) detections in wild birds within the reporting period for this report will be updated around the time of publication of this report as follow: a total of 46 A(H5) notifications in 12 wild species in 15 counties; Lesser Black-Backed Gull (*Larus fuscus*) is the only new species found infected compared to species detected in EU/EEA. These updates are not included in the current analysis as the information about them came to our knowledge too close to the publication date of this report.

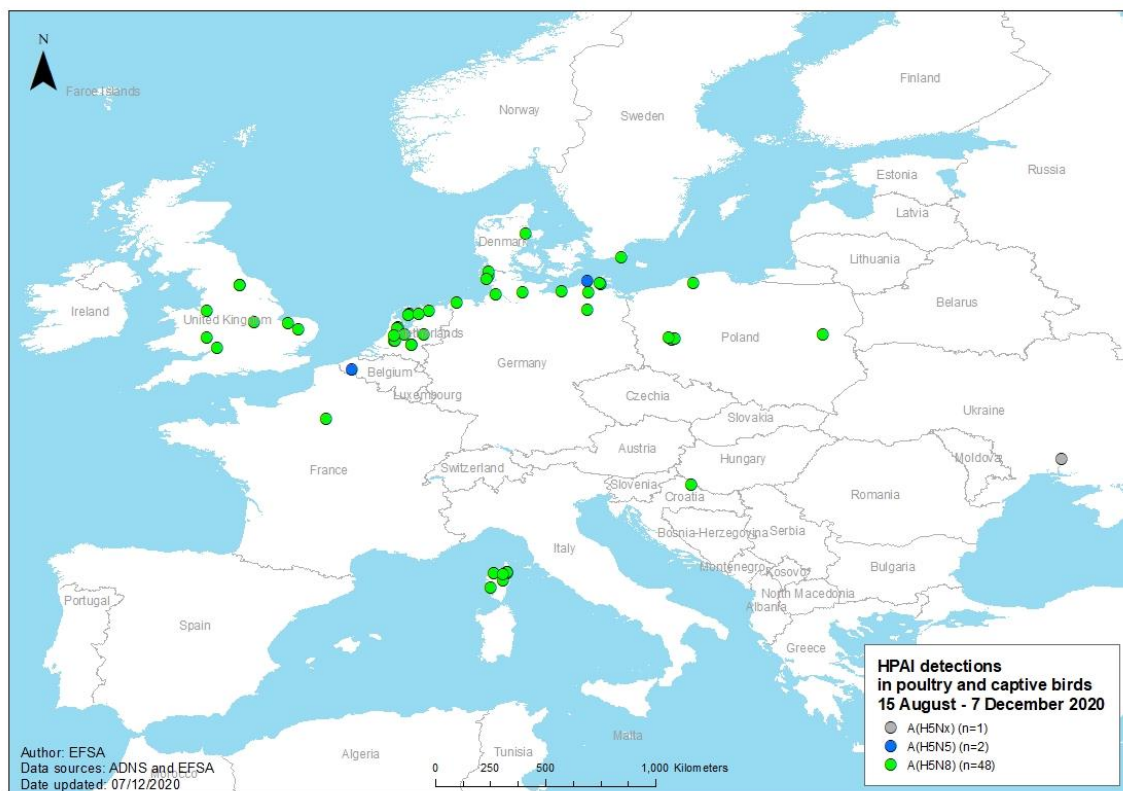
Data source: ADNS (7.12.20).



* When the date of suspicion is not available then the date of confirmation is used to assign the week of suspicion.

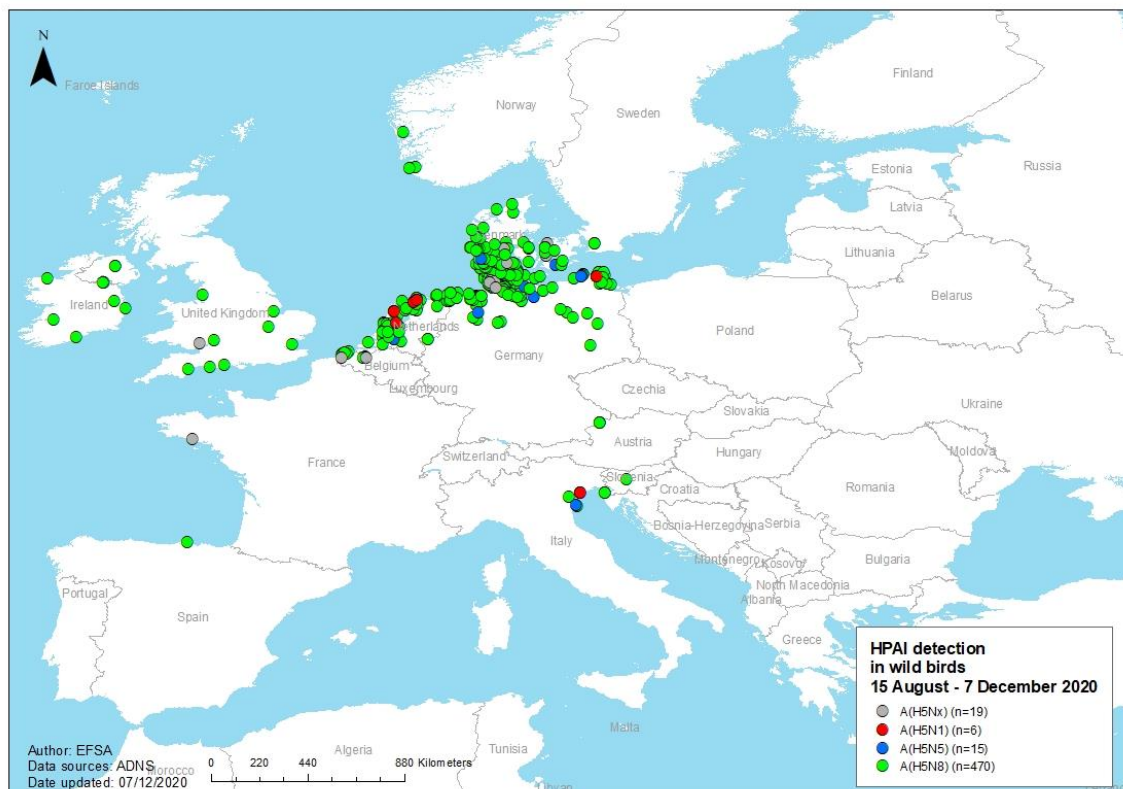
Data source: EFSA and ADNS (7.12.20).

Figure 7: Distribution of the highly pathogenic avian influenza detections in Europe, by day of suspicion and country in wild birds (n=510) and poultry and captive birds (n=51), from 16 October (date of first HPAI detection in this reporting period) to 7 December 2020 (n=561)



* This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

Figure 8: Geographical distribution, based on available geocoordinates, of avian influenza detections reported in poultry and in captive birds by virus subtype in Europe, 16 August – 7 December 2020 (n=51)



* This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

Figure 9: Geographical distribution, based on available geocoordinates, of avian influenza detections reported in wild birds by virus subtype in Europe, 16 August – 7 December 2020 (n=510)

As of 10 December, 18 pm, 35 HPAI detections have been notified to the ADNS outside the reporting period for this report (after 7 December 18 pm). Of those 25 have been detected in wild birds in Germany (n=10), France (n=2), Denmark (n=9), Sweden (n=3) and Poland (n=1); five in poultry in France (n=2), Netherlands (n=2) and Poland (n=1), and five in captive birds in the Netherlands (n=2), Belgium (n=1), Denmark (n=1) and Norway (n=1).

4.2.1.1. HPAI in domestic birds

Characterisation of the HPAI-affected poultry establishments

From 16 August to 7 December 2020, a total of 43 HPAI outbreaks in poultry were notified in Europe in ADNS. During this time, a total of 2,508,503 birds were affected. Only the outbreaks reported during 16 August and 24 November 2020 are more thoroughly presented in sections below due to the fact that the later outbreaks came to our knowledge too close to the publishing of this report, and in many cases, the epidemiological investigations of those outbreaks are still ongoing.

From 16 August to 25 November 2020, a total of 33 HPAI outbreaks in poultry were notified in Europe in ADNS (Table 2): one in Croatia, one in Denmark, eight in France, eleven in Germany, six in the Netherlands, one in Poland, three in the United Kingdom and one in Sweden. A total of 1,742,775 were affected in these outbreaks. One outbreak in Germany and one in Belgium were reported to be A(H5N5) subtype, all the other outbreaks were reported to be A(H5N8) subtype (Table 1). The description of the bird species and the production category of these HPAI-affected establishments are shown in Figure 10. A total of 14 establishments were housing >10,000 birds each with chicken, turkey or ducks as species/species group reared. Two establishments belong to the housing category of 1,001-10,000 birds; these two establishments were housing chickens. A total of 16 establishments were housing <1,000 birds each with mostly mixed species reared.

Between 26 November and 7 December 2020, an additional ten primary HPAI outbreaks in Europe were notified in ADNS. A total of 765,728 birds were affected in these outbreaks. In Ukraine one HPAI A(H5) outbreak was reported (the neuraminidase subtype is unknown). All the rest outbreaks were HPAI A(H5N8); one in laying hens in Germany, four in fattening turkey establishments in the United Kingdom and four in Poland (two in laying hens and two in fattening turkey) (Table 1). These ten outbreaks will not be included in the following chapters as the information about them came to our knowledge too close to the publication date of this report.

From 15 August to 7 December 2020, a total of eight HPAI outbreaks in captive birds were notified in Europe: seven in the Netherlands and one in the United Kingdom.

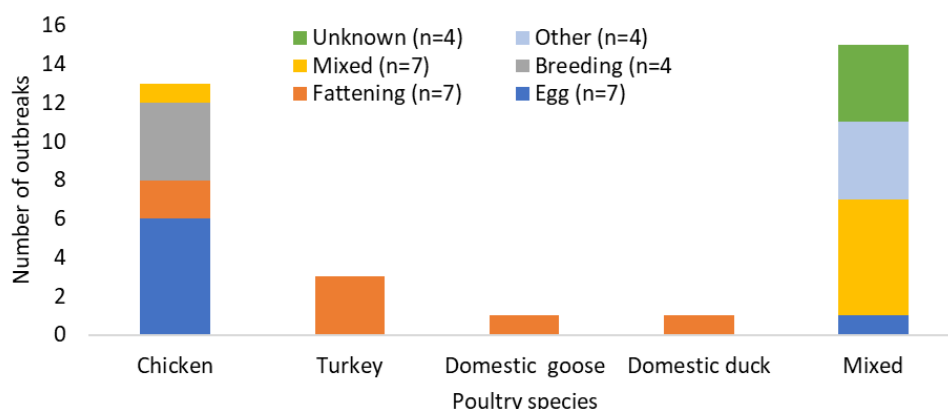


Figure 10: Number of HPAI-affected establishments by poultry species and production category in the EU, 16 August – 24 November 2020 (n=32)

HPAI A(H5N5)-affected poultry establishments in Belgium

On 25 November 2020, one HPAI A(H5N5) primary outbreak was confirmed by the Belgian authorities in a broiler farm with 151,600 birds in Menen in West Flanders. It is noteworthy that the clinical picture described was not that typical for HPAI, only a few signs were observed, and some mortality only started on the day of culling. All restriction and containment/control/eradication measures were promptly implemented in accordance with European legislation. The characteristics of the affected establishment and species reared are presented in Table 2.

HPAI A(H5N8)-affected poultry establishments in Croatia

On 21 November 2020, one HPAI A(H5N8) primary outbreak was confirmed at a commercial turkey fattening establishment in Koprivnica-Križevci region in Croatia. The suspicion was raised due to increased mortality in the flock; clinical signs were also present. The birds did not have outdoor access. The most likely source of infection is unknown. The characteristics of the affected establishment and species reared are presented in Table 2.

HPAI A(H5N8)-affected poultry establishments in Denmark

On 16 November 2020, one HPAI A(H5N8) primary outbreak was confirmed at a poultry establishment in Randers region in Denmark. The suspicion was raised in this commercial establishment housing 29,000 birds due to clinical illness the day before the confirmation; mortality, clinical signs, drop in egg production and feed/water intake were present at the flock. The birds housed were breeding hens in a high biosecurity establishment without outdoor access. The most likely source of infection is still unknown, as the epidemiological investigation is still ongoing. The characteristics of the affected establishment and species reared are presented in Table 2.

HPAI A(H5N8)-affected poultry establishments in France

Between 16 and 25 November 2020, eight HPAI A(H5N8) outbreaks were confirmed at poultry establishments in three regions in France. Three outbreaks were apparently primary, five were secondary to the first outbreak. The suspicion for the first outbreak was raised due to the presence of clinical signs suggestive of avian influenza infection, and due to the increasing mortality observed in chickens, ducks, pheasants, peacocks, swans and a Northern pintail. All three apparent primary outbreaks occurred in commercial pet shops with poultry and ornamental birds and are epidemiologically linked together through a common bird provider. The common source of infection could have been infected geese sold by a bird owner to a retailer who provided birds to the pet shops in the beginning of November 2020. The secondary outbreaks occurred in non-commercial backyard flocks where the owners had bought birds from the pet shop identified as the first primary outbreak. These backyard establishments were housing poultry and ornamental birds; the exact species are not known at the time of writing this report. In all the affected establishments, mortality and/or clinical signs were present. In the last pet store outbreak the suspicion was raised after the death of eight chickens and two peacocks. The characteristics of the affected establishment and species reared are presented in Table 2.

HPAI A(H5N8) and A(H5N5)-affected poultry establishments in Germany

Between 4 and 24 November 2020, a total of 10 HPAI A(H5N8) and one HPAI A(H5N5) primary outbreaks were confirmed in poultry establishments in six regions in Germany. In all the outbreaks, mortality and clinical signs were present in at least one species of birds reared in the establishment. Drop in egg production was only seen in one HPAI A(H5N8) outbreak in chicken but not other species reared in the same establishment. The establishments with HPAI outbreaks in Germany were raising poultry for eggs (chicken), fattening (mallard duck, unspecified duck and goose species), breeding (pigeon), mixed purposes (chicken) or for game (pheasant). The most likely source of infection for all except one establishment was indirect contact with wild birds; the establishment where drop in egg production was seen had most likely direct contact with wild birds as the source of infection. The characteristics of the affected establishments and species reared are presented in Table 2.

HPAI A(H5N8)-affected poultry establishments and in captive birds in the Netherlands

Between 29 October and 22 November 2020, a total of six HPAI A(H5N8) primary outbreaks were confirmed in poultry establishments in four regions in the Netherlands. In all the establishments, signs of avian influenza infection were present; mortality and clinical signs in all establishments and drop in egg production in five establishments. All the establishments were commercial; five of them were housing chickens and one was housing domestic ducks. Three of the establishments were producing eggs, one was a breeding establishment and two were fattening units (one for chickens and one for ducks). Since 21 October 2020 there is a 'housing order' in the country, where all poultry has been under compulsory 'indoor housing' (Annex A). Hence, all introductions took place whilst poultry were kept indoors. The most likely source of infection is unknown for all six outbreaks. The characteristics of the affected establishments and species reared are presented in Table 2.

Between 10 and 30 November 2020 seven HPAI A(H5N8) outbreaks in captive birds were detected in five regions in the Netherlands. Several captive birds were affected (n=370).

HPAI A(H5N8)-affected poultry establishments in Poland

On 24 November 2020, one HPAI A(H5N8) primary outbreak was confirmed at a poultry establishment in Wolsztynski region in Poland. The commercial establishment in question housed over 940,000 laying hens with no outdoor access, mortality in the flock was observed. The most likely source of infection is indirect contact with wild birds, due to a water canal in close proximity to the establishment. In total, there were 207 people that were exposed to the virus. The characteristics of the affected establishment and species reared are presented in Table 2.

HPAI A(H5N8)-affected poultry establishments in Sweden

On 16 November 2020, one HPAI A(H5N8) primary outbreak was confirmed at a commercial poultry establishment in Ystad region in Sweden. The suspicion was raised on 13 November due to clinical signs present and increased mortality in the flock. The epidemiological unit was comprised of three buildings; in one of the buildings the birds were showing symptoms. The establishment was housing fattening turkeys with no outdoor access. One building housed birds that were not showing symptoms and one building was empty at the time of the outbreak. The most likely source of infection is indirect contact with wild birds. Flocks of greylag geese had been sighted in the fields surrounding the establishments, and there were also some other local bird species present. The characteristics of the affected establishments and species reared are presented in Table 2.

