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Annual Report



Animal &
Plant Health
Agency

on surveillance
for avian influenza in
poultry and in wild birds in
Member States of the
European Union
in 2016



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Annual Report on surveillance for avian influenza in poultry and wild birds in Member States of the European Union in 2016



**Animal &
Plant Health
Agency**

EUROPEAN UNION REFERENCE LABORATORY FOR AVIAN INFLUENZA

About the report

The work of EU Member States' veterinary administrations, veterinary laboratories and others (such as ornithologists, bird watching organisations and hunters) involved in the sampling, laboratory testing and gathering of data for the avian influenza surveys in poultry and wild birds is specifically acknowledged.

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The European Commission is responsible for the evaluation and approval of Member States' avian influenza surveillance programmes in poultry and wild birds. For more information on this matter please consult the Commission's website on Funding of Animal Health Measures:

https://ec.europa.eu/food/funding/animal-health/national-veterinary-programmes_en

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The European Commission collects the surveillance data from MS via an online reporting system and is responsible for the final revision of the annual report on surveillance for avian influenza in poultry in the European Union and its publication on the Commission's website:

http://ec.europa.eu/food/animal/diseases/controlmeasures/avian/eu_resp_surveillance_en.htm

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1 EXECUTIVE SUMMARY

Background

Avian Influenza (AI) is a highly contagious viral infection, which can affect all species of birds. Highly Pathogenic Avian Influenza (HPAI) viruses can spread rapidly, causing serious disease with high mortality in many bird species. To date all HPAI viruses have been of H5 or H7 subtypes. The on-going circulation of H5 viruses continue to cause outbreaks throughout Asia, Africa, Europe and North America, resulting in the loss of hundreds of millions of birds and causing major socio-economic impacts. Since 2017, H5N8 has been the most common subtype reported by the highest number of countries at the global level. Strengthened surveillance in the veterinary sector not only provides opportunities for earlier intervention and control but also benefits public health where these viruses (i.e. H7N9 LPAI) carry zoonotic threat including in the absence of disease in some poultry species. Low Pathogenicity Avian Influenza (LPAI) viruses usually cause only mild disease in poultry however LPAI strains of haemagglutinin subtype H5 or H7 have the potential to mutate to HPAI viruses following introduction to poultry populations. Birds of the Orders Anseriformes (ducks, geese and swans) and Charadriiformes (waders and gulls) are the major reservoirs for LPAI viruses. Although historically (prior to c2005) HPAI infection had been rarely observed in wild birds and almost exclusively in connection with poultry outbreaks, since the continuing pan continental outbreaks of Eurasian lineage H5 HPAI, wild birds have been proven to have a role in the transboundary spread of some lineages of the virus.

In recent years, infection of wild birds in Europe was observed with the introduction of virus H5N8 HPAI (clade 2.3.4.4A) in late 2014 and early 2015, when infection also occurred in poultry holdings in Germany, the Netherlands, the United Kingdom, Italy and Hungary. HPAI H5N1 (clade 2.3.2.1c) was also detected in the EU in early 2015 in poultry and wild birds in Bulgaria and in wild birds in Romania.

In 2016 re-emergence of HPAI H5N8 and subsequent secondary reassortants (i.e. H5N5 and H5N6 arising from co-circulation with Eurasian viruses) were reported in both poultry and wild bird populations across Europe with over 20 countries affected by the end of 2016. This H5 HPAI (clade 2.3.4.4B) virus was associated with significant clinical disease in both infected wild bird and poultry populations. The clinical impact on wild birds with the clade 2.3.4.4B was markedly more severe enabling effective detection through dead bird surveillance programmes.

In 2003 the European Union (EU) introduced an annual serological survey in poultry to detect subclinical or prior infection with AI of subtypes H5 and H7 and complement early detection systems. Wild bird surveillance and the reporting of the results have been compulsory since 2005 in the EU. This report describes the sampling and test results of these surveillance activities in the EU in 2016.

Timing and mandate

The present survey was conducted between January and December 2016 according to Council Directive 2005/94/EC on Community measures to control avian influenza and guidelines laid down in Commission Decision 2010/367/EU.

Poultry survey participation (Section 4.1.1)

Twenty-eight Member States (MS) participated in the poultry survey in 2016. Ten MS followed a risk-based sampling approach in poultry (compared to 11 MS in 2015 and 2014). In total, 18,138 EU holdings were sampled (which compares to 21,867 in 2015 and 19,813 holdings in 2014). In addition, one non-EU country, Switzerland, submitted data for 66 holdings.

The most frequently sampled poultry category in 2016 was Laying Hens (Conventional and Free-Range), making up 28.9% of the total holdings sampled by EU MS, followed by Backyard Flocks (13.8% of EU holdings sampled), and Chicken Breeders (13.7% of EU holdings sampled). The least sampled poultry category was Ratites (0.8% of total EU holdings sampled) reflecting the low proportion of Ratite holdings across the EU (0.2% of total holdings reported to the survey). Italy and the Netherlands sampled the most holdings among MS, together sampling 40.0% (7,257 holdings) of the total holdings sampled in 2016.

Poultry survey results (Section 4.1.2)

In the 2016 EU serological survey for avian influenza in poultry, evidence of previous infection with H5 or H7 avian influenza according to Directive 2005/94/EC was detected in 134 holdings (0.74% of total EU holdings sampled), across ten MS. One hundred and twenty-four holdings were reported by MS as serologically positive for subtype H5 and ten were reported for subtype H7. The detection rate of H5/H7 seropositive holdings was greatest in Breeder Ducks (74 H5/H7 seropositive holdings/632 sampled, 11.7%), followed by Farmed Game Birds (waterfowl) (14 H5/H7 seropositive holdings/187 sampled 7.5%), and Breeder Geese (18 H5/H7 seropositive holdings/265 sampled, 6.8%). In comparison, the detection rate of H5/H7 seropositive holdings was greatest in Breeder Geese in 2015 (15 H5/H7 seropositive holdings/210 sampled, 7.1%) and also in 2014 (10 seropositive holdings/208 holdings sampled, 4.8%).

Holdings seropositive for H5 (Section 4.1.2.1)

In 2016, 124 poultry holdings (0.68% of total EU holdings sampled) were reported by MS as serologically positive for influenza A virus subtype H5. Two poultry holdings were H5 seropositive in two poultry categories; these holdings were counted in each of the poultry categories (total = 126 H5 seropositive holdings), but in the total number of H5 seropositive holdings by MS (total = 124 H5 seropositive holdings), they were only counted once. The number of H5 seropositive holdings reported by MS in 2016 was greater than in 2015 (33 holdings; 0.15% of total EU holdings sampled) and 2014 (38 holdings; 0.19% of total EU holdings sampled). Of the 124 H5 seropositive poultry holdings reported by MS in 2016, 119 holdings underwent follow-up testing for the presence of active infection, and seven of these (7/119, 5.9%) tested virologically positive (by PCR and in some cases virus isolation as well) for subtype H5.

Holdings seropositive for H7 (Section 4.1.2.2)

In 2016, ten poultry holdings (0.06% of total EU holdings sampled) were reported by MS as serologically positive for influenza A virus subtype H7. This compares to seven holdings seropositive for H7 in 2015 (0.03% of total EU holdings sampled) and five holdings seropositive in 2014 (0.03% of total EU holdings sampled). Of the ten H7 seropositive poultry holdings reported by MS in 2016, all underwent follow-up testing for the presence of active infection, and three of these (3/10, 30.0%) tested virologically positive (by PCR and virus isolation) for subtype H7.

Poultry survey discussion (Section 5.1)

The poultry survey continues to improve knowledge on which sectors of the poultry industry are more likely to be infected by H5 or H7 avian influenza viruses (e.g. Breeder Ducks and Breeder Geese) and identified other sectors which are consistently less likely to be affected (e.g. Broilers (even those considered at heightened risk) and Turkey Breeders). The results are consistent with those of previous years in demonstrating continual risk for spread of LPAI viruses into certain production sectors although extensive spread to other sectors is much less frequent. The sampling regimes among MS are diverse with different degrees of targeting and testing frequencies. Hence differences in between-flock detection rates for poultry categories or MS need to be interpreted with great caution. In particular, those MS undertaking risk-based sampling may experience higher seropositive detection rates than those using representative sampling. The ongoing review of the results of avian influenza surveillance, together with the global picture of avian influenza and scientific research in this field, will further improve AI disease prevention whilst ensuring development of resource efficient programmes consistent with the overall objectives.

The follow-up epidemiological investigations and further laboratory testing in response to the detection of seropositive holdings highlights the utility of the survey in providing case detection for presence of active infection in the apparent absence of clinical indicators. This mandatory programme is an invaluable complement to other programmes for the possible early detection of infection with AI viruses that may not otherwise be readily detected by scanning surveillance in poultry (e.g. H5N8 HPAI (2.3.4.4A clade) in domestic waterfowl).

Notification to the European Commission and OIE follows detection of current infection with H5 or H7 avian influenza virus on any holdings as appropriate.

2016 Poultry key facts:

- Total number of EU holdings sampled = 18,138 (28 MS); plus 66 holdings from non-EU country, Switzerland.
- Ten MS followed a risk-based sampling approach in poultry.
- One hundred and thirty-four poultry holdings were reported by MS as serologically positive for subtypes H5 or H7 (0.74% of total EU holdings sampled), across ten MS. One hundred and twenty-four holdings were seropositive for H5 (0.68% of total EU holdings sampled) and ten were seropositive for H7 (0.06% of total EU holdings sampled).
- The detection rate of H5/H7 seropositive holdings was greatest in Breeder Ducks (74 H5/H7 seropositive holdings/632 sampled, 11.7%), followed by Farmed Game Birds (waterfowl) (14 H5/H7 seropositive holdings/187 sampled 7.5%), and Breeder Geese (18 H5/H7 seropositive holdings/265 sampled, 6.8%).
- Of the 124 H5 seropositive poultry holdings reported by MS, 119 holdings underwent follow-up testing for the presence of active infection, and seven of these (7/119, 5.9%) tested virologically positive for subtype H5.
- Of the ten H7 seropositive poultry holdings reported by MS, all underwent follow-up testing for the presence of active infection, and three of these (3/10, 30.0%) tested virologically positive for subtype H7.

Wild bird survey participation (Section 4.2.1)

According to the guidelines (EC 2010), implementation of passive surveillance in wild birds (found dead, injured and live with clinical signs) is compulsory and hence EU co-financed. Data on active surveillance has only been included in the present report from the 13 MS that chose to submit data from their national surveys.

A total of 12,828 wild birds, from 27 MS of the European Union and one Non-Member State (Switzerland) were collected and tested via passive surveillance during the 2016 survey. The birds sampled belonged to 22 different Orders; with the top three being Anseriformes (32.1%), Passeriformes (16.7%) and Falconiformes (14.2%). At least 269 species were sampled and more than half of the birds (55.4%) were from defined 'Target species' in 2016. The top three species sampled were Mallard (*Anas platyrhynchos* - 8.6%), Tufted Duck (*Aythya fuligula* - 4.4%) and Mute Swan (*Cygnus olor* - 4.4%).

In addition, a total of 12,152 birds sampled by active surveillance were voluntarily reported from 13 MS.

Wild bird survey results (Section 4.2.2 and 4.2.3)

In 2016, HPAI was detected in 939 wild birds through passive surveillance; 892 cases of HPAI H5N8, five cases of HPAI H5N5 and 42 cases of HPAI H5, where the N type was not determined. HPAI H5N8 was detected by 15 Member States and Switzerland in 11 Orders and at least 61 species or genus aggregates. Germany (n=574) had the highest number of detections of HPAI H5N8, followed by Switzerland (n=117). HPAI H5N8 was most commonly detected in Tufted Ducks (*Aythya fuligula*) (n=367/892, 41.1%), followed by Mute Swans (*Cygnus olor*) (n=62/892, 7.0%) and dabbling ducks (*Anas sp.*) (n=57/892, 6.4%). HPAI H5N5 was detected in Croatia (two Mute Swans, *Cygnus olor*), Germany (one Greylag Goose, *Anser anser*), Italy (one Mallard, *Anas platyrhynchos*) and the Netherlands (one Mute Swan, *Cygnus olor*). The additional 42 HPAI H5 cases of unknown N type were detected in Germany (n=24), Sweden (n=16), Austria (n=1) and Denmark (n=1). All detections of HPAI were made in the 4th quarter of 2016 (Oct-Dec).

LPAI viruses of subtype H5 were detected in nine wild birds sampled via passive surveillance in 2016; three Barnacle Geese (*Branta leucopsis*), one Mew Gull (*Larus canus*), one Grey Heron (*Ardea cinerea*), one Mallard (*Anas platyrhynchos*) and one dabbling duck (*Anas sp.*) in Germany; one Mute Swan (*Cygnus olor*) in France; and one Eurasian Teal (*Anas crecca*) in Spain.

LPAI H7 was detected by passive surveillance in one Mute Swan (*Cygnus olor*) found in Poland.

Wild bird survey discussion (Section 5.2)

Highly pathogenic H5 virus (H5N8, H5N5, H5N6 in a single premises) was reported in Europe in late 2016 on multiple occasions in poultry and wild birds highlighting the changeable nature of the epidemiology of avian influenza viruses. The H5 HPAI cases detected represent a recurrence of the subtype seen in Europe in late 2014 and early 2015 with a significantly increased prevalence in wild bird populations in 2016. This new incursion was also associated with increased levels of wild bird mortality compared to the 2014 variant. There is definitive evidence for the ability of wild birds to transfer H5 HPAI from one area to another over relatively large distances (The Global Consortium for H5N8 and related influenza viruses, 2016). However the exact role and particular species involved in the epidemiology of H5 HPAI is still unclear. There were no detections of H5N1 in wild birds in the EU despite the ongoing threat with such viruses in North Africa and Central Asia.

There is evidence for wild birds playing a role in the 2014 introduction of H5N8 HPAI (clade 2.3.4.4A) to Europe (The Global Consortium for H5N8 and related influenza viruses, 2016; Verhagen *et al.* 2015), North America and parts of Asia. In 2016, the geospatial and temporal distribution of cases in poultry and wild birds confirms the role that migratory waterfowl species had in the introduction of virus. At the time of writing there are increased insights into the epidemiology of outbreak and the role of wild birds together with the spectrum of species affected but these will be presented in the 2017 surveillance report.

Further evolutionary events resulting in changes in the virus and increased knowledge of the role of wild birds illustrates the ongoing risk for further incursion of these viruses to the EU.

The EU survey provides detection of AI incidents in wild birds, independent of outbreaks in poultry, illustrating the value and role of wild bird surveillance as a potential early detection and monitoring system for the presence of HPAI (Goose/Guangdong lineage of viruses) in the EU.

Only limited inferences can be made by direct comparisons of detections in different MS, species and years. The non-random nature of the sampling, variable extent of sampling by MS, and the lack of identification of some sampled birds to a species, means that the proportion positive observed in a species, MS or time period cannot be assumed to be the true prevalence in the population sampled.

2016 Wild Bird key facts

Passive surveillance:

- Total birds sampled = 12,828 (27 MS and Switzerland)
- HPAI H5N8 detected in 892 birds
 - 15 Member States and Switzerland
 - 51 species from 11 Orders
 - All detections made Oct-Dec
- HPAI H5N5 detected in five birds
 - Four Member States
 - Three species from the Order
 - All detections in December
- HPAI H5 (unknown N type) detected in 42 birds
 - Four Member States
 - 22 species from six Orders
 - All detections Nov-Dec
- LPAI H5 detected in nine birds
 - Germany (seven), Spain (one) and France (one)
 - Seven species from three Orders
 - All detections in Oct-Dec
- LPAI H7 detected in one Mute Swan (*Cygnus olor*) in Poland in June.

Active surveillance:

- Total birds sampled voluntarily reported = 12,152 (13 MS)
- HPAI H5N8 detected in 22 birds
 - Austria (two) and Germany (twenty)
 - Nine species from five Orders
 - All detections made Nov-Dec
- HPAI H5 (unknown N type) detected in three birds
 - Germany (three)
 - Three species from three Orders
 - All detections made Nov-Dec
- LPAI H5 detected in 16 birds
 - Belgium (nine) and Germany (seven)
 - Four species from the Order Anseriformes
 - All detections made Sept-Dec
- LPAI H7 detected in nine birds
 - Belgium (five), Germany (two) and Slovakia (two)
 - All Mallards (*Anas platyrhynchos*)
 - All detections made Dec-Jan

ABBREVIATIONS AND GLOSSARY

Table 1 Key to Member State abbreviations

Abb.	Country
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovak Republic
UK	United Kingdom
CH*	Switzerland

*Non-EU country

Table 2a Key to poultry category abbreviations

Poultry species and production categories included in the poultry survey, as referenced in Commission Decision 2010/367/EU (EC 2010).

Abb.	Category
CB	Chicken Breeders
LH	Conventional Laying Hens
FR LH	Free-range Laying Hens
B	Broilers (at heightened risk)
FT	Fattening Turkeys
TB	Turkey Breeders
FD	Fattening Ducks
BD	Breeder Ducks
FG	Fattening Geese
BG	Breeder Geese
BYF	Backyard Flocks
FGB-G	Farmed Game Birds (gallinaceous)
FGB-W	Farmed Game Birds (waterfowl)
R	Ratites
O	Others

Table 2b Poultry species and production categories

Species	Production Category			
	Eggs	Meat	Breeding	Various
Chickens	LH; FR LH	B	CB	
Turkeys		FT	TB	
Ducks		FD	BD	
Geese		FG	BG	
Backyard Flocks				BYF
Game Birds				FGB-G; FGB-W
Ratites				R
Others				O

ADNS: Animal Disease Notification System
http://ec.europa.eu/food/animal/diseases/adns/index_en.htm

AI: Avian Influenza as defined in Directive 2005/94/EC (EC 2005a)

EURL: European Union Reference Laboratory for Avian Influenza, Animal and Plant Health Agency-Weybridge

DG SANTE: Directorate General for Health and Food Safety, European Commission

EC: European Commission

EU: European Union

HPAI: Highly Pathogenic Avian Influenza

HPAIV: Highly Pathogenic Avian Influenza virus

LPAI: Low Pathogenicity Avian Influenza defined as LPAI caused by AI viruses of the H5 and H7 subtype according to Directive 2005/94/EC (EC 2005a)

LPAIV: Low Pathogenicity Avian Influenza virus of the H5 and H7 subtype

LPAIV of 'other subtype': Low Pathogenicity Avian Influenza virus of subtype other than H5 or H7

MS: Member State(s)

NUTS: Nomenclature of Units for Territorial Statistics. For example, at NUTS 3 level this refers to a region, district, county, municipal or unitary authority (depending on the MS).

PCR: Polymerase chain reaction is a laboratory methodology that acts through the amplification of specific viral nucleic acid from clinical specimens.

Positive poultry holding: For the purpose of this report a poultry holding is considered positive if at least one sample from that holding tested positive on either serology or PCR or viral isolation.

Poultry holding: A facility used for the rearing or keeping of breeding or productive poultry, as defined in Council Directive 2009/158/EC (EC 2009). For the purposes of avian influenza surveillance, this may include facilities that only contain poultry during certain months of the year (i.e. poultry do not need to be present all year round).

TS: Target species. Wild birds, in particular migratory water birds, that have been shown to be at a higher risk of becoming infected with, and transmitting the HPAI H5N1 virus, as referenced in Commission Decision 2010/367/EU (EC 2010).

VI: Virus isolation is a laboratory methodology that enables the propagation of infectious virus directly from clinical specimens.

VI NP: Virus isolation not performed

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2 PURPOSE OF REPORT AND STRUCTURE

2.1 Purpose of Report

The aim of this report is to describe the sampling and test results of the avian influenza surveillance conducted in 2016 by EU MS according to Council Directive 2005/94/EC on Community measures to control avian influenza and guidelines laid down in Commission Decision 2010/367/EU. This provides EU MS and third countries with insight to the epidemiological situation of avian influenza and the surveillance activities conducted across Europe.

This report does not however intend to offer a critical discussion of the surveillance system nor provide evidence for epidemiological patterns or trends.

2.2 Structure of Report

This report is structured as follows:

- The Executive Summary provides an outline of the main findings and conclusions that can be drawn from these.
- The Introduction gives information on the objectives and framework for the surveillance carried out by the MS and also provides links to the Commission Decisions on which the surveillance is based.
- The Results section contains information on the results of the 2016 poultry survey and wild bird passive surveillance activities, including sampling effort and test results in MS.
- The Discussion section provides a summary of the findings and information on their importance in relation to the objectives of the survey.
- The Methods section includes information on the survey design, data received from the MS and methods of analysis of the data.
- The Annexes contain additional detailed tables on the sampling effort and test results of the poultry and wild bird surveys, including sampling effort and test results of wild bird active surveillance data, voluntarily submitted by MS.

3 INTRODUCTION

Avian Influenza (AI) is a highly contagious viral infection, which can affect all species of birds. Highly Pathogenic Avian Influenza (HPAI) viruses can spread rapidly, causing serious disease with high mortality in many bird species. The on-going circulation of H5 viruses continue to cause outbreaks throughout Asia, Africa, Europe and North America, resulting in the loss of hundreds of millions of birds and causing major socio-economic impacts. Since 2017, H5N8 has been the most common subtype reported by the highest number of countries at the global level.

Low Pathogenicity Avian Influenza (LPAI) can be any one of the haemagglutinin subtypes H1 to H16 and usually causes only mild disease in poultry. LPAI viruses of the H5 and H7 subtypes have the potential to mutate to highly pathogenic strains while circulating within domestic poultry populations.

Wild birds of the Orders Anseriformes and Charadriiformes are thought to be the major reservoirs for LPAI viruses. Historically HPAI infections have been rarely observed in wild birds and almost exclusively in connection with poultry outbreaks. However, during the H5 HPAI epidemic, wild birds have been implicated in the spread of the HPAI virus (EFSA 2014; Verhagen *et al.* 2015).

The Scientific Committee on Animal Health and Animal Welfare (SCAHAW 2000) recommended the implementation of serological surveys of poultry populations in MS in order to detect the presence of LPAI viruses of H5 and H7 subtypes.

Surveys for avian influenza in poultry and wild birds in MS were first carried out in 2003 under Commission Decision 2002/649/EC (EC 2002).

Wild bird surveillance and the reporting of the results became compulsory in the EU in 2005. Decision 2005/726/EC (EC 2005) laid down a first list of 'higher risk species'. Directive 2005/94/EC (EC 2006a) subsequently provided a better legal basis to carry out surveillance programmes in poultry and wild birds. Harmonised guidelines with more detailed requirements for wild bird surveillance were introduced in 2007 (EC 2007). These programmes were aimed at identifying the risk of introduction of AI viruses (LPAI and HPAI) into domestic poultry.

In 2006 and 2007, application of this system was demonstrated when H5N1 HPAI activity was relatively widespread in wild birds and incursions to poultry were limited and controlled (Hesterberg *et al.* 2009).

Since 2008 the number of detections of H5N1 HPAI in Europe has reduced. Clade 2.2 viruses and their derivatives seem to have disappeared from wild birds globally, while clade 2.3.2 viruses and their derivatives have been reported from wild birds more recently including in the EU (Bulgaria in 2010, and Bulgaria and Romania in 2015). Infection of wild birds in Europe was also observed with H5 HPAI clade 2.3.4.4A in late 2014 and early 2015, when infection also occurred in poultry holdings in Germany, the Netherlands, the United Kingdom, Italy and Hungary. Wild birds have been implicated in bringing the H5 HPAI clade 2.3.4.4A virus to Europe (EFSA 2014; Verhagen *et al.* 2015). The recent H5 HPAI clade 2.3.4.4B epizootic in late 2016 represents a continuation of the events of late 2014 and early 2015 with a significantly increased prevalence in wild bird populations in 2016 and significant findings in poultry holdings across Europe. The geospatial and temporal distribution of cases in poultry and wild birds confirms the role that migratory waterfowl species had in the introduction of virus. At the time of writing there are increased insights into the epidemiology of outbreak and the role of wild birds together with the spectrum of species affected but these will be presented in the 2017 surveillance report.

The most recent European Commission guidelines (EC 2010) on surveillance for avian influenza in wild birds (see below) includes a list of "Target Species" that incorporates knowledge in the late 2000s of the number of detections of H5N1 HPAI in the EU surveillance programme and findings on the epidemiology of this virus in wild birds.

3.1 Objectives of the Surveillance

3.1.1 Poultry

The objectives of the surveillance programme for avian influenza in poultry (as described in Commission Decision 2010/367/EU; EC 2010) are to inform the competent authority of circulating avian influenza virus with a view to controlling the disease in accordance with Directive 2005/94/EC (EC 2005a) by the annual detection through active surveillance for:

“(a) low pathogenicity avian influenza (LPAI) of subtypes H5 and H7 in gallinaceous birds (chickens, turkeys, guinea fowl, pheasants, partridges and quails) and ratites thereby complementing other existing early detection systems.

(b) LPAI of subtypes H5 and H7 and highly pathogenic avian influenza (HPAI) in domestic waterfowl (ducks, geese and mallards for re-stocking supplies of game).”

3.1.2 Wild birds

The objective of EU wild bird AI surveillance, according to Commission Decision 2010/367/EU (EC 2010), is the timely detection of HPAI of the subtype H5N1 in wild birds in order to protect poultry in poultry holdings and safeguard veterinary public health. It is also stated that:

“(a) A risk-based surveillance (RBS) shall be implemented as a ‘passive’ surveillance system by laboratory investigation of moribund wild birds or birds found dead and it shall be specifically directed towards water bird species.

(b) Wild birds, in particular migratory water birds, that have been shown to be at a higher risk of becoming infected with, and transmitting the HPAI H5N1 virus, the ‘target species’ (TS), shall be specifically targeted.

(c) Areas close to the sea, lakes and waterways where birds were found dead; and in particular when these areas are in close proximity to poultry holdings, especially in areas where there is a high density of poultry holdings, shall be targeted.

(d) Close cooperation with epidemiologists and ornithologists and the competent authority for nature conservation shall be ensured in the preparation of the surveillance programme, assisting in species identification and optimising sampling adapted to the national situation.

(e) If the epidemiological situation for the HPAI H5N1 virus so requires, surveillance activities shall be enhanced by awareness raising and active searching and monitoring for dead or moribund wild birds, in particular for those belonging to TS. This could be triggered by the detection of the HPAI H5N1 virus in poultry and/or wild birds in neighbouring Member States and third countries or in countries which are linked via the movement of migratory wild birds, in particular those of TS, to the Member State concerned. In that case the specific migration patterns and wild bird species, which may vary in different Member States shall be taken into account.”

3.2 Framework of Reporting

Directive 2005/94/EC (EC 2005a) on Community measures to control avian influenza established in its Article 4 the legal basis for the obligatory conduct of surveillance programmes in poultry and wild bird populations. Both surveillance programmes must be carried out following harmonised guidelines which were laid down in 2010/367/EU (EC 2010).

Surveillance programmes of the MS are evaluated and approved for co-financing by Commission’s procedures that are detailed on the Commission’s website:

http://ec.europa.eu/dgs/health_food-safety/funding/cff/animal_health/vet_progs_en.htm

Samples were tested in accordance with the Diagnostic Manual for avian influenza as set out in Decision 2006/437/EC (EC 2006b). Data with sample results were submitted to the European Commission at the end of each semester period. Data extraction, validation and analysis were carried out by the European reference laboratory for Avian Influenza (Animal Plant Health Agency, United Kingdom) and through consultation with the different MS. Final results and the report were internally peer reviewed by APHA experts, the EU commission and by MS Chief Veterinary Officers at the PAFF meeting (September 2017).

Previous Annual Reports and more information on surveillance for avian influenza in poultry and wild birds can be found at:

http://ec.europa.eu/food/animal/diseases/controlmeasures/avian/eu_resp_surveillance_en.htm

4 RESULTS

4.1 Poultry

4.1.1 Poultry holdings sampled

All totals and overall proportions refer to 28 MS.

- In 2016, a total of 612,097 poultry holdings among all MS were reported from regions where sampling took place. Of these, 18,138 holdings (3.0%) were sampled by the MS in their approved surveillance programmes. In addition, non-EU country, Switzerland, submitted data for 66 holdings. Information on the number of EU poultry holdings sampled in previous survey years is shown in [Table 3](#) and [Figure 1](#).
- Of the 28 MS undertaking AI surveillance in poultry in 2016, ten MS (BE, BG, DE, DK, FR, IT, LU, NL, RO and UK) carried out a risk-based sampling approach, as described in Commission Decision (EC 2010). For more information on the risk-based surveillance approaches used by these MS, please see [Table 20](#). Eleven MS followed a risk-based sampling approach in 2015 and 2014.
- There was considerable variation in the number of poultry holdings sampled among MS, varying from eight holdings in Lithuania to 3,708 holdings in the Netherlands. The Netherlands and Italy together sampled the most holdings (7,257 holdings) among MS, together sampling 40.0% of the total holdings sampled in 2016. Sixteen MS sampled more holdings when compared to 2015 (BE, BG, CZ, DE, EE, FR, HU, LT, LU, LV, PL, PT, RO, SE, SI and SK), while 12 MS (AT, CY, DK, EL, ES, FI, HR, IE, IT, MT, NL and UK) sampled fewer holdings. Overall, the total numbers of holdings sampled was the lowest since 2008 (Table 1, Figure 1). Some MS sampled individual holdings more than once during the period of the survey and hence the total reported number of holdings sampled during the survey exceeded the total number of holdings present for MS in certain poultry categories.
- Laying Hen (Conventional and Free-range) holdings were sampled in all 28 MS. This category was the most frequently sampled poultry category, making up 28.9% (5,248 of 18,138) of the total holdings sampled by EU MS in 2016, with most being sampled in the Netherlands (1,833 holdings) and Italy (953 holdings).
- Twenty-three MS sampled Chicken Breeders (13.7% of total EU holdings sampled) and Fattening Turkeys and Turkey Breeders (12.9% of total EU holdings sampled); 21 MS sampled Fattening Ducks and Breeder Ducks (8.9% of total EU holdings sampled); 20 MS sampled Farmed Game Birds (gallinaceous) and Farmed Game Birds (waterfowl) (5.5% of total EU holdings sampled); 18 MS sampled Fattening Geese and Breeder Geese (4.0% of total EU holdings sampled); 14 MS sampled Broilers (at heightened risk) (6.4% of total EU holdings sampled); 13 MS sampled Ratites (0.8% of total EU holdings sampled); and 11 MS sampled Backyard Flocks (13.8% of total EU holdings sampled) and Other poultry flocks (5.2% of total EU holdings sampled) - further details are given in Section 4.1.3 (Poultry categories).
- The total number of poultry holdings (from regions where sampling took place) and the number sampled by MS, reported to the survey in 2016, are displayed by poultry category in [Table 4](#).

Table 3 Total number of EU poultry holdings sampled and the percentage found H5 or H7 seropositive, from 2008 to 2016

Year	Total number of EU poultry holdings sampled	H5/H7 seropositive poultry holdings		H5 seropositive poultry holdings		H7 seropositive poultry holdings	
		Total number of seropositive poultry holdings	% of total number of EU poultry holdings sampled	Total number of seropositive poultry holdings	% of total number of EU poultry holdings sampled	Total number of seropositive poultry holdings	% of total number of EU poultry holdings sampled
2008	34,985	72	0.21	52	0.15	21	0.06
2009	35,016	90	0.26	52	0.15	38	0.11
2010	29,484	59	0.20	48	0.16	11	0.04
2011	29,806	65	0.22	50	0.17	15	0.05
2012	29,404	43	0.15	40	0.14	4	0.01
2013	25,220	63	0.25	57	0.23	6	0.02
2014	19,813	43	0.22	38	0.19	5	0.03
2015	21,867	40	0.18	33	0.15	7	0.03
2016	18,138	134	0.74	124	0.68	10	0.06

Figure 1 Total number of EU poultry holdings sampled and found H5 or H7 seropositive, from 2008 to 2016

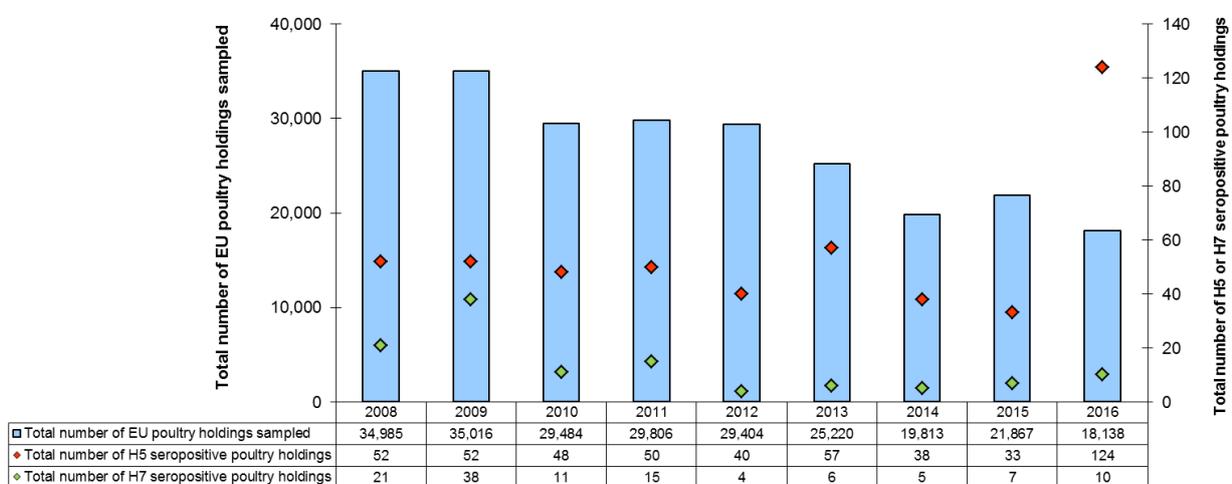


Table 4 Number of poultry holdings sampled and total number of poultry holdings in regions where sampling took place, by poultry category, across Member States, reported to the survey in 2016

The total number of poultry holdings (from regions where sampling took place) is displayed in parentheses.