HPAI A(H5N8)-affected poultry establishments and in captive birds in the United Kingdom

Between 2 and 23 November 2020, three HPAI A(H5N8) primary outbreaks were confirmed at poultry establishments in three regions in the United Kingdom. In all three establishments, mortality and clinical signs were observed. Two of the establishments were commercial and were housing broiler breeder chickens for rearing or breeding purposes, with no outdoor access provided. In these establishments, the most likely source of infection is indirect contact with wild birds. One establishment was a non-commercial zoo housing more than nine different species and group of species (turkey, guinea fowl, chicken, duck (unspecified species), goose (unspecified species), black swan, raptors (unspecified species), emu, and various exotic birds). All the species besides raptors and exotic birds had outdoor access. The most likely source of infection is direct contact with wild birds. The characteristics of the affected establishments and species reared are presented in Table 2.

On 20 November 2020, one HPAI A(H5N8) outbreak in captive birds was detected in a natural park near Stroud in Gloucester in the United Kingdom. A captive whistling duck was found dead and necropsy confirmed the suspicion of avian influenza. Previous HPAI A(H5N8)-positive wild birds were found in this very large natural park a week before and outside the captive area. The affected whistling duck was in an uncovered pen with 18 other pinioned ducks of the same species. This establishment contains other non-commercial captive birds that belong to a special category of conservation and/or rare species; there are no poultry on the site. The origin of the infection is considered to be direct contact with wild species.

Table 2: Characteristics of the HPAI A(H5N8) and A(H5N5)-positive poultry establishments by affected EU Member State, from 16 August to 25 November 2020 (n=33).

Country	Poultry species	Production category	Surveillance stream ^(a)	Presence of signs in the outbreaks	Outdoor access	Date of suspicion	Number of susceptible animals	Number of people exposed
Belgium	Chicken	Egg	Active ⁽ⁿ⁾	Yes	No	25/11/2020	151,600	-
Croatia	Turkey	Fattening	Passive	Yes	No	17/11/2020	67,068	19
Croatia	Turkey	Fattening	Passive	Yes	No	17/11/2020	67,068	19
Denmark	Chicken	Breeding	Passive	Yes	No	15/11/2020	29,000	-
France	Mixed ^(b)	Other	Passive	Yes	Unknown	07/11/2020	575	-
	Mixed ^(b)	Other	Outbreak related	Yes	Unknown	13/11/2020	205	-
	Mixed ^(c)	Unknown	Outbreak related ^(l)	Yes	Unknown	16/11/2020	70	-
	Mixed ^(c)	Unknown	Outbreak related ^(l)	Yes	Unknown	16/11/2020	40	-
	Mixed ^(c)	Unknown	Outbreak related ^(l)	Yes	Unknown	16/11/2020	203	-
	Mixed ^(c)	Unknown	Outbreak related ^(l)	Yes	Unknown	16/11/2020	35	-
	Mixed ^(d)	Egg	Outbreak related ^(l)	Yes	Yes	16/11/2020	60	-
	Mixed ^(d)	Other	Outbreak related	Yes	Unknown	12/11/2020	70	-
Germany	Chicken	Egg	Passive	Yes	Yes	04/11/2020	68	-
	Mixed ^(e)	Mixed	Passive	Yes	Yes	08/11/2020	36	-
	Mixed ^(f)	Mixed	Passive	Yes	Yes	09/11/2020	167	-
	Mixed ^(g)	Mixed	Passive	Yes		11/11/2020	257	-
	Chicken	Mixed	Passive	Yes	Yes	13/11/2020	3002	-
	Turkey	Fattening	Outbreak related	Yes	No	15/11/2020	16,063	-
	Chicken	Egg	Passive	Yes	Yes	16/11/2020	52,890	-
	Mixed ^(h)	Mixed	Passive	Yes	No	16/11/2020	1,236	-
	Mixed ⁽ⁱ⁾	Mixed	Passive	Yes	No	15/11/2020	43	-
	Mixed ^(j)	Mixed	Passive	Yes	No	18/11/2020	661	-
	Goose	Fattening	Passive	Yes	No	23/11/2020	659	-
The Netherlands	Chicken	Breeding	Passive	Yes	No ^(m)	28/10/2020	35,750	-
	Chicken	Egg	Passive	Yes	Unknown ^(m)	04/11/2020	99,516	-
	Chicken	Egg	Passive	Yes	Unknown ^(m)	09/11/2020	47,102	-
	Duck	Fattening	Passive	Yes	Unknown ^(m)	12/11/2020	22,040	-
	Chicken	Fattening	Passive	Yes	Unknown ^(m)	20/11/2020	89,366	-
	Chicken	Egg	Passive	Yes	Unknown ^(m)	21/11/2020	120,242	-
Poland	Chicken	Egg	Passive	Yes	No	23/11/2020	940,261	207
The United Kingdom	Chicken	Breeding ^(o)	Passive	Yes	No	24/10/2020	13,257	-
	Chicken	Breeding ^(o)	Passive	Yes	No	09/11/2020	46,000	-
	Mixed ^(k)	Other	Passive	Yes	Yes	18/11/2020	133	-
Sweden	Turkey	Fattening	Passive	Yes	No	13/11/2020	5,100	7
Total							1,742,775	233

(a) 'Outbreak-related', as part of outbreak response, i.e. control zones, tracing; 'passive', notifications of disease suspicion; 'active', screening of apparently healthy populations conducted in accordance with Decision 2010/367/EU.

(b) Pet store

(c) Poultry and ornamental birds

(d) Chicken for egg production and ornamental birds

(e) Pheasants (n=3), mallards (n=12) and laying hens (n=21)

(f) A(H5N5); laying hens (n=54), geese (n=10), domestic ducks (n=3) and doves (n=100)

(g) Chicken (fattening n=46, egg n=88), and fattening ducks (n=113) and geese (n=10)

(h) Fattening geese (n=267), hen (egg n=682) and duck (n=287)

(i) Laying hens (n=41) and fattening turkeys (n=2)

(j) Laying hens (n=7) and fattening geese (n=654)

(k) Chicken (n=14), turkey (n=9), guinea fowl (n=2), duck (n=9), goose (n=9), black swan (n=1), emu (n=2) and unknown number of raptors and various exotic bird species

(l) Secondary outbreak

(m) Since 21 October 2020, there is a compulsory housing order for all poultry farms in the Netherlands

(n) A(H5N5); the samples were taken for testing as other diseases were suspected but then also tested to exclude avian influenza

(o) The animals were broiler breeder rearers, not actually breeding at the time of infection

- Information not provided

Data source: ADNS (25.11.2020), EFSA.

4.2.1.2. HPAI in wild birds

As of 7 December, 18 pm, 510 HPAI detections in wild birds were reported to the ADNS by EU/EEA and UK. In 505 HPAI detections, only one wild bird species was found infected, whereas from two to six species were involved in the other five detections. In the following descriptive statistics, the number of detections for each affected wild bird species is described as the number of detections where the species was reported as infected, regardless it was the only species found in the detection. Overall, 34 wild bird species were reported as infected, mostly waterfowl species (21 species in 384 detections), followed by other aquatic wild bird species (11 species in 62 detections) and raptors (9 species in 59 detections) as showed in figure 11. The wild bird species most often reported were barnacle goose (*Branta leucopsis*) (n=182), greylag goose (*Anser anser*) (n=80), Eurasian wigeon (*Mareca penelope*) (n=38), common buzzard (*Buteo buteo*) (n=28), mallard (*Anas platyrhynchos*) (n=26), mute swan (*Cygnus olor*) (n=22), European herring gull (*Larus argentatus*) (n=16) and unspecified gulls (n=15) (see Table C.1, Annex C for the full data). The daily distribution of HPAI detections in the most affected wild bird species is shown in figure XX, starting from the date of the first detection. The majority of the reported detections of wild birds indicated that the birds had been found dead or moribund. However, there are also reports from Germany, the Netherlands, Denmark and Italy where apparently healthy ducks or geese have been tested and found to be infected, in some cases 100% (10/10) of the hunted birds being positive. In Italy, HPAI viruses were found in hunted wild birds not only in tracheal and cloacal swabs, but also on feathers, which may be a sign of high environmental contamination. The bird species described above were reported via ADNS, however, this does not exclude the possibility that other bird species are also affected⁴. Figure 12 shows the date of suspicion and the number of HPAI detections for the wild bird species reported in 15 or more HPAI detections.

Of the large number of reported detections of HPAI in geese (n=286), the most affected species was the barnacle goose, which was not commonly detected in previous HPAI outbreaks and was not included in the list of target species compiled by EFSA (EFSA et al., 2017a). Raptors have been reported in previous epidemics (e.g. 2016-2017) and are normally detected at a later phase of the epidemic, as they are likely to acquire the infection via hunting or scavenging infected wild waterfowl. Currently, many infected raptors (mainly common buzzards and peregrine falcons) have been reported: Denmark (n=12), Germany (n=39), Ireland (n=2), the Netherlands (n=4), Spain (n=1), and Sweden (n=1). In Denmark, Ireland, and Spain, the first HPAI detections were in peregrine falcons, suggesting that either HPAI was already present in wild waterfowl in those countries but had not been detected by passive or active surveillance, or that these birds were infected in another country.

The number of HPAI detections in wild birds only partly reflects the scale of wild bird mortality that is taking place during the current epidemic. For example, in the Netherlands, a total of 3,109 dead or moribund birds were reported in the three-week period from 31 October to 20 November 2020. Of these, 2,359 were ducks, geese, or swans, mainly barnacle geese (n=1,371), and 106 were raptors, mainly common buzzards (n=58) (T. Kuiken, pers. comm.; data from AImpact2021 working group, not corrected for possible duplications or observer effort). In Germany, more than 10,000 wild birds have been found moribund or dead along the North Sea coast during the current epidemic. About 75% of these are barnacle geese or Eurasian wigeons, but nearly 80 species of bird have been reported (Krumenacker T, online).

⁴ The detection and reporting of dead wild birds found via passive surveillance to ADNS, is determined by factors such as: human presence where the birds are located, the size and other phenotypic characteristics of the birds, etc. Therefore, it is not possible to know what other species are affected by these HPAI viruses if the species do not show clinical signs (including mortality), or if the deaths of these birds occurred in areas not frequented by humans.

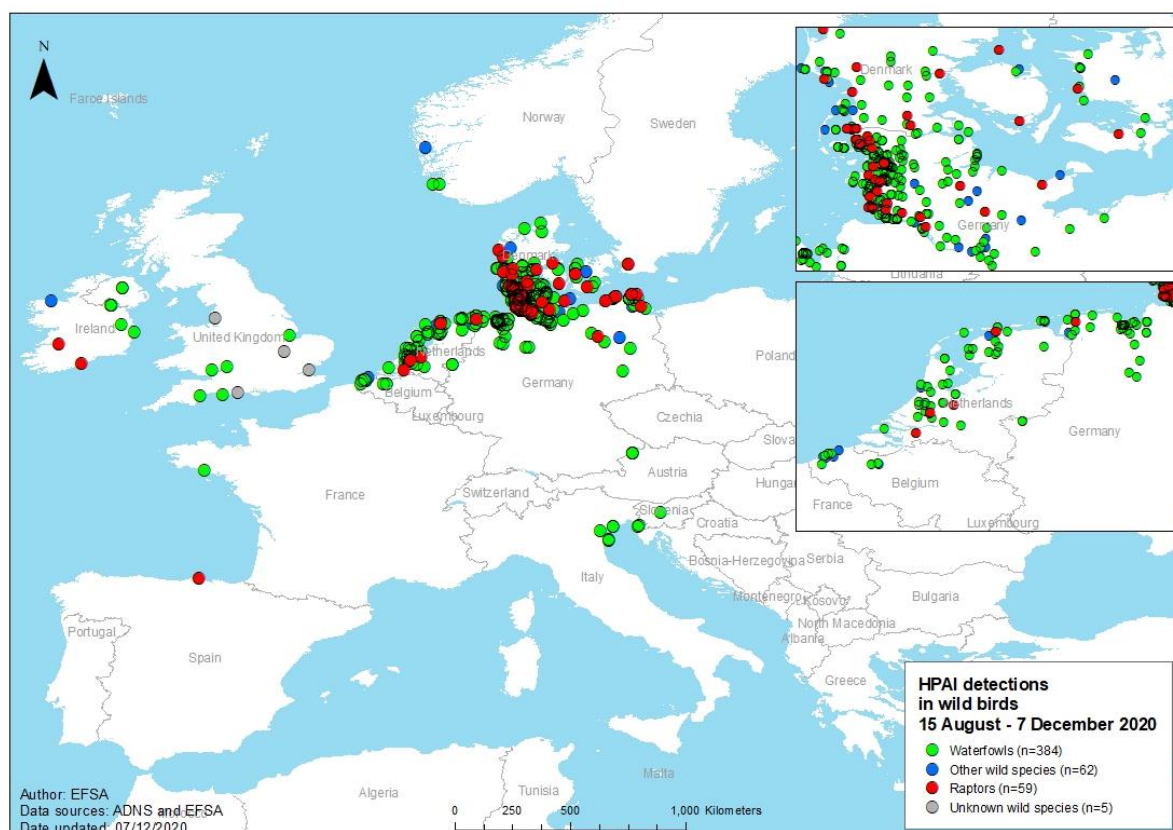
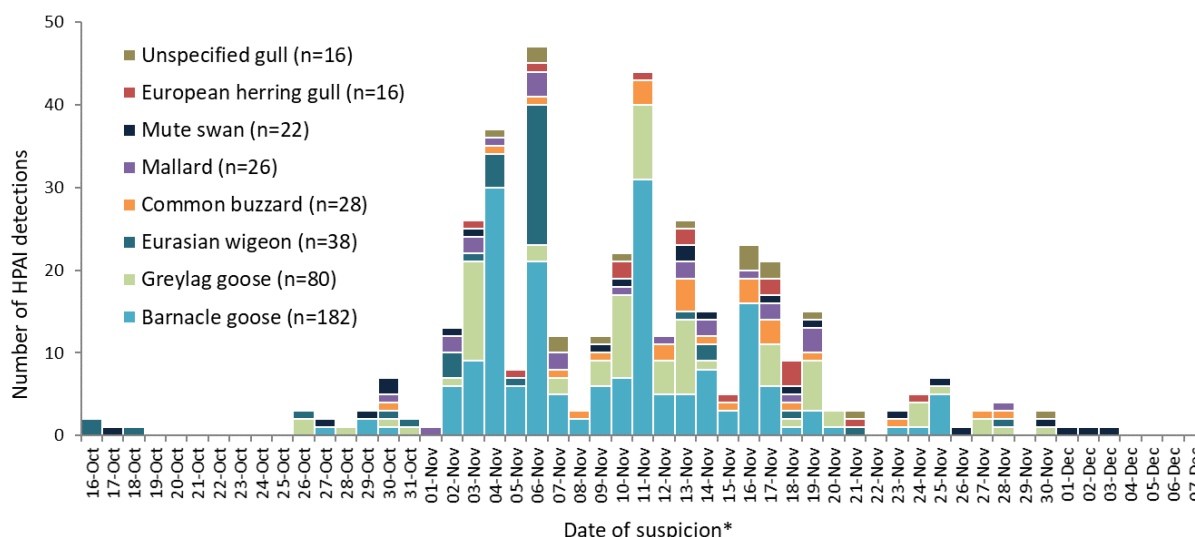


Figure 11: Geographical distribution, based on available geocoordinates, of avian influenza detections in wild birds in Europe, by species category, 16 August – 7 December 2020 (n=510)



* When the date of suspicion is not available then the date of confirmation is used to assign the week of suspicion.
Data source: EFSA and ADNS (7.12.20).

Figure 12: Number of reported detections of highly pathogenic avian influenza virus A(H5) in wild birds of the most affected wild bird species in EU/EEA and the UK, by date of suspicion, from 16 October (suspicion date of the first HPAI detection in this reporting period) to 7 December 2020. Note that on one single reported detection of HPAI in wild birds more than one wild bird species can be involved

4.2.2. LPAI in domestic birds

Characterisation of the LPAI-affected poultry establishments

Between 16 August and 7 December 2020, three LPAI outbreaks were notified in the poultry sector and in captive birds in Europe. Information available from the ADNS (European Commission, online-b), from the OIE (OIE, online-a) and provided by Member States, characterising the LPAI outbreaks, is presented in Table 3.

On 14 September 2020, infection by an A(H5N8) LPAI virus was confirmed in a captive guinea fowl found dead, from a zoo in Muenster, North Rhine-Westphalia, Germany. This virus is unrelated to the HPAI viruses currently detected in Europe.

An outbreak of A(H5N2) LPAI was confirmed on 2 November 2020 in a poultry farm in the United Kingdom, Kent county. The outbreak involved a small-scale mixed poultry holding (see detail of species in Table 3), not involved in international trade of live poultry or poultry products. The most likely source of introduction of the virus was considered to be indirect contact with infected wild birds, considering the ongoing migration from mainland Europe during the winter season.

LPAI A(H5N2) was identified on 1 December 2020 in a grower farm in the province of Pavia, Lombardy, Italy, following H5 serological positivity detected on 17 November 2020 in the context of the national surveillance plan. At the time of confirmation of the serological results, this holding was housing around 11,000 chickens and ducks, and no clinical symptoms or increased mortality were reported. The virus responsible for the seroconversion was not subsequently found in the samples collected to follow up the positive serological result. The farm did not attend fairs or markets and the epidemiological investigation did not identify any contacts at risk.

Table 3: Characteristics of the LPAI-affected poultry and captive bird establishments in Europe, 16 August – 7 December 2020 (n=3)

Country	Virus subtype	Poultry species	Surveillance stream	Presence of signs in the outbreaks	Date of suspicion	Number of susceptible birds
Germany*	A(H5N8)	Guinea fowl	Surveillance passive	yes	12/09/2020	68
Italy	A(H5N2)	Chicken and ducks	Surveillance active	no	17/11/2020	11,204
United Kingdom	A(H5N2)	Mixed**	Surveillance active	no	30/10/2020	416
Total						11,688

* Captive birds, zoo

**80 ducks, 220 chickens, 30 geese, 2 swans, 60 pigeons, 2 rhea, 4 guinea fowl

Data source: ADNS, OIE, Member States.

4.2.3. Genetic characterisation of avian influenza viruses

Description of the nomenclature of the HPAI A(H5) viruses used in the document

The HA gene of clade 2.3.4.4 A(H5) viruses has rapidly evolved since the most recent official update of the nomenclature of the A/goose/Guangdong/1/1996-lineage H5Nx virus (Smith et al., 2015). This clade emerged in China in 2008 and since then it has acquired various neuraminidase subtypes, including N1, N2, N5, N6 and N8, by reassortments with other enzootic avian influenza viruses from different regions, and evolved into several subgroups. While a revised nomenclature of clade 2.3.4.4 viruses is pending, in the previous reports we used the genetic clustering described in 2018 by Lee and co-authors, who recognised four groups (a to d) within clade 2.3.4.4 (Lee et al., 2018). Recently, an update to the unified nomenclature for clade 2.3.4.4 A(H5) viruses has been proposed by WHO (WHO, 2020a) and eight genetic groups (a to h) have been recognised. In order to align the nomenclature system between international organisations this classification has been adopted for this report. Based on this proposed clustering, A(H5) viruses of clades 2.3.4.4a and d–h have mainly been circulating in poultry in Asia,

while clades 2.3.4.4b and 2.3.4.4c have spread globally through wild bird migrations during 2014–2015 (2.3.4.4c) and 2016–2017 (2.3.4.4b)

Genetic characterisation of HPAI viruses of the A(H5) subtype circulating in Europe

The complete genome sequences of 28 European HPAI A(H5) viruses of clade 2.3.4.4b were deposited in the GISAID EpiFlu database by Member States (accessed on 3 December). The characterised viruses were collected between 16 October and 24 November from wild and domestic birds in Belgium, Croatia, Denmark, Germany, Italy, the Netherlands, Poland, Sweden and the United Kingdom.

Topology of the HA phylogenetic tree shows that the European viruses are closely related to the HPAI A(H5) viruses identified in wild and domestic birds between May and November 2020 in Iraq, Russia and Kazakhstan and cluster separately from the HPAI A(H5) viruses detected in Europe in the first half of 2020.

Analyses of the remaining gene segments identified five distinct genotypes – one A(H5N8), one A(H5N1) and three A(H5N5) – which originated from multiple reassortment events with LPAI viruses circulating in wild birds in Eurasia and Africa (Figure 13). Four of these genotypes, namely A(H5N8), A(H5N1) and two A(H5N5), were detected in Europe.

No evidence of mutations associated with mammalian adaptation has been observed in any of the viruses analysed at the EURL so far.

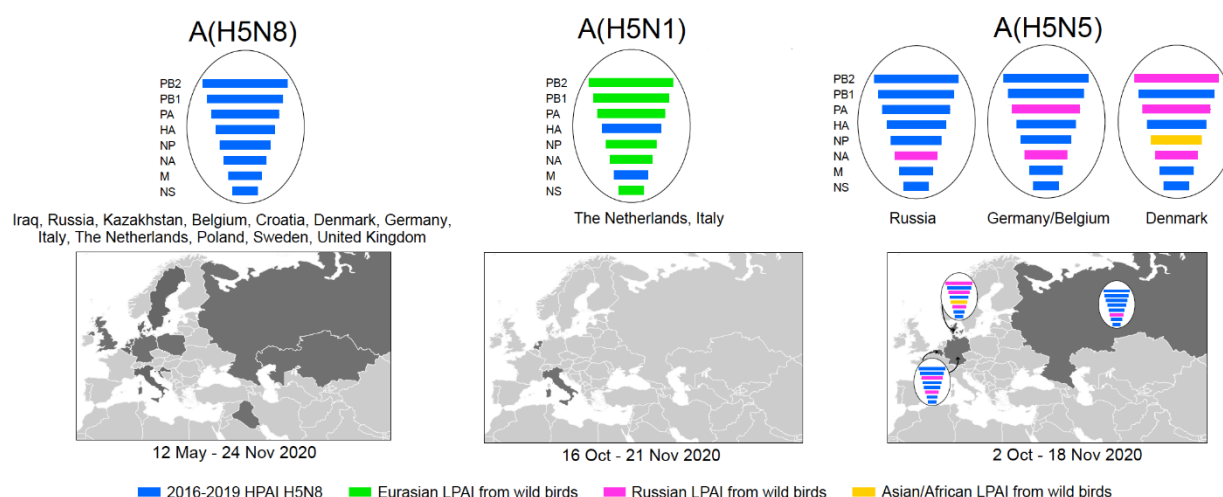


Figure 13. HPAI A(H5) genotypes identified in Eurasia since May 2020 and their geographic detection based on the available sequences. Blue bars: gene segments originating from Eurasian/African HPAI H5N8 of the epidemic wave started in 2016; green bars: gene segments closely related to LPAI viruses circulating in wild birds in Eurasia; pink bars: gene segments closely related to LPAI viruses identified in wild birds in Russia; yellow bars: gene segments closely related to LPAI viruses identified in wild birds in Asia and Africa. We gratefully acknowledge the authors, originating and submitting laboratories of the sequences from GISAID's EpiFlu™ Database on which this analysis is based.

Genetic characterisation of LPAI viruses of the A(H5) subtype circulating in Europe

The complete genome of the LPAI A(H5N8) virus (A/guinea fowl/Germany-NW/AI01184/2020) identified in September in a guinea fowl kept in a zoo in Muenster (Germany) was characterized. The phylogenetic analysis revealed that the HA gene of this virus clusters with LPAI A(H5N2) viruses collected from chickens in the Netherlands and from wild birds in Ukraine in 2016–2017; the PB2, PB1, PA, NP, NA and NS gene segments cluster with LPAI viruses identified from wild birds in Eurasia, while the M gene is related to LPAI viruses collected from wild birds in Egypt in 2015–2016.

4.2.4. Human cases due to A(H5N1), A(H5N2), A(H5N5) or A(H5N8) viruses detected in Europe

No human infection with avian influenza viruses, as detected in wild birds and poultry in Europe, has been reported during the period covered by this report or been previously reported (EFSA et al., 2020d). No virus genetic markers indicating adaptation to mammal receptor binding and increased risk of human transmission have been identified. A risk assessment on A(H5N8) is available from WHO stating that the likelihood of human infection with A(H5N8) virus is low (WHO, online-a).

4.3. Prevention and control measures applied in Europe, 16 August – 26 November 2020 (TOR 3)

From 16 August to 26 November 2020, a total of 32 HPAI outbreaks at poultry establishments were notified in Europe. For a description of the control and prevention measures applied in the affected Member States, see Annex A.

4.4. The avian influenza situation in other countries not reporting via ADNS, 16 August – 25 November 2020 (TOR 4)

An overview of the HPAI detections notified from other countries not reporting via ADNS but via the OIE or national authorities from 16 August to 7 December 2020 is presented in Table 4 and Figures 14 and 15. For the purposes of this report, only findings of avian influenza viruses occurring in countries that are considered to be of epidemiological interest for the EU/EEA or of public health relevance are described.

Table 4: Number of HPAI detections in other countries not reporting via ADNS, by virus subtype and country, 16 August – 7 December 2020 (n=131)

Region	Country	Domestic birds (n=113)					Wild birds (n=18)	Total
		A(H5Nx)	A(H5N1)	A(H5N5)	A(H5N6)	A(H5N8)	A(H5N8)	
Asia	China						1	1
	Iran						1	1
	Israel					8	3	11
	Japan					8		8
	Kazakhstan	1				10	1	12
	Laos		2					2
	Republic of Korea					5	4	9
	Taiwan			5				5
	Vietnam		2		6			8
Europe	Ukraine	1						1
	Russia	24		1		40	8	73
Total		26	4	6	6	71	18	131

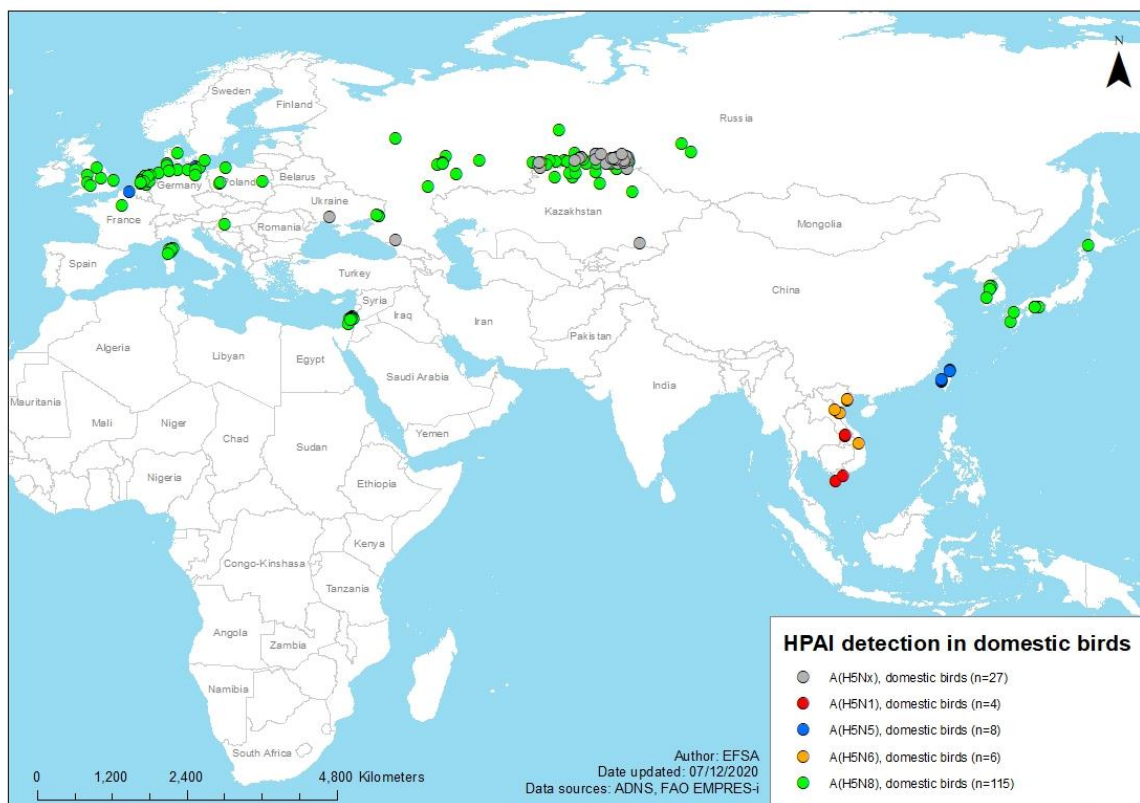


Figure 14: Geographical distribution, based on available geocoordinates, of HPAI detections reported in domestic birds in Europe, Asia and Africa, by virus type, 16 August – 7 December 2020 (n=160)

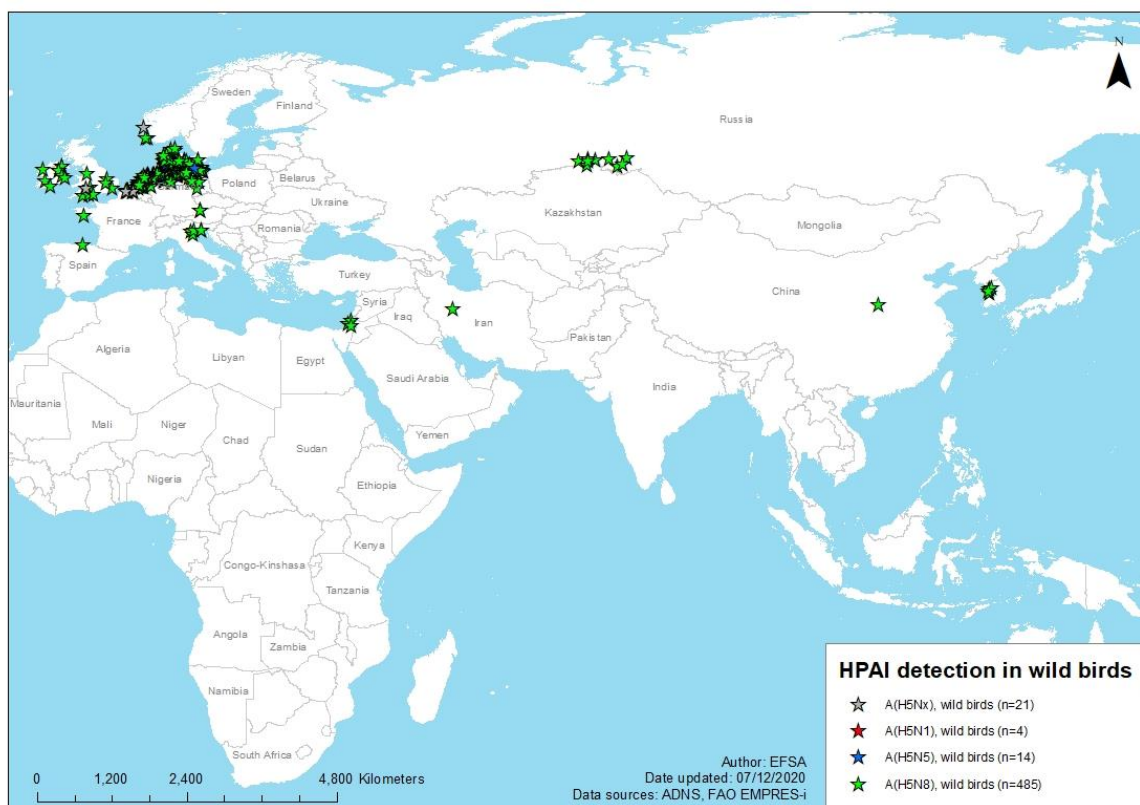


Figure 15: Geographical distribution, based on available geocoordinates, of HPAI detections reported in wild birds in Europe, Asia and Africa, by virus type, 16 August – 7 December 2020 (n=524). Outside Europe it was only reported the detection of A(H5N8).

4.4.1. HPAI A(H5N1)

4.4.1.1. Domestic and wild birds in previously affected regions

Detections

From 16 August to 25 November 2020 only two Asian countries notified the detection of HPAI A(H5N1) in domestic birds. The outbreak in Vietnam continued and two new cases were detected on backyard poultry farms. Furthermore, Lao People's Democratic Republic detected two cases of HPAI A(H5N1) on a small and medium-sized poultry farm. Again, no wild bird cases of HPAI A(H5N1) were reported in the relevant time period (Figure 16).