	Number of poultry holdings sampled (total number of poultry holdings reported in regions where sampling took place)											
	Chicken Breeders	Conventional Laying Hens and Free-range Laying Hens	Broilers (at heightened risk)	Fattening Turkeys and Turkey breeders	Fattening Ducks and Breeder Ducks	Fattening Geese and Breeder Geese	Backyard Flocks	Farmed Game Birds (gallinaceous and waterfowl)	Ratites	Others	Total Holdings sampled and percentage of EU total	Total Holdings reported and percentage of EU total
AT	24 (93)	126 (1,588)		57 (141)	15 (28)	56 (78)			5 (10)		283 1.56%	1,938 0.32%
BE	199 (206)	386 (253)		51 (36)	16 (24)	1 (2)		22 (21)		4 (5)	679 3.74%	547 0.09%
BG	9 (18)	51 (112)	3 (3)	2 (2)	109 (113)		394 (116,624)	4 (4)		1 (1)	573 3.16%	116,877 19.09%
CY	7 (10)	35 (37)	5 (3)	7 (7)			55 (1,247)	4 (6)			113 0.62%	1,310 0.21%
CZ		66 (145)		42 (58)	69 (69)	13 (13)		48 (48)			238 1.31%	333 0.05%
DE	25 (453)	171 (9,469)	20 (2,055)	128 (1,689)	195 (1,409)	132 (2,050)		5 (15)	29 (710)	34 (6,949)	739 4.07%	24,799 4.05%
DK	184 (147)	219 (139)	30 (42)	19 (59)	23 (73)	2 (8)		89 (233)			566 3.12%	701 0.11%
EE		24 (24)								1 (1)	25 0.14%	25 0.004%
EL	47 (83)	80 (548)	26 (32)	25 (41)				14 (18)	2 (4)	57 (102)	251 1.38%	828 0.14%
ES	80 (399)	127 (1,136)	2 (252)	72 (607)	45 (51)	15 (16)	6 (4,070)	328 (626)	33 (68)	50 (4,477)	758 4.18%	11,702 1.91%
FI	36 (57)	91 (474)	2 (2)	43 (46)	2 (2)	3 (5)		13 (26)	1 (1)		191 1.05%	613 0.10%
FR	393 (911)	103 (2,954)	49 (4,506)	153 (1,007)	594 (4,031)	123 (165)		123 (213)		3 (135)	1,541 8.50%	13,922 2.27%
HR	22 (52)	71 (149)		23 (48)	35 (67)	15 (20)	65 (314)	10 (10)			241 1.33%	660 0.11%
HU	49 (140)	67 (607)		87 (355)	93 (380)	111 (481)	495 (177,117)	51 (97)	8 (9)		961 5.30%	179,186 29.27%
IE	66 (81)	100 (225)	46 (65)	51 (136)	15 (15)	2 (4)					280 1.54%	526 0.09%
IT	261 (198)	953 (846)		1,182 (814)	69 (83)	15 (23)	166 (166)	108 (146)	8 (26)	787 (626)	3,549 19.57%	2,928 0.48%
LT		2 (5)	5 (21)							1 (3)	8 0.04%	29 0.005%
LU		8 (8)	3 (3)				15 (500)		2 (1)		28 0.15%	512 0.08%
LV	1 (1)	33 (33)			1 (1)	1 (1)	60 (3,873)				96 0.53%	3,909 0.64%
MT		24 (33)									24 0.13%	33 0.005%
NL	807 (308)	1,833 (911)	879 (245)	88 (44)	99 (57)					2 (2)	3,708 20.44%	1,567 0.26%
PL	63 (488)	110 (711)		67 (226)	111 (372)	177 (1,218)		39 (91)	34 (75)		601 3.31%	3,181 0.52%
PT	75 (79)	126 (148)	60 (222)	63 (132)	32 (19)	1 (1)	56 (237,000)	43 (58)	6 (6)		462 2.55%	237,665 38.83%
RO	72 (45)	179 (209)		29 (15)	3 (2)		1,097 (1,028)	14 (11)	1 (1)	2 (1)	1,397 7.70%	1,312 0.21%
SE	34 (34)	92 (380)	33 (34)	21 (21)	4 (4)	7 (7)		16 (20)	4 (3)		211 1.16%	503 0.08%
SI	7 (7)	64 (228)		43 (43)			93 (4,154)	6 (6)			213 1.17%	4,438 0.73%
SK	11 (12)	47 (136)		15 (14)	6 (14)	4 (9)		17 (17)	6 (14)		106 0.58%	216 0.04%
UK	10 (112)	60 (1,004)		62 (342)	72 (174)	44 (79)		48 (126)			296 1.63%	1,837 0.30%
Total holdings; % of EU total	2,482 (3,934) 13.7%	5,248 (22,512) 28.9%	1,163 (7,485) 6.4%	2,330 (5,883) 12.8%	1,608 (6,988) 8.9%	722 (4,180) 4.0%	2,502 (546,093) 13.8%	1,002 (1,792) 5.5%	139 (928) 0.8%	942 (12,302) 5.2%	18,138	612,097
CH		40 (1,757)		26 (70)							66	1,827

Percentages for the total number of poultry holdings sampled and total number of poultry holdings (from regions where sampling took place) are calculated as a percentage of the EU totals reported to the survey.

4.1.1.1 Summary – poultry holdings sampled

- In 2016, a total of 18,138 holdings were sampled by EU MS in their approved surveillance programmes. In addition, non-EU country, Switzerland submitted data for 66 holdings.
- Ten MS followed a risk-based sampling approach in poultry.
- The number of holdings sampled by MS varied from eight holdings in Lithuania to 3,708 holdings in the Netherlands. Italy and the Netherlands sampled the most holdings among MS, together sampling 40.0% (7,257 holdings) of the total holdings sampled in 2016.
- The most frequently sampled poultry category in 2016 was Laying Hens (Conventional and Free-range combined), making up 28.9% of the total holdings sampled by EU MS in 2016, followed by Backyard Flocks (13.8% of EU holdings sampled), and Chicken Breeders (13.7% of EU holdings sampled). The least sampled poultry category was Ratites, making up just 0.8% of total holdings sampled in the EU in 2016.

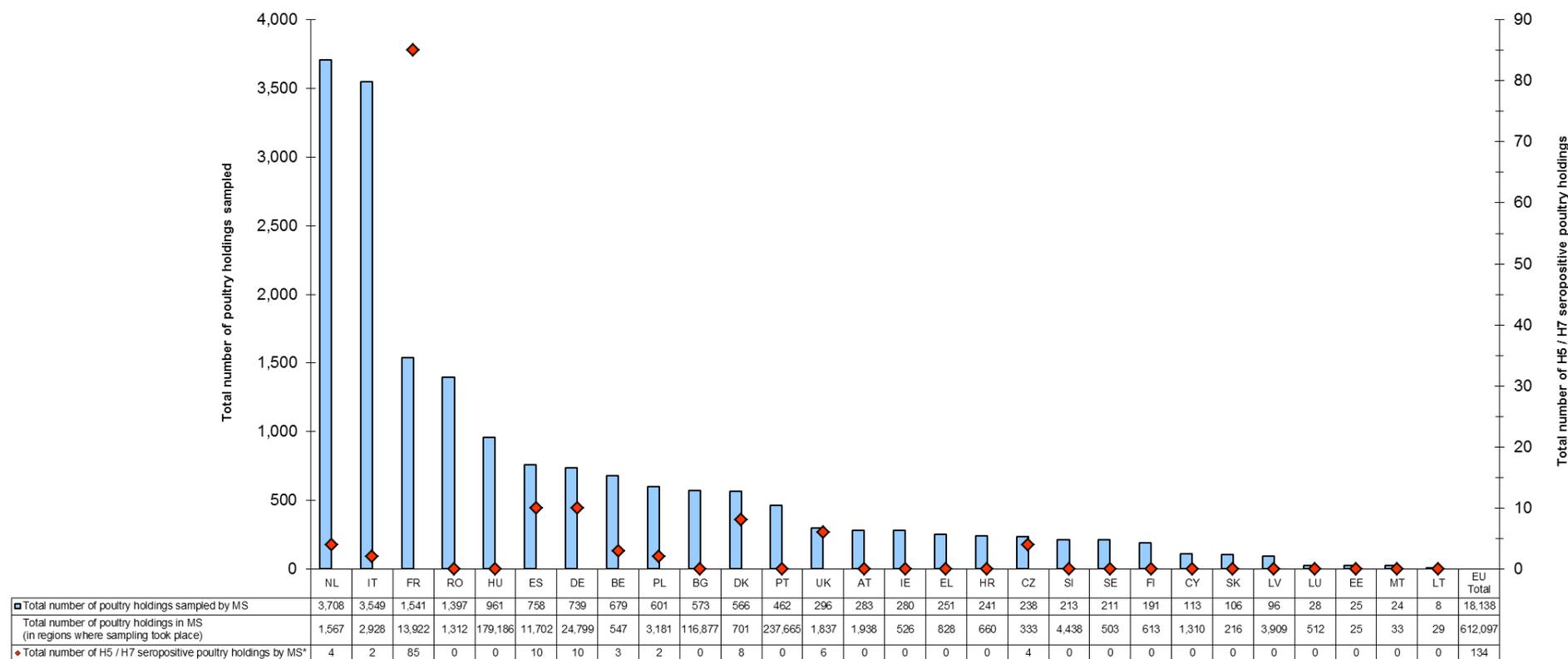
4.1.2 Poultry laboratory results

- Serological testing: In 2016, 134 poultry holdings were reported by MS as serologically positive for influenza A virus subtypes H5 and H7 (0.74% of EU holdings sampled) ([Figures 2, 3, 4](#)), including 124 of subtype H5 and ten of subtype H7. Information on the number of poultry holdings found seropositive for H5 or H7 across EU MS in previous survey years is shown in [Table 3](#) and [Figure 1](#).
- Virological testing: Twelve poultry holdings tested virologically positive (by PCR and in some cases by virus isolation as well) for influenza A virus subtypes H5 and H7 ([Table 5](#)). This included nine for subtype H5 (seven were also H5 seropositive, one was influenza A seropositive, and one did not undergo serological testing) and three for subtype H7 (all of which were H7 seropositive).

By MS: Overall, ten MS reported H5 or H7 seropositive poultry holdings in 2016 ([Figures 4 and 5](#)) - Belgium, the Czech Republic, Denmark, France, Germany, Italy, the Netherlands, Poland, Spain and the United Kingdom. Seven of these MS also reported H5 or H7 seropositive poultry holdings in 2015 (BE, DE, DK, FR, IT, NL and PL). In addition, one holding from Croatia, tested PCR positive for H5 (and serology and virus isolation positive for influenza A virus of undetermined subtype).

The non-EU country, Switzerland, did not detect any positive poultry holdings in 2016, as was the case in 2015 and 2014.

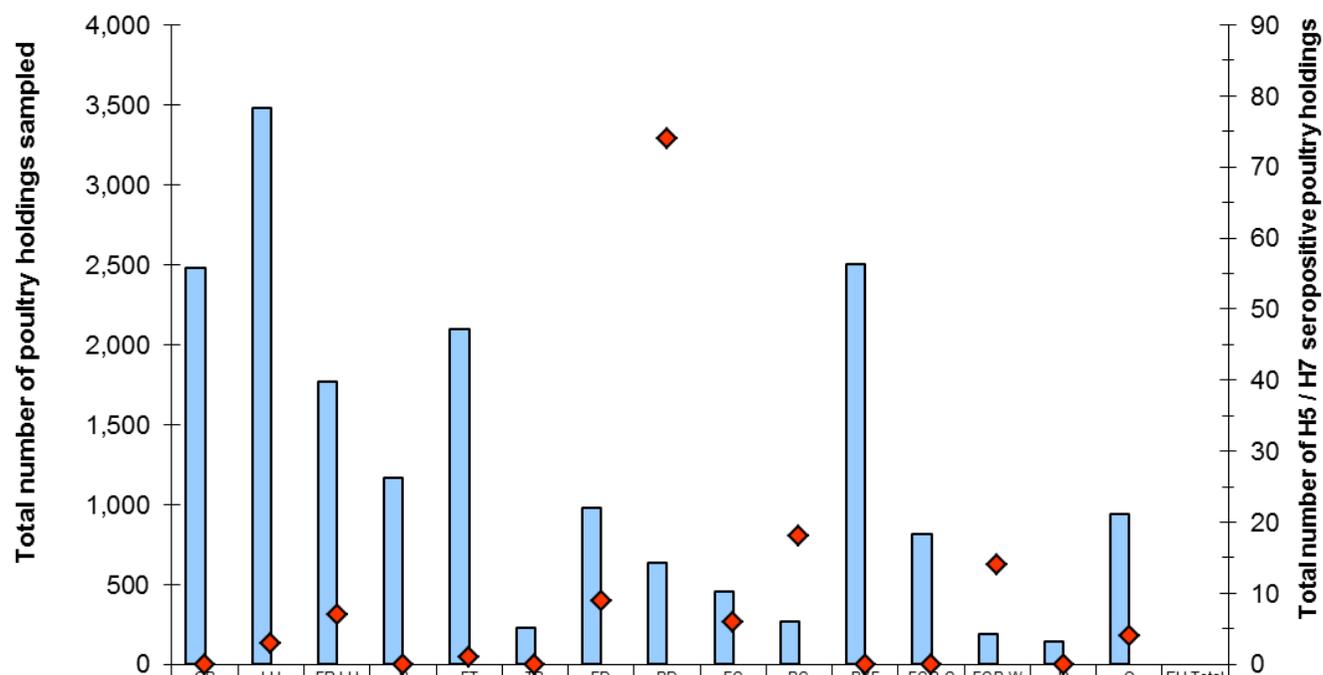
Figure 2 Total number of poultry holdings sampled and found seropositive for influenza A virus subtypes H5 and H7, by Member State, reported to the survey in 2016



***Notes on total number of H5 / H7 seropositive holdings by MS**

CZ: One holding was H5 seropositive in both the Breeder Geese and Farmed Game Bird (waterfowl) categories; it is only counted once in the total number of H5/H7 seropositive holdings for CZ.
 NL: One holding was H5 seropositive in both the Conventional Laying Hen and Free-range Laying Hen categories; it is only counted once in the total number of H5/H7 seropositive holdings for NL.

Figure 3 Total number of poultry holdings sampled and found seropositive for influenza A virus subtypes H5 and H7, by poultry category, in Member States, reported to the survey in 2016



■ Total number of poultry holdings sampled	2,482	3,480	1,768	1,163	2,098	232	976	632	457	265	2,502	815	187	139	942	18,138
■ Total number of poultry holdings (in regions where sampling took place)	3,934	14,842	7,670	7,485	5,439	444	6,306	682	3,676	504	546,093	1,498	294	928	12,302	612,097
◆ Total number of H5 / H7 seropositive poultry holdings by poultry category*	0	3	7	0	1	0	9	74	6	18	0	0	14	0	4	136

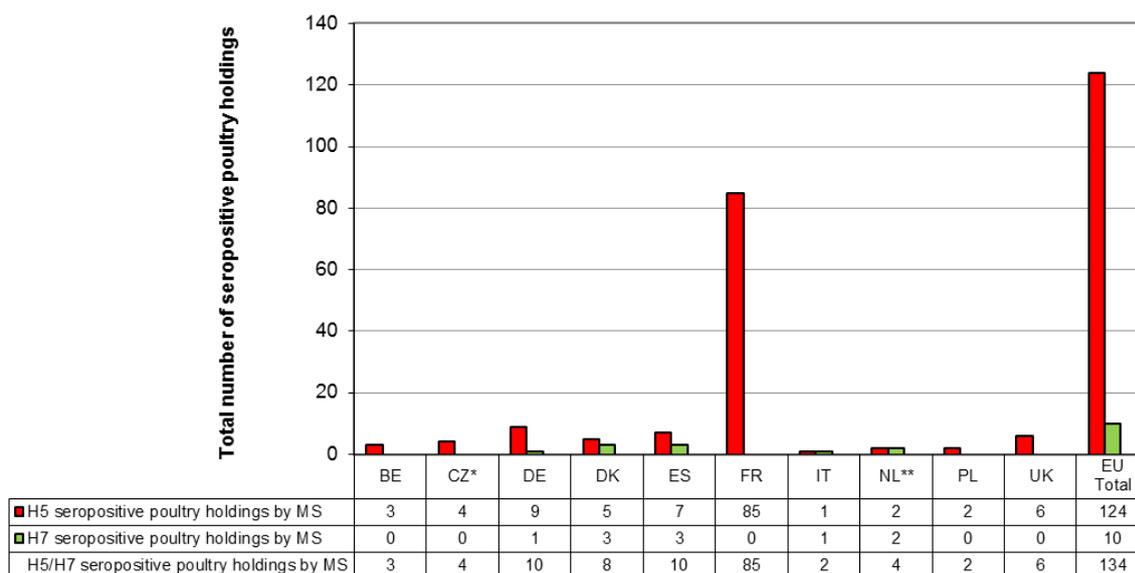
***Notes on total number of H5 / H7 seropositive holdings by poultry category**

One holding (from CZ) was H5 seropositive in both the BG and FGB-W categories and is counted in each category.

One holding (from NL) was H5 seropositive in both the LH and FR LH categories and is counted in each category.

See Abbreviations and Glossary and Section 6.1.1 Survey Design for the abbreviations of poultry categories.

Figure 4 Total number of H5 and H7 serologically positive poultry holdings, by Member State, reported to the survey in 2016



*CZ: One holding was H5 seropositive in both the Breeder Geese and Farmed Game Bird (waterfowl) categories; it is only counted once in the total number of H5 seropositive holdings for CZ.

**NL: One holding was H5 seropositive in both the Conventional Laying Hen and Free-range Laying Hen categories; it is only counted once in the total number of H5 seropositive holdings for NL.

4.1.2.1 H5 avian influenza

- In 2016, 124 poultry holdings (0.68% of total EU holdings sampled) were reported by MS as serologically positive for influenza A virus subtype H5 (Figure 4). Two poultry holdings were H5 seropositive in two poultry categories; these holdings were counted in each of the poultry categories (total = 126 H5 seropositive holdings), but in the total number of H5 seropositive holdings by MS (total = 124 H5 seropositive holdings), they were only counted once. Information on the number of poultry holdings found seropositive for H5 across EU MS in previous survey years is shown in Table 3 and Figure 1.
- Epidemiological follow-up investigations: Of the 124 poultry holdings reported by MS to be H5 seropositive in 2016, 119 holdings underwent follow-up testing for the presence of active infection, and seven of these (7/119, 5.9%) tested virologically positive (by PCR and in some cases virus isolation as well) for subtype H5. For more information on the epidemiological follow-up investigations, please see Table 6.
- By MS: H5 seropositive poultry holdings were reported from ten MS (BE, CZ, DE, DK, ES, FR, IT, NL, PL and UK) (Figures 4 and 5). In addition, one holding from Croatia, tested PCR positive for H5 (and serology and virus isolation positive for influenza A virus of undetermined subtype). A high proportion of the H5 seropositive holdings were found in France (85/124, 68.5%), which was also the case in 2015 (16/33, 48.5%) and 2014 (16/38, 42.1%).
- By poultry category: A high proportion of the H5 seropositive holdings were Breeder Ducks (74/126, 58.7%), followed by Breeder Geese (18/126, 14.3%), and Farmed Game Birds (waterfowl) (10/126, 7.9%) (Tables 7 and 8). In 2015, the highest number of holdings positive for the H5 subtype by serology was Breeder Geese (13/33, 39.4%), followed by Fattening Ducks (7/33, 21.2%), and Breeder Ducks (6/33, 18.2%), and in 2014, was Fattening Ducks (11/38, 28.9%), followed by Breeder Geese (9/38, 23.7%), and Breeder Ducks (7/38, 18.4%)

4.1.2.2 H7 avian influenza

- In 2016, ten poultry holdings (0.06% of total EU holdings sampled) were reported by MS as serologically positive for influenza A virus subtype H7 ([Figure 4](#)). Information on the number of poultry holdings found seropositive for H7 across EU MS in previous survey years is shown in [Table 3](#) and [Figure 1](#).
- Epidemiological follow-up investigations: Of the ten poultry holdings reported to be H7 seropositive in 2016, all underwent follow-up testing for the presence of active infection and three of these (3/10, 30.0%) tested virologically positive (by PCR and virus isolation) for subtype H7. For more information on the epidemiological follow-up investigations, please see [Table 6](#).
- By MS: H7 seropositive holdings were reported from five MS ([Figures 4 and 5](#)), including Denmark (3/10, 30.0%), Germany (1/10, 10.0%), Italy (1/10, 10.0%), the Netherlands (2/10, 20.0%) and Spain (3/10, 30.0%). In 2015, H7 seropositive holdings were reported from five MS, including Denmark (2/7, 28.6%), Hungary (1/7, 14.3%), Italy (1/7, 14.3%), the Netherlands (2/7, 28.6%) and Poland (1/7, 14.3%), while in 2014, H7 seropositive holdings were reported from three MS, including Germany (2/5, 40.0%), Italy (2/5, 40.0%) and Poland (1/5, 20.0%).
- By poultry category: H7 seropositive holdings were found in Free-range Laying Hens (4/10, 40.0%), Farmed Game Birds (waterfowl) (4/10, 40.0%), Conventional Laying Hens (1/10, 10%) and Others (1/10, 10%) ([Table 7 and 8](#)). In 2015, H7 seropositive holdings were found in Free-range Laying Hens (3/7, 42.9%), Breeder Geese (2/7, 28.6%), Backyard Flocks (1/7, 14.3%), and Farmed Game Birds (waterfowl) (1/7, 14.3%), while in 2014, H7 seropositive holdings were reported from Conventional Laying Hens (2/5, 40.0%), Others (2/5, 40.0%), and Breeder Geese (1/5, 20.0%).

4.1.2.3 Other avian influenza subtypes

- The identification of avian influenza subtypes other than H5 or H7 is not compulsory according to the surveillance guidelines (EC 2010) and the definition for avian influenza provided in Directive 2005/94/EC (EC 2005a). It will also depend on the laboratory method used.
- However, as part of the 2016 survey, the following subtypes other than H5 or H7 reported, included:
 - three H9 seropositive Fattening Turkey holdings from Germany; and
 - 104 holdings seropositive for influenza A virus of undetermined subtype, including:
 - one Backyard Flock holding from Croatia, which was also virologically positive for influenza A subtype H5 by PCR and influenza A virus of undetermined subtype by virus isolation;
 - 13 holdings from Germany (one Conventional Laying Hens, three Fattening Turkeys, one Turkey Breeders, four Fattening Ducks (one of which was also PCR and virus isolation positive for subtype H6), two Fattening Geese, one Breeder Geese, and one Others (which was also PCR positive for influenza A)); and
 - 90 holdings from Spain (six Chicken Breeders, three Conventional Laying Hens, four Free-range Laying Hens, three Fattening Turkeys, ten Fattening Ducks (one of which was also PCR positive for influenza A virus of undetermined subtype), one Backyard Flocks, nine Farmed Game Birds (gallinaceous), 49 Farmed Game Birds (waterfowl), and five Others).
- As part of the 2015 survey, the following subtypes other than H5 or H7 reported, included:
 - 11 H1 seropositive holdings from Spain (one Chicken Breeders, one Conventional Laying Hens, seven Fattening Ducks (two of which were also PCR

- positive for influenza A), one Farmed Game Birds (gallinaceous) and one Farmed Game Birds (waterfowl));
 - two H6 seropositive holdings from Spain (one Farmed Game Birds (waterfowl), and one Others, which was also seropositive for H10);
 - eight H9 seropositive holdings from Germany (one Free-range Laying Hens, six Fattening Turkeys and one Turkey Breeders);
 - one H10 seropositive Other holding from Spain (which was also seropositive for H6); and
 - 20 holdings seropositive for influenza A of undetermined subtype from Germany (one Free-range Laying Hens, one Broilers (at heightened risk), six Fattening Turkeys, one Turkey Breeders, four Fattening Ducks, six Fattening Geese and one Others).
- In 2014 five Fattening Turkey holdings from Germany were reported as seropositive for influenza A virus subtype H9, and eight holdings were reported as seropositive for influenza A virus of undetermined subtype (including one Conventional Laying Hen holding from Greece, four Fattening Turkey holdings from Germany, and three Fattening Duck holdings from Spain, which were also PCR positive for influenza A virus).

4.1.2.4 Summary – poultry laboratory results

- A total of 134 poultry holdings were reported by MS as serologically positive for influenza A virus subtypes H5 or H7 (0.74% of EU holdings sampled), 124 for subtype H5 (0.68% of total EU holdings sampled) and ten for subtype H7 (0.06% of total EU holdings sampled).
- H5 seropositive holdings were reported from ten MS (BE, CZ, DE, DK, ES, FR, IT, NL, PL and UK), with a high proportion of H5 seropositive poultry holdings found in France (85/124, 68.5%). The poultry categories with the most H5 seropositive detections were Breeder Ducks (74/126, 58.7%), followed by Breeder Geese (18/126, 14.3%), and Farmed Game Birds (waterfowl) (10/126, 7.9%). (N.B. Two poultry holdings were H5 seropositive in two poultry categories; these holdings were counted in each of the poultry categories (total = 126 H5 seropositive holdings), but in the total number of H5 seropositive holdings by MS (total = 124 H5 seropositive holdings), they were only counted once).
- Of the 124 H5 seropositive poultry holdings reported by MS, 119 holdings underwent follow-up testing for the presence of active infection, and seven of these (7/119, 5.9%) tested virologically positive for subtype H5.
- H7 seropositive poultry holdings were reported from five MS (DE, DK, ES, IT and NL) and were detected in Free-range Laying Hens (4/10, 40.0%), Farmed Game Birds (waterfowl) (4/10, 40.0%), Conventional Laying Hens (1/10, 10%) and Others (1/10, 10%).
- Of the ten H7 seropositive poultry holdings reported by MS, all underwent follow-up testing for the presence of active infection, and three of these (3/10, 30.0%) tested virologically positive for subtype H7.

Figure 5 Map of the intensity of sampling in the EU AI poultry survey and holdings testing serologically positive for H5 and H7 in 2016

The classification of intensity of surveillance is grouped by holdings sampled per 100km²
Low: up to 10, Medium: 11 - 100, High: 101 - 500, Very high: >500

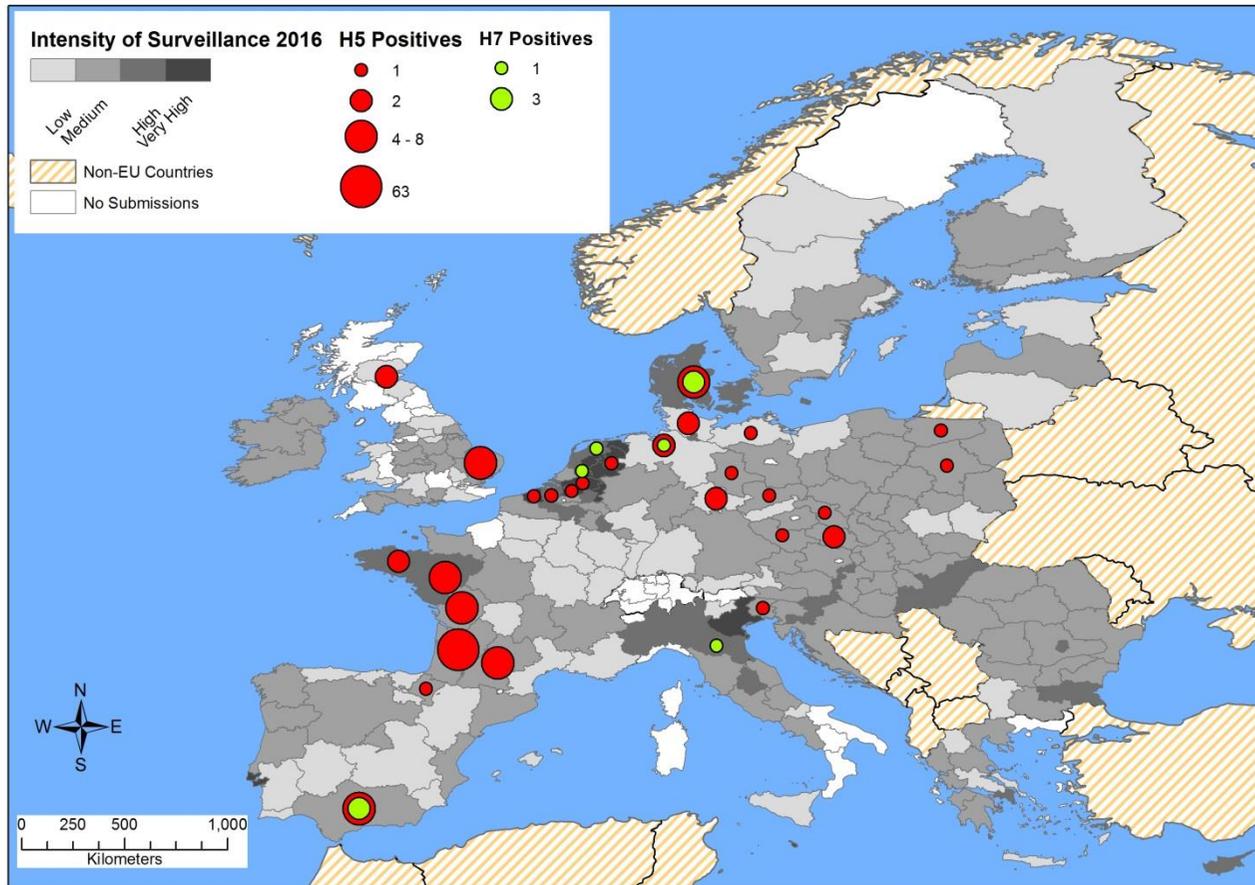


Table 5 Number of serological and virological H5 and H7 positive poultry holdings, by Member State, reported to the survey in 2016

MS	Total H5/H7 seropositive poultry holdings	Number of H5 seropositive poultry holdings	Number of H5 PCR/VI positive poultry holdings	Number of H7 seropositive poultry holdings	Number of H7 PCR/VI positive poultry holdings	Total poultry holdings sampled	Total poultry holdings reported (in regions where sampling took place)
AT	0	0	0	0	0	283	1,938
BE	3	3	0	0	0	679	547
BG	0	0	0	0	0	573	116,877
CY	0	0	0	0	0	113	1,310
CZ*	4	4	0	0	0	238	333
DE	10	9	4	1	0	739	24,799
DK	8	5	0	3	0	566	701
EE	0	0	0	0	0	25	25
EL	0	0	0	0	0	251	828
ES	10	7	0	3	0	758	11,702
FI	0	0	0	0	0	191	613
FR	85	85	0	0	0	1,541	13,922
HR	0	0	1	0	0	241	660
HU	0	0	0	0	0	961	179,186
IE	0	0	0	0	0	280	526
IT	2	1	2	1	1	3,549	2,928
LT	0	0	0	0	0	8	29
LU	0	0	0	0	0	28	512
LV	0	0	0	0	0	96	3,909
MT	0	0	0	0	0	24	33
NL**	4	2	2	2	2	3,708	1,567
PL	2	2	0	0	0	601	3,181
PT	0	0	0	0	0	462	237,665
RO	0	0	0	0	0	1,397	1,312
SE	0	0	0	0	0	211	503
SI	0	0	0	0	0	213	4,438
SK	0	0	0	0	0	106	216
UK	6	6	0	0	0	296	1,837
EU Total	134	124	9	10	3	18,138	612,097
CH	0	0	0	0	0	66	1,827

*CZ: One holding was H5 seropositive in both the BG and FGB-W categories; it is only counted once in the total number of H5 seropositive holdings for CZ.

**NL: One holding was H5 seropositive in both the LH and FR LH categories; it is only counted once in the total number of H5 seropositive holdings for NL.

Notes on virological data and subtypes other than H5 or H7

BE: One of the H5 seropositive holdings was also PCR positive for influenza A virus.

DE: Four of the H5 seropositive holdings were also PCR positive for H5. Three holdings were seropositive for H9. Thirteen holdings were seropositive for influenza A virus, one of which was also PCR/VI positive for subtype H6, and another was also PCR positive for influenza A virus.

ES: Ninety holdings were seropositive for influenza A virus, one of which was also PCR positive for influenza A virus.

HR: One holding was serology and VI positive for influenza A virus and PCR positive for H5.

IT: The H5 seropositive holding was also PCR positive for H5. The H7 seropositive holding was also PCR/VI positive for H7. In addition, one holding that did not undergo serological testing, was PCR/VI positive for H5.

NL: The H5 seropositive holdings were also PCR/VI positive for H5. The H7 seropositive holdings were also PCR/VI positive for H7.

Table 6 Information on epidemiological follow-up investigations at poultry holdings following a H5 or H7 seropositive result, reported by MS to the survey in 2016

H5 seropositive poultry holdings	Number of poultry holdings	% of total number of H5 seropositive poultry holdings
Following H5 seropositive result, epidemiological follow-up visit 'Done'	119	96.0
Done: H5 detected by virological testing	7	5.6
Done: No detection by virological testing	112	90.3
Following H5 seropositive result, epidemiological follow-up visit 'Not done'	5	4.0
Not done: Sampling at slaughter	1	0.8
Not done: Birds slaughtered/killed	4	3.2
Total number of H5 seropositive poultry holdings (by MS)	124	
H7 seropositive poultry holdings	Number of poultry holdings	% of total number of H7 seropositive poultry holdings
Following H7 seropositive result, epidemiological follow-up visit 'Done'	10	100
Done: H7 detected by virological testing	3	30.0
Done: No detection by virological testing	7	70.0
Following H7 seropositive result, epidemiological follow-up visit 'Not done'	0	0
Total number of H7 seropositive poultry holdings (by MS)	10	

4.1.3 Poultry categories

Table 7 shows the total number of poultry holdings sampled and the number found to be seropositive for subtypes H5 and H7 by poultry category reported to the survey in 2016 and 2015. The number of poultry holdings found serologically positive for subtypes H5 or H7 by poultry category across MS reported to the survey in 2016 is also displayed in Figure 6. This information is also shown in Table 8, along with the number of holdings sampled by poultry category across MS in 2016.

Descriptive results of the 2016 poultry survey by poultry category

Detailed tables displaying the number of poultry holdings reported (from regions where sampling took place), holdings sampled and holdings testing positive by poultry category across MS are shown in Section 8.1.1 Annex I.

4.1.3.1 Chicken Breeders

- Chicken Breeder holdings made up 13.7% of total holdings sampled in the EU in 2016. This compares to 25.4% in 2015 and 15.9% in 2014.
- Chicken Breeder holdings were sampled in 23 MS. This compares to 23 MS in 2015 and 24 MS in 2014. The number of holdings sampled varied from one holding (LV) to 807 (NL).
- In 2016, no Chicken Breeder holdings were found to be seropositive for influenza A virus subtypes H5 or H7. However, six holdings from Spain were reported to be seropositive for influenza A virus of undetermined subtype.