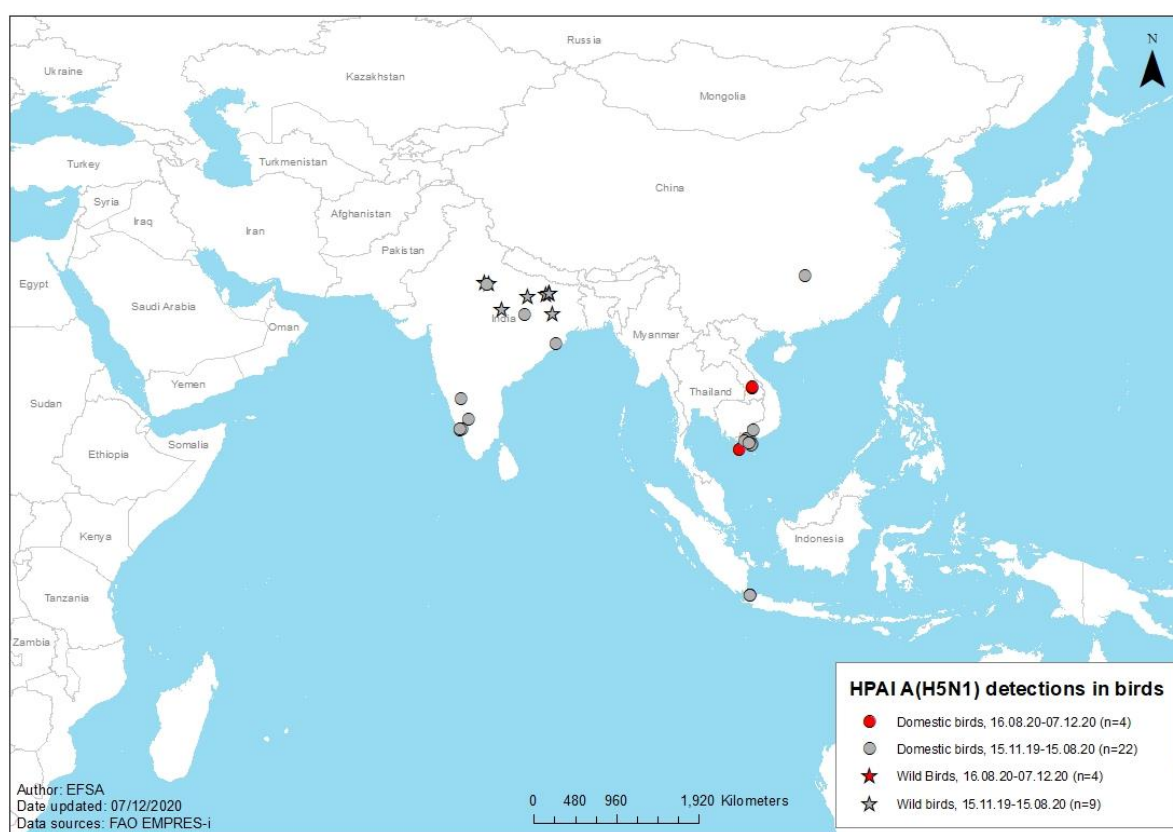
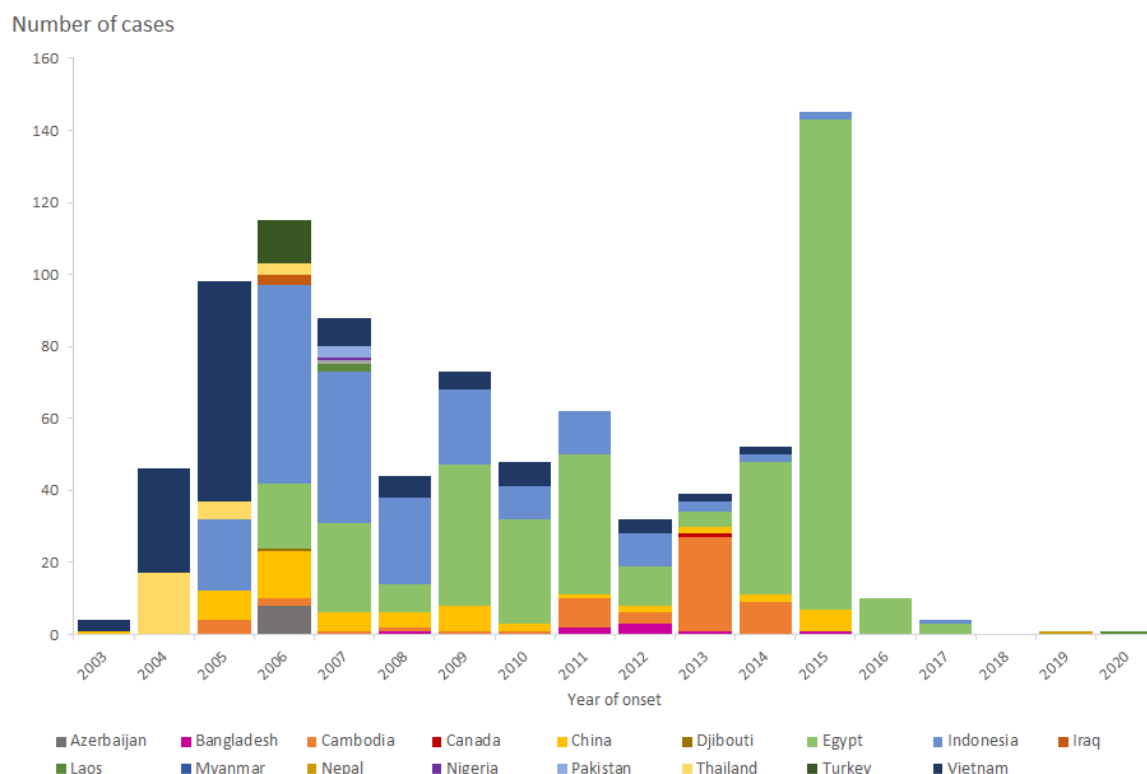


Figure 16: Geographical distribution, based on available geocoordinates, of HPAI A(H5N1) detections reported in domestic birds (circles) and wild birds (stars) (n=39); red symbols indicate outbreaks that occurred between 16 August and 7 December 2020, grey symbols indicate outbreaks that occurred between 15 November 2019 and 15 August 2020 (FAO, online-a)

4.4.1.2. Human infections due to A(H5N1)

One new human case due to avian influenza A(H5N1) has been reported from Lao on 28 October 2020. Since 2003, and as of 25 November 2020, 862 laboratory-confirmed cases of human infection with avian influenza A(H5N1) virus, including 455 deaths, have been reported from 17 countries outside the EU/EEA (CHP, 2020; WHO, 2020f, online-b) (Figure 17).



Data source: WHO (CHP, 2020; WHO, online-b).

Figure 17: Distribution of confirmed human cases of A(H5N1) by year and country of reporting, 2003 – 10 December 2020 (n=862)

4.4.2. HPAI A(H5N2) and A(H5N5)

4.4.2.1. Domestic and wild birds

Detections

The Taiwanese lineage HPAI A(H5N2) has been in circulation in Taiwan since 2012 and caused severe outbreaks at chicken, duck, goose and turkey establishments. In contrast to the last report, no case of HPAI A(H5N2) was reported to the OIE between 16 August and 25 November. The Taiwanese lineages of HPAI A(H5N2) (clade 2.3.4.4) differ from the Eurasian HPAI A(H5N2) lineage (Li et al., 2020); the latter belonging to clade 2.3.4.4b, which has been detected, with different genotypes, in Egypt and Russia as well as in Asian countries between 2016 and 2019 (EFSA et al., 2019a) and in Bulgaria in 2020.

Furthermore, the Taiwanese government reported 5 new outbreaks of HPAI A(H5N5) on two backyard and three medium-sized poultry farms in August and September 2020 (Figure 18).

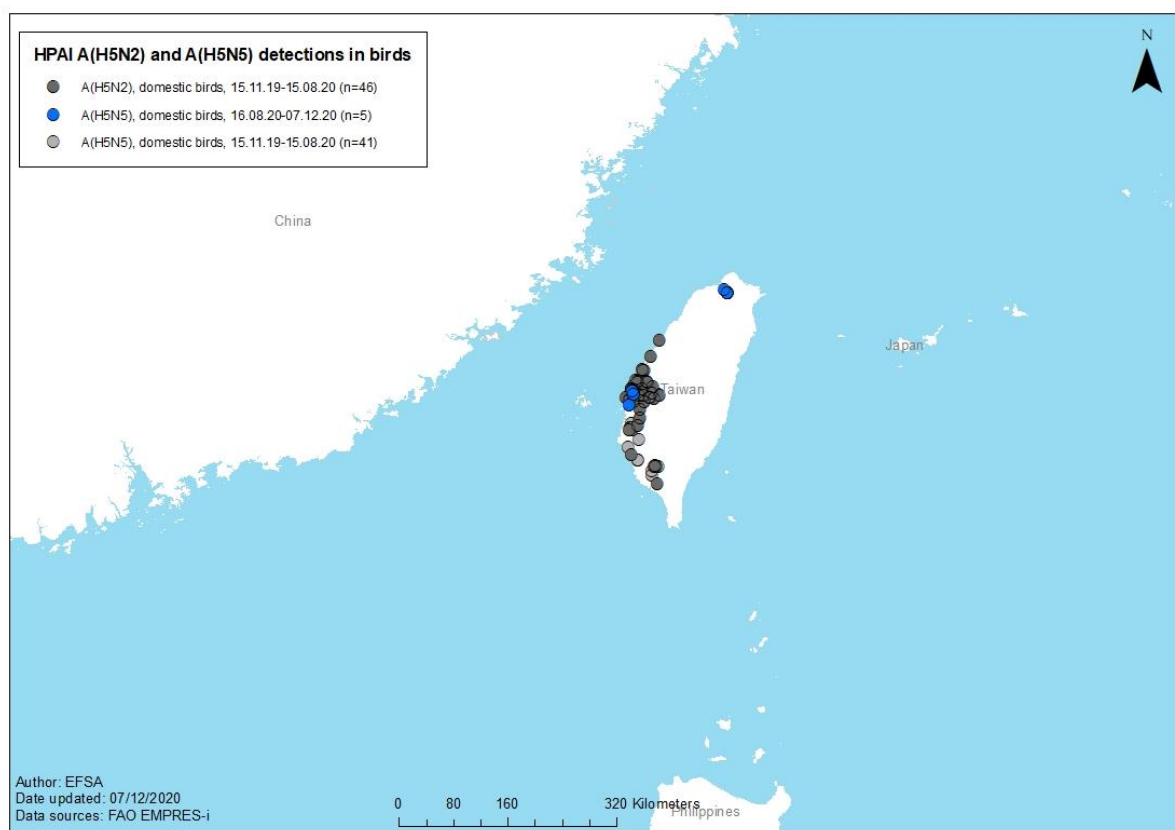


Figure 18: Geographical distribution, based on available geocoordinates, of HPAI A(H5N2) and A(H5N5) detections reported in domestic birds outside Europe (n=92); dark grey symbols indicate HPAI A(H5N2) detections between 15 November 2019 and 15 August 2020, light grey symbols indicate HPAI A(H5N5) detections between 15 November 2019 and 15 August 2020, blue symbols indicate HPAI A(H5N5) detections between 16 August and 7 December 2020, (FAO, online-a)

4.4.3. HPAI A(H5N6)

4.4.3.1. Domestic and wild birds

Detections

In the relevant reporting period, Vietnam reported 6 further outbreaks of the zoonotic reassortment of HPAI A(H5N6) clade 2.3.4.4c on small and medium-sized poultry farms. No wild bird cases of HPAI A(H5N6) were reported between 16 August to 25 November 2020 (Figure 19).

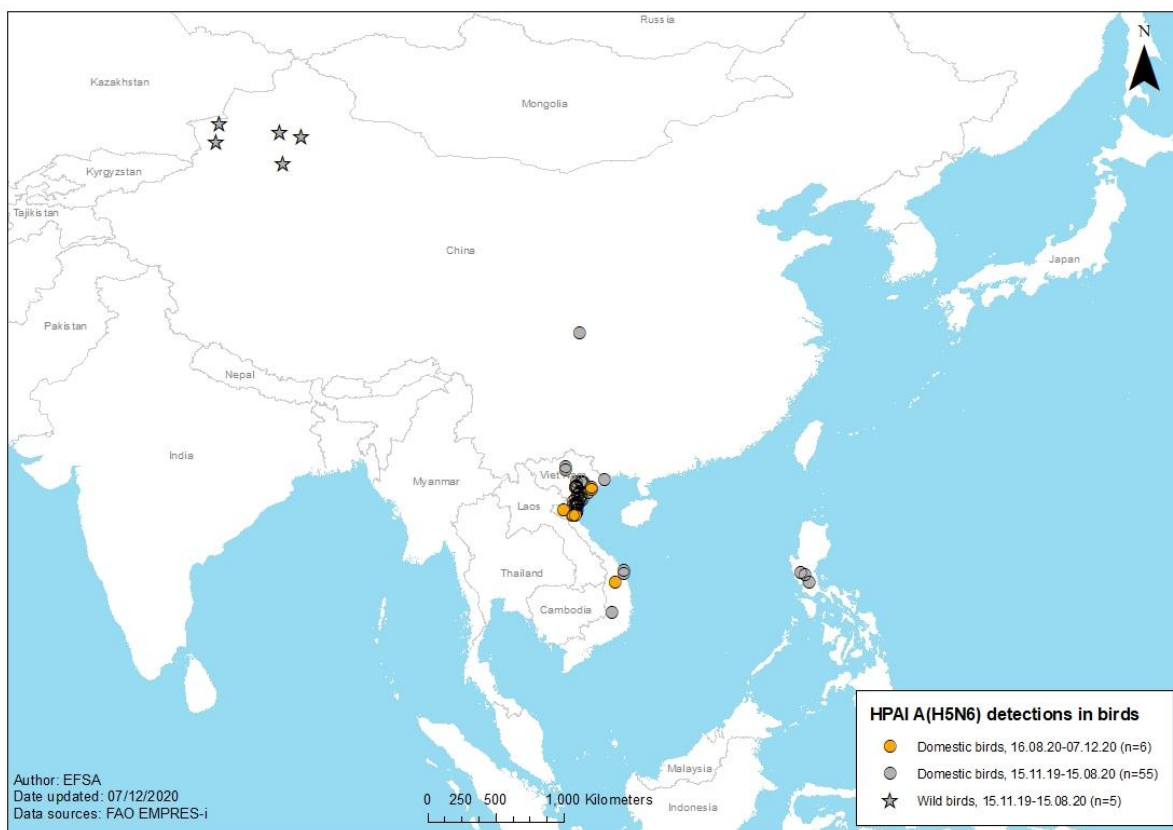
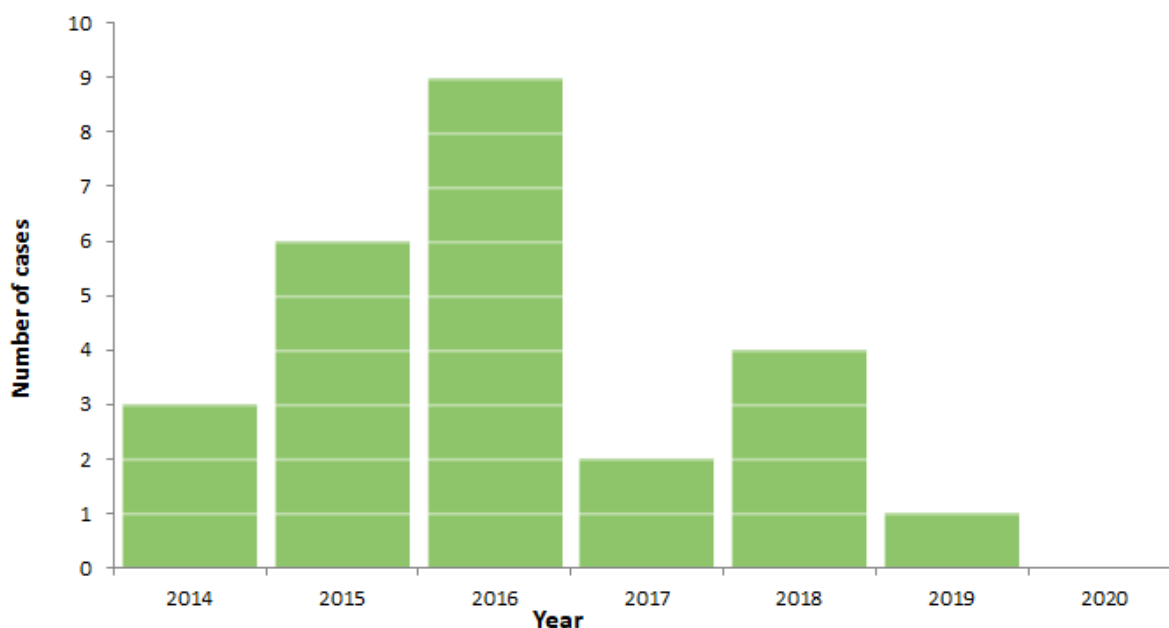


Figure 19: Geographical distribution, based on available geocoordinates, of HPAI A(H5N6) detections reported in domestic birds (circles) and wild birds (stars) (n=66); orange symbols indicate outbreaks that occurred from 16 August to 7 December 2020, grey symbols indicate outbreaks that occurred from 15 November 2019 to 15 August 2020, (FAO, online-a)

4.4.3.2. Human infections due to A(H5N6)

No new human case due to avian influenza A(H5N6) has been notified since the last EFSA report (EFSA et al., 2020d; WHO, 2020d, c). Since 2014, and as of 10 December 2020, 25 laboratory-confirmed cases of human infection with avian influenza A(H5N6) viruses of clade 2.3.4.4 circulating in South-East Asia have been reported globally (Figure 20). WHO lists 24 human cases of avian influenza A(H5N6), including 15 with fatal outcomes (WHO, 2020b). One additional case from 2015 was described by Li et al. (2016). Twelve deaths due to A(H5N6) had been reported between 2014 and 2017 (Jiang et al., 2017). All of the cases were infected and detected in mainland China (WHO, 2019a).