Similarly, in 2015, no Chicken Breeder holdings were found to be seropositive for influenza A virus subtypes H5 or H7. However, one holding from Spain was reported to be seropositive for influenza A virus subtype H1.

In 2014, two Chicken Breeder holdings from the Netherlands tested serologically and virologically (PCR and virus isolation) positive for influenza A virus subtype H5.

Table 7 Total number of H5 and H7 seropositive and sampled holdings, reported to the survey in 2016 and 2015, by poultry category

Poultry category	H5		H7	
	2016	2015	2016	2015
	Seropositive / sampled	Seropositive / sampled	Seropositive / sampled	Seropositive / sampled
Chicken Breeders	0 / 2,482	0 / 5,562	0 / 2,482	0 / 5,562
Conventional Laying Hens and Free-range Laying Hens*	5 / 5,248	1 / 6,314	5 / 5,248	3 / 6,314
Broilers (at heightened risk)	0 / 1,163	0 / 1,237	0 / 1,163	0 / 1,237
Fattening Turkeys and Turkey Breeders	1 / 2,330	0 / 2,497	0 / 2,330	0 / 2,497
Fattening and Breeder Ducks	83 / 1,608	13 / 1139	0 / 1,608	0 / 1139
Fattening and Breeder Geese**	24 / 722	14 / 608	0 / 722	2 / 608
Backyard Flocks	0 / 2,502	1 / 2,243	0 / 2,502	1 / 2,243
Farmed Game Birds (gallinaceous and waterfowl)**	10 / 1,002	0 / 925	4 / 1,002	1 / 925
Ratites	0 / 139	0 / 131	0 / 139	0 / 131
Others	3 / 942	4 / 1,211	1 / 942	0 / 1211
EU Total	126 / 18,138	33 / 21,867	10 / 18,138	7 / 21,867

*LH & FRLH: One holding was H5 seropositive in both the LH and FR LH categories and is counted in each category.

**BG & FGB-W: One holding was H5 seropositive in both the BG and FGB-W categories and is counted in each category.

2016 notes on virological data and subtypes other than H5 or H7 (not shown in table)

CB: Six holdings were seropositive for influenza A virus.

LH & FR LH: For LH, one of the H5 seropositive LH holdings was PCR/VI positive for H5 and the other H5 seropositive holding was PCR positive for H5. For FR LH, two of the H5 seropositive holdings were PCR/VI positive for H5 and two of the H7 seropositive holdings were PCR/VI positive for H7. In addition, four LH and four FR LH holdings were seropositive for influenza A virus.

FT & TB: For FT, the H5 seropositive holding was also PCR positive for H5. In addition, three FT holdings were seropositive for H9, and six FT holdings and one TB holding were seropositive for influenza A virus.

FD: Two H5 seropositive holdings were PCR positive for H5 and one H5 seropositive holding was PCR positive for influenza A virus. In addition, 14 FD holdings were seropositive for influenza A virus, one of which was also PCR/VI positive for H6, and another was PCR positive for influenza A virus.

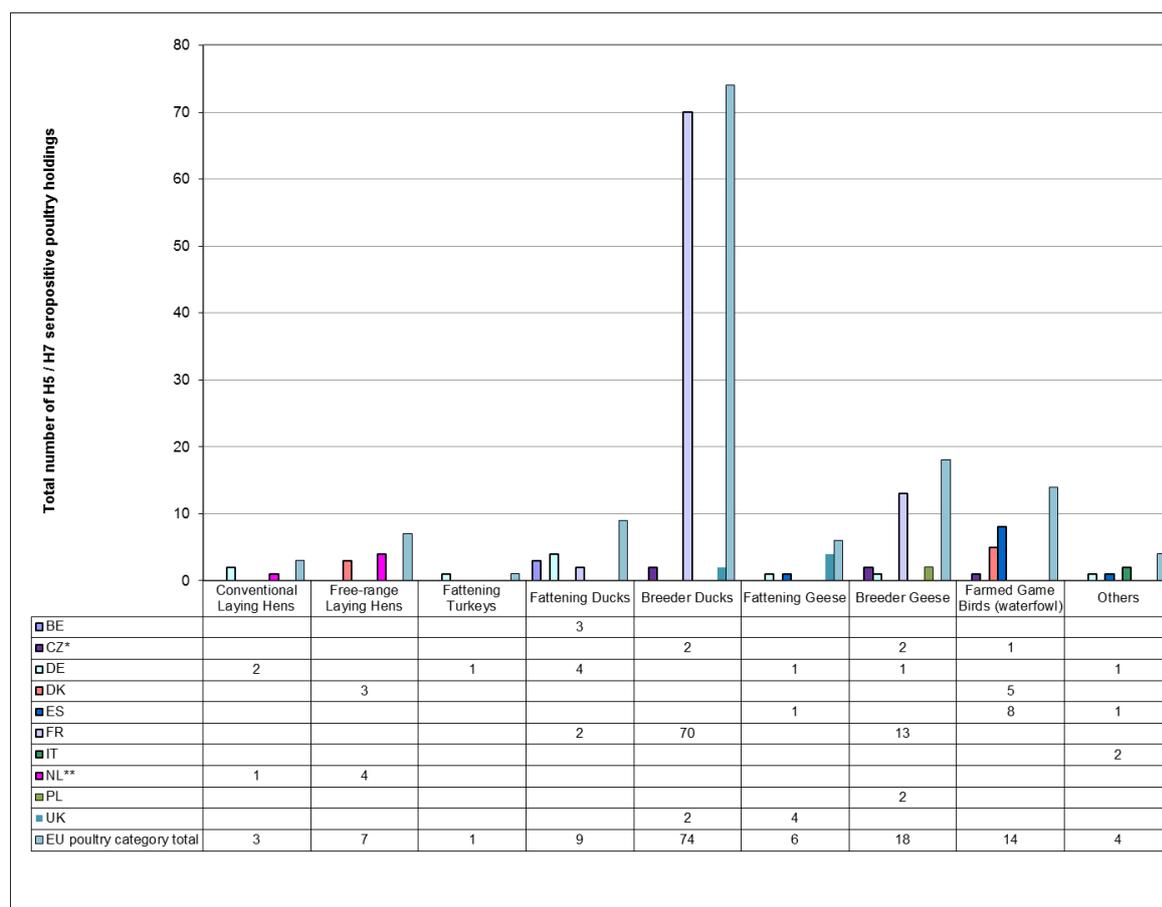
FG & BG: Two FG and one BG holdings were seropositive for influenza A virus.

BYF: One holding was serology and VI positive for influenza A virus and PCR positive for H5, and another was seropositive for influenza A virus (only).

FGB-G & FGB-W: Nine FGB-G and 49 FGB-W holdings were seropositive for influenza A virus.

O: One of the H5 seropositive holdings was PCR positive for H5. The H7 seropositive holding was PCR/VI positive for H7. One holding, that did not undergo serological testing, was PCR/VI positive for H5. In addition, six holdings were seropositive for influenza A virus, one of which was also PCR positive for influenza A virus.

Figure 6 Total number of poultry holdings found serologically positive for influenza A virus subtypes H5 and H7, by poultry category, across Member States, reported to the survey in 2016



*CZ: One holding was H5 seropositive in both the Breeder Geese and Farmed Game Bird (waterfowl) categories and is counted in each category.

**NL: One holding was H5 seropositive in both the Conventional Laying Hen and Free-range Laying Hen categories and is counted in each category.

4.1.3.2 Conventional Laying Hens and Free-range Laying Hens

- Overall, Laying Hen holdings (Conventional and Free-range combined) made up 28.9% of the total holdings sampled in the EU in 2016. Conventional holdings made up 19.2% of the total holdings sampled, which compares to 16.5% in 2015 and 20.9% in 2014. Free-range Laying Hen holdings made up 9.8% of the total holdings sampled, compared to 12.4% in 2015 and 8.6% in 2014.
- Conventional Laying Hen holdings were sampled in 27 MS (DK did not sample this category). In comparison, in 2015 and 2014, Conventional Laying Hens were sampled in all 28 MS. The number of holdings sampled varied from two holdings (LT) to 1,095 (NL). A total of 19 MS sampled Free-range Laying Hens, plus Switzerland. This was also the case in 2015 and 2014 (19 MS, plus Switzerland). The number of holdings sampled varied from four holdings (LU) to 738 (NL).
- In 2016, two Conventional Laying Hen holdings were found to be serologically and virologically positive for influenza A virus subtype H5, and one was seropositive for the H7 subtype. In addition, four Conventional Laying Hen holdings were reported to be seropositive for influenza A virus of undetermined subtype. For Free-range Laying Hen holdings, three were seropositive for the H5 subtype (two were also PCR and virus isolation positive for H5) and four were seropositive for the H7 subtype (two were also

PCR and virus isolation positive for H7). In addition, four Free-range Laying Hen holdings were reported to be seropositive for influenza A virus of undetermined subtype.

In 2015, no Conventional Laying Hen holdings were found to be seropositive for influenza A virus subtypes H5 or H7, although one holding was found to be seropositive for subtype H1. For Free-range Laying Hen holdings one holding was seropositive for the H5 subtype (which was also PCR and virus isolation positive for H5) and three were seropositive for the H7 subtype (two were also PCR and virus isolation positive for H7). In addition, one Free-range Laying Hen holding was seropositive for the H9 subtype and one was seropositive for influenza A of undetermined subtype.

In 2014, five Conventional Laying Hen holdings were found to be seropositive for influenza A virus, including two of the H5 subtype (which were also PCR and virus isolation positive for H5), two of the H7 subtype, and one of undetermined subtype. In addition, four Free-range Laying Hen holdings were found to be seropositive for the H5 subtype.

- Three MS detected H5 or H7 seropositive holdings from Laying Hens in 2016; Germany in Conventional Laying Hens, Denmark in Free-range Laying Hens, and the Netherlands in Conventional and Free-range Laying Hens (including one holding that was serologically and virologically positive for H5 in both categories). In addition Germany and Spain reported Laying Hen holdings seropositive for influenza A virus of undetermined subtype.

In 2015, two MS detected influenza A virus H5 or H7 seropositive Free-range Laying Hen holdings (DK and NL). In addition, a Conventional Laying Hen holding seropositive for influenza A virus subtype H1 was reported from Spain, while Free-range Laying Hen holdings seropositive for influenza A virus of the H9 subtype and of undetermined subtype were reported from Germany.

In 2014 four MS (BE, DE, DK and NL) reported H5 or H7 seropositive holdings from Laying Hens.

4.1.3.3 Broilers (at heightened risk)

- This category includes broilers when (i) they are kept in significant numbers in free-range production and (ii) they are considered to pose a higher risk of infection with avian influenza. In 2016, Broiler (at heightened risk) holdings made up 6.4% of total holdings sampled in the EU. This compares to 5.7% in 2015 and 5.3% in 2014.
- Broilers (at heightened risk) were sampled in 14 MS. This compares to 13 MS in 2015 and 12 MS in 2014. The number of holdings sampled varied from two holdings (in ES and FI) to 879 (NL).
- In 2016, no Broiler (at heightened risk) holdings were found to be seropositive for influenza A virus subtypes H5 or H7.

Similarly, in 2015, no Broiler (at heightened risk) holdings were found to be seropositive for influenza A virus subtypes H5 or H7. However, one holding from Germany was found to be seropositive for influenza A virus of undetermined subtype.

In 2014, no positive holdings were reported from this category.

4.1.3.4 Fattening Turkeys and Turkey Breeders

- Overall, Turkey holdings (Fattening and Breeder combined) made up 12.9% of the total holdings sampled in the EU in 2016. Fattening Turkey holdings made up 11.6% of the total holdings sampled in the EU in 2016, which compares to 10.5% in 2015 and 12.1% in

2014. Turkey Breeder holdings made up 1.3% of total holdings sampled in the EU in 2016, which compares to 0.9% in 2015 and 2014.

- Fattening Turkey holdings were sampled in 23 MS, plus Switzerland. This compares to 22 MS, plus Switzerland, in 2015, and 24 MS, plus Switzerland, in 2014. The number of holdings sampled varied from one holding (BG) to 1,135 (IT). A total of 13 MS sampled Turkey Breeder holdings, compared to 13 MS in 2015 and 14 MS in 2014. The number of holdings sampled varied from one holding (BG and EL) to 102 (FR).
- In 2016, one Fattening Turkey holding (from DE) was found to be serologically and PCR positive for influenza A virus subtype H5. In addition, three Fattening Turkey holdings (from DE) were reported to be seropositive for influenza A virus subtype H9, and a further six (three from DE and three from ES) were seropositive for influenza A virus of undetermined subtype. Also one Turkey Breeder holding (from DE) was reported to be seropositive for influenza A virus of undetermined subtype.

In 2015, no Turkey (Fattening or Breeder) holdings were reported to the survey as seropositive for influenza A virus subtypes H5 or H7. However, six Fattening Turkey holdings from Germany were found to be seropositive for influenza A virus subtype H9 and a further six were seropositive for influenza A virus of undetermined subtype. Also two Turkey Breeder holdings from Germany were found to be seropositive for influenza A virus, one of the H9 subtype and one of undetermined subtype.

In 2014, five Fattening Turkey holdings were found to be seropositive for influenza A virus subtype H9 and a further four were seropositive for influenza A virus of undetermined subtype (all from DE).

4.1.3.5 Fattening Ducks and Breeder Ducks

- Overall, Duck holdings (Fattening and Breeder combined) made up 8.9% of the total holdings sampled in the EU in 2016. Fattening Duck holdings made up 5.4% of those sampled, which compares to 3.9% in 2015 and 3.7% in 2014. Breeder Ducks made up 3.5% of the total holdings sampled, compared to 1.4% in 2015 and 1.3% in 2014.
- Fattening Duck holdings were sampled from 20 MS, which was the same number as in 2015 and 2014. The number of holdings sampled varied from one holding (LV) to 173 (DE). A total of 13 MS sampled Breeder Duck holdings, compared to 14 MS in 2015 and 12 MS in 2014. The number of holdings sampled varied from two holdings (SK) to 461 (FR).
- Overall, 83 Duck holdings were found to be seropositive for influenza A virus subtype H5 in 2016. This accounted for 61.0% (83/136) of all the H5/H7 seropositive holdings, reported by poultry category, to the survey in 2016, and 65.9% (83/126) of the H5 seropositive holdings. Of the 83 H5 seropositive Duck holdings, nine were Fattening Duck holdings (two were also PCR positive for H5 and one was also PCR positive for influenza A virus of undetermined subtype) and 74 were Breeder Duck holdings. The detection rate in Breeder Ducks (74 H5/H7 seropositive holdings/632 sampled, 11.7%) was the highest of the poultry categories surveyed in 2016. In addition, a further 14 Fattening Duck holdings were reported to be seropositive for influenza A virus of undetermined subtype (one was also PCR and virus isolation positive for H6 and one was PCR positive for influenza A virus of undetermined subtype).

In 2015, 13 Duck holdings were found to be seropositive for influenza A virus subtype H5, including seven Fattening Duck holdings (three were also PCR positive for H5) and six Breeder Duck holdings; this accounted for 39.4% (13/33) of the H5 seropositive holdings reported to the survey in 2015. In addition, a further seven Fattening Duck holdings were found to be seropositive for influenza A virus subtype H1 (two were also PCR positive for influenza A of undetermined subtype), and another four were seropositive for influenza A virus of undetermined subtype.

In 2014, 18 Duck holdings were found seropositive for influenza A virus subtype H5, including 11 Fattening Duck holdings (one was also PCR positive for H5) and seven Breeder Duck holdings; this accounted for 47.4% (18/38) of the H5 seropositive holdings reported to the survey in 2014. In addition, a further three Fattening Duck holdings were seropositive and PCR positive for influenza A virus of undetermined subtype.

- Five MS detected influenza A subtype H5 seropositive holdings in 2016; Belgium and Germany in Fattening Ducks, the Czech Republic and the United Kingdom in Breeder Ducks, and France in both Fattening and Breeder Ducks. In addition, Fattening Duck holdings, seropositive for influenza A virus of undetermined subtype were reported from Spain and Germany (one of the holdings from DE was also PCR and virus isolation positive for the H6 subtype).

In 2015, three MS detected influenza A virus subtype H5 seropositive holdings; Belgium and Germany in Fattening Ducks, and France in both Fattening Ducks and Breeder Ducks. In addition, Fattening Duck holdings, seropositive for influenza A virus of the H1 subtype and of undetermined subtype, were reported from Spain and Germany respectively.

Duck holdings found to be seropositive for influenza A virus subtype H5 were reported from four MS in 2014 (BE, DE, FR and NL).

4.1.3.6 Fattening Geese and Breeder Geese

- Overall, Geese holdings (Fattening and Breeder combined) made up 4.0% of the total holdings sampled in the EU in 2016. Fattening Geese holdings made up 2.5% of those sampled, compared to 1.8% in 2015 and 1.9% in 2014. Breeder Geese made up 1.5% of the total holdings sampled, compared to 1.0% in 2015 and 2014.
- Fattening Geese were sampled in 17 MS, which compares to 14 MS in 2015 and 13 MS in 2014. The number of holdings sampled varied from one holding (HR, LV and PT) to 115 (BE). Eleven MS sampled Breeder Geese holdings, compared to ten in 2015 and nine in 2014. The number of holdings sampled varied from one holding (BE and SK) to 81 (PL).
- Overall, 24 Geese holdings were found to be seropositive for influenza A virus subtype H5. This accounted for 17.6% (24/136) of all the H5/H7 seropositive holdings, reported by poultry category, to the survey in 2016, and 19.0% (24/126) of the H5 seropositive holdings. Of the 24 H5 seropositive Geese holdings, six were Fattening Geese and 18 were Breeder Geese holdings. The detection rate in Breeder Geese (18 H5/H7 seropositive holdings/265 sampled, 6.8%) was the third highest of the poultry categories surveyed in 2016, after Breeder Ducks (74 H5/H7 seropositive holdings/632 sampled, 11.7%) and Farmed Game Birds (waterfowl) (14 H5/H7 seropositive holdings/187 sampled 7.5%). In addition, a further two Fattening Geese and one Breeder Geese holdings were reported to be seropositive for influenza A virus of undetermined subtype.

In 2015, 16 Geese holdings were found to be seropositive for influenza A virus subtypes H5 or H7, accounting for 40% (16/40) of all the H5/H7 seropositive holdings reported to the survey in 2015. This included one H5 seropositive Fattening Geese holding, and 13 H5 seropositive (one was also PCR positive for H5) and two H7 seropositive Breeder Geese holdings. The H5/H7 detection rate in Breeder Geese (15 H5/H7 seropositive holdings/210 sampled, 7.1%) was the highest of the poultry categories surveyed in 2015. In addition in 2015, a further six Fattening Geese holdings were found to be seropositive for influenza A virus of undetermined subtype.

In 2014, 12 Geese holdings were found to be seropositive for influenza A virus subtypes of H5 or H7, including two H5 seropositive Fattening Geese holdings, and nine H5 and one H7 seropositive Breeder Geese holdings.

- Six MS detected influenza A virus subtype H5 seropositive Geese holdings in 2016; Spain and the United Kingdom in Fattening Geese, the Czech Republic, France and Poland in

Breeder Geese, and Germany in both Fattening and Breeder Geese. One of the H5 seropositive Breeder Geese holdings from the Czech Republic was also H5 seropositive in the Farmed Game Birds (waterfowl) category. In addition, Germany reported Geese holdings seropositive for influenza A virus of undetermined subtype.

In 2015, four MS detected influenza A virus subtype H5 or H7 seropositive Geese holdings; Finland in Fattening Geese, and France, Hungary and Poland in Breeder Geese. In addition, Fattening Geese holdings seropositive for influenza A virus of undetermined subtype were reported from Germany.

In 2014, Geese holdings found to be seropositive for influenza A virus subtypes H5 or H7 were reported from three MS (FI, FR and PL).

4.1.3.7 Backyard Flocks

- Backyard Flocks is the largest poultry category reported to the EU with 546,093 holdings reported in regions where sampling took place (546,093/612,097, 89.2% of EU total). Backyard Flocks made up 13.8% of total holding sampled in the EU in 2016, compared to 10.3% in 2015 and 13.7% in 2014.
- Backyard Flocks were sampled in 11 MS, compared to 13 MS in 2015 and 2014. The number of holdings sampled varied from six (ES) to 1,097 (RO). Three MS sampled the majority of Backyard Flock holdings: Romania (1,097 holdings, 43.8%), Hungary (495 holdings, 19.8%) and Bulgaria (394 holdings, 15.7%).
- In 2016, no Backyard Flock holdings were found to be seropositive for influenza A virus subtypes H5 or H7. However, one Backyard Flock holding, from Croatia, tested serologically positive for influenza A virus of undetermined subtype, and virologically positive for influenza A subtype H5 by PCR and influenza A virus of undetermined subtype by virus isolation. In addition, one Backyard Flock holding, from Spain, tested serologically positive for influenza A virus of undetermined subtype.

In 2015, one Backyard Flock holding, from Croatia, tested seropositive for influenza A virus subtype H5, and one Backyard Flock holding, from Italy, tested serologically and virologically (PCR and virus isolation) positive for influenza A virus subtype H7.

In 2014, no positive Backyard Flock holdings were reported to the survey.

4.1.3.8 Farmed Game Birds (gallinaceous and waterfowl)

- Overall, Farmed Game Birds (gallinaceous and waterfowl combined) made up 5.5% of the total holdings sampled in the EU in 2016. Farmed Game Birds (gallinaceous) made up 4.5% of those sampled, compared to 3.3% in 2015 and 5.0% in 2014. Farmed Game Birds (waterfowl) made up 1.0% of the total holdings sampled, comparable to 1.0% in 2015 and 1.2% in 2014.
- Farmed Game Bird (gallinaceous) holdings were sampled in 20 MS, which compares to 21 MS in 2015 and 20 MS in 2014. The number of holdings sampled varied from three holdings (BG) to 222 (ES). A total of 11 MS sampled Farmed Game Bird (waterfowl) holdings, compared to 12 MS in 2015 and 2014. The number of holdings sampled varied from one holding (BG, HR and SI) to 106 (ES).
- In 2016, no Farmed Game Bird (gallinaceous) holdings were found to be seropositive for influenza A virus subtypes H5 or H7. However, nine Farmed Game Bird (gallinaceous) holdings, from Spain, were reported to be serologically positive for influenza A virus of undetermined subtype. For Farmed Game Birds (waterfowl), ten holdings (from CZ, DK and ES) were seropositive for the H5 subtype and four (from DK and ES) were seropositive for the H7 subtype. The H5 seropositive Farmed Game Bird (waterfowl)

holding from the Czech Republic was also H5 seropositive in the Breeder Geese category. The detection rate in Farmed Game Birds (waterfowl) (14 H5/H7 seropositive holdings/187 sampled 7.5%) was the second highest of the poultry categories surveyed in 2016, after Breeder Ducks (74 H5/H7 seropositive holdings/632 sampled, 11.7%). In addition, 49 Farmed Game Birds (waterfowl) holdings, from Spain, were reported to be serologically positive for influenza A virus of undetermined subtype.

In 2015, one Farmed Game Bird (waterfowl) holding, from Denmark, was found to be seropositive for influenza A virus subtype H7. In addition, a further three Farmed Game Bird holdings from Spain were found to be seropositive for influenza A virus, including two of the H1 subtype (one in FGB-G and one in FGB-W) and one of the H6 subtype (in FGB-W).

In 2014, no positive Farmed Game Bird (gallinaceous and waterfowl) holdings were reported to the survey.

4.1.3.9 Ratites

- Ratite holdings made up just 0.8% of total holdings sampled in the EU in 2016, which compares to 0.6% in 2015 and 0.7% in 2014.
- Ratite holdings were sampled in 13 MS, which compares to 12 MS in 2015 and 13 MS in 2014. The number of holdings sampled varied from one holding (FI and RO) to 34 (PL).
- In 2016, no Ratite holdings were found to be seropositive for influenza A virus subtypes H5 or H7.

Similarly, in 2015, no positive Ratite holdings were reported to the survey.

In 2014, one Ratite holding from Poland was found to be seropositive for influenza A virus subtype H5.

4.1.3.10 Others

- Other holdings made up 5.2% of total holdings sampled in the EU in 2016, which compares to 5.5% in 2015 and 7.7% in 2014.
- Where details were provided, the types of poultry reported in this category included: mixed species reared and sold for use as backyard poultry, guinea fowl, quail, growers, pigeons, zoo, and other non-domestic species. For more information on this, please see [Table 21](#).
- Other holdings were sampled in 11 MS in 2016, which compares to eight MS in 2015 and ten MS in 2014. The number of holdings sampled varied from one holding (BG, EE and LT) to 787 (IT). As in 2015 and 2014, Italy sampled the majority of Other holdings (787/942, 83.5%).
- In 2016, four Other holdings were found to be seropositive for influenza A virus subtypes H5 and H7, including three for the H5 subtype (one was also PCR positive for H5), and one for the H7 subtype (which was also PCR and virus isolation positive for H7). In addition, one Other (grower) holding, which did not undergo serological testing, tested PCR and virus isolation positive for subtype H5. Furthermore, six Other holdings were reported to be seropositive for influenza A virus of undetermined subtype (one of which was also PCR positive for influenza A virus of undetermined subtype).

In 2015, four Other holdings were found to be seropositive for influenza A virus subtype H5. Three of these holdings were also virologically positive for H5 (two were PCR and virus isolation positive for H5 and one was PCR positive for H5/virus isolation not

performed). In addition, a further Other holding was found to be seropositive for influenza A virus subtypes H6 and H10, and another holding was seropositive for influenza A virus of undetermined subtype.

In 2014, two Other holdings were seropositive and PCR positive for influenza A virus subtype H7. In addition, one Other holding was PCR (only) positive for influenza A virus subtype H5 (serology and virus isolation negative).

- In 2016, three MS detected influenza A virus subtypes H5 and H7 seropositive Other holdings; including H5 seropositive holdings from Germany and Spain, and both H5 and H7 seropositive holdings from Italy. Italy also reported one Other (grower) holding, testing PCR and virus isolation positive for subtype H5, but which did not undergo serological testing according to the approved programme. In addition, Germany and Spain reported Other holdings seropositive for influenza A virus of undetermined subtype.

In 2015, two MS detected influenza A virus subtype H5 seropositive holdings (DE and IT). In addition, an Other holding seropositive for influenza A virus subtypes H6 and H10 was reported from Spain, while a further Other holding seropositive for influenza A virus of undetermined subtype was reported from Germany.

In 2014, one MS (IT) reported H5 and H7 seropositive holdings from Other holdings.

Table 8 Total number of poultry holdings sampled and those found H5 or H7 seropositive, by poultry category, across Member States, reported to the survey in 2016

The number of seropositive poultry holdings is displayed in parentheses.

Member States	Chicken Breeders	Conventional Laying Hens	Free-range Laying Hens	Broilers (at heightened risk)	Fattening Turkeys	Turkey Breeders	Fattening Ducks	Breeder Ducks	Fattening Geese	Breeder Geese	Backyard Flocks	Farmed Game Birds (gallinaceous)	Farmed Game Birds (waterfowl)	Rallies	Others	Total
AT	24	64	62		57		15		56					5		283
BE	199	201	185		51		16 (3)			1		22			4	679
BG	9	51		3	1	1	109				394	3	1		1	573
CY	7	22	13	5	7						55	4				113
CZ*		53	13		42		43	26 (2)	5	8 (2)		36	12 (1)			238
DE	25	86 (1)	85	20	118 (1)	10	173 (4)	22	115 (1)	17 (4)		5		29	34 (1)	739
DK	184		219 (2)	30	19		23		2			80	9 (1)			566
EE		24	219 (1)										9 (4)			113
EL	47	54	26	26	24	1						14		2	57	251
ES	80	71	56	2	60	12	42	3	10 (1)	5	6	222	106 (3)			758
FI	36	51	40	2	40	3	2		3			9	4	1		191
FR	393	41	62	49	51	102	133 (2)	461 (70)	48	75 (13)		106	17		3	1,541
HR	22	59	12		19	4	22	13	1	14	65	9	1			241
HU	49	54	13		61	26	74	19	65	46	495	38	13	8		961
IE	66	37	63	46	51		15		2							280
IT	261	878	75		1,135	47	57	12	4	11	166	108		8	787 (1)	3,549
LT		2		5											1	8
LU		4	4	3							15			2		28
LV	1	33					1		1		60					96
MT		24														24
NL**	807	1095 (1)	738 (2)	879	88		89	10							2	3,708
PL	63	74	36		55	12	83	28	96	81 (2)		39		34		601
PT	75	90	36	60	63		29	3	1		56	43		6		462
RO	72	179			29			3			1,097	14		1	2	1,397
SE	34	62	30	33	18	3	4		7			9	7	4		211
SI	7	64			43						93	5	1			213
SK	11	47			9	6	4	2	3	1		17		6		106
UK	10	60			57	5	42	30 (2)	38 (4)	6		32	16			296
EU Total	2,482	3,480	1,768	1,163	2,098	232	976	632	457	265	2,502	815	187	139	942	18,138
Total H5/H7 seropositive holdings	0	3	7	0	1	0	9	74	6	18	0	0	14	0	4	136
% positive	0%	0.09%	0.40%	0%	0.05%	0%	0.92%	11.71%	1.31%	6.79%	0%	0%	7.49%	0%	0.42%	0.75%
CH			40		26											66

*CZ: One holding was H5 seropositive in both the BG and FGB-W categories and is counted in each category.

**NL: One holding was H5 seropositive in both the LH and FR LH categories and is counted in each category.

 Seropositive H5 Seropositive H7

Notes on virological data and subtypes other than H5 or H7 (not shown in table)

BE: One H5 seropositive FD holding was also PCR positive for influenza A virus.

DE: One LH, one FT and two FD H5 seropositive holdings were also PCR positive for H5. Three FT holdings were seropositive for H9. Thirteen holdings (one LH, three FT, one TB, four FD, two FG, one BG, and one O) were seropositive for influenza A virus; one of the FD holdings was also PCR/VI positive for subtype H6, and the O holding was also PCR positive for influenza A virus.

ES: Ninety holdings (six CB, three LH, four FR LH, three FT, ten FD, one BYF, nine FGB-G, 49 FGB-W, and five O) were seropositive for influenza A virus; one of the FD holdings was also PCR positive for influenza A virus.

HR: One BYF holding was serology and VI positive for influenza A virus and PCR positive for H5.

IT: The H5 seropositive O holding was also PCR positive for H5. The H7 seropositive O holding was also PCR/VI positive for H7. In addition, one O holding that did not undergo serological testing, was PCR/VI positive for H5.

NL: The H5 seropositive LH and FR LH holdings were also PCR/VI positive for H5. The H7 seropositive FR LH holdings were also PCR/VI positive for H7.

4.1.3.11 Summary – poultry categories

- Poultry categories sampled: The most frequently sampled poultry category was Laying Hens (Conventional and Free-range), making up 28.9% of the total holdings sampled by EU MS in 2016, followed by Backyard Flocks (13.8% of EU holdings sampled), and Chicken Breeders (13.7% of EU holdings sampled). In 2015, the most sampled poultry categories were Laying Hens (Conventional and Free-range), followed by Chicken Breeders, and then Turkeys (Fattening and Breeder), while in 2014, it was Laying Hens (Conventional and Free-range), followed by Chicken Breeders, and then Backyard Flocks.

In 2016, compared to 2015, there was an increase in the number of holdings sampled from eight categories: Breeder Ducks (+112.8%), Breeder Geese (+26.2%), Turkey Breeders (+20.8%), Fattening Ducks (+15.9%), Fattening Geese (+14.8%), Farmed Game Birds (gallinaceous) (+13.7%), Backyard Flocks (+11.5%), and Ratites (+6.1%); while all the other poultry categories saw a decrease in the number of holdings sampled.

- H5 avian influenza: In 2016, the poultry category with the highest number of holdings positive for the H5 subtype by serology was Breeder Ducks (74/126, 58.7%), followed by Breeder Geese (18/126, 14.3%), and Farmed Game Birds (waterfowl) (10/126, 7.9%).

The highest number of holdings positive for the H5 subtype by serology in 2015 was Breeder Geese (13/33, 39.4%), followed by Fattening Ducks (7/33, 21.2%), and Breeder Ducks (6/33, 18.2%), and in 2014, was Fattening Ducks (11/38, 28.9%), followed by Breeder Geese (9/38, 23.7%), and Breeder Ducks (7/38, 18.4%).

- H7 avian influenza: In 2016, the poultry categories with the highest number of holdings positive for the H7 subtype by serology were Free-range Laying Hens (4/10, 40.0%) and Farmed Game Birds (waterfowl) (4/10, 40.0%), followed by Conventional Laying Hens (1/10, 10.0%) and Others (1/10, 10.0%).

The highest number of holdings positive for the H7 subtype by serology in 2015 was Free-range Laying Hens (3/7, 42.9%) and Breeder Geese (2/7, 28.6%), followed by Backyard Flocks (1/7, 14.3%) and Farmed Game Birds (waterfowl) (1/7, 14.3%), and in 2014, was Conventional Laying Hens (2/5, 40.0%) and Others (2/5, 40.0%), followed by Breeder Geese (1/5, 20.0%).

4.2 Wild Birds

4.2.1 Sampling by passive surveillance

4.2.1.1 Overview

Birds sampled by passive surveillance were reported as “found dead”, “injured” or “live with clinical signs”. During 2016, 12,828 birds were sampled by passive surveillance, which represents an 89.7% increase from 2015 and 98.2% increase over the last five years average. This includes 264 birds sampled by Switzerland, the one contributing non-MS, [Table 9](#).

Detailed information regarding the number of birds sampled by MS in each quarter is displayed in Annex 3 (section 8.2.1.3). In total, 27 EU MS submitted passive surveillance data for analysis in 2016, with Malta being the only country with no submissions. The MS with the highest number of birds tested by passive surveillance in 2016 was Germany (n = 5,861), which alone contributed 45.9% of the whole EU passive surveillance effort. Italy (n = 1,899) and Hungary (n = 960) also contributed to a large proportion of the 2016 surveillance effort (22.2% combined). Eleven MS each sampled fewer than 100 dead or moribund birds throughout the year.

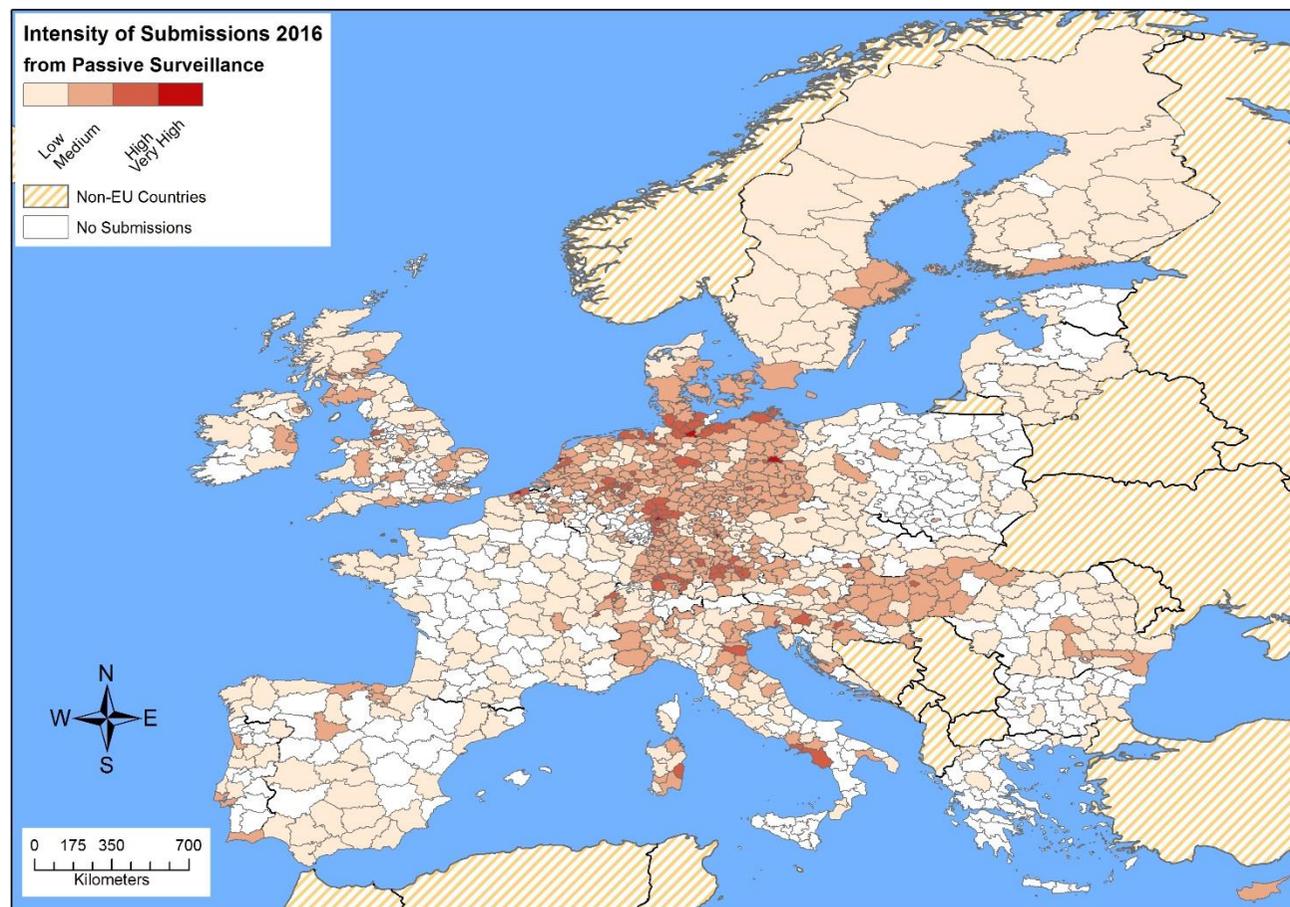
Table 9 Birds sampled by passive surveillance in 2016, 2015 and previous five year (2011-2015) average by EU Member State – Non-MS data included

Member State	Number of wild birds sampled by passive surveillance		
	2016	2015	5 year average (2011-2015)
DE	5,861	1,666	1,334
IT	1,899	1,132	1,146
HU	960	1,289	1,152
UK	537	472	526
NL	536	197	209
SE	354	220	234
BE	280	349	228
RO	275	193	213
ES	264	256	487
FI	208	102	99
DK	204	37	22
AT	201	137	110
FR	190	120	89
SI	151	92	116
CY	124	59	107
HR	116	48	41
PT	116	134	86
CZ	89	60	74
PL	85	40	30
SK	32	26	21
IE	25	37	30
LT	22	21	13
EL	16	11	52
BG	9	53	18
EE	5	9	9
LV	3	0	2
LU	2	1	12
EU Total	12,564	6,761	6,460
CH	264	1	12

4.2.1.2 Geographical targeting

Figure 7 Map of the intensity of sampling by passive surveillance across Member States in 2016 – EU-data only

The classification of sampling intensity is grouped by number of submissions per 100 square kilometres.
Low: >0 and ≤ 25 , Medium: >25 and ≤ 250 , High: >250 and ≤ 2500 , Very High: >2500



4.2.1.3 Seasonal targeting

Figure 8 displays the percentage of birds sampled by MS in each quarter. For the EU overall, comprising data for all 27 MS submitting passive surveillance data, the frequency of surveillance was greater in the winter months (1st and 4th quarters, 74.7%) than in the summer months (2nd and 3rd quarters, 25.3%). The highest concentration of data was collected in the fourth quarter (Oct-Dec, 60.6%) of the year. Temporal targeting of sampling varied greatly among MS. Eight MS carried out the majority of their sampling in the fourth quarter (Austria 75.1%, Denmark 91.7%, Estonia 80.0%, France 84.7%, Germany 84.0%, Greece 68.8%, Hungary 78.2% and Poland 77.6%). Some MS carried out more sampling during the summer months than in winter (Bulgaria 66.7%, Ireland 56.0%, Latvia 66.7%, Netherlands 60.3% and Slovenia 58%). In other cases the surveillance was relatively evenly distributed throughout the year, as was the case for Lithuania and Sweden (Figure 8).

Figure 8 Percentage of all birds sampled by passive surveillance in 2016, by quarter and MS. Raw numbers of birds sampled by quarter and MS are shown in the table below – Non-MS data included

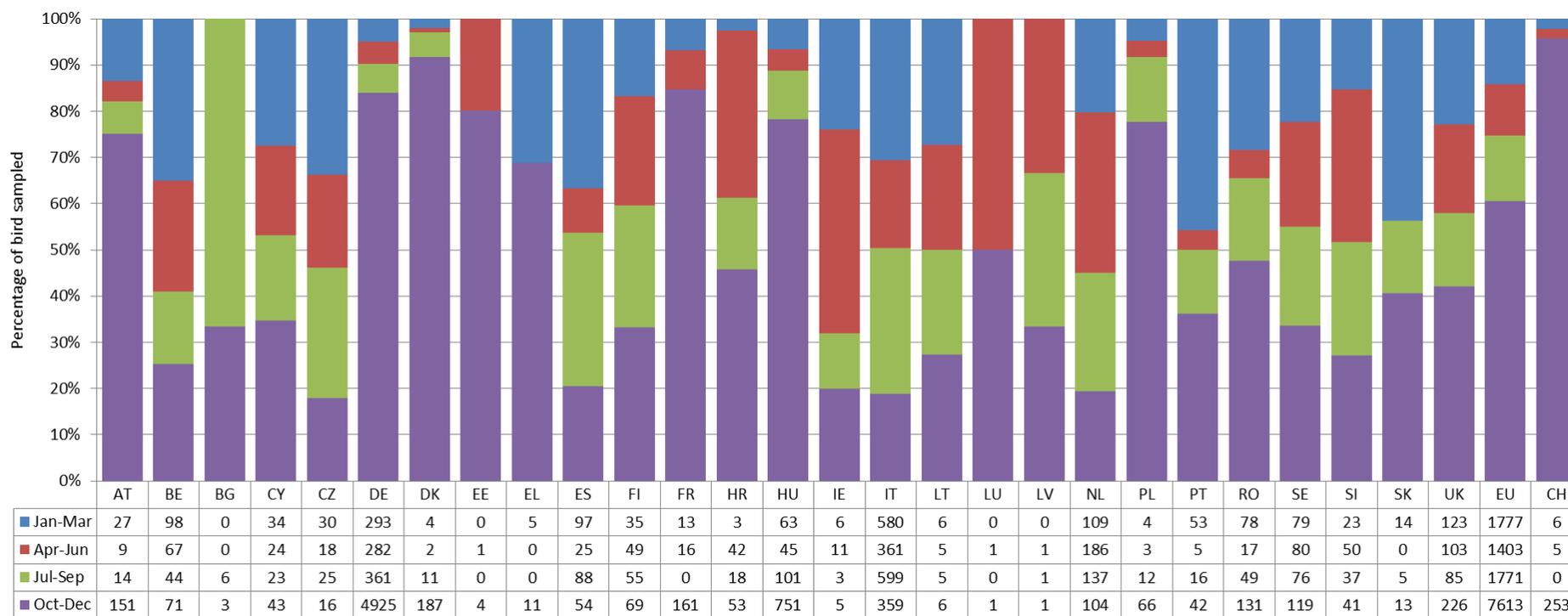


Figure 9 Percentage of birds sampled by passive surveillance in each quarter of 2016 for Member States – EU-data only

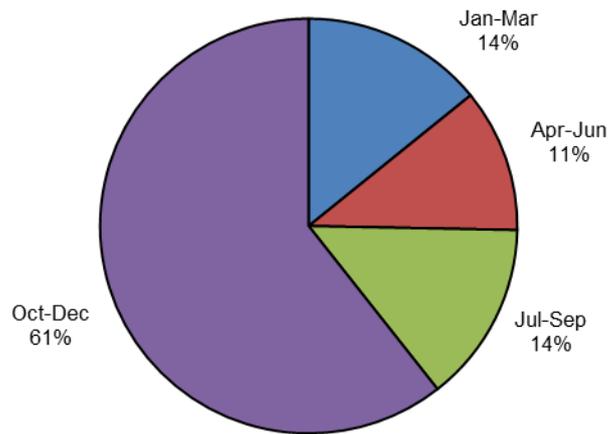
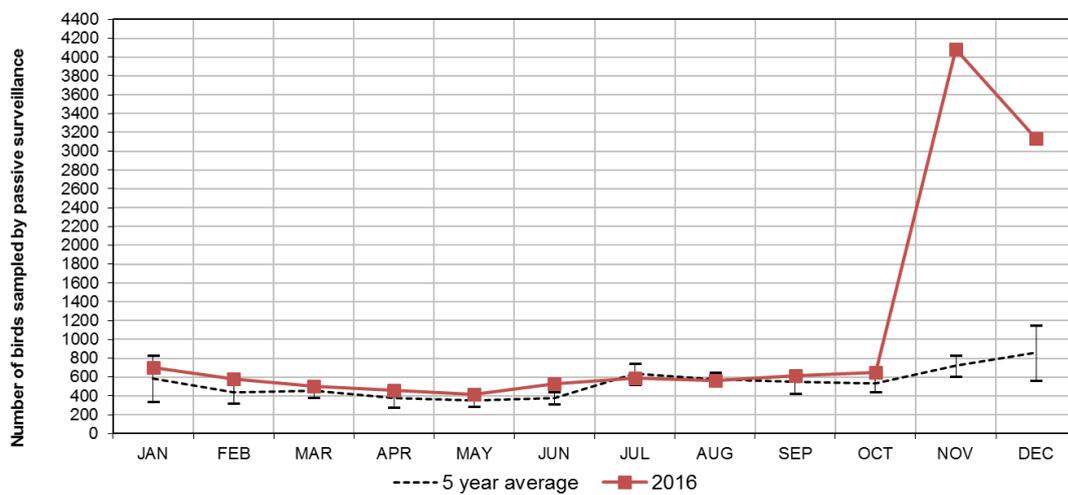


Figure 10 Temporal distribution of the number of birds sampled by passive surveillance during 2016 – Non-MS data included



4.2.1.4 Targeting of bird species

In total 12,828 birds of 22 Orders and at least 269 species were sampled by passive surveillance in 2016. [Table 10](#) displays the ten most frequently sampled Orders. As in 2006-2015, the Order in which most birds were sampled by passive surveillance was Anseriformes (ducks, geese and swans). In 2016 Passeriformes and Falconiformes were the second and third most commonly sampled Orders, respectively. This is similar to previous years, where Passeriformes and Falconiformes have been in the top five most commonly sampled Orders since 2006.

[Table 11](#) displays the top 15 species sampled by passive surveillance in 2016.

Bird species were reported as 'unknown' for 51 (0.4%) of the 12,828 wild birds sampled, this is an increase on the 2015 survey when just five birds (0.1%) were reported to be completely unknown species.

A total of 1,738 (13.5%) of birds were not identified to species level (identified only to genus or family level). This involved birds in the genera of *Columba* (n=378), *Anas* (n=362), *Cygnus* (n=320), *Larus* (n=248), *Buteo* (n=217), *Corvus* (n=106), *Anser* (n=101), *Ardea* (n=44), *Falco* (n=39), *Turdus* (n=38), *Accipiter* (n=28), *Streptopelia* (n=22), *Phalacrocorax* (n=16), *Parus* (n=12), *Ciconia* (n=11) and others (with less than 10 birds).

In 2016, the most commonly sampled species was Mallard (*Anas platyrhynchos*) (n=1,092), followed by Mute Swan (*Cygnus olor*) (n=555) and Tufted Duck (*Aythya fuligula*) (n=554). Very few Tufted Ducks were sampled by passive surveillance in 2015 (n=5/6757, <0.1%), representing a large increase in the sampling of this species during the 2016 reporting year. Mallards (*Anas platyrhynchos*) and Mute Swans (*Cygnus olor*) have both been sampled in high numbers since the surveillance began in 2006. Of the 11 most frequently sampled species in 2016 (excluding genus aggregates), over 60% were Target Species (TS). [Table 11](#) also indicates that the top 15 species or genera aggregates account for just under half of all birds tested by passive surveillance in 2016 (n=6,344/12,828, 49.5%).

Table 10 Wild bird Orders most frequently sampled by passive surveillance in 2016 – Non-MS data included

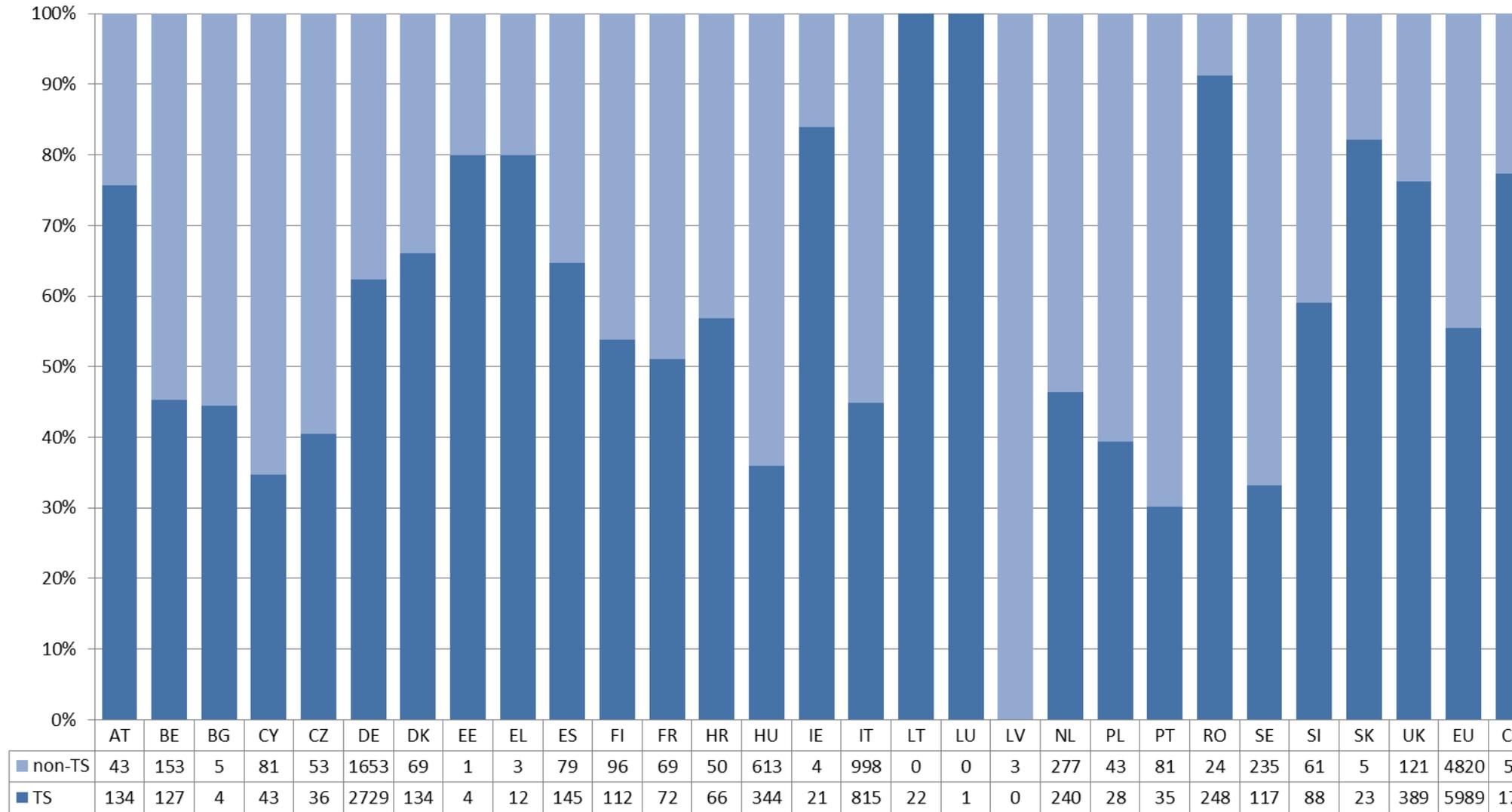
Order	Number sampled in 2016	% of 2016 passive surveillance (total n=12,645)	Number sampled in 2015	% of 2015 passive surveillance (total n=6,761)
Anseriformes	4,118	32.6%	1,893	28.0%
Passeriformes	2,146	17.0%	1,068	15.8%
Falconiformes	1,826	14.4%	966	14.3%
Charadriiformes	1,447	11.4%	749	11.1%
Columbiformes	1,060	8.4%	622	9.2%
Galliformes	519	4.1%	442	6.5%
Strigiformes	474	3.7%	322	4.8%
Ciconiiformes	450	3.6%	223	3.3%
Gruiformes	311	2.5%	139	2.1%
Pelecaniformes	172	1.4%	107	1.6%
Total (Top 10 Orders only)	12,523	99.0%		

Table 11 Wild bird species most frequently sampled by passive surveillance in 2016 – Non-MS data included

Species	Number sampled in 2016	% of 2016 passive surveillance (total n=12,828)	Number sampled in 2015	% of 2015 passive surveillance (total n=6,761)
<i>Anas platyrhynchos</i>	1,092	8.6%	735	10.9%
<i>Cygnus olor</i>	555	4.4%	349	5.2%
<i>Aythya fuligula</i>	554	4.4%	5	0.1%
<i>Buteo buteo</i>	548	4.3%	324	4.8%
<i>Turdus merula</i>	435	3.4%	147	2.2%
<i>Phasianus colchicus</i>	421	3.3%	376	5.6%
<i>Columba sp.</i>	378	3.0%	146	2.2%
<i>Anas sp.</i>	362	2.9%	127	1.9%
<i>Anas crecca</i>	347	2.7%	74	1.1%
<i>Cygnus sp.</i>	320	2.5%	145	2.1%
<i>Larus argentatus</i>	296	2.3%	306	4.5%
<i>Falco tinnunculus</i>	291	2.3%	198	2.9%
<i>Accipiter nisus</i>	274	2.2%	86	1.3%
<i>Ardea cinerea</i>	254	2.0%	75	1.1%
<i>Larus sp.</i>	248	2.0%	28	0.4%
Total (top 15 species only)	6,344	50.2%		

The total number of birds sampled from the Target Species category and birds sampled that were not Target Species (when considering birds reported to species level only) are shown in [Figure 11](#). In 2016 more than half of the birds identified to species level belong to the Target Species list (n=5990/10809, 55.4%). This proportion was similar in 2015 when around half of the identified birds were on the TS list (49.4%). In 2016 16 MSs submitted over half of their samples from birds on the Target Species list, when considering birds identified to species level only.

Figure 11 Proportion of TS and non-TS sampled by passive surveillance in 2016, by Member State – Non-MS data included



Note: 1,789 birds were not identified to species level and could not be classified as Target Species or non-Target Species.

4.2.2 Highly Pathogenic Avian Influenza Positives

4.2.2.1 Overview of HPAI results

In 2016, highly pathogenic avian influenza (HPAI) was detected in 939 birds by 17 MS (n=822) and Switzerland (n=117), the one reporting non-MS (Table 12). Five birds were confirmed as subtype HPAI H5N5 (Clade 2.3.4.4B) by four MS. Subtype HPAI H5N8 (clade 2.3.4.4B) was confirmed in 782 birds by 15 MS and Switzerland, while Germany (n=3) and Switzerland (n=107) reported a further 110 birds as positive for H5N8, but with pathogenicity undetermined. In both Germany and Switzerland detections of HPAI H5N8 were also made alongside the H5N8 birds with pathotype undetermined, while there were no detections of LPAI H5N8; as such, these 110 birds have been included in the HPAI section of this report in the HPAI H5N8 category (overall n=892, EU MS only n=775).

Forty-two birds were reported as HPAI H5 but the N type was not determined and five birds were reported as HPAI but the H type was not determined. For the purpose of this report it is assumed that HPAI where the H type was not determined was HPAI H5, so all 42 birds are presented as HPAI H5.

HPAI H5N8 was first detected in a Mute Swan (*Cygnus olor*) 'found dead' in Hungary on 19th October 2016. Two further Mute Swans were confirmed positive for HPAI H5N8 in Croatia on 31st October, followed by detections in five unidentified ducks and one unidentified gull in Poland on 2nd November. Detections of HPAI H5N8 continued in a further 11 MS and Switzerland to the end of the reporting year.

The first detection of HPAI H5N5 was made in the Netherlands on 12th December 2016, in one Mute Swan (*Cygnus olor*) 'found dead'. Detections were subsequently made in Italy in a Eurasian Wigeon (*Anas penelope*), Germany in a Greylag Goose (*Anser anser*) and Croatia in two Mute Swans (*Cygnus olor*); all birds were 'found dead'.

There were no detections of HPAI H5N1 by passive surveillance in 2016 despite the ongoing threat to Europe with frequent detection of these viruses in North Africa and Central Asia. HPAI H5N1 was last reported in 2015 in 12 birds in Bulgaria and Romania; ten Dalmatian Pelicans (*Pelicanus crispus*), one Black-headed Gull (*Larus ridibundus*), and one in a Rock Dove (*Columba livia*). In addition, HPAI H5N8 was reported in 2015 in Sweden in two Mute Swans (*Cygnus olor*).

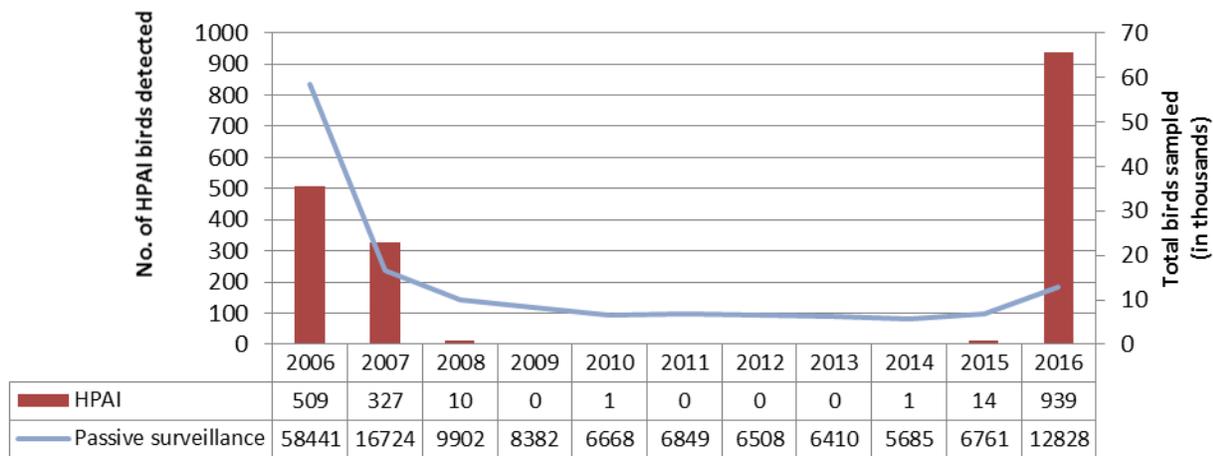
Table 12 Total number of wild birds sampled by passive surveillance and proportion testing positive for HPAI H5N8, HPAI H5N5 and HPAI H5 by Member States in 2016 – Non-MS data included

Member State	Number of Birds Sampled	Number of HPAI H5N8 detections	% HPAI H5N8 (proportion of total sampled)	Number of HPAI H5N5 detections	% HPAI H5N5 (proportion of total sampled)	Number of HPAI H5 detections	% HPAI H5 (proportion of total sampled)	Percentage of sampled birds with any HPAI detection
AT	201	29	14.4%	-	-	1	0.5%	14.9%
BG	9	2	22.2%	-	-	-	-	22.2%
DE	5,861	574	9.8%	1	0.02%	24	0.4%	10.2%
DK	204	64	31.4%	-	-	1	0.5%	31.9%
EL	16	1	6.3%	-	-	-	-	6.3%
FI	208	15	7.2%	-	-	-	-	7.2%
FR	190	6	3.2%	-	-	-	-	3.2%
HR	116	16	13.8%	2	1.7%	-	-	15.5%
HU	960	5	0.5%	-	-	-	-	0.5%
IE	25	1	4.0%	-	-	-	-	4.0%
IT	1,899	-	-	1	0.1%	-	-	0.1%
NL	536	8	1.5%	1	0.2%	-	-	1.7%
PL	85	16	18.8%	-	-	-	-	18.8%
RO	275	10	3.6%	-	-	-	-	3.6%
SE	354	-	-	-	-	16	4.5%	4.5%
SI	151	1	0.7%	-	-	-	-	0.7%
UK	537	27	5.0%	-	-	-	-	5.0%
EU	12,564	775	6.2%	5	0.04%	42	0.3%	6.5%
CH	264	117	44.3%	-	-	-	-	44.3%

When considering detections by EU MS, HPAI of any subtype was detected in 6.5% of birds tested by passive surveillance. HPAI H5N8 was detected in 6.2% of birds tested via the passive surveillance programme within MS. Denmark (n=64/204, 31.4%), Bulgaria (n=2/9, 22.2%) and Poland (n=16/85, 18.8%) reported the highest proportion of HPAI H5N8 positive detections, while Austria and Croatia also reported HPAI H5N8 in more than 10% of birds sampled. HPAI H5N5 was detected at a very low level of 0.04% of birds tested by passive surveillance amongst EU MS.

Figure 12 shows the number wild birds sampled by passive surveillance and the number of those birds reported positive for HPAI in each year between 2006 and 2016. When considering passive surveillance data submitted by both MS and Non-MS, in 2016 7.3% (n=939/12,828) of birds were found positive for HPAI, while in 2006 0.9% (n=509/58,441) of birds were found to be positive for HPAI.

Figure 12 Number of HPAI infected birds detected and total birds sampled by passive surveillance from 2006- 2016



4.2.2.2 Geographical distribution of HPAI detections

Figure 13a Intensity of sample submission from passive surveillance and distribution of HPAI H5N8, HPAI H5N5 and HPAI H5 detections in wild birds in EU MS in 2016 – EU-data only

The classification of sampling intensity is grouped by number of submissions per 100 square kilometres. Low: >0 and ≤ 25 , Medium: >25 and ≤ 250 , High: >250 and ≤ 2500 , Very High: >2500

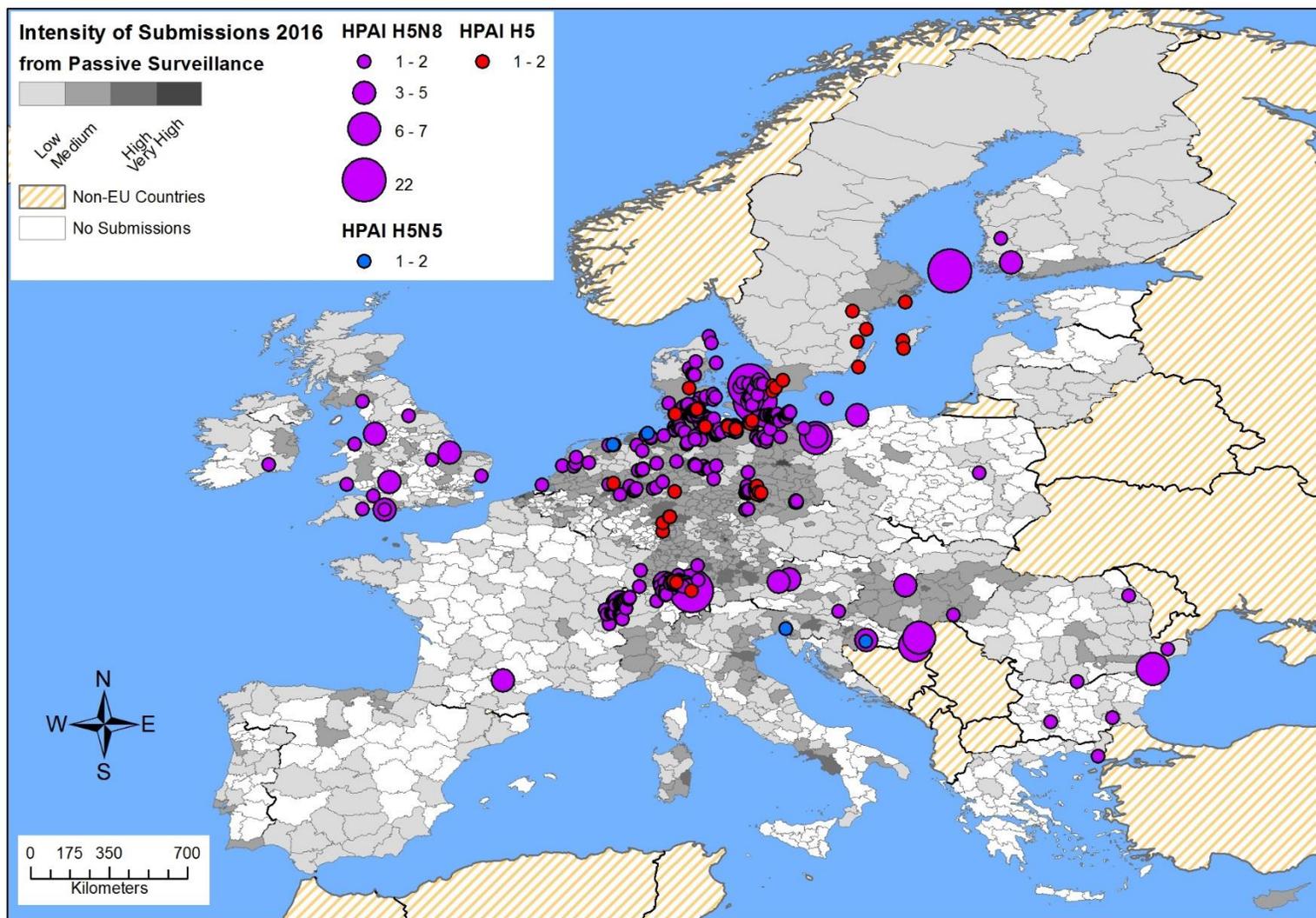
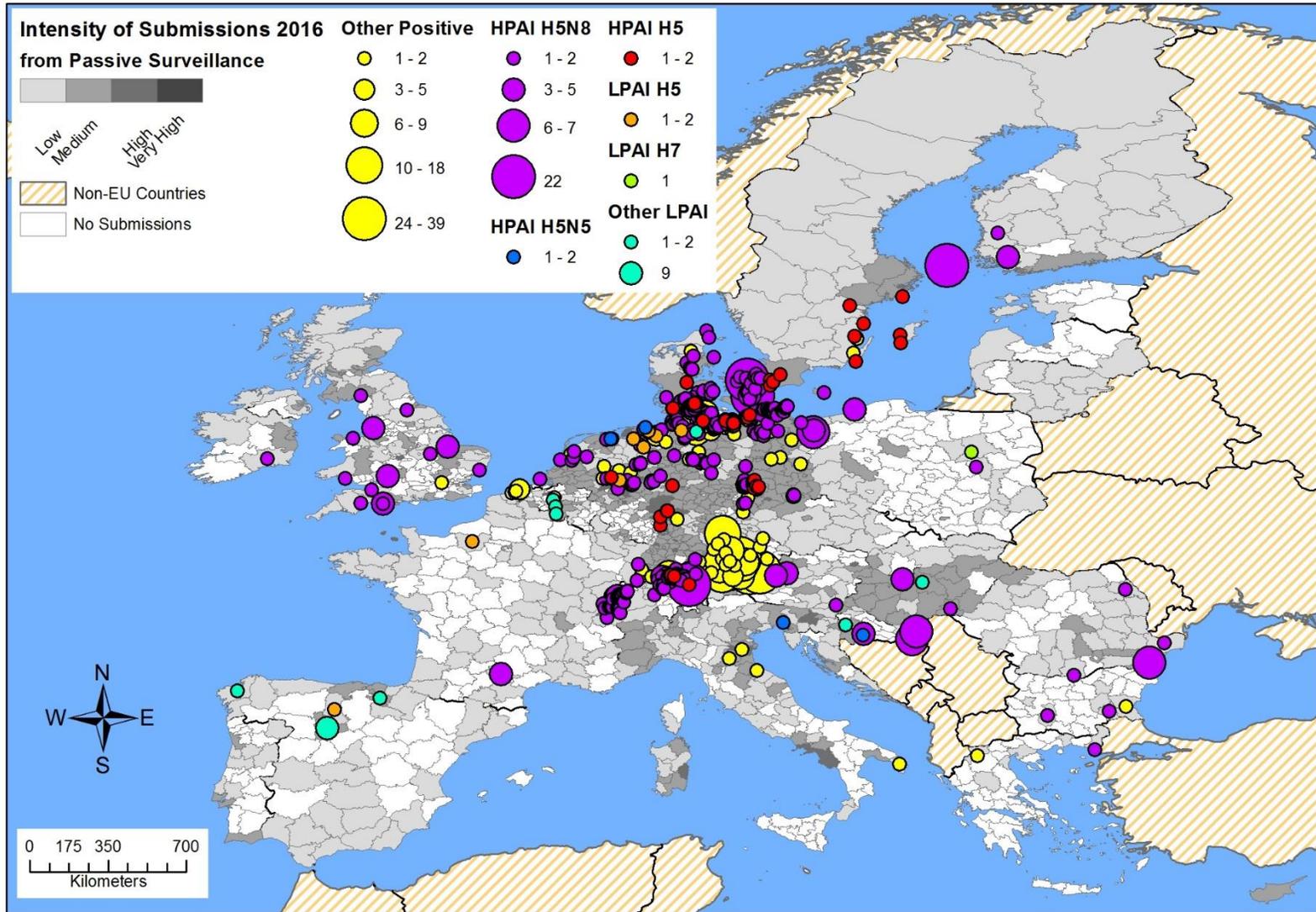


Figure 13b Intensity of sample submission from passive surveillance and distribution of all AI detections in wild birds in EU MS in 2016 – EU-data only

The classification of sampling intensity is grouped by number of submissions per 100 square kilometres.
 Low: >0 and ≤25, Medium: >25 and ≤250, High: >250 and ≤2500, Very High: >2500



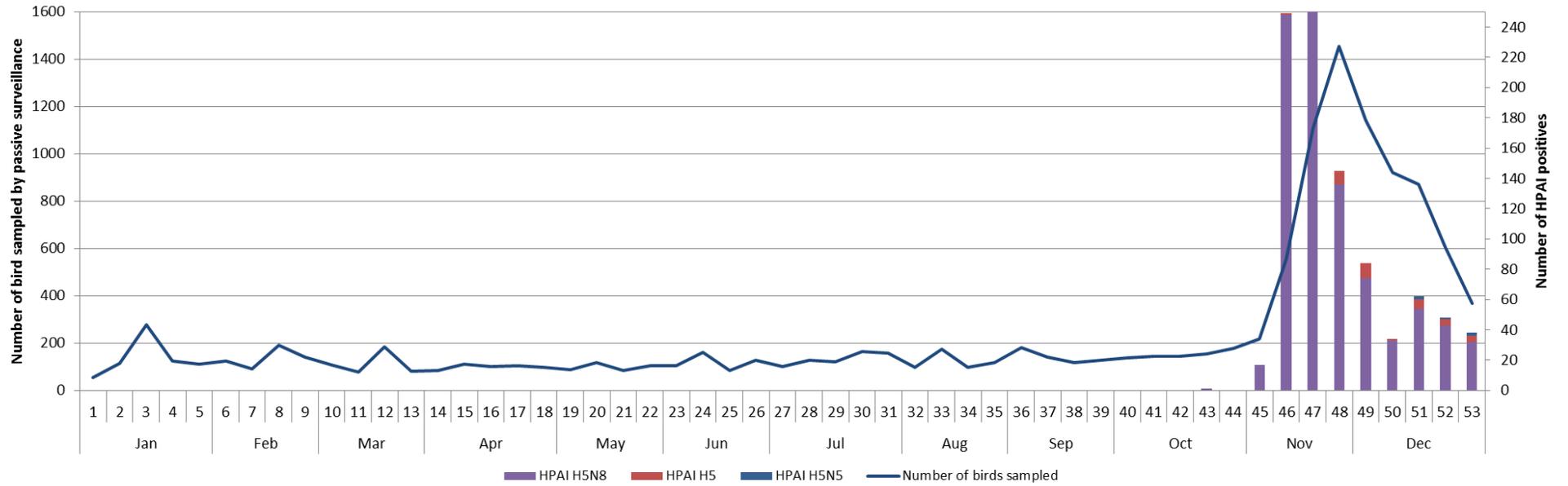
4.2.2.3 Temporal pattern of HPAI wild bird incidents

Figure 14 displays the calendar week of HPAI H5 detections by MS. Figure 16 displays the number of HPAI H5 detections and the number of birds sampled by passive surveillance for each week. In both Figure 14 and Figure 15 the first week is only two days long as January did not begin on a Sunday.