If date of onset is not available, the date of reporting has been used; the epicurve includes one case reported in the literature with year of onset in 2015.

Source: ECDC line list (see Appendix B.2).

Figure 20: Number of human cases due to A(H5N6), clade 2.3.4.4, infection by year of onset, China 2014–2020 (n=25)

4.4.4. HPAI A(H5N8)

4.4.4.1. Domestic and wild birds

Detections

In Kazakhstan and the Russian Federation, the outbreak of clade 2.3.4.4b, HPAI A(H5N8) continued in the relevant time period of this report. Besides small, medium and very large poultry farms, wild birds were also affected. In most cases unidentified Anatidae were notified, but also concrete species as mallards (*Anas platyrhynchos*), common pochard (*Aythya ferina*), garganey (*Anas querquedula*), gadwall (*Mareca strepera*) and mute swan (*Cygnus olor*) were recorded. Israel detected 8 outbreaks in one large and several medium-sized poultry farms as well as in zoos nearby Jerusalem and Tel Aviv between 15 August and 25 November. Several wild bird species were identified as e.g., mute swan (*Cygnus olor*), Egyptian goose (*Alopochen aegyptiacus*), black swan (*Cygnus atratus*), great cormorant (*Phalacrocorax carbo*) and a Dalmatian pelican (*Pelecanus crispus*) in northern Israel. In October and November 2020, Japan and the Republic of Korea reported several outbreaks of HPAI A(H5N8) on medium and large sized poultry farms and in environmental samples. Furthermore, the Republic of Korea confirmed HPAI A(H5N8) in several unspecified ducks incl. mandarin ducks (*Aix galericulata*) (Jeong et al., 2020). HPAI A(H5N8) was also detected in a whooper swan (*Cygnus cygnus*) in China and a greylag goose (*Anser anser*) in Iran (Jeong et al., 2020) (Figure 21).

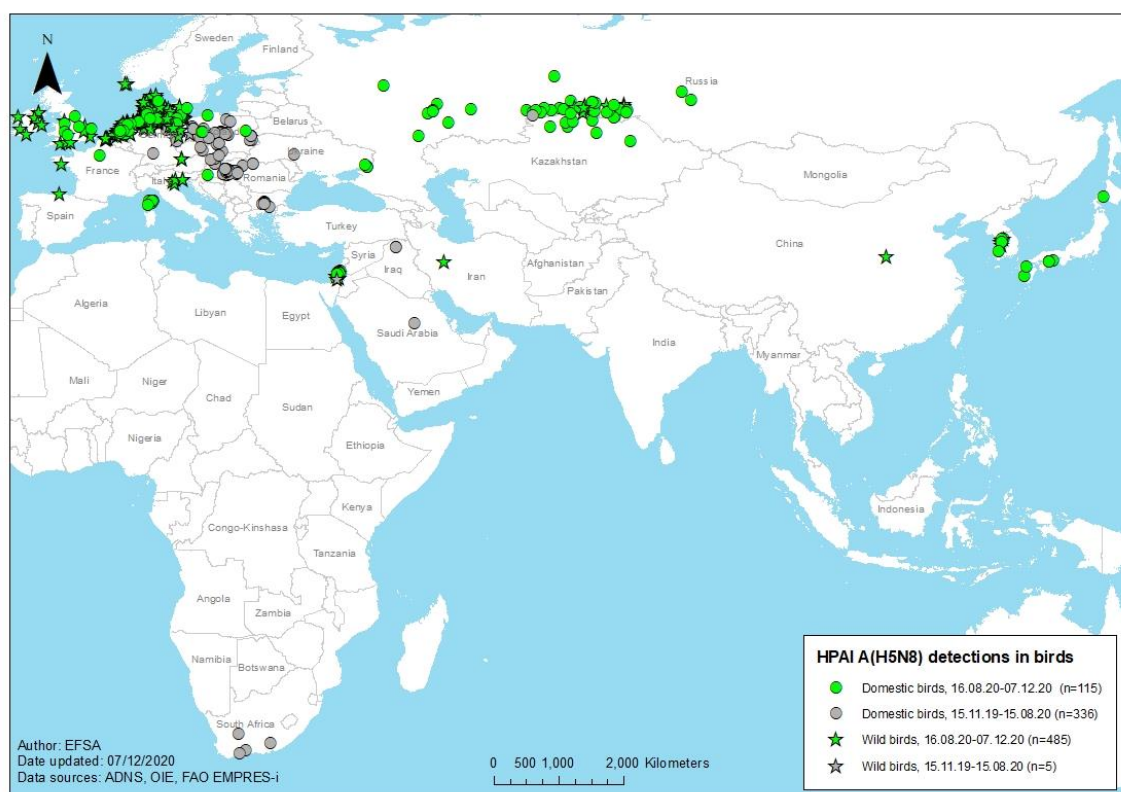


Figure 21: Geographical distribution, based on available geocoordinates, of confirmed HPAI A(H5N8) outbreaks in domestic birds (circles) and wild birds (stars) (n=941); green symbols indicate outbreaks that occurred between 16 August and 7 December 2020, grey symbols indicate outbreaks that occurred from 15 November 2019 to 15 August 2020, (FAO, online-a)

Genetic characterisation

The complete genomes of three HPAI A(H5N8) viruses, two identified in October in wild mandarin ducks in South Korea (Jeong et al., 2020) and one identified in November from an environmental sample in Japan, were deposited in the GISAID EpiFlu database. The viruses belong to clade 2.3.4.4b and all gene segments cluster together with the HPAI A(H5N8) viruses detected in west-central Europe in the first half of 2020.

4.4.5. HPAI-LPAI A(H7N9)

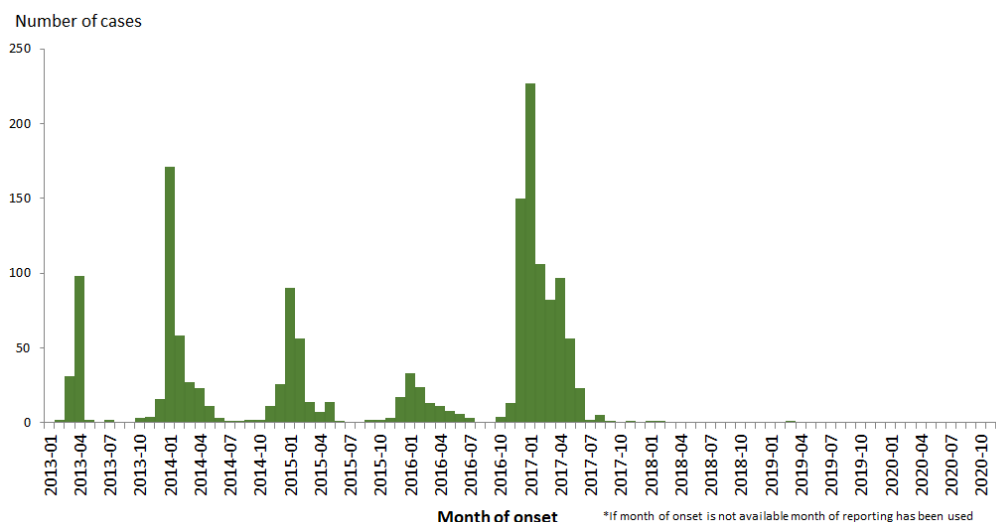
4.4.5.1. Domestic and wild birds

Detection

No LPAI or HPAI A(H7N9) cases were notified in poultry or wild birds within the relevant time period for this report. The last case was reported from Liaoning province, China, in March 2019. The nationwide A(H7N9) vaccination campaigns for poultry, with the exception of poultry in AI-free zones and export farms, started extensively in September 2017 (FAO, online-b).

4.4.5.2. Human infections due to A(H7N9)

No human cases due to avian influenza A(H7N9) have ever been reported from Europe and no human case has been reported globally since 2019 (WHO, 2020d, c). Since February 2013, a total of 1,568 human cases have been reported from outside of Europe (Figure 22), including at least 615 deaths (39%) (WHO, 2019a, b). Of all human cases, 32 have been infected with HPAI virus A(H7N9), 13 of them fatal, according to the Chinese National Influenza Center (Chinese National Influenza Center et al., 2018).



Source: ECDC line list (see Appendix B.2).

Figure 22: Number of human cases due to A(H7N9), infection by month and year of onset, 2013 – 2020 (n=1,568)

4.4.6. LPAI A(H9N2)

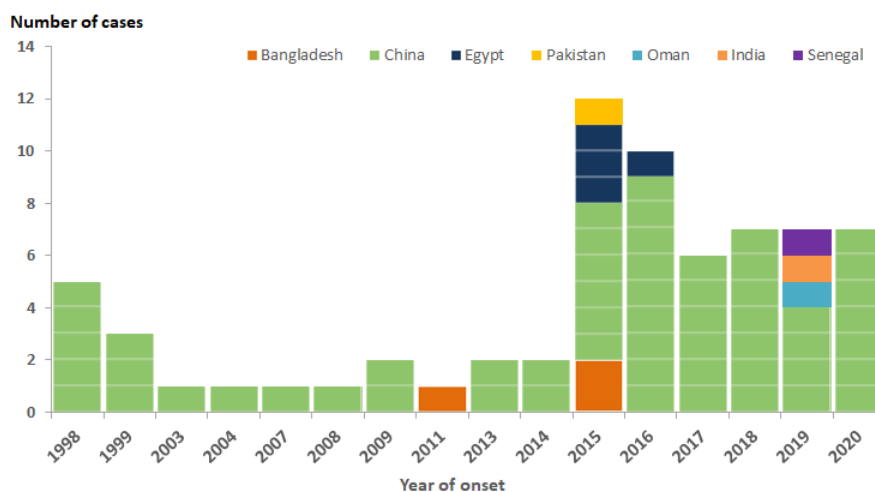
4.4.6.1. Domestic and wild birds

Detection

As mentioned in previous EFSA reports, A(H9N2) is the most commonly detected non-notifiable subtype of influenza virus in poultry in Asia, the Middle East and Africa (Zecchin et al., 2017; Bonfante et al., 2018; Chrzastek et al., 2018; Xu et al., 2018; Zhu et al., 2018; Awuni et al., 2019; Kariithi et al., 2019). The endemic status of these regions continued from 16 August to 7 December 2020.

4.4.6.2. Human infections due to A(H9N2)

Since the last EFSA report, one human case of infection in a three-year-old girl has been reported from China (CHP, 2020). Since 1998, and as of 10 December 2020, 68 laboratory-confirmed cases of human infection with avian influenza A(H9N2) virus, including one death, have been reported globally. Cases were reported from China (57), Egypt (4), Bangladesh (3), India (1), Oman (1), Pakistan (1) and Senegal (1) (ECDC line list; see Appendix B.2) (Figure 23). Exposure to live or slaughtered poultry or contaminated environment has been reported. The age group most affected by A(H9N2) infections in humans is children under 10 years of age (Figure 24).



Data source: ECDC line list; see Appendix B.2; (Peacock et al., 2019; Potdar et al., 2019; WHO, 2019b, 2020e, c; Taiwan Centers for Disease Control Press Releases, online; The Government of Hong Kong Special Administrative Region Press Release, online)

Figure 23: Distribution of confirmed human cases of A(H9N2) by reporting country, 1998 – 10 December 2020 (n=68)

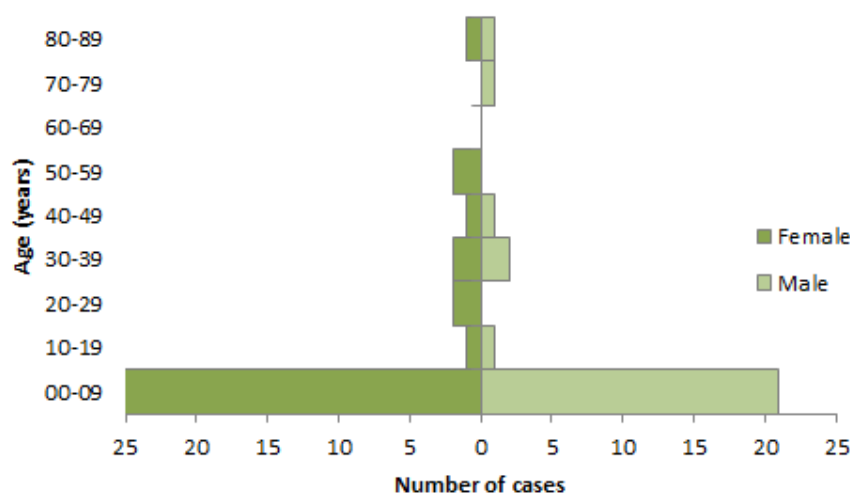


Figure 24: Distribution of confirmed human cases of A(H9N2) by age group, 1998 – 10 December 2020 (n=68)

4.5. Scientific analysis of avian influenza spread from non-EU/EEA countries and within the EU/EEA

Possible pathways by which avian influenza viruses can be brought into the EU have been described in previous EFSA reports (EFSA AHAW Panel, 2017; EFSA et al., 2018a; EFSA et al., 2018b). An assessment of the risk of further introductions of the avian influenza viruses to the EU/EEA, and spread within the EU/EEA, has been recently performed in an overview of the situation up to 19 November 2019 (EFSA et al., 2020b).

LPAI and HPAI influenza outbreaks in poultry and wild birds have been reported in several Asian countries and Russia (Table 4). Of note is that, in this reporting period, HPAI A(H5N8) and A(H5) outbreaks in poultry and in wild waterbirds were continuously (following detection in the period 16 May to 15 August 2020) reported in Russia, near the eastern and western border with Kazakhstan, and in north Kazakhstan. The presence of HPAI virus in western Russia and northern Kazakhstan is associated with the spread of the virus via wild birds migrating to the EU (EFSA AHAW Panel, 2017; EFSA et al., 2020a). Migration from breeding sites in the Russia/Kazakhstan region towards wintering sites in Europe is likely to continue and the risk of new virus introductions via migrating wild birds remains high.

Up to the date of this report, HPAI has been detected in wild birds and poultry in 15 European countries, with the most southern detections being in the non-professional poultry sector (petshops and backyards) in France, and in wild birds in Italy and Spain. The fact that: (1) some countries such as Spain and Ireland detected HPAI in wild birds (falcons) in the absence of mass mortalities (as observed in other affected countries), (2) wild birds which appeared to be healthy have been detected positive (i.e. Denmark, Italy and the Netherlands), and (3) some countries reported outbreaks in poultry before or in the absence of detections in wild birds, may indicate that the risk of further spread within Europe due to short distance movements of infected wild birds remains high. Also, the lack of HPAI A(H5) virus detections in wild birds in some areas may not indicate the absence of circulating viruses in the wild reservoirs. Under this scenario, active surveillance of wild birds and enhanced passive surveillance in poultry should be strengthened. The low temperatures of autumn and winter may increase wild bird movements and facilitate the environmental survival of avian influenza virus and the spread within

Europe. As a result, the risk of introduction of AI infection in poultry increases. The detection of outbreaks in breeder farms (where poultry are kept indoors, as observed in Denmark, the Netherlands and UK) highlights the risk of introduction via contaminated people.

Summarising, the HPAI A(H5) epidemic is still progressing in Europe. Its evolution to date and the observed high mortalities in wild birds resemble the pattern of transmission shown during the 2016-2017 HPAI A(H5N8) epidemic wave (Figure 3), in which wild migratory birds played a role as HPAI virus carriers.

Even though it is difficult to predict the spread and duration of these epidemics, the ongoing migration from breeding and staging sites to wintering areas, the observed high virus prevalence in healthy waterfowl in Germany, Italy, and the Netherlands, the possible establishment of infection in native sedentary birds, and the capacity of the virus to persist in the environment at winter temperatures (Ramey et al., 2020) suggests a high risk of further spread of HPAI A(H5) viruses in EU/EAA countries.

4.6. Surveillance and diagnosis of human infections and public health measures for prevention and control

4.6.1. Surveillance in the EU, diagnosis and options for public health control measures (in relation to the EU)

The measures outlined in the EFSA report for November 2017 – February 2018 (EFSA et al., 2018c) remain valid.

4.6.2. Candidate vaccine viruses

Candidate vaccine viruses (CVV) developed, under development or proposed are listed in a report from WHO (WHO, 2020g). In the latest report from October 2020, a new A(H5N6) clade 2.3.4.4g CVV antigenically like A/chicken/Vietnam/RAHO4-CD-20-421/2020 has been proposed.

4.7. ECDC risk assessment for the general public in the EU/EEA

The risk of zoonotic influenza transmission to the general public in EU/EEA countries remains very low. Transmission to humans of avian influenza viruses, detected in wild birds or poultry in Europe, has not been observed over the last few years. However, zoonotic transmission of avian influenza viruses cannot be fully excluded in general when avian influenza viruses are present in birds. The use of personal protective measures for people exposed to avian influenza viruses will minimise any residual risk. Overall, avian influenza virus transmission to humans is a rare event and the risk is considered very low for viruses adapted to avian species. However, people should avoid touching sick or dead birds or their droppings unprotected or wear personal protective equipment when in direct contact.

The risk of travel-related importation of human avian influenza cases from countries where the viruses are detected in poultry or wild birds is very low also considering the generally lower travel volume due to the ongoing COVID-19 pandemic. Sporadic human cases infected with A(H9N2) LPAI, or A(H5N1) or A(H5N6) HPAI viruses outside of Europe as reported in 2020 underline the risk of transmission whenever people are exposed to infected birds. Therefore, surveillance of avian influenza viruses in wild birds and poultry in the EU/EEA is important in order to detect newly introduced and circulating viruses and reduce the possible risk of exposure of humans to infected birds.

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Abbreviations

ADNS	Animal Disease Notification System
AI	Avian influenza
CVO	Chief Veterinary Officer
ECDC	European Centre for Disease Prevention and Control
EFSA	European Food Safety Authority
EEA	European Economic Area
EU	European Union
EURL	European Union Reference Laboratory
FAO	Food and Agriculture Organization
HPAI	Highly pathogenic avian influenza
LPAI	Low pathogenic avian influenza
OIE	World Organisation for Animal Health
SCOPAFF	Standing Committee on plants, animals, food and feed
TOR	Terms of reference
WHO	World Health Organization

Appendix A – Terms of reference

A.1. Background and terms of reference as provided by the requestor

Avian influenza is an infectious viral disease in birds, including domestic poultry. Infections with avian influenza viruses in poultry cause two main forms of that disease that are distinguished by their virulence. The low pathogenic (LPAI) form generally only causes mild symptoms, while the highly pathogenic (HPAI) form results in very high mortality rates in most poultry species. That disease may have a severe impact on the profitability of poultry farming.

Avian influenza is mainly found in birds, but under certain circumstances infections can also occur in humans even though the risk is generally very low.

More than a decade ago, it was discovered that virus acquired the capability to be carried by wild birds over long distances. This occurred for the HPAI of the subtype A(H5N1) from South East and Far East Asia to other parts of Asia, Europe and Africa as well as to North America. In the current epidemic the extent of the wild bird involvement in the epidemiology of the disease is exceptional.

Since late October 2016 up to early February 2017, highly pathogenic avian influenza (HPAI) of the subtype A(H5N8) has been detected in wild migratory birds or captive birds on the territory of 21 Member States, namely Austria, Belgium, Bulgaria, Croatia, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. In 17 Member States the virus has spilled over to poultry holdings leading also to lateral spread between holdings in a few Member States, in particular in those with a high density of duck and geese holdings where the poultry cannot sufficiently be protected against contacts with wild birds. A second HP AI subtype A(H5N5) has been detected in wild birds and recently also in poultry holdings in Germany.

The number of infected migratory wild birds found dead and the geographical extent of these findings are posing an immense threat for virus introduction into poultry or captive birds holdings as demonstrated by the high number of outbreaks (~700 as of 08/02/2017).

In the event of an outbreak of avian influenza, there is a risk that the disease agent might spread to other holdings where poultry or other captive birds are kept. As a result it may spread from one Member State to other Member States or to third countries through trade in live birds or their products.

There is knowledge, legislation⁵, technical and financial tools in the EU to effectively deal with outbreaks of avian influenza in poultry and captive birds. However, the very wide virus spread by wild birds and the increased risk of direct or indirect virus introduction into poultry or captive bird holdings has led to the largest HPAI epidemic in the EU so far. This situation calls for a reflection and evaluation how preparedness, risk assessment, early detection and control measures could be improved.

The Commission and Member States are therefore in need of an epidemiological analysis based on the data collected from the disease affected Member States. The use of the EFSA Data Collection Framework is encouraged given it promotes the harmonisation of data collection. Any data that is available from neighbouring third countries should be used as well, if relevant.

Therefore, in the context of Article 31 of Regulation (EC) No. 178/2002⁶, EFSA should provide the technical and scientific assistance to the Commission based on the following Terms of Reference (TOR):

⁵ Council Directive 2005/94/EC of 20 December 2005 on Community measures for the control of avian influenza and repealing Directive 92/40/EEC. OJ L 10, 14.1.2006, p. 16.

⁶ Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. OJ L 31, 1.2.2002, p. 1–24.

1. Analyse the epidemiological data on highly pathogenic avian influenza (HPAI) and low pathogenic avian influenza (LPAI), where co-circulating or linked within the same epidemic, from HPAI disease affected Member States.
2. Analyse the temporal and spatial pattern of HPAI and LPAI as appropriate in poultry, captive birds and wild birds, as well the risk factors involved in the occurrence, spread and persistence of the HPAI virus in and at the interface of these avian populations.
3. Based on the findings from the points above, describe the effect of prevention and control measures.
4. Provide for regular quarterly reports updating on the avian influenza situation within the Union and worldwide, in particular with a view to describe the evolution of virus spread from certain regions towards the EU. In case of significant changes in the epidemiology of avian influenza, these reports could be needed more frequently. These reports should in particular closely follow the developments of zoonotic avian influenza viruses (such as HPAI A(H5N6) and LPAI A(H7N9)) in collaboration with the European Centre for Disease Prevention and Control (ECDC).

A.2. Interpretation of the terms of reference

In reply to TOR 1 and TOR 2, this scientific report gives an overview of the HPAI and LPAI outbreaks in poultry, captive and wild birds detected in Europe between 16 August and 7 December 2020 and reported by Member States and neighbouring countries via ADNS. Member States, where avian influenza outbreaks occurred in poultry, submitted additional epidemiological data to EFSA, which have been used to analyse the characteristics of the affected poultry establishments.

It was not possible to collect data for a risk factor analysis on the occurrence and persistence of HPAI virus within the EU. Risk factor analysis requires not only case-related information, but also data on the susceptible population (e.g. location of establishments, population structure), which should be collected in a harmonised manner across the EU. Limitations in the data collection, reporting and analysis were explained in the first AI overview report (EFSA AHAW Panel, 2017).

If HPAI outbreaks in poultry are detected in the EU, a description of the applied prevention and control measures (TOR 3) is given in the case report provided by representatives from the affected Member States and attached as an annex. Information were collected for outbreaks occurred from 15 August up to 24 November. The main topics covered are increasing awareness, release and repeal of housing orders, strengthening biosecurity, preventive culling, implementation of a regional standstill, bans on hunting and derogations from restriction zone implementation after a risk assessment.

Monitoring of the AI situation in other countries (TOR 4) is based on data submitted via the OIE or reported to the FAO. The description focuses only on findings of avian influenza viruses occurring in countries that are considered to be of epidemiological interest for the EU/EEA and UK or of public health relevance, specifically on HPAI A(H5N1), HPAI A(H5N2), HPAI A(H5N5), HPAI A(H5N6), HPAI A(H5N8), HPAI/LPAI A(H7N9) and LPAI A(H9N2). The background and epidemiology, detections, phenotypic and genetic characterisations are described based on information from confirmed human, poultry and wild bird cases that occurred between 16 August and 7 December 2020. Possible actions for preparedness in the EU are discussed.

This report mainly describes information that became available since the publication of the EFSA report for the period May – August 2020 (EFSA et al., 2020d) and that might affect the interpretation of risks related to avian influenza introduction and/or spread in Europe.

Appendix B – Data and methodologies

B.1. Data on animals

B.1.1. Overview of avian influenza outbreaks in Europe (TOR 1 and TOR 2)

Data on the avian influenza outbreaks that occurred in Europe from 16 August to 7 December 2020 submitted by Member States to the ADNS (European Commission, online-b) were taken into account for this report. In addition, HPAI-affected Member States were asked to provide more detailed epidemiological data directly to EFSA on the avian influenza outbreaks that occurred in poultry during the same period.

The information, which EU Member States affected by HPAI and LPAI presented to the Standing Committee on Plants, Animals, Food and Feed (SCOPAFF) meetings, and the evidence on HPAI and LPAI outbreaks provided in the info notes from the affected Member States to the European Commission, were consulted to extract the relevant information which is reported in Section 4.2.2. The PDFs of the SCOPAFF presentations are available on the European Commission website (European Commission, online-a).

The public GISAID's EpiFlu Database was accessed to download newly released avian influenza sequences.

A descriptive analysis of the data collected is reported in Section 4.2.

B.1.2. Overview of avian influenza outbreaks in other countries not reporting via ADNS (TOR 4)

Data from FAO EMPRES-i (FAO, online-a) on HPAI A(H5N1), HPAI A(H5N2), HPAI A(H5N5), A(H5N6), A(H5N8), HPAI and LPAI A(H7N9) in domestic, captive and wild birds, and environmental samples, were used to describe and to map the geographical distribution of avian influenza cases in domestic and wild birds in Africa, Asia and Europe on the basis of the observation dates. Data were extracted on 7 December 2020. Also, OIE WHAIS (OIE, online-a) was consulted on 7 December to complement the information reported by FAO. With the purpose of avoiding over-complication of the maps, captive birds and environmental samples have been mapped as domestic birds. Although some of these kept animals may be wild species, in most of the cases captive birds, or, for environmental samples, the birds from which samples have been taken (mainly at live market-places) will not move around and not spread the infection by migrating and for this reason have been considered as domestic birds in the maps provided in this report. Only when there was a strong discrepancy between the locality, the administrative regions and geocoordinates, and the outbreaks were not officially reported to the OIE, the outbreaks were not taken into account in the analysis.

B.2. Data on humans

The numbers of human cases due to infection with AI viruses have been collected by ECDC. Multiple sources are scanned regularly as part of epidemic intelligence activities at ECDC to collect information about laboratory-confirmed human cases. Data were extracted and line lists developed to collect case-based information on virus type, date of disease onset, country of reporting, country of exposure, sex, age, exposure, clinical information (hospitalisation, severity) and outcome. All cases included in the line list and mentioned in the document have been laboratory-confirmed. Data are continuously checked for double entries and validity. The data on human cases cover the full period of time since the first human case was reported. Therefore, data on human cases refer to different time periods and are included irrespective of whether there have been any new human cases during the reporting period.

B.3. Data on wild birds

Table A.1: Wild birds species reported to ADNS as HPAI detection up to 7 December 2020, 18 pm

Category of wild bird species	Wild bird specie	Country from where the HPAI detection in the wild bird species where reported (NL: observed mortality in one week: 31 October to 6 November; raw data; source: working group AImpact2021)	Number of HPAI detections where the wild bird species was reported*	Total number of HPAI detections where the wild bird species was reported*
Waterfowls	Barnacle goose (<i>Branta leucopsis</i>)	Denmark (n=32), Germany (n=142), Netherlands (n=7), Sweden (n=1)	182	384
	Greylag goose (<i>Anser anser</i>)	Denmark (n=3), Germany (n=65), Netherlands (n=10), United Kingdom (n=2)	80	
	Eurasian wigeon (<i>Mareca penelope</i>)	Denmark (n=1), Germany (n=29), Italy (n=3), Netherlands (n=4), United Kingdom (n=1)	38	
	Mallard (<i>Anas platyrhynchos</i>)	Denmark (n=1), Germany (n=20), Italy (n=2), Netherlands (n=3)	26	
	Mute swan (<i>Cygnus olor</i>)	Belgium (n=1), Germany (n=1), Ireland (n=3), Netherlands (n=11), Slovenia (n=1), United Kingdom (n=3)	22	
	Bean goose (<i>Anser fabalis</i>)	Denmark (n=1), Germany (n=4), Netherlands (n=2)	7	
	Canada goose (<i>Branta canadensis</i>)	Belgium (n=1), Germany (n=2), United Kingdom (n=3)	6	
	Greater white-fronted goose (<i>Anser albifrons</i>)	Belgium (n=1), Denmark (n=1), Germany (n=1), Netherlands (n=1)	4	
	Cygnus sp	Germany (n=3)	3	
	Black swan (<i>Cygnus atratus</i>)	United Kingdom (n=1)	1	
	Brent Goose (<i>Branta bernicla</i>)	Denmark (n=1), France (n=1), Germany (n=2), United Kingdom (n=1)	5	
	Common eider (<i>Somateria mollissima</i>)	Denmark (n=1), Germany (n=1)	2	
	Eurasian teal (<i>Anas crecca</i>)	Germany (n=1), Italy (n=3), Netherlands (n=1)	5	
	Pink footed goose	Belgium (n=1), Denmark (n=1), Norway (n=2)	4	
	Common moorhen	Denmark (n=1),	1	
	Egyptian goose	Belgium (n=1),	1	
	Eurasian coot	Germany (n=1)	1	
	Gadwall	Denmark (n=1)	1	
	Great crested grebe	Belgium (n=1)	1	
	Whooper swan (<i>Cygnus cygnus</i>)	Ireland (n=1)	1	
	Charadriidae	Germany (n=1)	1	
	Pintail (<i>Anas acuta</i>)	Italy (n=1)	1	
	Shelduck (<i>Tadorna tadorna</i>)	United Kingdom (n=1)	1	
Raptors	Common buzzard (<i>Buteo buteo</i>)	Denmark (n=7), Germany (n=18), Netherlands (n=3)	28	59
	Peregrine falcon (<i>Falco peregrinus</i>)	Denmark (n=4), Germany (n=5), Ireland (n=2), Spain (n=1), Sweden (n=1)	13	
	Eurasian sparrowhawk (<i>Accipiter nisus</i>)	Denmark (n=1), Germany (n=1)	2	
	Accipitriformes	Germany (n=2)	2	
	Common kestrel (<i>Falco tinnunculus</i>)	Germany (n=4)	4	

	Eurasian eagle-owl (<i>Bubo bubo</i>)	Germany (n=5)	5	
	Falco sp	Germany (n=1)	1	
	Short-eared owl (<i>Asio flammeus</i>)	Netherlands (n=1)	1	
	White-tailed eagle (<i>Haliaeetus albicilla</i>)	Germany (n=1)	1	
	Tawny owl (<i>Strix aluco</i>)	Germany (n=15)	1	
	Strigiformes	Germany (n=1)	1	
Other wild bird species	Unspecified gull	Germany (n=7)	15	62
	Numenius sp	Germany (n=8)	8	
	Curlew (<i>Numenius arquata</i>)	Belgium (n=2), Denmark (n=1), Ireland (n=1), Netherlands (n=1)	5	
	European herring gull (<i>Larus argentatus</i>)	Belgium (n=1), Denmark (n=5), Germany (n=10)	16	
	Great black-backed gull (<i>Larus marinus</i>)	Germany (n=3), Norway (n=1)	4	
	Black-headed gull (<i>Chroicocephalus ridibundus</i>)	Denmark (n=1), Germany (n=5)	6	
	Crane (<i>Grus grus</i>)	Germany (n=1)	1	
	Eurasian oystercatcher (<i>Haematopus ostralegus</i>)	Germany (n=1)	1	
	Great cormorant (<i>Phalacrocorax carbo</i>)	Netherlands (n=1)	1	
	Curlew sandpiper (<i>Calidris ferruginea</i>)	Germany (n=1)	1	
	Eurasian magpie (<i>Pica pica</i>)	Belgium (n=1)	1	
	Gruidae	Germany (n=1)	1	
	Common pheasant (<i>Phasianus colchicus</i>)	Denmark (n=1)	1	
	Common wood pigeon (<i>Columba palumbus</i>)	Belgium (n=1)	1	
Unknown wild bird specie	Unknown	Germany (n=1), United Kingdom (n=4)	5	5
Total				510

Data source: ADNS (7 December, 17 pm)

* Note that on one single reported detection of HPAI in wild birds more than one wild bird species can be involved

Annex A – Applied prevention and control measures on avian influenza

Scope

This document provides a brief overview of specific prevention and control measures applied in the Croatia, Denmark, the Netherlands, Poland, Sweden, the United Kingdom from 16 August to 24 November 2020 in relation to avian influenza outbreaks in poultry and in wild birds. There is only information provided that is relevant to the implementation of measures such as increasing awareness of stakeholders and the general public, housing order, strengthening biosecurity measures (other than poultry confinement), preventive culling, regional stand still, derogations on restriction zone implementation after risk assessment, hunting or any other relevant measures that have been applied. This document is made to support the EFSA working group in generating an overview on the application of the selected measures at EU level.