All detections of HPAI H5N8 were temporally clustered in Quarter 4 (Oct-Dec) of 2016, from week 43 onwards. HPAI H5N5 detections were also tightly temporally clustered in the second half of December, from week 51 to week 53, despite being isolated in spatially disparate locations.

The highest number of HPAI detections were made in week 47 of 2016, when 261 detections were reported by just five MS, Germany (n=174), Denmark (n=12), Austria (n=6), Finland (n=4) and Sweden (n=1), plus Switzerland (n=64). The greatest intensity of passive surveillance was carried out during week 48, when 1,449 birds (11.5% of total passive surveillance effort) were sampled by the reporting EU MS and CH.

Figure 15 Number of HPAI incidents in wild birds and number of wild birds sampled by passive surveillance in the EU by week in 2016 – Non-MS data included



Each week has been assigned to the month in which most days occurred.

4.2.2.4 Order and species of birds affected by HPAI infections

Table 13 shows the Order of birds in which the HPAI cases were found in 2016 and the percentage of birds from this Order testing positive. Anseriformes (ducks, swans and geese) was the Order with the highest number of HPAI detections in the EU in 2016. The greatest proportion of HPAI positives were reported in Podicipediformes (grebes) (n=18/79, 22.8%), followed by Anseriformes (n=637/4118, 15.5%).

Table 13 Number of birds tested by passive surveillance and number positive for HPAI H5N8, HPAI H5N5 and HPAI H5 by Order in 2016 – Non MS data included

Order	Total number tested	Number of HPAI H5N8 positives	Number of HPAI H5N5 positives	Number of HPAI H5 positives	Percentage of birds testing positive for any HPAI
Anseriformes	4,118	616	5	16	15.5%
Charadriiformes	1,397	183	-	11	13.9%
Ciconiiformes	450	10	-	-	2.2%
Columbiformes	1,060	5	-	-	0.5%
Cuculiformes	9	1	-	-	11.1%
Falconiformes	1,826	45	-	8	2.9%
Gruiformes	311	3	-	1	1.3%
Passeriformes	2,146	6	-	5	0.5%
Pelecaniformes	172	1	-	-	0.6%
Podicipediformes	79	18	-	-	22.8%
Strigiformes	474	3	-	1	0.8%
Order unknown	51	1	-	-	2.0%

Table 14 below displays the total number of birds reported as tested through passive surveillance activities in the EU for the species where HPAI detections were obtained. In 2016, HPAI detections were made in 51 different species of wild bird and in 10 genus aggregates of wild bird species (e.g. *Anas sp.*). The species with the highest number of HPAI detections was Tufted Ducks (*Aythya fuligula*) (n=370). For species where more than 10 individuals were sampled, the highest proportion of HPAI positives were found in Greater Scaup (*Aythya marila*) (n=9/11, 81.8%) and Great Black-backed gulls (*Larus marinus*) (n=30/43, 69.8%).

Of the 51 wild bird species with detections of HPAI, 30 were from the Target Species list, while 21 were not Target Species. The three non-Target Species with the highest number of HPAI detections were; European Herring Gull (*Larus argentatus argentatus*) (n=53/130), Great Black-backed Gull (*Larus marinus*) (n=30/43) and White-tailed Eagle (*Haliaeetus albicilla*) (n=19/115).

Table 14 Number of birds tested by passive surveillance and number positive for HPAI H5N8, HPAI H5N5 and HPAI H5 by species in 2016 – Non MS data included

Species*	Total number tested	Number of HPAI H5N8 positives	Number of HPAI H5N5 positives	Number of HPAI H5 positives	Percentage of birds testing positive for any HPAI
Aythya fuligula	554	367	-	3	66.8%
Cygnus olor	555	62	3	-	11.7%
<i>Anas sp.</i>	362	57	-	-	15.7%
<i>Larus argentatus argentatus</i>	130	50	-	3	40.8%
<i>Larus sp.</i>	248	43	-	-	17.3%
Aythya farina	72	30	-	3	45.8%
<i>Larus marinus</i>	43	28	-	2	69.8%
Larus ridibundus	241	24	-	3	11.2%
<i>Haliaeetus albicilla</i>	115	15	-	4	16.5%
Cygnus sp.	320	16	-	2	5.6%
<i>Larus argentatus michahellis</i>	68	18	-	-	26.5%
Buteo buteo	548	16	-	1	3.1%
Anas penelope	29	13	1	-	48.3%
Anas platyrhynchos	1092	12	-	2	1.3%
<i>Larus argentatus</i>	296	11	-	2	4.4%
Podiceps cristatus	66	12	-	-	18.2%
<i>Anser spp.</i>	101	10	-	-	9.9%
Anser anser	179	7	1	1	5.0%
<i>Aythya marila</i>	11	9	-	-	81.8%
Cygnus cygnus	138	9	-	-	6.5%
Ardea cinerea	254	8	-	-	3.1%
<i>Buteo spp.</i>	217	7	-	-	3.2%
Larus canus	50	5	-	1	12.0%
Tachybaptus ruficollis	12	6	-	-	50.0%
Branta canadensis	46	4	-	1	10.9%
Pica pica	229	2	-	3	2.2%
Accipiter gentilis	87	3	-	1	4.6%
<i>Somateria mollissima</i>	8	4	-	-	50.0%
<i>Streptopelia decaocto</i>	160	4	-	-	2.5%
Anser erythropus	5	3	-	-	60.0%
Branta leucopsis	30	2	-	1	10.0%
<i>Corvus corone</i>	51	1	-	2	5.9%
Falco peregrinus	76	3	-	-	3.9%
Netta rufina	7	2	-	1	42.9%
Accipiter nisus	274	-	-	2	0.7%
Anas acuta	13	2	-	-	15.4%
<i>Bucephala clangula</i>	7	1	-	1	28.6%
Fulica atra	164	1	-	1	1.2%
<i>Numenius sp.</i>	2	2	-	-	100.0%
Phalacrocorax carbo	142	2	-	-	1.4%
<i>Strigidae</i>	25	1	-	1	8.0%

*Target species highlighted in bold. Table continued overleaf.

Table 14 Cont. Number of birds tested by passive surveillance and number positive for HPAI H5N8, HPAI H5N5 and HPAI H5 by species in 2016 – Non MS data included

Species*	Total number tested	Number of HPAI H5N8 positives	Number of HPAI H5N5 positives	Number of HPAI H5 positives	Percentage of birds testing positive for any HPAI
<i>Accipiter sp.</i>	28	1	-	-	3.6%
<i>Anas crecca</i>	347	1	-	-	0.3%
<i>Anas strepera</i>	16	1	-	-	6.3%
<i>Anser albifrons</i>	28	1	-	-	3.6%
<i>Anser fabalis</i>	33	1	-	-	3.0%
<i>Asio otus</i>	67	1	-	-	1.5%
<i>Branta bernicla</i>	4	1	-	-	25.0%
<i>Bubo bubo</i>	64	1	-	-	1.6%
<i>Chrysococcyx caprius</i>	1	1	-	-	100.0%
<i>Ciconia sp.</i>	11	1	-	-	9.1%
<i>Columba livia</i>	216	1	-	-	0.5%
<i>Corvus corax</i>	20	1	-	-	5.0%
<i>Corvus frugilegus</i>	95	1	-	-	1.1%
<i>Corvus sp.</i>	106	1	-	-	0.9%
<i>Egretta garzetta</i>	5	1	-	-	20.0%
<i>Gallinula chloropus</i>	93	1	-	-	1.1%
<i>Larus fuscus</i>	108	1	-	-	0.9%
<i>Mergus merganser</i>	9	-	-	1	11.1%
<i>Mergus sp.</i>	3	1	-	-	33.3%
<i>Species unknown</i>	51	1	-	-	2.0%
<i>Tringa ochropus</i>	1	1	-	-	100.0%

*Target species highlighted in bold.

4.2.3 Low Pathogenicity Avian Influenza Positives

This section describes detections of LPAI detected by passive surveillance, particularly focusing on 'H' subtypes H5 and H7.

As some virus-positive birds were reported with virus pathotype "unknown", "pending", "missing" etc., birds that tested positive on PCR or virus isolation are reported in four groups in this section:

- 1) 'LPAI H5' are birds positive for LPAI subtype H5.
- 2) 'LPAI H7' are birds positive for LPAI subtype H7.
- 3) 'LPAI other' are birds reported as LPAI of other, or unspecified, 'H' subtypes.
- 4) 'Other Positives' are birds positive for influenza A by PCR or virus isolation but were not reported as either LPAI or HPAI, excluding 110 birds positive for H5N8 pathotype unknown, which have been presented in the HPAI H5 section of this report (4.2.2 Highly Pathogenic Avian Influenza Positives) in the HPAI H5N8 category.

4.2.3.1 Overview of LPAI results

In 2016, 28 birds tested positive for LPAI from 7 MSs when considering MS's passive surveillance data. There were no LPAI positive birds detected in Switzerland, the only reporting non-MS.

There were nine H5 LPAI positives detected by passive surveillance in 2016. Seven detections were made in Germany in three Barnacle Geese (*Branta leucopsis*), one Mew Gull (*Larus canus*), one Grey Heron (*Ardea cinerea*), one Mallard (*Anas platyrhynchos*) and one in a dabbling duck (*Anas sp.*). The two other LPAI H5 detections were made in France and Spain in one Mute Swan (*Cygnus olor*) and one Eurasian Teal (*Anas crecca*), respectively.

One detection of LPAI H7 was made in 2016, in a Mute Swan (*Cygnus olor*) reported by Poland.

LPAI of other subtypes (LPAI Other) were detected in 18 birds from five MSs; Spain (11), Belgium (3), Germany (2), Croatia (1) and Hungary (1). "Other Positives" were detected in 348 birds from nine MSs; Belgium (8), Bulgaria (1), Germany (301), Denmark (1), Greece (1), Italy (5), Netherlands (3), Sweden (3) and the United Kingdom (25).

Table 15 indicates the total number and proportion of wild birds testing positive for LPAI H5, LPAI H7, LPAI other and "Other Positives" by Member State, when considering passive surveillance data only. A very low proportion of birds tested positive for LPAI H5 by passive surveillance in 2016 (0.07%). This is similar to findings in previous years: 2015 (0.12%), 2014 (0.04%), 2013 (0.05%), 2012 (0.05%), 2011 (0.04%) and 2010 (0.07%).

In 2016 a very low proportion of LPAI H7 was detected (0.01%). There have been no, or very low numbers of detections of LPAI H7 by passive surveillance in recent years: 2012-2015 (none), 2011 (0.01%), 2010 (none).

Figure 16 Number of LPAI H5, LPAI H7, LPAI of other subtypes and 'Other Positives' for the period 2006-2016

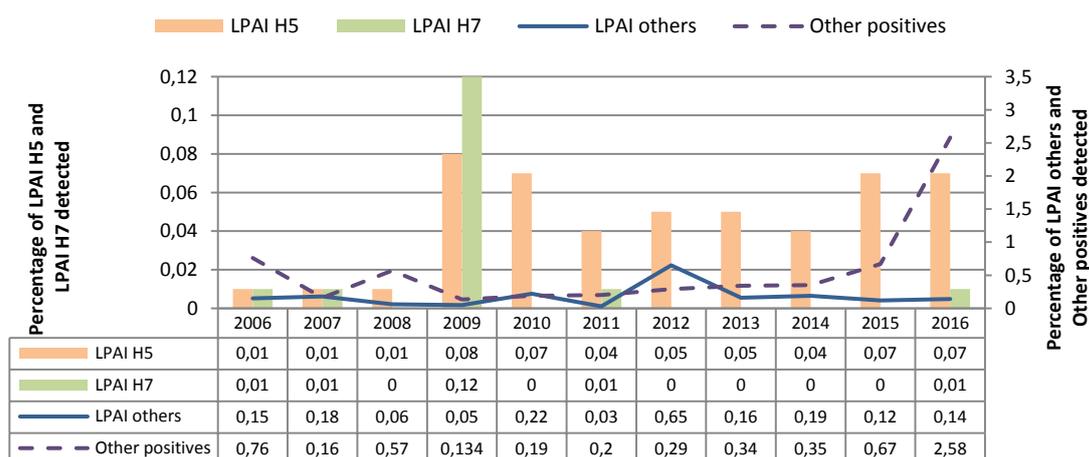


Table 15 Total number of wild birds sampled by passive surveillance and proportion testing positive for LPAI H5, LPAI H7, other LPAI subtypes and 'Other Positives' by Member State, during 2016

Member State	Number of birds sampled	Number of LPAI H5 detections	% LPAI H5 (proportion of total sampled)	Number of LPAI H7 detections	% LPAI H7 (proportion of total sampled)	Number of LPAI other detections	% LPAI other (proportion of total sampled)	Number of "Other positives" detections	% "Other positives" (proportion of total sampled)
BE	280	-	-	-	-	3	1.1%	8	2.9%
BG	9	-	-	-	-	-	-	1	11.1%
DE	5,861	7	0.1%	-	-	2	0.03%	301	5.1%
DK	204	-	-	-	-	-	-	1	0.5%
EL	16	-	-	-	-	-	-	1	6.3%
ES	264	1	0.4%	-	-	11	4.2%	-	-
FR	190	1	0.5%	-	-	-	-	-	-
HR	116	-	-	-	-	1	0.9%	-	-
HU	960	-	-	-	-	1	0.1%	-	-
IT	1,899	-	-	-	-	-	-	5	0.3%
NL	536	-	-	-	-	-	-	3	0.6%
PL	85	-	-	1	1.2%	-	-	-	-
SE	354	-	-	-	-	-	-	3	0.8%
UK	537	-	-	-	-	-	-	1	0.2%
EU	12,564	9	0.07%	1	0.01%	18	0.14%	324	2.6%

4.2.3.2 Geographical distribution of LPAI detections

Figure 13b in (Section 4.2.2.2 Geographical distribution of HPAI detections) shows the location of the LPAI H5 and LPAI H7 detections in 2016.

4.2.3.3 Temporal pattern of LPAI wild bird incidents

Figure 17 displays the calendar week of LPAI H5 and LPAI H7 detections by MS and Figure 18 presents the week of LPAI H5 and H7 detections alongside the number of birds sampled by passive surveillance. In 2016, all LPAI H5 detections occurred in the 4th quarter of the year (Oct-Dec). The one LPAI H7 detection made in Poland was isolated in week 26, at the end of June, a time of year when a low proportion of sampling by passive surveillance was undertaken.

4.2.3.4 Order and species of birds affected by LPAI infections

LPAI H5 was detected in Anseriformes, Charadriiformes and Ciconiiformes in 2016, while LPAI H7 was detected in a single Anseriforme. Other LPAI positives (not H5 or H7) and 'Other Positives' were detected in eight different Orders, most notably Anseriformes (n=257) and Charadriiformes (n=58) (Table 16).

Table 16 Number of birds tested by passive surveillance and number positive for LPAI H5, LPAI H7, other LPAI subtypes and 'Other Positives' by Order in 2016 – EU-data only

Order	Total sampled	Number of LPAI H5	Number of LPAI H7	Number of "LPAI other"	Number of "Other positives"
Anseriformes	4,118	7	1	11	238
Charadriiformes	1,447	1	-	6	51
Ciconiiformes	450	1	-	-	9
Columbiformes	1,060	-	-	-	1
Falconiformes	1,826	-	-	1	11
Gruiformes	311	-	-	-	4
Passeriformes	2,146	-	-	-	5
Podicipediformes	79	-	-	-	5

In total, 33 species and 10 species groups (e.g. *Anas sp.*) tested positive for AI (excluding HPAI) in 2016, Table 17. Most observations of LPAI or 'Other Positives' were made in Tufted Ducks (*Aythya fuligula*) (n=136/554, 24.5%), as was the case for detections of HPAI in 2016. Of the 33 species with detections of LPAI and 'Other Positives', 23 belong to the Target Species list, while detections were made in 10 species not on the Target Species list.

Table 17 Number of birds tested by passive surveillance and number positive for LPAI H5, LPAI H7, other LPAI subtypes and 'Other Positives' by species in 2016 – EU-data only

Species*	Total sampled	Number of LPAI H5	Number of LPAI H7	Number of "LPAI other"	Number of "Other positives"
<i>Anas platyrhynchos</i>	1092	1	-	8	13
<i>Cygnus olor</i>	555	1	1	-	3
<i>Aythya fuligula</i>	554	-	-	-	136
<i>Buteo buteo</i>	548	-	-	-	4
<i>Columba sp.</i>	378	-	-	-	1
<i>Anas sp.</i>	362	1	-	-	18
<i>Anas crecca</i>	347	1	-	2	2
<i>Cygnus sp.</i>	320	-	-	-	33
<i>Larus argentatus</i>	296	-	-	-	8
<i>Falco tinnunculus</i>	291	-	-	-	2
<i>Accipiter nisus</i>	274	-	-	1	-
<i>Ardea cinerea</i>	254	1	-	-	6
<i>Larus sp.</i>	248	-	-	2	17
<i>Larus ridibundus</i>	241	-	-	3	7
<i>Pica pica</i>	229	-	-	-	1

*Target species indicated with bold text. Table continues overleaf.

Table 17 Cont. Number of birds tested by passive surveillance and number positive for LPAI H5, LPAI H7, other LPAI subtypes and 'Other Positives' by species in 2016 – EU-data only

Species*	Total sampled	Number of LPAI H5	Number of LPAI H7	Number of "LPAI other"	Number of "Other positives"
<i>Buteo spp.</i>	217	-	-	-	4
Anser anser	179	-	-	-	3
Fulica atra	164	-	-	-	4
<i>Corvus corone cornix</i>	153	-	-	-	1
Cygnus cygnus	138	-	-	-	1
<i>Larus argentatus argentatus</i>	130	-	-	-	10
<i>Garrulus glandarius</i>	121	-	-	-	1
<i>Larus fuscus</i>	108	-	-	-	3
<i>Corvus sp.</i>	106	-	-	-	1
<i>Anser spp.</i>	101	-	-	-	3
<i>Scolopax rusticola</i>	101	-	-	-	1
Accipiter gentilis	87	-	-	-	1
Aythya ferina	72	-	-	-	21
<i>Alopochen aegyptiacus</i>	70	-	-	-	1
<i>Larus argentatus michahellis</i>	68	-	-	1	1
Podiceps cristatus	66	-	-	-	4
Larus canus	50	1	-	-	1
Branta canadensis	46	-	-	-	1
<i>Ardea sp.</i>	44	-	-	-	2
<i>Larus marinus</i>	43	-	-	-	2
Anas clypeata	31	-	-	1	-
Branta leucopsis	30	3	-	-	-
Anas penelope	29	-	-	-	2
<i>Passer sp.</i>	26	-	-	-	1
<i>Tachybaptus ruficollis</i>	12	-	-	-	1
<i>Netta rufina</i>	7	-	-	-	1
<i>Larus argentatus argenteus</i>	1	-	-	-	1
<i>Sterna sp.</i>	1	-	-	-	1

*Target species indicated with bold text.

Further details regarding sampling and results for Target-Species and other species by individual MS can be found in Annex 3 (section 8.2.1 Passive surveillance data, supplementary tables and figures). Observations of LPAI H5, detected through passive surveillance, were made in a similar number of genera in 2016 as previous years. In 2015 two detections were made in Mallards (*Anas platyrhynchos*), two in Mute Swans (*Cygnus olor*) and one in a dabbling duck (*Anas sp.*); In 2014, the two detections were made in a Razorbill (*Alca torda*) and a Mute Swan (*Cygnus olor*), whilst in 2013 all detections occurred in dabbling ducks (*Anas sp.*)

4.3 Poultry and Wild Bird Survey Results by Member State

Table 4 shows the number of poultry holdings sampled and the total number of holdings (from regions where sampling took place) by poultry category across MS reported to the survey in 2016. In addition, Table 8 shows the number of poultry holdings sampled and the number of seropositive H5 and H7 holdings by poultry category across MS in 2016. Furthermore, for wild birds, Table 9 shows the number of birds sampled by passive surveillance and Table 12 and Table 15 in section 4.2.2.1 show the number of AI detections across MS in 2016.

Descriptive results relating to individual Member State's programmes

Poultry: The total number of poultry holdings (from regions where sampling took place) reported for each poultry category per MS is given in parentheses in the text below. Where the number of sampled holdings exceeds the total number of holdings reported, holdings are assumed to have been sampled more than once. For more information on how the poultry data were processed, including the definition of a poultry holding and how the total number of poultry holdings figure (from regions where sampling took place) was calculated, please refer to the Methods Section 6.1. Details are also given below on the number of influenza A virus positive poultry holdings (including H5, H7 and other subtypes) detected in each MS. Information on positive poultry holdings from the two previous years is also provided to aid inter-year comparison.

Wild Birds: The total number of wild birds sampled as a result of passive surveillance is reported, including the number of HPAI H5, LPAI H5 or H7 subtypes detected through passive surveillance.

Austria

Poultry:

- Austria carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Fattening Ducks, Fattening Geese, and Ratites.
- 24 Chicken Breeder holdings were sampled (93 total).
- 64 Conventional Laying Hen holdings were sampled (778 total).
- 62 Free-range Laying Hen holdings were sampled (810 total).
- 57 Fattening Turkey holdings were sampled (141 total).
- 15 Fattening Duck holdings were sampled (28 total).
- 56 Fattening Geese holdings were sampled (78 total).
- Five Ratite holdings were sampled (ten total).
- Austria reported from eight regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 201 wild birds were sampled by passive surveillance.

- There were 29 positive HPAI H5N8 detections in wild birds sampled by passive surveillance in 2016. These were 13 Tufted Ducks (*Aythya fuligula*), three Common Pochard (*Aythya ferina*), two European Herring Gull (*Larus argentatus*), two Black-headed Gull (*Larus ridibundus*), two unspecified Gulls (*Larus sp.*), two Curlew (*Numenius sp.*), one Grey Heron (*Ardea cinerea*), one Common Buzzard (*Buteo buteo*), one Swan (*Cygnus sp.*), one Great Crested Grebe (*Podiceps cristatus*) and one Green Sandpiper (*Tringa ochropus*).
- One Mew Gull (*Larus canus*) was positive for HPAI H5, N type unspecified.
- There were no positive LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.

Belgium

Poultry:

- Belgium carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Fattening Ducks, Breeder Geese, Farmed Game Birds (gallinaceous), and Others.
- 199 Chicken Breeder holdings were sampled (206 total).
- 201 Conventional Laying Hen holdings were sampled (153 total).
- 185 Free-range Laying Hen holdings were sampled (100 total).
- 51 Fattening Turkey holdings were sampled (36 total).
- 16 Fattening Duck holdings were sampled (24 total).
- One Breeder Geese holding was sampled (two total).
- 22 Farmed Game Bird (gallinaceous) holdings were sampled (21 total).
- Four Other holdings were sampled (five total).
- Belgium reported from ten regions.
- **Positive holdings were reported in 2016, which was also the case in 2015 and 2014.**
- **In 2016, three Fattening Duck holdings tested serologically positive for influenza A virus subtype H5 (one was also PCR positive for influenza A virus of undetermined subtype).**
- *In 2015, one Fattening Duck holding tested serologically positive for influenza A virus subtype H5.*
- *In 2014, six holdings were reported as positive. One Free-range Laying Hen holding and five Fattening Duck holdings tested serologically positive for influenza A virus subtype H5.*

Wild Birds:

- 280 wild birds were sampled by passive surveillance.
- **There were no positive HPAI H5, LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Bulgaria

Poultry:

- Bulgaria carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Turkey Breeders, Fattening Ducks, Backyard Flocks, Farmed Game Birds (gallinaceous), Farmed Game Birds (waterfowl), and Others.
- Nine Chicken Breeder holdings were sampled (18 total).
- 51 Conventional Laying Hen holdings were sampled (112 total).
- Three Broilers (at heightened risk) holdings were sampled (three total).
- One Fattening Turkey holding was sampled (one total).
- One Turkey Breeder holding was sampled (one total).
- 109 Fattening Duck holdings were sampled (113 total).
- 394 Backyard Flock holdings were sampled (116,624 total).
- Three Farmed Game Bird (gallinaceous) holdings were sampled (three total).
- One Farmed Game Bird (waterfowl) holding was sampled (one total).
- One Other holding was sampled (one total).
- Bulgaria reported from 25 regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- Nine wild birds were sampled by passive surveillance.
- **HPAI H5N8 was detected in two birds: one Long-eared Owl (*Asio otus*) and one Little Egret (*Egretta garzetta*).**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Croatia

Poultry:

- Croatia carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Backyard Flocks, Farmed Game Birds (gallinaceous), and Farmed Game Birds (waterfowl).
- 22 Chicken Breeder holdings were sampled (52 total).
- 59 Conventional Laying Hen holdings were sampled (137 total).
- 12 Free-range Laying Hen holdings were sampled (12 total).
- 19 Fattening Turkey holdings were sampled (37 total).
- Four Turkey Breeder holdings were sampled (11 total).
- 22 Fattening Duck holdings were sampled (40 total).
- 13 Breeder Duck holdings were sampled (27 total).
- One Fattening Geese holding was sampled (five total).
- 14 Breeder Geese holdings were sampled (15 total).
- 65 Backyard Flock holdings were sampled (314 total).
- Nine Farmed Game Bird (gallinaceous) holdings were sampled (nine total).
- One Farmed Game Bird (waterfowl) holding was sampled (one total).
- Croatia reported as one region.
- **Positive holdings were reported in 2016, as was the case in 2015, but not 2014.**
- **In 2016, one Backyard Flock holding tested serologically positive for influenza A virus of undetermined subtype. It also tested virologically positive for influenza A subtype H5 by PCR and influenza A virus of undetermined subtype by virus isolation.**
- *In 2015, one Backyard Flock holding tested serologically positive for influenza A virus subtype H5.*

Wild Birds:

- 116 wild birds were sampled by passive surveillance.
- **16 Mute Swans (*Cygnus olor*) 'found dead' tested positive for HPAI H5N8.**
- **Detections of HPAI H5N5 were made in two Mute Swans (*Cygnus olor*) 'found dead'.**

- **There were no positive H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Cyprus

Poultry:

- Cyprus carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Backyard Flocks, and Farmed Game Birds (gallinaceous).
- Seven Chicken Breeder holdings were sampled (ten total).
- 22 Conventional Laying Hen holdings were sampled (23 total).
- 13 Free-range Laying Hen holdings were sampled (14 total).
- Five Broiler (at heightened risk) holdings were sampled (three total).
- Seven Fattening Turkey holdings were sampled (seven total).
- 55 Backyard Flock holdings were sampled (1,247 total).
- Four Farmed Game Bird (gallinaceous) holdings were sampled (six total).
- Cyprus reported as one region.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 124 wild birds were sampled by passive surveillance.
- **There were no positive HPAI H5, LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Czech Republic

Poultry:

- The Czech Republic carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Farmed Game Birds (gallinaceous), and Farmed Game Birds (waterfowl).
- 53 Conventional Laying Hen holdings were sampled (132 total).
- 13 Free-range Laying Hen holdings were sampled (13 total).

- 42 Fattening Turkey holdings were sampled (58 total).
- 43 Fattening Duck holdings were sampled (43 total).
- 26 Breeder Duck holdings were sampled (26 total).
- Five Fattening Geese holdings were sampled (five total).
- Eight Breeder Geese holdings were sampled (eight total).
- 36 Farmed Game Bird (gallinaceous) holdings were sampled (36 total).
- 12 Farmed Game Bird (waterfowl) holdings were sampled (12 total).
- The Czech Republic reported from 13 regions.
- **Positive holdings were reported in 2016, unlike in 2015 and 2014.**
- **In 2016, four holdings were reported as serologically positive for influenza A virus subtype H5. This included two Breeder Duck holdings, one Breeder Geese holding, and one holding positive in both the Breeder Geese and Farmed Game Bird (waterfowl) categories.**

Wild Birds:

- 89 wild birds were sampled by passive surveillance.
- **There were no positive HPAI H5, LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Denmark

Poultry:

- Denmark carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Fattening Ducks, Fattening Geese, Farmed Game Birds (gallinaceous), and Farmed Game Birds (waterfowl).
- 184 Chicken Breeder holdings were sampled (147 total).
- 219 Free-range Laying Hen holdings were sampled (139 total).
- 30 Broiler (at heightened risk) holdings were sampled (42 total).
- 19 Fattening Turkey holdings were sampled (59 total).
- 23 Fattening Duck holdings were sampled (73 total).
- Two Fattening Geese holdings were sampled (eight total).
- 80 Farmed Game Bird (gallinaceous) holdings were sampled (202 total).
- Nine Farmed Game Bird (waterfowl) holdings were sampled (31 total).

- Denmark reported as one region.
- **Positive holdings were reported in 2016, as was the case in 2015 and 2014.**
- **In 2016, eight holdings were reported as positive. Three Free-range Laying Hen holdings tested serologically positive for influenza A virus; one for the H5 subtype and two for the H7 subtype. Five Farmed Game Bird (waterfowl) holdings tested serologically positive for influenza A virus; four for the H5 subtype and one for the H7 subtype.**
- *In 2015, two holdings were reported as positive. One Free-range Laying Hen holding and one Farmed Game Bird (waterfowl) holding tested serologically positive for influenza A virus subtype H7.*
- *In 2014, one Free-range Laying Hen holding tested serologically positive for influenza A virus subtype H5.*

Wild Birds:

- 204 wild birds were sampled by passive surveillance.
- **There were 65 HPAI H5N8 positives sampled by passive surveillance in 2016, all 'found dead'; one black headed gull (*Larus ridibundus*), five Common Buzzards (*Buteo buteo*), one Common Eider (*Somateria mollissima*), four European Herring Gulls (*Larus argentatus*), eight Great Black-backed Gulls (*Larus marinus*), three Mew Gulls (*Larus canus*), eight Mute Swans (*Cygnus olor*), one Northern Goshawk (*Accipiter gentilis*), one Northern Raven (*Corvus corax*), twenty eight Tufted Ducks (*Aythya fuligula*), three White-tailed Eagles (*Haliaeetus albicilla*) and one Whooper Swan (*Cygnus cygnus*).**
- **HPAI H5 was detected in one Great Black-backed Gull (*Larus marinus*), 'found dead' in 2016.**
- **There were no LPAI H5 or H7 positives in 2016.**

Estonia

Poultry:

- Estonia carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Conventional Laying Hens and Others.
- 24 Conventional Laying Hen holdings were sampled (24 total).
- One Other holding was sampled (one total).
- Estonia reported from one region.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- Five wild birds were sampled by passive surveillance.

- **There were no positive HPAI H5, LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Finland

Poultry:

- Finland carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Turkey Breeders, Fattening Ducks, Fattening Geese, Farmed Game Birds (gallinaceous), Farmed Game Birds (waterfowl), and Ratites.
- 36 Chicken Breeder holdings were sampled (57 total).
- 51 Conventional Laying Hen holdings were sampled (424 total).
- 40 Free-range Laying Hen holdings were sampled (50 total).
- Two Broiler (at heightened risk) holdings were sampled (two total).
- 40 Fattening Turkey holdings were sampled (42 total).
- Three Turkey Breeder holdings were sampled (Four total).
- Two Fattening Duck holdings were sampled (two total).
- Three Fattening Geese holdings were sampled (five total).
- Nine Farmed Game Bird (gallinaceous) holdings were sampled (18 total).
- Four Farmed Game Bird (waterfowl) holdings were sampled (eight total).
- One Ratite holding was sampled (one total).
- Finland reported from four regions.
- **No positive holdings were reported in 2016, unlike in 2015 and 2014.**
- *In 2015, one Fattening Geese holding tested serologically positive for influenza A virus subtype H5.*
- *In 2014, two Fattening Geese holdings tested serologically positive for influenza A virus subtype H5.*

Wild Birds:

- 208 wild birds were sampled by passive surveillance.
- **15 wild birds tested positive for HPAI H5N8 in 2016; 12 birds 'found dead', eight Tufted Ducks (*Aythya fuligula*), two White-tailed Eagles (*Haliaeetus albicilla*), one Eurasian Eagle-owl (*Bubo bubo*) and one Common Pigeon (*Columba livia*), and three birds 'live with clinical signs', all White-tailed Eagles (*Haliaeetus albicilla*).**

- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

France

Poultry:

- France carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Farmed Game Birds (gallinaceous), Farmed Game Birds (waterfowl), and Others.
- 393 Chicken Breeder holdings were sampled (911 total).
- 41 Conventional Laying Hen holdings were sampled (1,909 total).
- 62 Free-range Laying Hen holdings were sampled (1,045 total).
- 49 Broiler (at heightened risk) holdings were sampled (4,506 total).
- 51 Fattening Turkey holdings were sampled (724 total).
- 102 Turkey Breeder holdings were sampled (283 total).
- 133 Fattening Duck holdings were sampled (3,659 total).
- 461 Breeder Duck holdings were sampled (372 total).
- 48 Fattening Geese holdings were sampled (94 total).
- 75 Breeder Geese holdings were sampled (71 total).
- 106 Farmed Game Bird (gallinaceous) holdings were sampled (157 total).
- 17 Farmed Game Bird (waterfowl) holdings were sampled (56 total).
- Three Other holdings were sampled (135 total).
- France reported from 71 regions.
- **Positive holdings were reported in 2016, which was also the case in 2015 and 2014.**
- **In 2016, 85 holdings tested serologically positive for influenza A subtype H5, including two Fattening Duck holdings, 70 Breeder Duck holdings, and 13 Breeder Geese holdings.**
- *In 2015, 16 holdings tested serologically positive for influenza A virus subtype H5, including five Fattening Duck holdings (three were also PCR positive for H5), six Breeder Duck holdings, and five Breeder Geese holdings (one was also PCR positive for H5).*

- In 2014, 16 holdings were reported as positive. Four Fattening Duck holdings, seven Breeder Duck holdings and five Breeder Geese holdings tested serologically positive for influenza A virus subtype H5.

Wild Birds:

- 190 wild birds were sampled by passive surveillance.
- **Six birds ‘found dead’ tested positive for HPAI H5N8 in 2016: four Eurasian Collared Doves (*Streptopelia decaocto*), one Eurasian Magpie (*Pica pica*) and one European Herring Gull (*Larus argentatus*)**
- **One Mute Swan (*Cygnus olor*) found dead was positive for LPAI H5 in 2016.**
- **There were no positive LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Germany

Poultry:

- Germany carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Farmed Game Birds (gallinaceous), Ratites, and Others.
- 25 Chicken Breeder holdings were sampled (453 total).
- 86 Conventional Laying Hen holdings were sampled (5,287 total).
- 85 Free-range Laying Hen holdings were sampled (4,182 total).
- 20 Broiler (at heightened risk) holdings were sampled (2,055 total).
- 118 Fattening Turkey holdings were sampled (1,659 total).
- Ten Turkey Breeder holdings were sampled (30 total).
- 173 Fattening Duck holdings were sampled (1,311 total).
- 22 Breeder Duck holdings were sampled (98 total).
- 115 Fattening Geese holdings were sampled (1,965 total).
- 17 Breeder Geese holdings were sampled (85 total).
- Five Farmed Game Bird (gallinaceous) holdings were sampled (15 total).
- 29 Ratite holdings were sampled (710 total).
- 34 Other holdings were sampled (6,949 total).
- Germany reported from 17 regions.

- **Positive holdings were reported in 2016, which was also the case in 2015 and 2014.**
- **In 2016, nine holdings were reported as serologically positive for influenza A virus subtype H5, including one Conventional Laying Hen holding (which was also PCR positive for H5), four Fattening Duck holdings (two were also PCR positive for H5), one Fattening Geese holding, one Breeder Geese holding, one Fattening Turkey holding (which was also PCR positive for H5), and one Other holding.**

In addition, one Conventional Laying Hen holding tested serologically positive for influenza A virus subtype H7.

Furthermore, although not a compulsory requirement of the surveillance programme, the following subtypes other than H5 or H7 were reported:

- **three Fattening Turkey holdings seropositive for influenza A virus subtype H9; and**
- **13 holdings seropositive for influenza A virus of undetermined subtype, including one Conventional Laying Hen holding, three Fattening Turkey holdings, one Turkey Breeder holding, four Fattening Duck holdings (one of which was also PCR and virus isolation positive for subtype H6), two Fattening Geese holdings, one Breeder Geese holding, and one Other holding (which was also PCR positive for influenza A virus of undetermined subtype).**
- *In 2015, three holdings were reported as serologically positive for influenza A virus subtype H5, including one Fattening Duck holding and two Other holdings (one was also PCR and virus isolation positive for H5).*

In addition, although not a compulsory requirement of the surveillance programme, the following subtypes other than H5 or H7 were reported:

- *eight H9 seropositive holdings (one Free-range Laying Hens, six Fattening Turkeys and one Turkey Breeders); and*
- *20 holdings seropositive for influenza A of undetermined subtype (one Free-range Laying Hens, one Broilers (at heightened risk), six Fattening Turkeys, one Turkey Breeders, four Fattening Ducks, six Fattening Geese and one Others).*
- *In 2014, 12 holdings were reported as positive. Two Conventional Laying holdings tested serologically positive for influenza A virus subtype H7. Nine Fattening Turkey holdings tested serologically positive for influenza A virus; five were serologically positive for the H9 subtype and four were of undetermined subtype. One Fattening Duck holding tested serologically positive for influenza A virus subtype H5.*

Wild Birds:

- 5,861 wild birds were sampled by passive surveillance.
- **In 2016, 574 birds were found positive for HPAI H5N8. Due to the number of positive birds, species are listed as genus aggregates only. For further details of the individual species with detections of HPAI H5N8 please refer to section 8.2.1.4 (overview of results by species). One Buzzard (*Buteo sp.*) was found live with clinical signs, while the remaining 573 birds were found dead: 292 diving ducks (*Aythya sp.*), 122 gulls (*Larus sp.*), 55 dabbling ducks (*Anas sp.*), 30 swans (*Cygnus sp.*), 23 geese (*Anser sp.* and *Branta sp.*), 14 buzzards (*Buteo sp.*), nine grebes (*Podiceps sp.* and *Tachybaptus sp.*), seven heron (*Ardea sp.*), seven sea eagles (*Haliaeetus sp.*), four sea ducks (*Mergus sp.* and *Somateria sp.*), three hawks (*Accipiter sp.*), two crows (*Corvus sp.*), one Coot**

(*Fulica atra*), one Cormorant (*Phalacrocorax carbo*), One Common Goldeneye (*Bucephala clangula*), one owl (*Strigidae sp.*) and one stork (*Ciconia sp.*).

- One Greylag Goose 'found dead' tested positive for HPAI H5N5 in 2016.
- 24 birds, all found dead, were positive for HPAI H5 where the N type was not specified. These were: six diving ducks (*Aythya sp.*), five gulls (*Larus sp.*), three geese (*Anser sp.* and *Branta sp.*), two dabbling ducks (*Anas sp.*), two hawk (*Accipiter sp.*), two swans (*Cygnus sp.*), one Coot (*Fulicia atra*), one Magpie (*Pica pica*), one owl (*Strigidae sp.*) and one Common Merganser (*Mergus merganser*).
- Seven birds were reported positive for LPAI H5: three Barnacle Geese (*Branta leucopsis*), one Mallard (*Anas platyrhynchos*), one unspecified dabbling duck (*Anas sp.*), one Grey Heron (*Ardea cinerea*), and one Mew Gull (*Larus canus*).
- There were no detections of LPAI H7 by passive surveillance in 2016.

Greece

Poultry:

- Greece carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Turkey Breeders, Farmed Game Birds (gallinaceous), Ratites, and Others.
- 47 Chicken Breeder holdings were sampled (83 total).
- 54 Conventional Laying Hen holdings were sampled (414 total).
- 26 Free-range Laying Hen holdings were sampled (134 total).
- 26 Broiler (at heightened risk) holdings were sampled (32 total).
- 24 Fattening Turkey holdings were sampled (40 total).
- One Turkey Breeder holding was sampled (one total).
- 14 Farmed Game Bird (gallinaceous) holdings were sampled (18 total).
- Two Ratite holdings were sampled (four total).
- 57 Other holdings were sampled (102 total).
- Greece reported from ten regions.
- **No positive holdings were reported in 2016, as was the case in 2015, but not 2014.**
- *In 2014, one Conventional Laying Hen holding tested serologically positive for influenza A virus of undetermined subtype.*

Wild Birds:

- 16 wild birds were sampled by passive surveillance.
- **HPAI H5N8 was detected in one Mute Swan (*Cygnus olor*), that was live with clinical signs.**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Hungary

Poultry:

- Hungary carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Backyard Flocks, Farmed Game Birds (gallinaceous), Farmed Game Birds (waterfowl), and Ratites.
- 49 Chicken Breeder holdings were sampled (140 total).
- 54 Conventional Laying Hen holdings were sampled (592 total).
- 13 Free-range Laying Hen holdings were sampled (15 total).
- 61 Fattening Turkey holdings were sampled (326 total).
- 26 Turkey Breeder holdings were sampled (29 total).
- 74 Fattening Duck holdings were sampled (360 total).
- 19 Breeder Duck holdings were sampled (20 total).
- 65 Fattening Geese holdings were sampled (413 total).
- 46 Breeder Geese holdings were sampled (68 total).
- 495 Backyard Flock holdings were sampled (177,117 total).
- 38 Farmed Game Bird (gallinaceous) holdings were sampled (83 total).
- 13 Farmed Game Bird (waterfowl) holdings were sampled (14 total).
- Eight Ratite holdings were sampled (nine total).
- Hungary reported from 19 regions.
- **No positive holdings were reported in 2016, as was the case in 2014, but not 2015.**
- *In 2015, one Breeder Geese holding tested serologically positive for influenza A virus subtype H7.*

Wild Birds:

- 960 wild birds were sampled by passive surveillance.
- **HPAI H5N8 was detected in five wild birds all 'found dead': four Mute Swans (*Cygnus olor*) and one Lesser White-fronted Goose (*Anser erythropus*).**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Ireland

Poultry:

- Ireland carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Fattening Ducks, and Fattening Geese.
- 66 Chicken Breeder holdings were sampled (81 total).
- 37 Conventional Laying Hen holdings were sampled (45 total).
- 63 Free-range Laying Hen holdings were sampled (180 total).
- 46 Broiler (at heightened risk) holdings were sampled (65 total).
- 51 Fattening Turkey holdings were sampled (136 total).
- 15 Fattening Duck holdings were sampled (15 total).
- Two Fattening Geese holdings were sampled (four total).
- Ireland reported from two regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 25 wild birds were sampled by passive surveillance.
- **HPAI H5N8 was detected in one Eurasian Wigeon (*Anas penelope*) found 'live with clinical signs'.**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Italy

Poultry:

- Italy carried out surveillance using a risk-based sampling approach.

- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Backyard Flocks, Farmed Game Birds (gallinaceous), Ratites, and Others.
- 261 Chicken Breeder holdings were sampled (198 total).
- 878 Conventional Laying Hen holdings were sampled (769 total).
- 75 Free-range Laying Hen holdings were sampled (77 total).
- 1,135 Fattening Turkey holdings were sampled (776 total).
- 47 Turkey Breeder holdings were sampled (38 total).
- 57 Fattening Duck holdings were sampled (75 total).
- 12 Breeder Duck holdings were sampled (eight total).
- Four Fattening Geese holdings were sampled (16 total).
- 11 Breeder Geese holdings were sampled (seven total).
- 166 Backyard Flock holdings were sampled (166 total).
- 108 Farmed Game Bird (gallinaceous) holdings were sampled (146 total).
- Eight Ratite holdings were sampled (26 total).
- 787 Other holdings were sampled (626 total).
- Italy reported from 14 regions.
- **Positive holdings were reported in 2016, which was also the case in 2015 and 2014.**
- **In 2016, two Other (grower) holdings were reported as serologically positive for influenza A virus, one for subtype H5 (which was also PCR positive for H5) and one for subtype H7 (which was also PCR and virus isolation positive for H7). In addition, one Other (grower) holding, which did not undergo serological testing according to the approved programme, tested PCR and virus isolation positive for subtype H5.**
- *In 2015, three holdings were reported as positive. One Backyard Flock holding tested serologically and virologically (PCR and virus isolation) positive for influenza A virus subtype H7. Two Other holdings tested serologically and virologically positive for influenza A virus subtype H5 (one was PCR/virus isolation positive for H5, while the other was PCR positive for H5/virus isolation not performed).*
- *In 2014, three Other (grower) holdings were reported as positive. Two were serologically and PCR positive for influenza A virus subtype H7 and one was PCR (only) positive for influenza A virus subtype H5 (serology/virus isolation negative).*

Wild Birds:

- 1899 wild birds were sampled by passive surveillance.
- **H5N1 was detected in one Eurasian Wigeon (*Anas penelope*) ‘found dead’.**

- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Latvia

Poultry:

- Latvia carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Fattening Ducks, Fattening Geese, and Backyard Flocks.
- One Chicken Breeder holding was sampled (one total).
- 33 Conventional Laying Hen holdings were sampled (33 total).
- One Fattening Duck holding was sampled (one total).
- One Fattening Geese holding was sampled (one total).
- 60 Backyard Flock holdings were sampled (3,873 total).
- Latvia reported from five regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- Three wild birds were sampled by passive surveillance.
- **There were no positive HPAI H5, LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Lithuania

Poultry:

- Lithuania carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Conventional Laying Hens, Broilers (at heightened risk), and Others.
- Two Conventional Laying Hen holdings were sampled (five total).
- Five Broiler (at heightened risk) holdings were sampled (21 total).
- One Other holding was sampled (three total).
- Lithuania reported from seven regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 22 wild birds were sampled by passive surveillance.
- **There were no positive HPAI H5, LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Luxembourg

Poultry:

- Luxembourg carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Backyard Flocks, and Ratites.
- Four Conventional Laying Hen holdings were sampled (four total).
- Four Free-range Laying Hen holdings were sampled (four total).
- Three Broiler (at heightened risk) holdings were sampled (three total).
- 15 Backyard Flock holdings were sampled (500 total).
- Two Ratite holdings were sampled (one total).
- Luxembourg reported from one region.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- Two wild birds were sampled by passive surveillance.
- **There were no positive HPAI H5, LPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Malta

Poultry:

- Malta carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Conventional Laying Hens.
- 24 Conventional Laying Hen holdings were sampled (33 total).
- Malta reported from one region.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- No wild birds were sampled by passive surveillance in 2016.

The Netherlands

Poultry:

- The Netherlands carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Fattening Ducks, Breeder Ducks, and Others.
- 807 Chicken Breeder holdings were sampled (308 total).
- 1,095 Conventional Laying Hen holdings were sampled (504 total).
- 738 Free-range Laying Hen holdings were sampled (407 total).
- 879 Broiler (at heightened risk) holdings were sampled (245 total).
- 88 Fattening Turkey holdings were sampled (44 total).
- 89 Fattening Duck holdings were sampled (47 total).
- Ten Breeder Duck holdings were sampled (ten total).
- Two Other holdings were sampled (two total).
- The Netherlands reported from 12 regions.
- **Positive holdings were reported in 2016, which was also the case in 2015 and 2014.**
- **In 2016, four holdings were reported as positive. Two holdings tested serologically and virologically (PCR and virus isolation) positive for influenza A virus subtype H5, including one Free-range Laying Hen holding and one holding positive in both the Conventional Laying Hen and Free-range Laying Hen categories. In addition, two Free-range Laying Hen holdings tested serologically and virologically (PCR and virus isolation) positive for influenza A virus subtype H7.**
- *In 2015, three Free-range Laying Hen holdings were reported as positive. One was serologically and virologically (PCR and virus isolation) positive for influenza A virus subtype H5 and two were serologically and virologically (PCR and virus isolation) positive for influenza A virus subtype H7.*
- *In 2014, seven holdings were reported as positive. Two Chicken Breeder holdings, two Conventional Laying Hen holdings, two Free-range Laying Hen holdings and one Fattening Duck holding tested serologically positive for influenza A virus subtype H5. They were also all virologically (PCR and virus isolation) positive for influenza A virus subtype H5.*

Wild Birds:

- 536 wild birds were sampled by passive surveillance.
- **Eight wild birds all 'found dead' tested positive for HPAI H5N8 in 2016; two Eurasian Wigeon (*Anas penelope*) and one of each: Tufted Duck (*Aythya fuligula*), Common Buzzard (*Buteo buteo*), Carrion Crow (*Corvus corone*),**

Peregrine Falcon (*Falco peregrinus*), Lesser Black-backed Gull (*Larus fuscus*) and Eurasian Magpie (*Pica pica*).

- **One Mute Swan (*Cygnus olor*) 'found dead' tested positive for HPAI H5N5.**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Poland

Poultry:

- Poland carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Farmed Game Birds (gallinaceous), and Ratites.
- 63 Chicken Breeder holdings were sampled (488 total).
- 74 Conventional Laying Hen holdings were sampled (622 total).
- 36 Free-range Laying Hen holdings were sampled (89 total).
- 55 Fattening Turkey holdings were sampled (215 total).
- 12 Turkey Breeder holdings were sampled (11 total).
- 83 Fattening Duck holdings were sampled (338 total).
- 28 Breeder Duck holdings were sampled (34 total).
- 96 Fattening Geese holdings were sampled (991 total).
- 81 Breeder Geese holdings were sampled (227 total).
- 39 Farmed Game Bird (gallinaceous) holdings were sampled (91 total).
- 34 Ratite holdings were sampled (75 total).
- Poland reported from 16 regions.
- **Positive holdings were reported in 2016, which was also the case in 2015 and 2014.**
- **In 2016, two Breeder Geese holdings were reported as serologically positive for influenza A virus subtype H5.**
- *In 2015, nine Breeder Geese holdings were reported as positive. Eight were serologically positive for influenza A virus subtype H5 and one was serologically positive for influenza A virus subtype H7.*
- *In 2014, six holdings were reported as positive. Five Breeder Geese holdings tested serologically positive for influenza A virus; four were serologically positive for the H5 subtype and one was serologically positive for the H7 subtype. In addition, one Ratite holding tested serologically positive for influenza A virus subtype H5.*

Wild Birds:

- 85 wild birds were sampled by passive surveillance.
- **16 birds, all 'found dead' tested positive for HPAI H5N8. These were 10 unspecified dabbling ducks (*Anas sp.*), four European Herring Gulls (*Larus argentatus*), one unspecified Gull (*Larus sp.*) and one Mute Swan (*Cygnus olor*).**
- **LPAI H7 was detected in one Mute Swan (*Cygnus olor*) 'found dead'.**
- **There were no positive LPAI H5 detections in wild birds sampled by passive surveillance in 2016.**

Portugal

Poultry:

- Portugal carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Fattening Ducks, Breeder Ducks, Fattening Geese, Backyard Flocks, Farmed Game Birds (gallinaceous), and Ratites.
- 75 Chicken Breeder holdings were sampled (79 total).
- 90 Conventional Laying Hen holdings were sampled (128 total).
- 36 Free-range Laying Hen holdings were sampled (20 total).
- 60 Broiler (at heightened risk) holdings were sampled (222 total).
- 63 Fattening Turkey holdings were sampled (132 total).
- 29 Fattening Duck holdings were sampled (17 total).
- Three Breeder Duck holdings were sampled (two total).
- One Fattening Geese holding was sampled (one total).
- 56 Backyard Flock holdings were sampled (237,000 total).
- 43 Farmed Game Bird (gallinaceous) holdings were sampled (58 total).
- Six Ratite holdings were sampled (six total).
- Portugal reported from seven regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 116 wild birds were sampled by passive surveillance.

- **There were no positive HPAI H5, LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Romania

Poultry:

- Romania carried out surveillance using a risk-based sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Fattening Turkeys, Breeder Ducks, Backyard Flocks, Farmed Game Birds (gallinaceous), Ratites, and Others.
- 72 Chicken Breeder holdings were sampled (45 total).
- 179 Conventional Laying Hen holdings were sampled (209 total).
- 29 Fattening Turkey holdings were sampled (15 total).
- Three Breeder Duck holdings were sampled (two total).
- 1,097 Backyard Flock holdings were sampled (1,028 total).
- 14 Farmed Game Bird (gallinaceous) holdings were sampled (11 total).
- One Ratite holding was sampled (one total).
- Two Other holdings were sampled (one total).
- Romania reported from 43 regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 275 wild birds were sampled by passive surveillance.
- **HPAI H5N8 was detected in 10 wild birds. One Whooper Swan (*Cygnus Cygnus*) found 'injured', six Whooper Swans (*Cygnus cygnus*) 'found dead', two Lesser White-fronted Geese (*Anser erythropus*) 'found dead' and one Great Cormorant (*Palacrocorax carbo*) 'found dead'.**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Slovak Republic

Poultry:

- The Slovak Republic carried out surveillance using a representative sampling approach.

- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Farmed Game Birds (gallinaceous), and Ratites.
- 11 Chicken Breeder holdings were sampled (12 total).
- 47 Conventional Laying Hen holdings were sampled (136 total).
- Nine Fattening Turkey holdings were sampled (eight total).
- Six Turkey Breeder holdings were sampled (six total).
- Four Fattening Duck holdings were sampled (11 total).
- Two Breeder Duck holding were sampled (three total).
- Three Fattening Geese holdings were sampled (eight total).
- One Breeder Geese holding was sampled (one total).
- 17 Farmed Game Bird (gallinaceous) holdings were sampled (17 total).
- Six Ratite holdings were sampled (14 total).
- Slovak Republic reported from four regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 32 wild birds were sampled by passive surveillance.
- **There were no positive HPAI H5, LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Slovenia

Poultry:

- Slovenia carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Fattening Turkeys, Backyard Flocks, Farmed Game Birds (gallinaceous), and Farmed Game Birds (waterfowl).
- Seven Chicken Breeder holdings were sampled (seven total).
- 64 Conventional Laying Hen holdings were sampled (228 total).
- 43 Fattening Turkey holdings were sampled (43 total).
- 93 Backyard Flock holdings were sampled (4,154 total).
- Five Farmed Game Bird (gallinaceous) holdings were sampled (five total).

- One Farmed Game Bird (waterfowl) holding was sampled (one total).
- Slovenia reported from two regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 151 wild birds were sampled by passive surveillance.
- **One Mute Swan (Cygnus olor) 'found dead', was positive for HPAI H5N8.**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Spain

Poultry:

- Spain carried out surveillance using a representative sampling approach.
- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Backyard Flocks, Farmed Game Birds (gallinaceous), Farmed Game Birds (waterfowl), Ratites, and Others.
- 80 Chicken Breeder holdings were sampled (399 total).
- 71 Conventional Laying Hen holdings were sampled (908 total).
- 56 Free-range Laying Hen holdings were sampled (228 total).
- Two Broiler (at heightened risk) holdings were sampled (252 total).
- 60 Fattening Turkey holdings were sampled (593 total).
- 12 Turkey Breeder holdings were sampled (14 total).
- 42 Fattening Duck holdings were sampled (48 total).
- Three Breeder Duck holdings were sampled (three total).
- Ten Fattening Geese holdings were sampled (11 total).
- Five Breeder Geese holdings were sampled (five total).
- Six Backyard Flock holdings were sampled (4,070 total).
- 222 Farmed Game Bird (gallinaceous) holdings were sampled (505 total).
- 106 Farmed Game Bird (waterfowl) holdings were sampled (121 total).
- 33 Ratite holdings were sampled (68 total).
- 50 Other holdings were sampled (4,477 total).

- Spain reported from 17 regions.
- **Positive holdings were reported in 2016, which was also the case in 2015 and 2014.**
- **In 2016, seven holdings were reported as serologically positive for influenza A virus subtype H5, including one Fattening Geese holding, five Farmed Game Bird (waterfowl) holdings, and one Other holding.**

In addition, three Farmed Game Bird (waterfowl) holdings tested serologically positive for influenza A virus subtype H7.

Furthermore, although not a compulsory requirement of the surveillance programme, the following seropositive holdings were reported:

- **90 holdings seropositive for influenza A virus of undetermined subtype, including six Chicken Breeder holdings, three Conventional Laying Hen holdings, four Free-range Laying Hen holdings, three Fattening Turkey holdings, ten Fattening Duck holdings (one of which was also PCR positive for influenza A virus of undetermined subtype), one Backyard Flock holding, nine Farmed Game Bird (gallinaceous) holdings, 49 Farmed Game Bird (waterfowl) holdings, and five Other holdings.**
- *In 2015, no holdings were found to be seropositive for influenza A virus subtypes H5 or H7.*

However, although not a compulsory requirement of the surveillance programme, the following subtypes other than H5 or H7 were reported:

- *11 H1 seropositive holdings (one Chicken Breeders, one Conventional Laying Hens, seven Fattening Ducks (two of which were also PCR positive for influenza A), one Farmed Game Birds (gallinaceous) and one Farmed Game Birds (waterfowl));*
- *two H6 seropositive holdings (one Farmed Game Birds (waterfowl), and one Others, which was also seropositive for H10); and*
- *one H10 seropositive Other holding (which was also seropositive for H6).*
- *In 2014, three Fattening Duck holdings tested serologically and PCR positive for influenza A virus of undetermined subtype.*

Wild Birds:

- 264 wild birds were sampled by passive surveillance.
- **One Eurasian Teal (*Anas crecca*) 'found dead', was positive for LPAI H5.**
- **There were no positive HPAI H5 or LPAI H7 detections in wild birds sampled by passive surveillance in 2016.**

Sweden

Poultry:

- Sweden carried out surveillance using a representative sampling approach.

- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Free-range Laying Hens, Broilers (at heightened risk), Fattening Turkeys, Turkey Breeders, Fattening Ducks, Fattening Geese, Farmed Game Birds (gallinaceous), Farmed Game Birds (waterfowl), and Ratites.
- 34 Chicken Breeder holdings were sampled (34 total).
- 62 Conventional Laying Hen holdings were sampled (229 total).
- 30 Free-range Laying Hen holdings were sampled (151 total).
- 33 Broiler (at heightened risk) holdings were sampled (34 total).
- 18 Fattening Turkey holdings were sampled (18 total).
- Three Turkey Breeder holdings were sampled (three total).
- Four Fattening Duck holdings were sampled (four total).
- Seven Fattening Geese holdings were sampled (seven total).
- Nine Farmed Game Bird (gallinaceous) holdings were sampled (13 total).
- Seven Farmed Game Bird (waterfowl) holdings were sampled (seven total).
- Four Ratite holdings were sampled (three total).
- Sweden reported from seven regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 354 wild birds were sampled by passive surveillance.
- **16 wild birds were reported as positive for HPAI H5 where the N type was unspecified. 12 were 'found dead': three White-tailed Eagles (*Haliaeetus albicilla*), two European Herring Gulls (*Larus argentatus*), two Eurasian Magpies (*Pica pica*), one Tufted Duck (*Aythya fuligula*), one Common Goldeneye (*Bucephala clangula*), one Common Buzzard (*Buteo buteo*), one Carrion Crow (*Corvus corone*) and one Black-headed Gull (*Larus ridibundus*). Four birds were found live with clinical signs, these were: one White-tailed Eagle (*Haliaeetus albicilla*), one Eurasian sparrowhawk (*Accipter nissus*), one black headed gull (*Larus ribibundus*) and one carrion crow (*Corvus corrione*).**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

United Kingdom

Poultry:

- The United Kingdom carried out surveillance using a risk-based sampling approach.

- Test results from holdings sampled were reported from Chicken Breeders, Conventional Laying Hens, Fattening Turkeys, Turkey Breeders, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Farmed Game Birds (gallinaceous), and Farmed Game Birds (waterfowl).
- Ten Chicken Breeder holdings were sampled (112 total).
- 60 Conventional Laying Hen holdings were sampled (1,004 total).
- 57 Fattening Turkey holdings were sampled (329 total).
- Five Turkey Breeder holding were sampled (13 total).
- 42 Fattening Duck holdings were sampled (97 total).
- 30 Breeder Duck holdings were sampled (77 total).
- 38 Fattening Geese holdings were sampled (64 total).
- Six Breeder Geese holdings were sampled (15 total).
- 32 Farmed Game Bird (gallinaceous) holdings were sampled (84 total).
- 16 Farmed Game Birds (waterfowl) holdings were sampled (42 total).
- The UK reported from 23 regions.
- **Positive holdings were reported in 2016, unlike in 2015 and 2014.**
- **In 2016, six holdings were reported as positive. Two Breeder Duck holdings and four Fattening Geese holdings tested serologically positive for influenza A virus subtype H5.**

Wild Birds:

- 537 wild birds were sampled by passive surveillance.
- **Twenty seven birds 'found dead' tested positive for HPAI H5N8: One Eurasian teal (*Anas crecca*), ten Eurasian Wigeon (*Anas penelope*), seven Mute Swans (*Cynus olor*), one Black-headed gull (*Laurus ridibundus*), one Mallard (*Anas platyrhynchos*), one Greater White-fronted goose (*Anser albifrons*), one Greylag goose (*Anser anser*), two Common Pochard (*Aythya farina*), one Canada Goose (*Branta canadensis*) one Peregrine Falcon (*Falco peregrinus*) and one Great Cormorant (*Phalacrocorax carbo*).**
- **There were no positive LPAI H5 or H7 detections in wild birds sampled by passive surveillance in 2016.**

Non-EU countries

Switzerland

Poultry:

- Switzerland carried out surveillance using a representative sampling approach.

- Test results from holdings sampled were reported from Free-range Laying Hens and Fattening Turkeys.
- 40 Free-range Laying Hen holdings were sampled (1,757 total).
- 26 Fattening Turkey holdings were sampled (70 total).
- Switzerland reported from seven regions.
- **No positive holdings were reported in 2016, which was also the case in 2015 and 2014.**

Wild Birds:

- 264 wild birds were sampled by passive surveillance in 2016.
- **117 wild birds tested positive for H5N8. 10 birds were confirmed as HPAI H5N8; the remaining 107 H5N8 detections had an undetermined pathotype. Detections of H5N8 were made in 115 wild birds 'found dead': 53 Tufted Ducks (*Aythya fuligula*), 18 Mediterranean Herring Gulls (*Larus argentatus michahellis*), 10 Mute Swans (*Cygnus olor*), six Common Pochard (*Aythya farina*), six Black-headed Gulls (*Larus ridibundus*), five Great Crested Grebe (*Podiceps cristatus*), four Mallards (*Anas platyrhynchos*), three Little Grebe (*Tachybaptus ruficollis*), two unspecified dabbling ducks (*Anas sp.*), two unspecified gulls (*Larus sp.*), two Red-crested Pochard (*Netta rufina*), one Common Buzzard (*Buteo buteo*), one Peregrine Falcon (*Falco peregrinus*), one Common Moorhen (*Gallinula chloropus*) and one unknown species. Two detections of H5N8 were made in Black-headed Gulls (*Larus ridibundus*) that were 'live with clinical signs'.**
- There were no positive LPAI H5 or H7 detections in the wild bird sampled by passive surveillance in 2016.

5 DISCUSSION

5.1 Poultry

In 2016 active surveillance for avian influenza in poultry holdings was carried out in 28 MS according to Directive 2005/94/EC (EC 2005a). In addition, one non-EU country, Switzerland, submitted data for this report. Ten MS applied a risk-based sampling approach according to guidelines of Commission Decision 2010/367/EC (EC 2010) (11 MS used a risk-based approach in 2015 and 2014).

A total of 18,138 holdings were sampled, which compares to 21,867 holdings in 2015 and 19,813 holdings in 2014. The most frequently sampled poultry category in 2016 was Laying Hens (Conventional and Free-range combined), making up 28.9% of the total holdings sampled by EU MS in 2016, followed by Backyard Flocks (13.8% of EU holdings sampled), and Chicken Breeders (13.7% of EU holdings sampled). The least sampled poultry category was Ratites (0.8% of total EU holdings sampled) reflecting the low proportion of Ratite holdings across the EU (0.2% of total holdings reported to the survey).

The number of holdings sampled by MS varied from eight holdings in Lithuania to 3,708 holdings in the Netherlands. Italy and the Netherlands sampled the most holdings among MS, together sampling 40.0% (7,257 holdings) of the total holdings sampled in 2016. There was an increase in the number of holdings sampled from Turkey Breeders (+20.8%), Fattening Ducks (+15.9%), Breeder Ducks (+112.8%), Fattening Geese (+14.8%), Breeder Geese (+26.2%), Backyard Flocks (+11.5%), Farmed Game Birds (gallinaceous) (+13.7%), and Ratites (+6.1%), compared to 2015, while all the other poultry categories saw a decrease in the number of holdings sampled in 2016. Overall there was a 17.1% decrease in the number of holdings sampled in 2016 compared to 2015.

In 2016, evidence of previous infection with H5 or H7 avian influenza was detected in 134 holdings, which is 0.74% of the total EU holdings sampled. This compares to 40 H5/H7 seropositive holdings in 2015 (0.18% of total EU holdings sampled) and 43 H5/H7 seropositive holdings in 2014 (0.22% of total EU holdings sampled).