Timing of the applied prevention and control measures

Tables A.1–A.6 provide timelines for the main events that triggered actions in relation to the selected prevention and control measures in Croatia, Denmark, the Netherlands, Poland, Sweden and the United Kingdom. More information on the actions taken is provided in the sections below the tables.

A.1 Croatia

Tihana Miškić

Ministry of Agriculture

Timing of the applied prevention and control measures

Table A.1 provides a timeline on the main events that triggered actions in relation to the selected prevention and control measures. More information on the actions taken is provided in the sections below.

Table A.1: Overview of main actions

Date	Event that triggered action	Type of action taken
17/11/2020	Suspicion on HPAI (increased mortality) received from the owner of the farm	Samples from one establishment out of 10 on the farm were taken by authorized veterinary organization and sent to the National referent laboratory (NRL) for testing.
18/11/2020	Confirmation of AI subtype H5N8	National referent laboratory confirmed AI subtype H5N8.
	Sampling and testing	Samples taken from other 9 establishments and sent on laboratory testing.
19/11/2020	Protection and surveillance zone	Veterinary authority established protection and surveillance zone.
20/11/2020	Culling of susceptible animals	Veterinary inspection ordered culling and destroying of all susceptible poultry on the farm.
21/11/2020	Confirmation of HPAI	NRL confirmed HPAI subtype H5N8.
25/11/2020	Epidemiological investigation	Conducting of expanded epidemiological investigation.
26/11/2020	Culling of animals	Culling of all susceptible animals from the farm (67 068 turkey) is finished.
30/11/2020	Safety disposal	All dead and culled animals are dispatched in processing plant for disposal.
ongoing	Measures in accordance with Directive 2005/94/EC	Listing of holdings, taking samples and laboratory testing in accordance with Directive 2005/94/EC.
ongoing		Disposal of bedding, cleaning and disinfection of holding etc.

Increasing awareness of the stakeholders and the general public

Brief description of the communication /activities during 2020:

- Continuously publishing summary of epidemiological situation related to AI, recommendations to the poultry producers and other relevant information on official web- site of Ministry of Agriculture and Veterinary and Food Safety Directorate (<http://www.veterinarstvo.hr/>),
- Preparing information for general public via social media,
- Continuously informing of authorized veterinarians about signs of disease, reporting of suspicion and confirmation of the disease, epidemiological situation in neighbouring countries, transmission of knowledge about AI to the animal owners via e- mails,
- Written communication with Croatian hunting association in order to increase awareness among hunters.

Housing order

Annual order on measures to protect animal health from infectious and parasitic diseases and the financing thereof (NN 7/20) prescribes obligatory biosecurity measures for poultry producers keeping 5000 birds and more.

Order on measures for preventing occurrence and control of spread of avian influenza in the Republic of Croatia (Official Gazette, No 127/20) applied from 18th November 2020, prescribes obligatory detention of poultry and game birds in fenced areas in such a way that any contact with wild birds is prevented.

Order on measures for preventing occurrence and control of spread of avian influence in protection and surveillance areas of the Republic of Croatia (Official Gazette, No 130/20) from November 25th 2020, in accordance with the Directive 2005/94/EC, has set implementation of the restrictive measures in restricted areas:

- Obligatory detention of poultry and game birds in closed enclosures.
- Compulsory separate keeping of ducks, geese and/or other water birds from other poultry.

Strengthening biosecurity measures (other than housing order)

Order on measures for preventing occurrence and control of spread of avian influence in the Republic of Croatia (Official Gazette, No 127/20) prescribes for the whole territory of Croatia following:

- Obligatory keeping of feeders and drinkers for poultry, game birds and birds in captivity in closed or covered areas, which prevents the landing and the contact of wild birds with food and water.
- Mandatory storage of feed intended for poultry, game birds and captive birds in facilities protected from the access of wild birds and rodents
- The water supply of poultry, game birds and captive birds with water from surface water tanks to which wild birds have access, or outdoor water tanks, unless protected from the access of wild waterfowl, is prohibited.
- It is mandatory to keep poultry and game birds at fairs, markets, exhibitions, shows and cultural events indoors or closed pens without the possibility of contact with other animals and wild birds. Mandatory implementation and maintenance of hygienic conditions and biosecurity measures in all facilities for breeding and rearing poultry, game birds and captive birds as well as at fairs, markets, exhibitions, shows and cultural events and on all locations on which poultry, game birds and captive birds temporarily stay.

In Order on measures for preventing occurrence and control of spread of avian influence in protection and surveillance areas of the Republic of Croatia (Official Gazette, No 130/20), these measures are more stringently prescribed for the restricted area, with addition of:

- Prohibition of holding of fairs, exhibitions, sports competitions and all other gatherings of poultry, game birds and birds at markets, events and cultural events, including bird flying competitions. More rigorous cleansing and disinfection of all the vehicles used for transportation of poultry, hatching eggs, farmed and wild game, or captive birds, their products and by-products, including carcasses

- More stringent implementation and maintenance of hygienic conditions and biosecurity measures in all facilities for breeding and rearing poultry, game birds and captive birds, including:
 - use of personal protective equipment,
 - disinfection of hands and footwear upon entering the facility,
 - cleaning, washing and disinfection of footwear upon leaving the facility,
 - it is forbidden to leave the building in the same protective clothing and footwear,
 - ban of entry of unauthorized personnel into the facility,
 - disinfection of facilities and equipment in accordance with technological requirements, using approved disinfectant in the prescribed concentration,
 - storage of animal feed and litter in facilities protected from access of wild birds and rodents

Preventive culling

Not applicable.

Regional stand still (beyond the restriction zones specified in the EU Regulation)

Establishment of restricted areas, including the protection zone (3 km radius) and surveillance zone (10 km radius) on November, 19th 2020. Zoning details are published in Annex to Commission implementing decision (EU) 2020/1809 of 30 November 2020 concerning certain protective measures in relation to outbreaks of highly pathogenic avian influenza in certain Member States. Zoning and restrictive measures will remain in place for the protection zone until December 31st 2020 and for the surveillance zone until January 10th 2021.

Regional stand still (beyond the restriction zones specified in the EU Regulation) is not implemented.

Derogations on restriction zone implementation after risk assessment

Not applicable

Hunting

Hunting is allowed, only recommendations are given to improve biosecurity during and after the hunt. Individuals engaged in hunting must avoid contact with domestic poultry and must adhere to all biosecurity measures. It is recommended to avoid staying in the areas of nature where wild birds are gathered by the time of duration the measures determined by the Order on measures for preventing occurrence and control of spread of avian influence in the Republic of Croatia. Hunters are obliged to report all changes in the health status and behavior of poultry, game birds and captive birds.

A.2 Denmark

Pernille Dahl Nielsen

Danish Veterinary and Food Administration

Timing of the applied prevention and control measures

Table A.2 provides a timeline on the main events that triggered actions in relation to the selected prevention and control measures. More information on the actions taken is provided in the sections below.

Table A.2: Overview of main actions

Date	Event that triggered action	Type of action taken	Target audience (if applicable)
30/09/2020	Avian influenza alert from European Centre for Disease Prevention and Control	11/10/2020: assessment of the avian influenza situation in Europe done by Danish Veterinary Consortium. 15/10/2020: information to the poultry industry about the avian influenza situation. 19/10/2020: press release to increase the public awareness of avian influenza, biosecurity and how to contact the Danish Veterinary and Food Administration (DVFA) in case of findings of dead wild birds. Also updated information on the DVFA's homepage.	Poultry associations, general public, etc.
21/10/2020 - 04/11/2020	Outbreaks of HPAI in wild birds and poultry holdings in Germany, Netherlands and UK	03/11/2020: first meeting in the national AI expert group (weekly meetings thereafter) 5/11/2020: rapid risk assessment performed. Risk level for introduction of HPAI by wild birds: <u>High</u> 6/11/2020: mandatory housing order for poultry and other captive birds Fairs, markets, shows or other gatherings of poultry or other captive birds were prohibited in the whole country.	Poultry associations, general public, etc.
05/11/2020	First detection of HPAI H5N8 in a wild bird in Denmark	Press release to increase the public awareness of avian influenza, biosecurity and how to contact the Danish Veterinary and Food Administration (DVFA) in case of findings of dead wild birds.	Poultry associations, general public, etc.
16/11/2020	First outbreak of HPAI in a poultry holding in Denmark in the municipality of Randers.	Stamping out of all poultry at the infected holding. Establishment of a protection and surveillance zone of 3 and 10 km around the holding and implementation of the necessary measures in accordance with Council Directive 2005/94/EC. Destruction of hatching eggs delivered to a hatchery from the infected farm	Poultry associations and poultry holdings in the zone.
16/11/2020	Outbreak of HPAI in a poultry holding in Germany close to the Danish border. The German surveillance zone extends into the Danish territory	Establishment of a Danish surveillance zone in the municipality of Tønder with implementation of the necessary measures in accordance with Council Directive 2005/94/EC.	Poultry associations and poultry holdings in the zone.
19/11/2020	Changes of criteria for an avian influenza suspicion	newsletter sent out	Official and private veterinarians. National Reference Laboratory

Increasing awareness of the stakeholders and the general public

DVFA has continuously informed the public and stakeholders about the situation using press releases, news and facts updates on the Danish Veterinary and Food administration (DVFA) homepage, and Facebook. The staff of the DVFA call centre are prepared for answering questions from the public (via FAQ's).

Representatives from the poultry industry participate in meetings in the AI expert group, giving the opportunity to exchange useful information and reach the stakeholders quickly.

DVFA uses the app for smartphones called "FugleinfluenzaTip" ("Bird flu Tip") in order to make it easier for the public to notify the DVFA in case of findings of dead wild birds. This app allows citizens to send exact data about findings of dead wild birds including the location and a photo. The submitted data are directly transferred to the DVFA wild bird database and allocated for collection by the Veterinary

Inspection Units. The avian influenza situation in wild birds can be followed on the [Danish avian influenza database](#).

Due to the avian influenza situation and experience from the avian influenza outbreak on 16 November, DVFA decided to change the criteria for reporting a suspicion of avian influenza. Changes in production parameters and mortality that would normally only raise an 'early warning' of AI will now result in a suspicion and handled very quickly. Both private and official veterinarians have been informed about this including the National Reference Laboratory.

Criteria for an "early warning" (now suspicion):

Event of one or more of the following incidents in the herd:

- 1) A decrease in intake of feed or water of more than 20% within a day.
- 2) A decrease in egg production, in addition to the normal production level, of a total of more than 5% over two days.
- 3) An excess mortality of 3% within three days in relation to the expected mortality for the type of poultry and age in question.

Housing order

The DVFA has followed a pre-determined strategy for implementation of measures in case of an HPAI epidemic. A Rapid risk assessment performed after findings of HPAI in several wild birds in the Northern part of Germany resulted in the risk level being raised from very low to high. Consequently, a housing order was implemented on 6 November 2020 applicable for the whole country. The DVFA considers Denmark as one risk area due to its small size, the geographical position with many resting migratory birds, the long coastline and wide areas with wetlands and fjords.

The housing order is applicable for all production categories including zoos, professional and non-professional poultry holdings including other captive birds. The definition of housing: poultry/other captive birds have to be kept inside or fenced under roof, net or wire. Ducks, geese and ostriches are excepted from covering if wild birds effectively can be prevented from landing in the enclosure using other methods. Enclosures $\leq 40 \text{ m}^2$ are also excepted from covering. Furthermore, Zoo birds vaccinated against avian influenza are excepted from the requirements.

The housing order is implemented based on a national legal act. Information to the public is given through the media (press release), the DVFA homepage and Facebook.

Housing order:

<https://www.retsinformation.dk/eli/lt/2020/1707>

Press release:

<https://www.foedevarestyrelsen.dk/Nyheder/Aktuelt/Sider/Pressemeddelelser%202020/F%C3%B8devarestyrelsen-advarer-om-h%C3%B8j-risiko-for-fugleinfluenza.aspx>

Strengthening biosecurity measures (other than housing order)

On 6 November 2020, fairs, markets, shows or other gatherings of poultry or other captive birds were prohibited in the whole country.

Regardless of the AI situation, the following risk mitigation measures always have to be followed in all poultry farms:

- Poultry or other captive birds must be fed and watered indoors or under fixed roofs or fixed coverings, ensuring that larger wild birds cannot get into contact with the feed and water.
- Poultry and other captive birds are not allowed to have access to surface water or rainwater.
- Ponds/lakes in outdoor poultry areas have to be shielded from larger wild birds.
- Ducks and geese have to be kept physical separated from other poultry.

Preventive culling

Hatching eggs delivered to a hatchery from the infected farm in the incubations period were destructed as a preventive action based on a risk assessment made by the [Danish Veterinary Consortium](#).

Regional stand still (beyond the restriction zones specified in the EU Regulation)

Has not been applied.

Derogations on restriction zone implementation after risk assessment

Has not been applied.

Hunting

Is still allowed

A.3 The Netherlands

M.A.H. Spierenburg DVM LLM

Netherlands Food and Consumer Product Authority (NVWA), Ministry of Agriculture, Nature and Food Quality (Min LNV)

Timing of the applied prevention and control measures

Table A.3 provides a timeline on the main events that triggered actions in relation to the selected prevention and control measures. More information on the actions taken is provided in the sections below.

Table A.3: Overview of main actions

Date	Event that triggered action	Type of action taken
20/10/2020	First HPAI positive wild bird finding On Oktober 17th, 1 Mute Swan (<i>Cygnus Olor</i>) was found dead in a wetland area. On Oktober 20th the national reference laboratory confirmed HPAI Virus H5N8 in the samples from the Swan.	Measurements for the whole country: As of 20th of October 2020: 1: housing order commercial poultry confinement and housing order hobby birds and other non-commercial captive birds confinement. 2: Measures regarding cover and application of litter on duck holdings.
28/10/2020	First outbreak HPAI serotype H5N8 positive commercial poultry holding (parent breeding)	<p>Measurements for protection and surveillance zone: as of 28th of October 2020 Culling HPAI positive commercial poultry holding, implement protection (3km) zones and surveillance (10km) zones around HPAI positive commercial poultry holding with transport restrictions for all birds inclusive commercial poultry and poultry products, sperm, manure and feed as well transport restrictions for domestic mammals, feed, sperm, milk and manure of these domestic mammals. Ban hunting ducks or to hunt in general in wet areas with waterfowl</p> <p>Measurements for the whole country: as of 28th of October 2020 next measures were also implemented: 3: ban for visit commercial poultry holdings and other holdings or locations where birds are held. 4: mandatory visitors registration, 5: ban races and exhibitions with birds, 6: ban hunting ducks or to hunt in general in wet areas with waterfowl 7: mandatory clinical examination of birds for transport to or from commercial poultry holdings 8: mandatory intensive clinical examination ante mortem of ducks and turkeys at slaughterhouses, 9: using a hygiene protocol for visiting of commercial poultry holdings, 9: Increasing awareness, repeal housing order (commercial poultry confinement), strengthening biosecurity, intensified wild bird monitoring</p>

04/11/2020	Second outbreak HPAI serotype H5N8 positive commercial poultry holding (Laying hen holding)	Measurements for protection and surveillance zone: same as above. Measurements for the whole country: same as above.
09/11/2020	Third outbreak HPAI serotype H5N8 positive commercial poultry holding (Laying hen holding)	
13/11/2020	Fourth outbreak HPAI serotype H5N8 positive commercial poultry holding (Fattening duck holding)	
20/10/2020-15/11/2020	30 HPAI H5N8 positive wild bird findings and 4 HPAI H5N1 positive wild bird findings	
21/11/2020	Fifth outbreak HPAI serotype H5N8 positive commercial poultry holding (Fattening chicken broiler holding)	
22/11/2020	Sixth outbreak HPAI serotype H5N8 positive commercial poultry holding (Laying hen holding)	

Increasing awareness of the stakeholders and the general public

Development of biosecurity measures during crisis in contact with poultry sector. Communication both by Ministry and poultry sector like as follows: Directly published on government website (www.rijksoverheid.nl): Legal information/Information to Parliament / Information for press / Questions & Answers / Phone center for questions from both poultry owners and general public, in direct contact with poultry advisors / Communication department in close contact with press / Meeting for all stakeholders and communication by media with general public.