In 2016, detection of antibodies to avian influenza, H5 and H7 subtypes, occurred in Conventional Laying Hens, Free-range Laying Hens, Fattening Turkeys, Fattening Ducks, Breeder Ducks, Fattening Geese, Breeder Geese, Farmed Game Birds (waterfowl), and Others. Most detections of antibodies to subtype H5 infection were in Breeder Ducks (74/126, 58.7%), followed by Breeder Geese (18/126, 14.3%), and Farmed Game Birds (waterfowl) (10/126, 7.9%). Antibodies to the H7 subtype were detected in Free-range Laying Hens (4/10, 40.0%), Farmed Game Birds (waterfowl) (4/10, 40.0%), Conventional Laying Hens (1/10, 10%) and Others (1/10, 10%).

In 2016, 124 holdings were found positive for subtype H5 by serological testing (0.68% of total EU holdings sampled). This compares to 33 holdings seropositive for H5 in 2015 (0.15% of total EU holdings sampled) and 38 holdings seropositive for H5 in 2014 (0.19% of total EU holdings sampled). Of the 124 poultry holdings reported by MS to be H5 seropositive in 2016, 119 holdings underwent follow-up testing for the presence of active infection, and seven of these (7/119, 5.9%) tested virologically positive (by PCR and in some cases virus isolation as well) for subtype H5. In comparison in 2015, eight of 26 H5 seropositive holdings (30.8%) that underwent follow-up testing, tested positive for subtype H5 by PCR or virus isolation, and in 2014, seven of 28 H5 seropositive holdings (25.0%) that underwent follow-up testing, tested positive for subtype H5 by PCR or virus isolation.

In 2016, ten holdings were found positive for subtype H7 by serological testing (0.06% of total EU holdings sampled). This compares to seven holdings seropositive for H7 in 2015 (0.03% of total EU holdings sampled) and five holdings seropositive for H7 in 2014 (0.03% of total EU holdings sampled). Of the ten poultry holdings reported to be H7 seropositive in 2016, all underwent follow-up testing for the presence of active infection and three of these (3/10, 30.0%) tested virologically positive (by PCR and virus isolation) for subtype H7. In comparison in 2015, three of seven H7 seropositive holdings (42.9%) that underwent follow-up testing, tested positive for subtype H7 by PCR or virus isolation, and in 2014, two of five H7 seropositive holdings (40.0%) that underwent follow-up testing, tested positive for subtype H7 by PCR or virus isolation.

Overall, ten MS reported H5 or H7 seropositive poultry holdings in 2016: Belgium, the Czech Republic, Denmark, France, Germany, Italy, the Netherlands, Poland, Spain and the United Kingdom. Seven of these MS also reported H5 or H7 seropositive poultry holdings in 2015 (BE, DE, DK, FR, IT, NL and PL). A high proportion of the H5 seropositive holdings were found in France (85/124, 68.5%), while H7 seropositive holdings were detected from Denmark (3/10, 30.0%), Germany (1/10, 10.0%), Italy (1/10, 10.0%), the Netherlands (2/10, 20.0%) and Spain (3/10, 30.0%). In addition, in 2016, Germany reported holdings that were seropositive for subtype H9 and of undetermined subtype (one of which was also PCR and virus isolation positive for subtype H6), Croatia reported a holding that was serology and virus isolation positive for influenza A virus of undetermined subtype and PCR positive for H5, and Spain reported holdings that were seropositive for influenza A virus of undetermined subtype.

The detection rate of H5/H7 seropositive holdings in 2016 was greatest in Breeder Ducks (74 H5/H7 seropositive holdings/632 sampled, 11.7%), followed by Farmed Game Birds (waterfowl) (14 H5/H7 seropositive holdings/187 sampled 7.5%), and Breeder Geese (18 H5/H7 seropositive holdings/265 sampled, 6.8%). In previous survey years there have also been high rates of detection in ducks and geese; the detection rate of H5/H7 seropositive holdings was greatest in Breeder Geese in 2015 (15 H5/H7 seropositive holdings/210 sampled, 7.1%) and also in 2014 (10 seropositive holdings/208 holdings sampled, 4.8%). The high rate of detections in these categories may be due to the following factors: ducks and geese are less likely to show clinical signs than other poultry species so infection is less likely to have been detected earlier by passive surveillance, while in other species clinical disease due to AI may lead to earlier detection. The breeder category birds tend to have a longer lifespan than birds of other poultry categories and therefore a longer time period over which they could be exposed to the virus. Ducks and geese are also frequently kept outdoors and therefore may have a higher probability of contact with wild birds, either directly or indirectly, and hence possibly a greater risk of exposure to AI virus. Furthermore, in general viruses of wild bird origin have a better fitness and replication capacity in domestic waterfowl species compared to gallinaceous hosts.

The sampling regimes among MS and poultry categories are diverse with different degrees of targeting and testing frequencies, varying numbers of samples collected in each flock and likely variance of within-flock seroprevalence at the time of sampling. Hence differences in between-flock detection rates for poultry categories or MS need to be interpreted with great caution. In particular, those MS undertaking risk-based sampling may experience higher seropositive detection rates than those using representative sampling.

Infection with LPAI in any poultry species, and even HPAI in domestic ducks and geese, can result in only mild clinical signs and may not be detected by poultry keepers and veterinary practitioners. Serological surveillance has greatest value in these situations and particularly at the current time given the recent increased HPAI activity globally. The H5 HPAI epidemic in France of 2015-16 most probably emerged through this pathway whereby clinical infection with HPAI viruses was difficult to detect through passive surveillance in local duck breeds owing to largely asymptomatic infection. In addition to the value of serological surveillance for poultry health, recent events involving H7N9 LPAI virus in China highlight the potential value for public health in surveillance for avian influenza in the absence of disease. A positive PCR or virus isolation result indicates that active infection is present on the holding and potential for transmission exists. Such a test result will lead to the implementation of measures and restrictions in accordance with Council Directive 2005/94/EC (EC 2005a).

The current guidelines on surveillance in poultry for the EU surveillance programme encourage a risk-based approach. Criteria and risk factors suggested for incorporation include those associated with virus introduction into poultry holdings due to direct or indirect exposure to wild birds; those for virus spread within and between poultry holdings; as well as the consequences (impact) of the spread of avian influenza between poultry holdings. It is recognised that to carry out risk-based surveillance incorporating such risk factors, an evidence-base applicable to the individual Member State is required. If insufficient evidence is available to develop a risk-based surveillance plan, then representative sampling is recommended.

5.2 Wild Birds

Avian influenza (AI) is a highly contagious viral infection, which can affect all species of birds. Highly pathogenic avian influenza (HPAI) can spread rapidly causing serious disease with high mortality in many poultry species. To date all HPAI viruses have been of H5 or H7 subtypes of influenza A. The on-going circulation of H5 viruses continue to cause outbreaks throughout Asia, Africa, Europe and North America, resulting in the loss of hundreds of millions of birds and causing major socio-economic impacts. Since 2017, H5N8 has been the most common subtype reported by the highest number of countries at the global level. Prior to 2005, HPAI infection had rarely been observed in wild birds, and nearly always in connection with poultry outbreaks indicating infection spread from poultry to wild birds. However, since the current H5N1 HPAI epizootic, wild birds have, together with other vectors, been implicated in the spread of this virus and more recently with other H5 HPAI subtypes in Asia, Europe and North America.

The EU guidelines on surveillance for avian influenza in wild birds published in 2010 (EU 2010) focus the objective of the surveillance to the timely detection of H5N1 HPAI and do not include baseline surveillance for LPAI H5 or H7. The guidelines state that a risk-based design should be implemented via passive surveillance i.e. moribund wild birds or birds found dead, particularly those on the target species list (see Annex 6, Table 1). Formulation of this list incorporated data on the number of detections of H5N1 HPAI in the EU surveillance programme from 2005 – 2009 and findings on the epidemiology of this virus in wild birds which in the 2000s indicated that HPAI infection of wild birds caused consequent mortality. The list is kept under continuous review.

The detection of H5N1 HPAI in wild birds not associated with outbreaks in poultry illustrates the value of wild bird surveillance in the early detection of the presence of H5N1 HPAI in a country (e.g. Hesterberg *et al.* 2009). Detections of such infections in wild birds require the implementation of control measures, which include investigations on poultry holdings to detect possible virus introduction, increasing vigilance and reinforcement of biosecurity measures amongst the poultry sector, especially free-range poultry (EC 2005b). There is also broader value through the possibility to detect other H5 HPAI subtypes in wild birds that potentially provide early warning of increased risk for poultry incursion in a region or MS.

There is evidence for wild birds playing a role in the 2014 introduction of H5N8 HPAI (clade 2.3.4.4A) to Europe (Verhagen *et al.* 2015), North America and parts of Asia. This introduction was associated with limited clinical disease in wild bird populations with detections in Mute swans (Mute Swans (*Cygnus olor*) in Sweden, Eurasian wigeon (*Anas penelope*) in the Netherlands, and Eurasian teal (*Anas crecca*) and Mallards (*Anas platyrhynchos*) in Germany.

As in previous years, surveillance programmes in 2016 were variable between MS with respect to a number of parameters (including sample size, temporal pattern, and differential targeting of species and areas). Therefore only limited inferences can be made by direct comparisons of detections in different MS, species and seasons. The non-random nature of the sampling means that the proportion positive observed in a species, Member State or time period cannot be assumed to be the true prevalence in the population sampled. The efficacy of passive surveillance is problematic to measure as detection relies on i) birds dying, and ii) then being found. A large amount of time and resources may be spent in patrolling a reserve, or the public may frequently observe a particular area, but if mortalities are not observed and reported to the appropriate veterinary authority then dead birds will not be tested for AI. Nonetheless, passive surveillance may be effective for the detection of Highly Pathogenic Avian Influenza even when only a relatively small number of birds are tested.

A total of 12,828 wild birds, from 27 Member States of the European Union and one non-MS (Switzerland) were tested as a result of passive sampling programmes during the 2016 survey. During the 4th quarter of 2016, HPAI detections were made in 939 birds across 17 MS and Switzerland. These detections were made in a diverse range of birds belonging to 11 Orders and 51 species. All HPAI detections belonged to clade 2.3.4.4B but were separated into two main subtypes (H5N8 – 892 birds; H5N5 – 5 birds; H5 (N unknown) – 42 birds). Detections were made in both passive and active sampling programmes.

The proportion of all wild birds sampled by passive surveillance that yielded any AI virus was 10.06% (n=1,291/12,828) in 2016, this is much higher than previous years (0.29-2.96%). For HPAI detected by passive surveillance, the proportion of wild birds testing positive was 7.3% (n=939/12,828) in 2016 (much higher than previous years); whilst the proportion testing positive for LPAI H5 or LPAI H7 was 0.08% (n=10/12,828) in 2016 (similar to previous years) (0.06% in 2011, 0.05% in 2012, 0.05% in 2013 and 0.04% in 2014, 0.07 in 2015).

LPAI viruses of subtype H5 were detected in nine birds, from three Member States, while LPAI H7 was detected in one bird only. It is pertinent to note here that H5 or H7 LPAI infection is highly unlikely to result in significant morbidity or mortality in most wild birds exposed in nature, while HPAI can be fatal to many wild bird species.

This episode represents a continuation of the events of late 2014 and early 2015 with a significantly increased prevalence in wild bird populations in 2016. This new incursion has also been associated with increased levels of wild bird mortality compared to the 2014 variant. These findings highlight the complex and changeable nature of the epidemiology of avian influenza and the potential role for active and passive surveillance in wild birds in Europe in the future (EFSA 2014). The short or long term maintenance of clade specific strains in wild birds is uncertain but currently 2.3.2.1 and 2.3.4.4 continue to be detected in wild birds and hence provide an ongoing threat for reintroduction to the EU with risk for spillover to domestic species. Preliminary observations might indicate an expanded range of risk species but this will be formally reviewed once the 2017 data has been analysed.

6 METHODS

6.1 Poultry

6.1.1 Survey design

A 'poultry holding', as defined in Council Directive 2009/158/EC (EC 2009), is a facility used for the rearing or keeping of breeding or productive poultry. For the purposes of avian influenza surveillance, this may include facilities that only contain poultry during certain months of the year (i.e. poultry do not need to be present all year round).

MS sampled holdings and submitted data for some or all of the following poultry categories:

- Chicken Breeders (CB)
- Conventional Laying Hens (LH) and Free-range Laying Hens (FR LH)
- Broilers (at heightened risk) (B)
- Fattening Turkeys (FT)
- Turkey Breeders (TB)
- Fattening Ducks (FD)
- Breeder Ducks (BD)
- Fattening Geese (FG)
- Breeder Geese (BG)
- Backyard Flocks (BYF)
- Farmed Game Birds (gallinaceous) (FGB-G) and Farmed Game Birds (waterfowl) (FGB-W)
- Ratites (R)
- Others (O)

Where the survey design was based upon **representative sampling**, the required number of holdings to be sampled for specified poultry categories was determined according to Tables 18 and 19 below.

Table 18 Number of holdings to be sampled of each poultry category (except turkey, duck and goose holdings)

Number of holdings per poultry category per Member State	Number of holdings to be sampled
Up to 34	All
35–50	35
51-80	42
81-250	53
>250	60

Note: The number of holdings to be sampled is defined to ensure the identification of at least one infected holding if the prevalence of infected holdings is at least 5%, with a 95% confidence interval.

Table 19 Number of turkey, duck and goose holdings to be sampled

Number of holdings per poultry category per Member State	Number of holdings to be sampled
Up to 46	All
47-60	47
61-100	59
101-350	80
>350	90

Note: The number of turkey, duck and goose holdings to be sampled is defined to ensure the identification of at least one infected holding if the prevalence of infected holdings is at least 5%, with a 99% confidence interval.

Where the survey design was based upon **risk-based surveillance**, the following criteria and risk factors would be considered:

- Criteria and risk factors for virus introduction into poultry holdings due to direct or indirect exposure to wild birds in particular those of identified ‘target species’ for HPAI H5N1 detection (EC 2010):
 - (a) The location of the poultry holding in proximity to wet areas, ponds, swamps, lakes, rivers or sea shores where migratory wild water birds may gather.
 - (b) The location of the poultry holding in areas with a high density of migratory wild birds, in particular of those birds that are characterised as ‘target species’.
 - (c) The location of poultry holding in proximity to resting and breeding places of migratory wild water birds, in particular where these areas are linked through migratory birds’ movements to areas where HPAI H5N1 is known to occur in wild birds or poultry.
 - (d) Poultry holdings with free range production, or poultry holdings where poultry or other captive birds are kept in the open-air in any premises in which contact with wild birds cannot be sufficiently prevented.
 - (e) Low biosecurity level in the poultry holding, including the method of storage of feed and the use of surface water.
- Criteria and risk factors for virus spread within the poultry holding and between poultry holdings, as well as the consequences (impact) of the spread of avian influenza from poultry to poultry and between poultry holdings:
 - (a) The presence of more than one poultry species in the same poultry holding, in particular the presence of domestic ducks and geese together with other poultry species.
 - (b) The type of poultry production and the poultry species on the holding for which surveillance data have shown an increased detection rate of avian influenza infection in the Member State, such as duck holdings and poultry intended for re-stocking supplies of game (in particular farmed Mallards).
 - (c) The location of the poultry holding in areas with high densities of poultry holdings.

- (d) Trade patterns, including imports and related intensity of movements, both direct and indirect, of poultry and other factors including vehicles, equipment and persons.
- (e) The presence of long lived poultry categories and multi-age groups of poultry on the holding (such as layers).

In addition, in terms of targeting of populations at risk:

- The level of targeting must reflect the number and local weighting of risk factors present on the poultry holding.
- The competent authority may consider other risk factors in its assessment in designing its surveillance design, which must be duly indicated and justified in their surveillance programme.
- Broilers should only be included when: (i) they are kept in significant numbers in free range production and (ii) they are considered to pose a higher risk of infection with avian influenza.
- Backyard Flocks generally play a minor role in virus circulation and spread and sampling them is resource intensive; however, in certain Member States Backyard Flocks may pose a higher risk of avian influenza due to their presence in significant numbers, their proximity to commercial poultry holdings, involvement in local/regional trade, and other criteria and risk factors.

Table 20 shows the criteria and risk factors considered by Member States following a risk-based surveillance approach in their 2016 programmes, according to the guidelines of Commission Decision 2010/367/EU (EC 2010).

6.1.2 Laboratory testing

Samples were tested in accordance with the Diagnostic Manual for avian influenza, which lays down the procedures for confirmation and differential diagnosis of avian influenza (EC 2006a). Furthermore, for domestic waterfowl species, testing to include additional viral antigens for H5N8 was recommended by the EURL in addition to the standard H5N3 strain. (Letter reference: SANTE/G2/MP/dj (2015) 1234231).

All positive serological findings must then be followed up at the poultry holding by epidemiological investigations and further sampling for testing by virological methods, in order to determine if active infection of avian influenza virus is present on the poultry holding.

Table 20 Criteria and risk factors considered by Member States following a risk-based surveillance approach in their 2016 poultry survey programme

Member State	Geographical				Demographic	Production Type	Biosecurity	Trade	Timing of Sampling	Reactive Sampling	Epidemiology	Location Explicitly Defined	Sampling difference between risk strata
	Proximity to waterbodies	Proximity to high density areas of migratory wild birds	Proximity to resting and breeding areas of migratory wild birds	Others	Densely populated poultry areas	Free-text	Presence of poultry holdings where poultry or other birds are kept in the open air in premises in which contact with wild birds cannot be sufficiently prevented.	Free-text	Free-text	Free-text			
BE	✓	✓			✓	Free-Range holdings; Turkey, ducks and geese are considered most at risk; Distance between poultry holdings	✓					YES	
BG		✓	✓	Increased sampling on Romanian border					Sampling to coincide with seasonal production		Previous outbreak in 4 regions in 2006, these regions are included in risk strata	YES	
DE		✓			✓								
DK	Additional risk areas are defined as areas 3 km from the coastal line and around large lakes.					Game birds for restocking explicitly mentioned		When poultry and game birds are traded, they have to prove they have been tested within the preceding three months for poultry and two months for game birds				YES	Indoor Laying hens sampled in high risk areas only; Doubled frequency in breeding flocks (Hens, Ducks and Geese) in high risk area. Free range flocks sampled 4 times a year.
FR	✓	✓				Free Range holdings; Holdings supplying non-EU approved abattoirs; More sampling of holdings with Chickens; Turkeys; Ducks and Geese; Game birds; Laying Hens	✓				samples will be taken of game birds (pheasants, partridges and ducks Molluscs) and palmipeds, which have shown a higher serological prevalence In previous investigations	NO	

Member State	Geographical				Demographic	Production Type	Biosecurity	Trade	Timing of Sampling	Reactive Sampling	Epidemiology	Location Explicitly Defined	Sampling difference between risk strata
	Proximity to waterbodies	Proximity to high density areas of migratory wild birds	Proximity to resting and breeding areas of migratory wild birds	Others	Densely populated poultry areas	Free-text	Presence of poultry holdings where poultry or other birds are kept in the open air in premises in which contact with wild birds cannot be sufficiently prevented.	Free-text	Free-text	Free-text			
IT	✓	✓	✓		✓	productive type and biosecurity measures of industrial poultry farms (e.g. long productive life animals, multi-age or multi-species farm).	✓	Flows and types			Risk factors for introduction and spread of previous epidemics	YES	Sampling in defined High Risk Areas: Turkey broilers; Breeding quail; Breeding ducks and geese; fattening ducks and geese; breeding flocks and laying hen flocks; ostriches; other birds bred for meat (excluding broilers and quail); Wild game Sampling in defined Low Risk Areas : fattening and breeding ducks and geese; breeding turkeys and broilers; breeding chicken; laying hens, both those kept indoors and free range; breeding wild game
LU					✓	layer and Broiler chickens	✓		sampling twice a year when the migratory wild birds are passing;				
NL	✓	✓	✓		✓		✓	Flows and types: Breeders have extra testing. All birds tested if they are moved.		Contiguous and contact testing on seropositives		YES	Turkey holdings sampled 3 times more frequently, free range holdings samples 4 times more frequently. Pre-movement sampling.
RO	✓	✓				Presence of multiple species; Backyard Flocks; all holdings with game birds, quail and ratites will be sampled. Increased sampling in holdings with turkeys, ducks and geese			Sampling to coincide with seasonal production for commercial holdings, all year round for backyard flocks	Increased sampling in local areas where necessary. i.e. increased sampling in Danube area where wild birds can gather if poultry production is high in those areas			
UK	✓	✓			✓	Free-Range holdings; Mixed Poultry species holding, where one of the species is waterfowl					Minimum flock sizes for sampling	YES	Samples only taken from defined risk area

6.1.3 Data and data processing

The poultry data presented in the report are restricted to data that were collected in 2016 according to the guidelines laid down in Decision 2010/367/EU (EC 2010).

MS submitted data to the EC database in a standardised format, containing laboratory testing information and more detailed information on the positive holdings found for each poultry category. The data submitted by MS were extracted from the EC database and checked and analysed by the EURL. The standardised format for submission of data ensured that in the majority of MS the data were complete and could be analysed effectively.

The total number of holdings for each poultry category in a MS was calculated using the total number of holdings figure provided for each NUTS code in the last semester of the year, or where this was not given, the first semester, only from NUTS regions where sampling took place. Hence if a MS did not sample in all NUTS regions that a poultry category is present, this figure will differ from the total number of holdings for that poultry category at the MS level.

Some MS sample holdings more than once within their approved surveillance programmes for the survey period. This was assumed to be the case where the reported number of holdings sampled for a poultry category exceeded the total number of holdings reported for that category.

If positives are found in two or more poultry categories on the same holding, they are reported in each of the poultry categories, but in the overall positive holdings figures for the MS, the holding would only be counted once. Similarly if positives are found for both H5 and H7 subtypes on the same holding, they are reported under each of the subtypes, but in the overall H5/H7 positive holdings figures for the MS, the holding would only be counted once.

For the comparison of survey results according to poultry categories across years, free-range and indoor categories were combined, as were fatteners and breeders for Turkeys, Ducks and Geese, and gallinaceous and waterfowl for Farmed Game Birds.

A number of MS that submitted data in the Others category provided further species details ([Table 21](#)). In light of this information, if queries arose concerning whether a type of poultry should be included under Others or another category, they were referred to the relevant MS.

The map ([Figure 5](#)) showing the intensity of sampling in the poultry survey and H5/H7 serologically positive holdings was produced using the ArcMap function of Arc GIS version 10.2.2.

The intensity of surveillance is calculated as the sum of the number of holdings sampled in each region per 100 km², mainly NUTS 2 with some NUTS 1 regions. Low (≤ 10), Medium (> 10 and ≤ 100), High (> 100 and ≤ 500) and Very High (> 500). H5 and H7 seropositive holdings are shown as the centroid of the region they are located in.

Table 21 Information on holdings included under the 'Others' poultry category in 2016 (where category species details were provided)

Member State	Category species detail included	Comments
BE	Includes pigeon and guinea fowl.	Destined for slaughter, not to be released as game birds.
BG	Includes zoo.	
EE	Includes free-range ducks.	Small backyard hobby farm keeping a wide range of bird species without a certain purpose, mainly for showing animals and selling duck/chicken eggs and baby birds.
EL	Includes poultry (mainly chicken) reared and sold for use as backyard.	This poultry category is exclusively farmed indoors in 'authorised holdings' with no access to the outside. At a certain age the birds are distributed by authorised merchants to rural areas where they are kept outside as backyard poultry. Due to this unique production system, EL reports these holdings under 'Others'.
ES	Includes vultures, kestrels, geese for fairs/zoos, pigeons, zoo birds.	
FR	Includes guinea fowl.	Destined for slaughter, not to be released as game birds.
IT	Includes guinea fowl breeders, quail breeders and growers.	Guinea fowl breeders and quail breeders belonging to the meat-production system (and not reared for the hunting/gaming chain). Grower holdings consisted of several species (often reared together).
RO	Different wild bird species	Kept in captivity, for repopulation for hunting.

6.2 Wild Birds

6.2.1 Survey design

Details of individual MS passive surveillance sampling strategies, as described in their 2016 survey plans can be found in [Table 22](#).

6.2.2 Laboratory testing

Laboratory tests were carried out in accordance with the EU diagnostic manual for avian influenza (EC 2006a). It was recommended that samples should initially be tested using M gene PCR (to detect presence of AI virus), with rapid testing of positives for H5, and if possible N1, and that analysis of the haemagglutinin cleavage site should be undertaken to determine the pathogenicity of the AI virus. Following the emergence of H5N8 viruses MS were expected to either confirm the virus subtype to include N serotype using newly available methods or forward materials to the EURL to carry out the characterisation.

6.2.3 Data and data processing

The data presented in this report is limited to data collected under Commission Decision 2010/367/EU (EC 2010), submitted to the EC database in the required format. Consequently the data may differ from other reporting systems such as the Animal Disease Notification System (ADNS).

Species of wild birds

For passive surveillance, 10,757 birds were identified to species level (83.9%), 2,019 birds were identified to genus or family (15.7%), while 52 birds were completely unidentified (submitted as species unknown) (0.4%). For active surveillance 11140 birds (91.7%) were identified to species level, 1003 were identified to genus (8.3%), while nine were completely unidentified (0.1%).

Wild bird status

Information on the status of the bird at sampling (e.g. live, found dead etc.) was complete, with all birds sampled in 2016 submitted with this information.

Wild bird Subtype / Pathotype information

Of the 1,291 wild birds testing positive for influenza by passive surveillance, 433 (33.5%) had an undetermined pathotype and 275 (21.3%) had an undetermined H subtype. Of the 433 birds submitted without a pathotype, 110 were subtype H5N8 and were handled as HPAI H5N8 due to positive detections of HPAI H5N8 in the spatial and temporal locality of the unspecified birds. Of the 275 birds submitted with an undetermined H type, five were also reported as HPAI, and were therefore handled as HPAI H5.

Date of wild bird sampling

MS provided a localisation date (from when the bird was sampled in the field) for all birds sampled in 2016.

Wild bird spatial information

Maps were produced using the ArcMap function of Arc GIS version 10.2.2, and the sampling intensity is calculated as the sum of the number of birds sampled in each region (mainly NUTS3 level) per 100km². Low (<=25), Medium (>25 and <=250), High (>250 and <=2500) and Very High (>2500). Positive cases are shown either at provided coordinates or at the centroid of the NUTS3 region in which the bird was found.

Table 22 Summary of passive surveillance sampling strategies, as described in Member States 2016 wild bird survey plans

Member State	Target number of birds to sample	Surveillance design													
		EU Target Species	Location							Mass mortalities	Searching for birds	Collaboration with hunting or ornithological interest groups	General public	Temporal targeting	
			Proximity to water	Proximity of poultry holdings	Density of poultry holdings	Density of target species	Where HPAI found previously	Epi linked areas	Increased mortalities						
AT	350	✓	✓												
BE	400	✓							✓	✓		✓	✓		
BG	290	✓	✓	✓	✓					✓	✓(2)	✓			
CY	200	(1)	✓						✓		✓				
CZ	200	(3)	✓	✓				✓	✓	✓					
DE	1,570	✓	✓				✓	✓							
DK	100	✓								✓					
EE	10	(4)	✓												✓
EL	500	✓	✓			✓	✓	✓			✓(5)	✓			
ES	1,435	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		
FI	200	✓								✓					
FR	120	(6)	✓				✓			✓					
HU	1,440	✓	✓	✓				✓	✓	✓					
IE	1,000	✓	✓			✓						✓	✓		
IT	7,000	✓	✓					✓	✓	✓	✓(5)				✓(9)
LT	51	(10)	✓							✓	✓				
LU	150	(1)								✓					✓
LV	20	(7)													
MT	10	(8)										✓	✓		
NL	1,000	✓	✓	✓	✓			✓			✓(5)	✓	✓		
PL	50	✓	✓				✓	✓			✓(5)				✓
PT	350	✓	✓	✓			✓		✓			✓			
RO	560	✓	✓	✓	✓			✓	✓		✓(5)	✓			
SE	500	(1)									✓(5)				
SI	420	✓	✓	✓	✓						✓(5)	✓	✓		
SK	200	✓	✓	✓	✓				✓		✓(5)	✓			
UK	800	✓				✓	✓			✓	✓		✓		
HR	200	✓							✓			✓			

(1) Information was not specified in the 2016 survey plan

(2) If the epidemiological situation for the HPAI H5N1 virus so requires

(3) CZ uses 6 'target species' considered higher risk in their country, not EU TS list

(4) EE target species are 'Waterfowl 70% and shorebirds 20% and other wild birds 10%'

(5) Searching for dead or moribund birds will occur if the epidemiological situation requires

(6) FR targeting Anatidae family

(7) LV targeting orders Anseriformes and Charadriiformes

(8) MT targets wild ducks and other migratory birds

(9) Active surveillance activates on wild waterfowl during the main migratory periods of spring and fall.

(10) Anseriformes (water fowl) and Charadriiformes (shorebirds) target species

7 REFERENCES

EC (2002) Commission Decision 2002/649/EC of 5 August 2002 on the implementation of surveys for avian influenza in poultry and wild birds in the Member States, *Official Journal of the European Union*, L 213, 9.8.2002, p.38.

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8 ANNEXES

8.1 Poultry Survey

8.1.1 Annex 1 Details of sampling by poultry category and MS for 2016 and 2015

Annex 1 Table 1 Total number of Chicken Breeder holdings reported (from regions where sampling took place), total number sampled and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016					2015				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			Total H5/H7	H5	H7			Total H5/H7	H5	H7
AT	93	24	0	0	0	87	28	0	0	0
BE	206	199	0	0	0	197	200	0	0	0
BG	18	9	0	0	0	11	4	0	0	0
CY	10	7	0	0	0	9	6	0	0	0
CZ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DE	453	25	0	0	0	501	20	0	0	0
DK	147	184	0	0	0	148	327	0	0	0
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EL	83	47	0	0	0	94	56	0	0	0
ES	399	80	0	0	0	419	74	0	0	0
FI	57	36	0	0	0	60	42	0	0	0
FR	911	393	0	0	0	850	60	0	0	0
HR	52	22	0	0	0	32	31	0	0	0
HU	140	49	0	0	0	158	48	0	0	0
IE	81	66	0	0	0	93	89	0	0	0
IT	198	261	0	0	0	166	259	0	0	0
LT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LV	1	1	0	0	0	1	1	0	0	0
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	308	807	0	0	0	2,045	4,069	0	0	0
PL	488	63	0	0	0	480	61	0	0	0
PT	79	75	0	0	0	83	56	0	0	0
RO	45	72	0	0	0	41	68	0	0	0
SE	34	34	0	0	0	31	31	0	0	0
SI	7	7	0	0	0	9	9	0	0	0
SK	12	11	0	0	0	12	13	0	0	0
UK	112	10	0	0	0	172	10	0	0	0
Total	3,934	2,482	0	0	0	5,699	5,562	0	0	0
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

2016 notes

ES: Six CB holdings were seropositive for influenza A virus.

2015 notes

ES: One CB holding was seropositive for H1 (PCR/VI not performed).

Annex 1 Table 2 Total number of Conventional and Free-range Laying Hen holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016										2015									
	Conventional Laying Hens					Free-range Laying Hens					Conventional Laying Hens					Free-range Laying Hens				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			Total H5/H7	H5	H7			Total H5/H7	H5	H7			Total H5/H7	H5	H7			Total H5/H7	H5	H7
AT	778	64	0	0	0	810	62	0	0	0	741	63	0	0	0	1,114	62	0	0	0
BE	153	201	0	0	0	100	185	0	0	0	157	191	0	0	0	96	192	0	0	0
BG	112	51	0	0	0	NS	NS	NS	NS	NS	41	12	0	0	0	NS	NS	NS	NS	NS
CY	23	22	0	0	0	14	13	0	0	0	28	27	0	0	0	11	11	0	0	0
CZ	132	53	0	0	0	13	13	0	0	0	143	54	0	0	0	7	7	0	0	0
DE	5,287	86	2(1)	1(1)	1	4,182	85	0	0	0	7,033	83	0	0	0	28,018	81	0	0	0
DK	NS	NS	NS	NS	NS	139	219	3	1	2	22	14	0	0	0	124	184	1	0	1
EE	24	24	0	0	0	NS	NS	NS	NS	NS	19	19	0	0	0	NS	NS	NS	NS	NS
EL	414	54	0	0	0	134	26	0	0	0	368	57	0	0	0	78	26	0	0	0
ES	908	71	0	0	0	228	56	0	0	0	775	79	0	0	0	227	65	0	0	0
FI	424	51	0	0	0	50	40	0	0	0	303	50	0	0	0	39	32	0	0	0
FR	1,909	41	0	0	0	1,045	62	0	0	0	1,585	56	0	0	0	6,612	61	0	0	0
HR	137	59	0	0	0	12	12	0	0	0	365	50	0	0	0	17	19	0	0	0
HU	592	54	0	0	0	15	13	0	0	0	455	53	0	0	0	12	9	0	0	0
IE	45	37	0	0	0	180	63	0	0	0	53	33	0	0	0	151	85	0	0	0
IT	769	878	0	0	0	77	75	0	0	0	595	857	0	0	0	87	72	0	0	0
LT	5	2	0	0	0	NS	NS	NS	NS	NS	5	7	0	0	0	NS	NS	NS	NS	NS
LU	4	4	0	0	0	4	4	0	0	0	4	4	0	0	0	4	4	0	0	0
LV	33	33	0	0	0	NS	NS	NS	NS	NS	67	33	0	0	0	NS	NS	NS	NS	NS
MT	33	24	0	0	0	NS	NS	NS	NS	NS	34	45	0	0	0	NS	NS	NS	NS	NS
NL*	504	1,095	1(1)	1(1)	0	407	738	4(4)	2(2)	2(2)	650	1,250	0	0	0	866	1,717	3(3)	1(1)	2(2)
PL	622	74	0	0	0	89	36	0	0	0	622	68	0	0	0	84	45	0	0	0
PT	128	90	0	0	0	20	36	0	0	0	128	59	0	0	0	21	18	0	0	0
RO	209	179	0	0	0	NS	NS	NS	NS	NS	212	178	0	0	0	NS	NS	NS	NS	NS
SE	229	62	0	0	0	151	30	0	0	0	226	71	0	0	0	109	24	0	0	0
SI	228	64	0	0	0	NS	NS	NS	NS	NS	228	54	0	0	0	NS	NS	NS	NS	NS
SK	136	47	0	0	0	NS	NS	NS	NS	NS	136	44	0	0	0	NS	NS	NS	NS	NS
UK	1,004	60	0	0	0	NS	NS	NS	NS	NS	1,056	89	0	0	0	NS	NS	NS	NS	NS
Total	14,842	3,480	3(2)	2(2)	1	7,670	1,768	7(4)	3(2)	4(2)	16,051	3,600	0	0	0	37,677	2,714	4(3)	1(1)	3(2)
CH	NS	NS	NS	NS	NS	1,757	40	0	0	0	NS	NS	NS	NS	NS	1,596	61	0	0	0

*NL: One holding was serologically and PCR/VI positive for H5 in both the LH and FR LH categories and is counted in each category.