Housing order

The housing order was implemented in mandatory national legislation as 20th of October 2020 after an executed risk assessment by the Commission of animal disease experts which consists of this matter of Avian Influenza experts. This Commission advise the Chief Veterinary Officer and The Minister to introduce measures against HPAI. The trigger of implementing the housing order was the HPAI H5N8 wild bird finding (1 Mute Swan (*Cygnus Olor*) was found dead in a wetland area) as 20th of October 2020.

Strengthening biosecurity measures (other than housing order)

We have concluded multiple years service level agreements with suppliers who can deliver cleaning and disinfection equipment 24H/7days within 4 hours after calling by Dutch government for culling on every location in the whole country.

Preventive culling

It was applied in the second outbreak HPAI serotype H5N8 positive commercial poultry holding (Laying hen holding) as 4th of November 2020, there was one other commercial poultry holding in the 1 km zone (chicken breeding holding) which was preventive culled. In the first and third outbreaks there were no other commercial poultry holdings in the one kilometer radius zone around the index holdings. In the fourth outbreak there was one other poultry holding in the 1 km zone but this poultry holding was not culled because this holding was more than 500 metres from the index holding and there were no other poultry holdings in the 1 km zone of this holding and the screening test results were PCR and serology AI tested negative.

Regional stand still (beyond the restriction zones specified in the EU Regulation)

No, only the 1km/ 3km and 10 km zones (protection and surveillance zones).

Derogations on restriction zone implementation after risk assessment

No

Hunting

There is a ban implemented hunting ducks or to hunt in general in wet areas with waterfowl

A.4 Poland

Katarzyna Wawrzak and Magdalena Gawędzka

General Veterinary Inspectorate

Timing of the applied prevention and control measures

Table A.4 provides a timeline on the main events that triggered actions in relation to the selected prevention and control measures. More information on the actions taken is provided in the sections below.

Table A.4: Overview of main actions

Date	Event that triggered action	Type of action taken	Target audience (if applicable)
19/10/2020	EFSA alert on HPAI in Russia and Kazakhstan	Increasing awareness	Local level of veterinary authority, poultry associations and general public
October-November 2020	Notifications by ADNS system on HPAI in other EU countries	Increasing awareness	Local level of veterinary authority, poultry associations and general public
November 2020	Publication of risk analysis on HPAI prepared by National Veterinary Research Institute in Puławy	Increasing awareness	Local level of veterinary authority, poultry associations and general public
24/11/2020	First outbreak was confirmed in Poland in commercial farm keeping laying hens on the base of test results obtained from NRL in Puławy in relation to samples taken due to notification of farmer on higher mortality	Notification by ADNS system. Internal notification.	NRL/ local and central level of veterinary authority/EC/general public
27/11/2020	Increasing number of ADNS notifications by other EU countries on HPAI in wild birds	Recommendation to increase monitoring in wild birds	Local level of veterinary authority

Increasing awareness of the stakeholders and the general public

Information published on the website of the General Veterinary Inspectorate: <https://www.wetgiw.gov.pl/nadzor-weterynaryjny/grypa-ptakow>

Trainings organized by poultry associations with veterinary services.

Housing order

Orders and prohibitions for poultry breeders in protection and risk zones designated around HPAI outbreaks are set out in the Regulation of the Minister of Agriculture and Rural Development of December 18, 2007 on eradication of avian influenza (implementation of Council Directive 2005/94 / EC).

Requirements in the field of biosecurity applicable to poultry breeders throughout the country are set out in the Regulation of the Minister of Agriculture and Rural Development of April 4, 2017 on the ordinance of measures related to the occurrence of highly pathogenic avian influenza. This regulation imposes the following obligations on breeders:

- an order to keep poultry in a way that limits its contact with wild birds,

- reporting to the District Veterinary Officer places where poultry or other birds are kept, excluding birds kept permanently in living quarters,
- keeping the poultry in a way that excludes its access to water bodies to which wild birds have access,
- storing bird feed in a way that prevents contact with wild birds and their droppings,
- feeding and watering poultry and captive birds in a manner that protects feed and water from access by wild birds and their droppings,
- laying disinfection mats in front of the entrances and exits of livestock buildings in which poultry is kept, in a number ensuring the security of entrances and exits from these buildings - in the case of farms where poultry is kept in a non-running system,
- use by persons entering livestock buildings in which poultry is kept, protective clothing and safety footwear, intended for use only in the given building - in the case of farms where poultry is kept in a non-running system,
- personal hygiene rules applied by persons performing poultry handling operations, including washing hands before entering livestock buildings,
- cleaning and disinfection of equipment and tools used for handling poultry before each use,
- abstentions by persons who have participated in hunting birds in the last 72 hours from carrying out poultry-handling activities,
- carrying out daily inspections of poultry flocks and keeping records containing, in particular, information on the number of dead birds, decrease in feed intake or lay.
- a ban on watering poultry and birds kept by humans with water from tanks to which wild birds have access, and
- a ban on bringing (on foot or by vehicle) to the holding where poultry is kept, corpses of wild birds or carcasses of game birds.

Strengthening biosecurity measures (other than housing order)

The Regulation of the Minister of Agriculture and Rural Development of April 4, 2017 regarding the ordinance of measures related to the occurrence of highly pathogenic avian influenza introduces into the territory of the Republic of Poland, among others an order to keep the poultry in a way that limits its contact with wild birds or to store feed for birds in a way that prevents contact with wild birds and their droppings. The measures specified in the provisions of this Regulation are also applied during the outbreak of highly pathogenic avian influenza in the territory of the Republic of Poland.

The Chief Veterinary Officer in message informing about outbreak reminds poultry farmers about the necessity to follow biosecurity principles when handling poultry:

<https://www.wetgiw.gov.pl/main/komunikaty/-Glowny-Lekarz-Weterynarii-informuje-o-wyznaczeniu-ogniska-wysoce-zjadliwej-grypy-ptakow-HPAI-u-drobiu/idn:1520>

In addition, information on avian influenza is available on the website of the Chief Veterinary Officer (link: <https://www.wetgiw.gov.pl/nadzor-weterynaryjny/grypa-ptakow>), including a description of biosecurity rules (<https://www.wetgiw.gov.pl/nadzor-weterynaryjny/zasady-ochrony-drobiu-przed-grypa-ptakow>)

Preventive culling

Pursuant to the Regulation of the Minister of Agriculture and Rural Development of December 18, 2007 on eradication of avian influenza, slaughter / preventive killing of poultry may be implemented in an protection zone, i.e. 3 km around the HPAI outbreak. The competent authority to make a decision in this matter is the District Veterinary Officer. Decisions regarding the slaughter / preventive killing of poultry, related to the occurrence of HPAI in a given protection zone, are taken on the basis of a risk assessment, which takes into account, inter alia, the following areas: the specificity of poultry production in a given district together with the number of commercial / non-commercial farms, possible pathways of the pathogen spread in the environment and potential ways of entering the farm, among others the

manner of its protection, as well as topographic conditions of the area, infrastructure and all other circumstances affecting decision taking in the matter in question.

Within the period covered by the report, after confirmation HPAI outbreak on 24 November 2020, preventive culling was not carried out.

Regional stand still (beyond the restriction zones specified in the EU Regulation)

In the period covered by the report regional stand still was not applied.

Derogations on restriction zone implementation after risk assessment

Pursuant to the Regulation of the Minister of Agriculture and Rural Development of 18 December 2007 on eradication of avian influenza, derogations on restriction zone implementation may be implemented if highly pathogenic avian influenza is confirmed in other birds kept in a non-commercial holding, a zoo, a circus, a pet shop, a wild life park or in a fenced area where other birds are kept or reared for purposes related to shows, education or the protection and conservation of endangered species or officially registered rare breeds of poultry or other captive birds and conducting basic or applied scientific research, provided such derogations do not prevent disease control.

In the period covered by the report no derogation was used.

Hunting

Due to restrictions implemented due to COVID-19 pandemic, hunting is limited. Collective hunts are not performed.

A.5 Sweden

Malin Grant

National Veterinary Institute

Timing of the applied prevention and control measures

Table A.5 provides a timeline on the main events that triggered actions in relation to the selected prevention and control measures. More information on the actions taken is provided in the sections below.

Table A.5: Overview of main actions

Date	Event that triggered action	Type of action taken	Target audience (if applicable)
06/11/2020	Rapid risk assessment NVI	National housing order for commercial poultry and requirements for all poultry keepers to separate poultry from contact with wild birds.	All keepers of poultry and captive birds.
17/11/2020	Outbreak in turkey flock	Stamping out of all poultry on the infected holding. Establishment of a protection and surveillance zone of 3 and 10 km around the holding and implementation of measures in accordance with Council Directive 2005/94/EC.	Poultry establishments in protection and surveillance zone.

Increasing awareness of the stakeholders and the general public

Press releases sent out on several occasions to raise awareness:

- 15 October – message about awareness and strengthened biosecurity due to outbreaks of HPAI in Russia and Kazakhstan

- 22 October – Findings of pigeon paramyxovirus in wild birds. Information to poultry producers about risks of both Newcastle disease and Avian Influenza.
- 6 November 2020 – Housing order for commercial poultry and requirements for increased biosecurity for all keepers of poultry.
- 17 November 2020 – Information about outbreak of HPAI in Turkey flock.
- 30 November 2020. HPAI in wild birds in Skåne county. Message about vigilance for poultry keepers and to report to the Swedish Veterinary Institute if wild birds are found dead.

On most occasion when press releases were sent out information was also shared directly with poultry associations and other organisations with interest in for example hobby flocks or captive birds.

Information of websites of Swedish Board of agriculture (SBA) and Swedish National Veterinary Institute (NVI) updated with latest information and advice to poultry keepers.

Weekly meetings with representatives for poultry association, farmers union and county administrative boards (CAB) in affected region.

Housing order

A rapid risk assessment from NVI on 5th October advised higher risk for incursion of avian influenza to Swedish poultry so a housing order was decided on by SBA 6 October. The housing order is in place until further notice from SBA. Information was sent out as a press release and directly with poultry association. CBA are responsible for official controls of the compliance of the housing order.

Strengthening biosecurity measures (other than housing order)

Captive birds including hobby flocks should be fenced in to prevent contact with wild birds. Ponds or water should be covered, and food and water should be given indoors or under cover. Further biosecurity advice is given and communicated on the websites of the SBA and NVI and through the poultry associations.

Preventive culling

N/A

Regional stand still (beyond the restriction zones specified in the EU Regulation)

N/A

Derogations on restriction zone implementation after risk assessment

N/A

Hunting

No regulations or recommendations on hunting implemented.

A.6 United Kingdom

Helen Roberts, Adam Brouwer, Ian Brown

(Department for Environment, Food and Rural Affairs, UK & Animal & Plant Health Agency, UK)

Timing of the applied prevention and control measures

Table A.6 provides a timeline on the main events that triggered actions in relation to the selected prevention and control measures. More information on the actions taken is provided in the sections below.

Table A.6: Overview of main actions

Date	Event that triggered action	Type of action taken	Target audience (if applicable)
30/10/2020	Multiple cases of wild birds detected positive for HPAI H5N8 in Germany and Netherlands	The risk level for incursion to UK through the movement of infected wild birds is assessed as MEDIUM	All
02/11/2020	First poultry case of H5N8 in England (Cheshire). Confirmed as HPAI 3/11/20	Disease control measures – implementation of 3km and 10km zones	Poultry keepers in the control zone(s). Initially temporary control zones of 3km and 10km were put in place, replaced by Protection and Surveillance zones when pathogenicity of the virus is confirmed. General information on the Defra website.
04/11/2020	Outbreak Assessment for the poultry case in the UK	Risk level raised to HIGH for incursion through wild birds and MEDIUM for exposure to poultry	All
09/11/2020	Risk Assessment on prevention of avian flu introduction to housed and non-housed poultry	In depth review of the biosecurity measures associated with AI Prevention Zones	All
12/11/2020	Second poultry case of HPAI H5N8 in England (Herefordshire)	Disease control measures – implementation of 3km and 10km zones	Poultry keepers in the control zone(s). Initially temporary control zones of 3km and 10km were put in place, replaced by Protection and Surveillance zones when pathogenicity of the virus is confirmed. General information on the Defra website.
11/11/2020	First wild bird cases detected in Devon, Dorset and Gloucestershire	Avian Influenza Prevention Zone put in place across all GB – heightened biosecurity measures; general licence for bird gatherings revoked	All
19/11/2020	Third confirmed case of H5N8 on a captive bird establishment in Gloucestershire. Confirmed as HPAI on 21/11/20	Derogations applied to the culling of all birds (critical endangered, threatened and vulnerable species present) and to the restriction zone size and measures therein. A 3km Captive Bird (Monitoring) Zone is established	Poultry keepers in the control zone(s). Initially a temporary control zone of 10km was put in place, while the decision to derogate was made. The risk assessment was sent to the European Commission for information. General information on the Defra website.
20/11/2020	Updated biosecurity guidance	Self-assessment check list for all poultry keepers.	General information on the Defra website.
21/11/2020	Fourth case of H5N8 confirmed in poultry and captive birds in Leicestershire. Confirmed as HPAI on 23/11/20	No derogations as these are poultry. Disease control measures – implementation of 3km and 10km zones	Poultry keepers in the control zone(s). Initially temporary control zones of 3km and 10km were put in place, replaced by Protection and Surveillance zones when pathogenicity of the virus is confirmed. General information on the Defra website.

Increasing awareness of the stakeholders and the general public

Mass messaging to poultry keepers is sent out when a new infected establishment or new control zone measures are put in place. In addition, press notices are issued with the updated maps of the zones and any updated biosecurity requirements.

<https://www.gov.uk/guidance/avian-influenza-bird-flu#latest-situation>

All links are found on this page.

Housing order

No housing order in place at present. However, it has been announced that a housing order for all GB will take effect as of 14 December.

Strengthening biosecurity measures (other than housing order)

Defra updated the [biosecurity guidance](#) and published a new [self-assessment biosecurity checklist](#) for all bird keepers. The Avian Influenza Prevention Zone means it is a legal requirement for all bird keepers in GB (for pet birds, captive birds, commercial flocks or just a few birds in a backyard flock) to follow strict biosecurity measures. Keepers should use the biosecurity guidance and self-assessment checklist to help enhance and maintain robust biosecurity measures and reduce the risk of incursion of avian influenza into their birds.

Preventive culling

None applied

Regional stand still (beyond the restriction zones specified in the EU Regulation)

None applied

Derogations on restriction zone implementation after risk assessment

IP3 – captive bird establishment in Gloucestershire. Derogation applied to the culling of birds present at the site, based on a risk assessment. Birds in the pen of the positive duck were culled. All other birds in the same general area will be subject to regular testing, based on a statistical sample, to detect 5% prevalence with 95% confidence. Those birds which were assessed to be low risk (as these were housed or in aviaries) will not be tested. A separate risk assessment looked at the requirement to implement zones around the establishment and this was shared with the European Commission. A 3km Captive Bird (Monitoring) Zone was put in place.

Hunting

There is currently no ban on hunting for disease control purposes but the release of game for shooting is prohibited in the PZ and SZ. A risk assessment has been published to support this action.