2016 notes

DE: One LH holding was seropositive for influenza A virus.

ES: Three LH and four FR LH holdings were seropositive for influenza A virus.

2015 notes

ES: One LH holding was seropositive for H1 (PCR/VI not performed).

DE: One FR LH holding was seropositive for H9 (PCR/VI not performed) and another was seropositive for influenza A (PCR/VI not performed).

Annex 1 Table 3 Total number of Broiler (at heightened risk) holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016					2015				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			Total H5/H7	H5	H7			Total H5/H7	H5	H7
AT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BG	3	3	0	0	0	NS	NS	NS	NS	NS
CY	3	5	0	0	0	3	3	0	0	0
CZ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DE	2,055	20	0	0	0	200	18	0	0	0
DK	42	30	0	0	0	34	23	0	0	0
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EL	32	26	0	0	0	45	33	0	0	0
ES	252	2	0	0	0	783	1	0	0	0
FI	2	2	0	0	0	2	2	0	0	0
FR	4,506	49	0	0	0	7,200	69	0	0	0
HR	NS	NS	NS	NS	NS	126	5	0	0	0
HU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
IE	65	46	0	0	0	61	59	0	0	0
IT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LT	21	5	0	0	0	NS	NS	NS	NS	NS
LU	3	3	0	0	0	3	3	0	0	0
LV	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	245	879	0	0	0	307	936	0	0	0
PL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PT	222	60	0	0	0	243	64	0	0	0
RO	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SE	34	33	0	0	0	22	21	0	0	0
SI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
UK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total	7,485	1,163	0	0	0	9,029	1,237	0	0	0
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

2015 notes

DE: One B holding was seropositive for influenza A (PCR/VI not performed).

Annex 1 Table 4 Total number of Fattening Turkey and Turkey Breeder holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016										2015									
	Fattening Turkeys					Turkey Breeders					Fattening Turkeys					Turkey Breeders				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			Total H5/H7	H5	H7			Total H5/H7	H5	H7			Total H5/H7	H5	H7			Total H5/H7	H5	H7
AT	141	57	0	0	0	NS	NS	NS	NS	NS	142	53	0	0	0	NS	NS	NS	NS	NS
BE	36	51	0	0	0	NS	NS	NS	NS	NS	40	48	0	0	0	NS	NS	NS	NS	NS
BG	1	1	0	0	0	1	1	0	0	0	NS	NS	NS	NS	NS	1	1	0	0	0
CY	7	7	0	0	0	NS	NS	NS	NS	NS	6	6	0	0	0	NS	NS	NS	NS	NS
CZ	58	42	0	0	0	NS	NS	NS	NS	NS	56	42	0	0	0	NS	NS	NS	NS	NS
DE	1,659	118	1(1)	1(1)	0	30	10	0	0	0	1,904	100	0	0	0	289	29	0	0	0
DK	59	19	0	0	0	NS	NS	NS	NS	NS	58	19	0	0	0	NS	NS	NS	NS	NS
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EL	40	24	0	0	0	1	1	0	0	0	39	28	0	0	0	NS	NS	NS	NS	NS
ES	593	60	0	0	0	14	12	0	0	0	554	59	0	0	0	14	12	0	0	0
FI	42	40	0	0	0	4	3	0	0	0	42	42	0	0	0	7	3	0	0	0
FR	724	51	0	0	0	283	102	0	0	0	2,500	56	0	0	0	283	60	0	0	0
HR	37	19	0	0	0	11	4	0	0	0	37	30	0	0	0	4	3	0	0	0
HU	326	61	0	0	0	29	26	0	0	0	281	63	0	0	0	24	16	0	0	0
IE	136	51	0	0	0	NS	NS	NS	NS	NS	102	53	0	0	0	2	2	0	0	0
IT	776	1,135	0	0	0	38	47	0	0	0	744	1,250	0	0	0	32	42	0	0	0
LT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LV	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	44	88	0	0	0	NS	NS	NS	NS	NS	97	188	0	0	0	NS	NS	NS	NS	NS
PL	215	55	0	0	0	11	12	0	0	0	219	54	0	0	0	11	11	0	0	0
PT	132	63	0	0	0	NS	NS	NS	NS	NS	133	64	0	0	0	NS	NS	NS	NS	NS
RO	15	29	0	0	0	NS	NS	NS	NS	NS	12	13	0	0	0	NS	NS	NS	NS	NS
SE	18	18	0	0	0	3	3	0	0	0	18	18	0	0	0	3	3	0	0	0
SI	43	43	0	0	0	NS	NS	NS	NS	NS	43	41	0	0	0	NS	NS	NS	NS	NS
SK	8	9	0	0	0	6	6	0	0	0	8	3	0	0	0	4	4	0	0	0
UK	329	57	0	0	0	13	5	0	0	0	307	75	0	0	0	6	6	0	0	0
Total	5,439	2,098	1(1)	1(1)	0	444	232	0	0	0	7,342	2,305	0	0	0	680	192	0	0	0
CH	70	26	0	0	0	NS	NS	NS	NS	NS	91	22	0	0	0	NS	NS	NS	NS	NS

2016 notes

DE: Three FT holdings were seropositive for H9. Three FT and one TB holdings were seropositive for influenza A virus.

ES: Three FT holdings were seropositive for influenza A virus.

2015 notes

DE: Six FT holdings were seropositive for H9 (PCR/VI not performed) and a further six were seropositive for influenza A (PCR/VI not performed). In addition, one TB holding was seropositive for H9 (PCR/VI not performed) and another one was seropositive for influenza A (PCR/VI not performed).

Annex 1 Table 5 Total number of Fattening and Breeder Duck holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016										2015									
	Fattening Ducks					Breeder Ducks					Fattening Ducks					Breeder Ducks				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			H5/H7	H5	H7			H5/H7	H5	H7			H5/H7	H5	H7			H5/H7	H5	H7
AT	28	15	0	0	0	NS	NS	NS	NS	NS	21	18	0	0	0	NS	NS	NS	NS	NS
BE	24	16	3	3	0	NS	NS	NS	NS	NS	23	19	1	1	0	NS	NS	NS	NS	NS
BG	113	109	0	0	0	NS	NS	NS	NS	NS	41	17	0	0	0	NS	NS	NS	NS	NS
CY	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CZ	43	43	0	0	0	26	26	2	2	0	41	41	0	0	0	25	25	0	0	0
DE	1,311	173	4(2)	4(2)	0	98	22	0	0	0	9,959	137	1	1	0	270	25	0	0	0
DK	73	23	0	0	0	NS	NS	NS	NS	NS	60	8	0	0	0	NS	NS	NS	NS	NS
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
ES	48	42	0	0	0	3	3	0	0	0	47	41	0	0	0	3	3	0	0	0
FI	2	2	0	0	0	NS	NS	NS	NS	NS	2	2	0	0	0	NS	NS	NS	NS	NS
FR	3,659	133	2	2	0	372	461	70	70	0	2,348	95	5(3)	5(3)	0	147	72	6	6	0
HR	40	22	0	0	0	27	13	0	0	0	40	22	0	0	0	27	20	0	0	0
HU	360	74	0	0	0	20	19	0	0	0	278	37	0	0	0	29	24	0	0	0
IE	15	15	0	0	0	NS	NS	NS	NS	NS	10	8	0	0	0	2	2	0	0	0
IT	75	57	0	0	0	8	12	0	0	0	58	67	0	0	0	9	15	0	0	0
LT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LV	1	1	0	0	0	NS	NS	NS	NS	NS	2	2	0	0	0	NS	NS	NS	NS	NS
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	47	89	0	0	0	10	10	0	0	0	138	192	0	0	0	36	43	0	0	0
PL	338	83	0	0	0	34	28	0	0	0	339	82	0	0	0	39	33	0	0	0
PT	17	29	0	0	0	2	3	0	0	0	15	15	0	0	0	2	2	0	0	0
RO	NS	NS	NS	NS	NS	2	3	0	0	0	NS	NS	NS	NS	NS	2	4	0	0	0
SE	4	4	0	0	0	NS	NS	NS	NS	NS	3	3	0	0	0	NS	NS	NS	NS	NS
SI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SK	11	4	0	0	0	3	2	0	0	0	12	5	0	0	0	2	1	0	0	0
UK	97	42	0	0	0	77	30	2	2	0	79	31	0	0	0	131	28	0	0	0
Total	6,306	976	9(2)	9(2)	0	682	632	74	74	0	13,516	842	7(3)	7(3)	0	724	297	6	6	0
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

2016 notes

BE: One H5 seropositive FD holding was also PCR positive for influenza A virus.

DE: Four FT holdings were seropositive for influenza A virus, one of which was also also PCR/VI positive for subtype H6.

ES: Ten FT holdings were seropositive for influenza A virus, one of which was also PCR positive for influenza A virus.

2015 notes

DE: Four FD holdings were seropositive for influenza A (PCR/VI not performed).

ES: Seven FD holdings were seropositive for H1; two of these were also PCR positive for influenza A.

Annex 1 Table 6 Total number of Fattening and Breeder Geese holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016										2015									
	Fattening Geese					Breeder Geese					Fattening Geese					Breeder Geese				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			H5/H7	H5	H7			H5/H7	H5	H7			H5/H7	H5	H7			H5/H7	H5	H7
AT	78	56	0	0	0	NS	NS	NS	NS	NS	71	56	0	0	0	NS	NS	NS	NS	NS
BE	NS	NS	NS	NS	NS	2	1	0	0	0	NS	NS	NS	NS	NS	2	4	0	0	0
BG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CY	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CZ*	5	5	0	0	0	8	8	2	2	0	3	3	0	0	0	8	8	0	0	0
DE	1,965	115	1	1	0	85	17	1	1	0	4,353	106	0	0	0	172	16	0	0	0
DK	8	2	0	0	0	NS	NS	NS	NS	NS	6	4	0	0	0	NS	NS	NS	NS	NS
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
ES	11	10	1	1	0	5	5	0	0	0	10	8	0	0	0	4	4	0	0	0
FI	5	3	0	0	0	NS	NS	NS	NS	NS	3	2	1	1	0	NS	NS	NS	NS	NS
FR	94	48	0	0	0	71	75	13	13	0	NS	NS	NS	NS	NS	40	28	5(1)	5(1)	0
HR	5	1	0	0	0	15	14	0	0	0	6	3	0	0	0	15	14	0	0	0
HU	413	65	0	0	0	68	46	0	0	0	346	62	0	0	0	63	40	1	0	1
IE	4	2	0	0	0	NS	NS	NS	NS	NS	5	3	0	0	0	NS	NS	NS	NS	NS
IT	16	4	0	0	0	7	11	0	0	0	12	10	0	0	0	6	10	0	0	0
LT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LV	1	1	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PL	991	96	0	0	0	227	81	2	2	0	994	91	0	0	0	230	80	9	8	1
PT	1	1	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
RO	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SE	7	7	0	0	0	NS	NS	NS	NS	NS	9	9	0	0	0	NS	NS	NS	NS	NS
SI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SK	8	3	0	0	0	1	1	0	0	0	8	4	0	0	0	NS	NS	NS	NS	NS
UK	64	38	4	4	0	15	6	0	0	0	74	37	0	0	0	12	6	0	0	0
Total	3,676	457	6	6	0	504	265	18	18	0	5,900	398	1	1	0	552	210	15(1)	13(1)	2
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

*CZ: One of the H5 seropositive BG holdings was also H5 seropositive in the FGB-W category; it is counted in each category.

2016 notes

DE: Two FG and one BG holdings were seropositive for influenza A virus.

2015 notes

DE: Six FG holdings were seropositive for influenza A (PCR/VI not performed).

Annex 1 Table 7 Total number of Backyard Flock holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016					2015				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			Total H5/H7	H5	H7			Total H5/H7	H5	H7
AT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BG	116,624	394	0	0	0	127,428	74	0	0	0
CY	1,247	55	0	0	0	1,247	60	0	0	0
CZ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DE	NS	NS	NS	NS	NS	53,922	32	0	0	0
DK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
ES	4,070	6	0	0	0	4,070	16	0	0	0
FI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FR	NS	NS	NS	NS	NS	3,579	39	0	0	0
HR	314	65	0	0	0	973	40	1	1	0
HU	177,117	495	0	0	0	205,514	482	0	0	0
IE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
IT	166	166	0	0	0	232	232	1(1)	0	1(1)
LT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LU	500	15	0	0	0	500	12	0	0	0
LV	3,873	60	0	0	0	3,306	59	0	0	0
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PT	237,000	56	0	0	0	237,000	66	0	0	0
RO	1,028	1,097	0	0	0	1,010	1,042	0	0	0
SE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SI	4,154	93	0	0	0	4,154	89	0	0	0
SK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
UK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total	546,093	2,502	0	0	0	642,935	2,243	2(1)	1	1(1)
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

2016 notes

ES: One BYF holding was seropositive for influenza A virus.

HR: One BYF holding was serology and VI positive for influenza A virus and PCR positive for H5.

Annex 1 Table 8 Total number of Farmed Game Bird (gallinaceous) and Farmed Game Bird (waterfowl) holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016											2015										
	Farmed Game Birds (gallinaceous)						Farmed Game Birds (waterfowl)					Farmed Game Birds (gallinaceous)						Farmed Game Birds (waterfowl)				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings				
			Total H5/H7	H5	H7			Total H5/H7	H5	H7			Total H5/H7	H5	H7			Total H5/H7	H5	H7		
AT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
BE	21	22	0	0	0	NS	NS	NS	NS	NS	20	19	0	0	0	NS	NS	NS	NS			
BG	3	3	0	0	0	1	1	0	0	0	1	1	0	0	0	NS	NS	NS	NS			
CY	6	4	0	0	0	NS	NS	NS	NS	NS	7	5	0	0	0	NS	NS	NS	NS			
CZ*	36	36	0	0	0	12	12	1	1	0	31	31	0	0	0	11	11	0	0			
DE	15	5	0	0	0	NS	NS	NS	NS	NS	20	3	0	0	0	NS	NS	NS	NS			
DK	202	80	0	0	0	31	9	5	4	1	164	75	0	0	0	42	12	1	0			
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1	1	0	0	0	NS	NS	NS	NS			
EL	18	14	0	0	0	NS	NS	NS	NS	NS	20	16	0	0	0	NS	NS	NS	NS			
ES	505	222	0	0	0	121	106	8	5	3	377	176	0	0	0	142	134	0	0			
FI	18	9	0	0	0	8	4	0	0	0	11	11	0	0	0	4	4	0	0			
FR	157	106	0	0	0	56	17	0	0	0	600	51	0	0	0	100	14	0	0			
HR	9	9	0	0	0	1	1	0	0	0	15	15	0	0	0	48	3	0	0			
HU	83	38	0	0	0	14	13	0	0	0	74	40	0	0	0	13	10	0	0			
IE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1	1	0	0			
IT	146	108	0	0	0	NS	NS	NS	NS	NS	91	109	0	0	0	NS	NS	NS	NS			
LT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
LU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
LV	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
PL	91	39	0	0	0	NS	NS	NS	NS	NS	92	37	0	0	0	NS	NS	NS	NS			
PT	58	43	0	0	0	NS	NS	NS	NS	NS	64	43	0	0	0	1	1	0	0			
RO	11	14	0	0	0	NS	NS	NS	NS	NS	14	15	0	0	0	NS	NS	NS	NS			
SE	13	9	0	0	0	7	7	0	0	0	13	13	0	0	0	5	5	0	0			
SI	5	5	0	0	0	1	1	0	0	0	5	5	0	0	0	1	1	0	0			
SK	17	17	0	0	0	NS	NS	NS	NS	NS	18	18	0	0	0	NS	NS	NS	NS			
UK	84	32	0	0	0	42	16	0	0	0	94	33	0	0	0	66	12	0	0			
Total	1,498	815	0	0	0	294	187	14	10	4	1,732	717	0	0	0	434	208	1	0			
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			

*CZ: The H5 seropositive FGB-W holding was also H5 seropositive in the BG category; it is counted in each category.

2016 notes

ES: Nine FGB-G and 49 FGB-W holdings were seropositive for influenza A virus.

2015 notes

ES: One FGB-G holding was seropositive for H1 (PCR/M negative). In addition, one FGB-W holding was seropositive for H1 (PCR/M not performed) and another one was seropositive for H6 (PCR negative/M not performed).

Annex 1 Table 9 Total number of Ratite holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

Member State	2016					2015				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			Total H5/H7	H5	H7			Total H5/H7	H5	H7
AT	10	5	0	0	0	15	15	0	0	0
BE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CY	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CZ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DE	710	29	0	0	0	268	11	0	0	0
DK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EL	4	2	0	0	0	3	2	0	0	0
ES	68	33	0	0	0	51	29	0	0	0
FI	1	1	0	0	0	3	2	0	0	0
FR	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
HR	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
HU	9	8	0	0	0	4	3	0	0	0
IE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
IT	26	8	0	0	0	35	15	0	0	0
LT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LU	1	2	0	0	0	1	2	0	0	0
LV	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PL	75	34	0	0	0	75	35	0	0	0
PT	6	6	0	0	0	6	6	0	0	0
RO	1	1	0	0	0	NS	NS	NS	NS	NS
SE	3	4	0	0	0	3	3	0	0	0
SI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SK	14	6	0	0	0	14	8	0	0	0
UK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total	928	139	0	0	0	478	131	0	0	0
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Annex 1 Table 10 Total number of Other holdings reported (from regions where sampling took place), total number sampled, and total number of H5 and H7 positive holdings reported for 2016 and 2015 by Member State

Virological data is displayed in italics in parentheses. If a holding was virologically positive for H5/H7 only, further information is provided at the base of the table. Information is also provided at the base of the table on serological/virological data other than H5/H7.

NS = Not sampled.

For information on the type of holdings included under Others, please see [Table 21](#).

	2016					2015				
	Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings			Total No. of Holdings	Total No. of Holdings Sampled	Positive Holdings		
			Total H5/H7	H5	H7			Total H5/H7	H5	H7
AT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BE	5	4	0	0	0	6	5	0	0	0
BG	1	1	0	0	0	700	12	0	0	0
CY	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CZ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DE	6,949	34	1	1	0	2,713	17	2(1)	2(1)	0
DK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EE	1	1	0	0	0	NS	NS	NS	NS	NS
EL	102	57	0	0	0	104	60	0	0	0
ES	4,477	50	1	1	0	4,486	132	0	0	0
FI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FR	135	3	0	0	0	143	57	0	0	0
HR	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
HU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
IE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
IT	626	787	2(2)	1(1)	1(1)	645	927	2(2)	2(2)	0
LT	3	1	0	0	0	NS	NS	NS	NS	NS
LU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
LV	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NL	2	2	0	0	0	NS	NS	NS	NS	NS
PL	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
RO	1	2	0	0	0	1	1	0	0	0
SE	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
UK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total	12,302	942	4(2)	3(1)	1(1)	8,798	1,211	4(3)	4(3)	0
CH	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

2016 notes

DE: One O holding was seropositive and PCR positive for influenza A virus.

ES: Five O holdings were seropositive for influenza A virus.

IT: One O (grower) holding, was PCR/VI positive for H5, serology not performed.

2015 notes

DE: One O holding was seropositive for influenza A (PCR/VI not performed).

ES: One O holding was seropositive for H6 and H10 (PCR negative/VI not performed).

8.1.2 Annex 2 Additional information on results of the 2016 poultry survey

Annex 2 Table 1 Poultry holdings testing positive for subtype H5

Member State	Poultry category	Total poultry holdings reported (from regions where sampling took place)	Total poultry holdings sampled	Number of H5 serological positive poultry holdings	Number of PCR / virus isolation H5 positive poultry holdings	Comments
BE	Fattening Ducks	24	16	3	0	
CZ	Breeder Ducks	26	26	2	0	One holding was H5 sero positive in both the BG and FGB-W categories and is counted in each category
	Breeder Geese	8	8	2	0	
	Farmed Game Birds (waterfowl)	12	12	1	0	
DE	Conventional Laying Hens	5,287	86	1	1	One holding serologically and PCR positive for H5 (VI not performed)
	Fattening Turkeys	1,659	118	1	1	One holding serologically and PCR positive for H5 (VI not performed)
	Fattening Ducks	1,311	173	4	2	Four holdings serologically positive for H5, two of which were also PCR positive for H5 (VI not performed)
	Fattening Geese	1,965	115	1	0	
	Breeder Geese	85	17	1	0	
	Others	6,949	34	1	0	
DK	Free-range Laying Hens	139	219	1	0	
	Farmed Game Birds (waterfowl)	31	9	4	0	
ES	Fattening Geese	11	10	1	0	
	Farmed Game Birds (waterfowl)	121	106	5	0	
	Others	4,477	50	1	0	
FR	Fattening Ducks	3,659	133	2	0	
	Breeder Ducks	372	461	70	0	
	Breeder Geese	71	75	13	0	
HR	Backyard Flocks	314	65	0	1	One holding PCR positive for H5 and serology/VI positive for influenza A virus
IT	Others	626	787	1	2	One holding serologically and PCR positive for H5 (VI not performed); One holding PCR/VI positive for H5 (serology not performed)
NL	Conventional Laying Hens	504	1,095	1	1	One holding was serologically and PCR/VI positive for H5 in both the LH and FR LH categories and is counted in each category; Another FR LH holding was serologically and PCR/VI positive for H5
	Free-range Laying Hens	407	738	2	2	
PL	Breeder Geese	227	81	2	0	
UK	Breeder Ducks	77	30	2	0	
	Fattening Geese	64	38	4	0	
Total		28,426	4,502	126	10	

Annex 2 Table 2 Poultry holdings testing positive for subtype H7

Member State	Poultry category	Total poultry holdings reported (from regions where sampling took place)	Total poultry holdings sampled	Number of H7 serological positive poultry holdings	Number of PCR / virus isolation H7 positive poultry holdings	Comments
DE	Conventional Laying Hens			1		
DK	Free-range Laying Hens			2		
	Farmed Game Birds (waterfowl)			1		
ES	Farmed Game Birds (waterfowl)			3		
IT	Others			1	1	One holding serologically and PCR/VI positive for H7
NL	Free-range Laying Hens			2	2	Two holdings serologically and PCR/VI positive for H7
Total		0	0	10	3	

Annex 2 Table 3 Number of poultry holdings positive for subtype H5 by serology, serology and PCR/virus isolation, or PCR/virus isolation only

Member State	Poultry category	Number H5 serologically positive only, PCR/virus isolation negative or not performed	Number H5 serologically positive and PCR/virus isolation positive	Number H5 PCR/virus isolation positive, serology negative or not performed
BE	Fattening Ducks	3		
CZ*	Breeder Ducks	2		
	Breeder Geese	2		
	Farmed Game Birds	1		
DE	Conventional Laying Hens		1	
	Fattening Turkeys		1	
	Fattening Ducks	2	2	
	Fattening Geese	1		
	Breeder Geese	1		
	Others	1		
DK	Free-range Laying Hens	1		
	Farmed Game Birds (waterfowl)	4		
ES	Fattening Geese	1		
	Farmed Game Birds (waterfowl)	5		
	Others	1		
FR	Fattening Ducks	2		
	Breeder Ducks	70		
	Breeder Geese	13		
HR	Backyard Flocks			1
IT	Others		1	1
NL**	Conventional Laying Hens		1	
	Free-range Laying Hens		2	
PL	Breeder Geese	2		
UK	Breeder Ducks	2		
	Fattening Geese	4		
Total		118	8	2

*CZ: One holding was H5 seropositive in both the BG and FGB-W categories and is counted in each category.

**NL: One holding was serologically and PCR/VI positive for H5 in both the LH and FR LH categories and is counted in each category.

Annex 2 Table 4 Number of poultry holdings positive for subtype H7 by serology, serology and PCR/virus isolation, or PCR/virus isolation only

Member State	Poultry category	Number H7 serologically positive only, PCR/virus isolation negative or not performed	Number H7 serologically positive and PCR/virus isolation positive	Number H7 PCR/virus isolation positive, serology negative or not performed
DE	Conventional Laying Hens	1		
DK	Free-range Laying Hens	2		
	Farmed Game Birds (waterfowl)	1		
ES	Farmed Game Birds (waterfowl)	3		
IT	Others		1	
NL	Free-range Laying Hens		2	
Total		7	3	0

8.2 Wild Bird Annex

8.2.1 Annex 3 – Passive surveillance data

8.2.1.1 Diagnosis

This section reports the samples collected through passive surveillance activities and the associated test results. The 2007 guidelines (EC, 2007) recommend oro-pharyngeal (tracheal) and cloacal swabs to be collected from healthy free living birds and cloacal and oro-pharyngeal swabs and/ or tissues from dead or shot birds as the basis of sampling for HPAI H5N1. Similarly, the 2010 guidelines (EC 2010a) recommend that cloacal and tracheal/oro-pharyngeal swabs and/or tissues from wild birds found dead or moribund should be sampled. The totals for the 2016 testing regimes are shown below.

Annex 3 Table 1 Type of samples collected for birds sampled by passive surveillance in 2016, by status of bird

Sample type	Status of bird			Passive surveillance total
	Found dead	Injured	Live with clinical signs	
Cloacal	914	70	12	996
Faeces	139	-	1	140
Other	2,059	-	56	2,115
Tissue	2,901	-	109	3,010
Tracheal	1,696	3	9	1,708
Cloacal and Tissue	7	-	-	7
Cloacal and Tracheal	4,269	34	134	4,437
Faeces and Other	5	-	-	5
Faeces and Tissue	19	-	5	24
Tissue and Other	98	-	-	98
Tracheal and Tissue	2	-	-	2
Cloacal, Tracheal and Tissue	22	-	-	22
EU Total	12,131	107	326	12,564

Samples from 12,564 birds submitted by EU member states are considered in this section (excluding the 264 birds submitted by Switzerland). The most commonly submitted sample type for birds found dead was cloacal and oro-pharyngeal (tracheal) swab (35.2%). Tissue only sample types (23.9%) and sample types described as 'other' (17.0%) were also tested in large numbers for dead birds. For injured birds, the majority of birds were sampled by the collection of cloacal swabs only (65.4%) or dual sampling with cloacal and tracheal swabs (31.8%). For live birds with clinical signs, the most common sample types were for birds where both cloacal and tracheal samples were collected (41.4%), or only tissue was submitted (33.4%) (Table A3.1).

8.2.1.2 AI Positives

In 2016, AI positive results were detected in all bird status categories; birds found dead, injured and those live with clinical signs. Tables A3.2 to A3.5 show the test results for birds that were positive for HPAI H5N8, HPAI H5N5, HPAI H5 N type undetermined, and all other positives, including LPAI virus and birds where the pathotype was not determined. For birds testing positive for H5N8 HPAI (n=776), 94.7% were only PCR positive with either negative virus isolation results, or virus isolation not performed; 57.4% (446 birds) were detected when cloacal and oro-pharyngeal (tracheal) swab samples were both tested, and 16.3% (127 birds) were detected through cloacal samples. Of the five birds with H5N5 HPAI, the virus was isolated from three birds where tissue sampling only was conducted, while for the other two birds AI was detected when both cloacal and oro-pharyngeal (tracheal) swabs were taken. Both PCR and virus isolation was carried out for four of the five birds found positive for H5N5 HPAI. Where birds were reported as positive for HPAI H5, but the N type was not determined (n=37), 5.4% (n=2) of birds were found positive by both PCR and virus isolation, while for 94.6% of birds (n=35) virus isolation was not performed.

Annex 3 Table 2 HPAI H5N8 test results and samples taken for found dead, injured and birds live with clinical signs - EU-data only

Status of bird	Sample type	Total number of birds sampled	Total number of birds positive	PCR+ VI+	PCR+ VI-	PCR+ VI NP	PCR- VI NP
Found dead	Cloacal	914	127	-	-	127	-
	Tissue	2,901	86	23	2	63	-
	Tracheal	1,696	105	2	-	103	-
	Cloacal & Tissue	7	1	-	-	1	1
				-	-	1	-
	Cloacal & Tracheal	4,269	444	8	1	431	1
				8	1	431	-
	Tissue & Other	98	2	2	-	-	-
				-	-	2	-
	Cloacal & Tracheal & Tissue	22	4	1	-	3	-
-				-	4	1	
1				-	3	-	
Injured	Tracheal	3	1	-	-	1	-
Live with clinical signs	Other	56	1	-	-	1	-
	Tissue	109	2	-	1	1	-
	Cloacal & Tracheal	134	2	1	-	1	-
				1	-	1	-
	Faeces & Tissue	5	1	1	-	-	-
1				-	-	-	

Annex 3 Table 3 HPAI H5N5 test-results and samples taken for found dead birds - EU-data only

Sample type	Total number of birds sampled	Total number of birds positive	PCR+ VI+	PCR+ VI-	PCR+ VI NP	PCR- VI NP
Tissue	2,901	3	3	-	-	-
Cloacal & Tracheal	4,296	2	1	-	1	-
			-	-	2	-

Annex 3 Table 4 HPAI H5 test-results and samples taken for found dead birds - EU-data only

Sample type	Total number of birds sampled	Total number of birds positive	PCR+ VI+	PCR+ VI-	PCR+ VI NP	PCR- VI NP
Cloacal	914	3	-	-	3	-
Other	2,059	12	-	-	12	-
Tracheal	1,696	12	2	-	10	-
Cloacal & Tracheal	4,269	10	-	-	10	-
			-	-	10	-

Annex 3 Table 5 AI positives (excluding confirmed HPAI) test-results and samples taken for birds found dead and live with clinical signs - EU-data only

Status of bird	Sample type	Total number of birds sampled	Total number of birds positive	PCR+ VI+	PCR+ VI-	PCR+ VI NP	PCR- VI NP	PCR- VI-
Found dead	Cloacal	914	6	-	-	6	-	-
	Other	2059	207	-	-	207	-	-
	Tissue	2901	21	-	9	12	-	-
	Tracheal	1708	18	-	2	16	-	-
	Cloacal & Tracheal	4269	96	1	20	75	-	-
				-	10	74	11	1
	Tissue & Other	98	1	-	-	1	-	-
				1	-	-	-	-
	Tracheal & Tissue	2	1	1	-	-	-	-
				1	-	-	-	-
Cloacal & Tracheal & Tissue	22	1	-	-	-	1	-	
			-	-	-	1	-	
			-	-	-	1	-	
Live with clinical signs	Cloacal	12	1	-	-	1	-	-
	Other	56	2	-	-	2	-	-
	Faeces	1	1	-	1	-	-	-

8.2.1.3 Type of Surveillance by Quarter

Table A3.6 displays the number of birds sampled in in each quarter of 2016, by passive surveillance in each bird status category (found dead, injured and live with clinical signs).

Annex 3 Table 6 Number of birds tested through passive surveillance by quarter and Member State in 2016 – Non MS data included

Member State	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	Found dead	Injured	Live with clinical signs	Found dead	Injured	Live with clinical signs	Found dead	Injured	Live with clinical signs	Found dead	Injured	Live with clinical signs
AT	27	-	-	9	-	-	14	-	-	151	-	-
BE	98	-	-	67	-	-	44	-	-	71	-	-
BG	-	-	-	-	-	-	4	-	2	3	-	-
CY	11	23	-	5	19	-	17	6	-	16	22	5
CZ	30	-	-	18	-	-	25	-	-	16	-	-
DE	292	-	1	274	-	8	356	-	5	4,916	-	9
DK	4	-	-	2	-	-	11	-	-	187	-	-
EE	-	-	-	1	-	-	-	-	-	4	-	-
EL	5	-	-	-	-	-	-	-	-	4	-	7
ES	82	14	1	23	2	-	73	11	4	49	1	4
FI	26	-	9	36	-	13	37	-	18	57	-	12
FR	13	-	-	16	-	-	-	-	-	161	-	-
HR	3	-	-	42	-	-	18	-	-	53	-	-
HU	63	-	-	45	-	-	101	-	-	751	-	-
IE	6	-	-	9	-	2	3	-	-	2	-	3
IT	568	-	12	321	-	40	577	-	22	333	-	26
LT	6	-	-	5	-	-	5	-	-	6	-	-
LU	-	-	-	1	-	-	-	-	-	1	-	-
LV	-	-	-	1	-	-	1	-	-	1	-	-
NL	109	-	-	186	-	-	137	-	-	104	-	-
PL	4	-	-	3	-	-	12	-	-	66	-	-
PT	49	-	4	1	-	4	16	-	-	37	1	4
RO	78	-	-	17	-	-	48	1	-	129	2	-
SE	72	-	7	67	-	13	64	-	12	95	-	24
SI	11	2	10	24	1	25	19	1	17	38	-	3
SK	14	-	-	-	-	-	4	1	-	13	-	-
UK	123	-	-	103	-	-	85	-	-	226	-	-
EU Total	1,694	39	44	1,276	22	105	1,671	20	80	7,490	26	97
CH	5	-	1	5	-	-	-	-	-	231	5	17

Table A3.7 displays the number of birds of Target Species and non-Target Species sampled by MS and quarter in 2016.

Annex 3 Table 7 Number of target species (TS) sampled in each quarter by Member State in 2016 – Non-MS data included

Member State	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
	TS	Non-TS	TS	Non-TS	TS	Non-TS	TS	Non-TS
AT	23	1	8	0	12	2	91	40
BE	51	47	27	40	21	23	28	43
BG	0	0	0	0	4	2	0	3
CY	18	16	9	15	2	21	14	29
CZ	6	24	10	8	11	14	9	7
DE	152	82	123	89	166	108	2,288	1,374
DK	4	0	2	0	10	1	118	68
EE	0	0	0	1	0	0	4	0
EL	4	0	0	0	0	0	8	3
ES	46	27	5	20	66	15	28	17
FI	15	20	27	22	35	20	35	34
FR	4	9	14	2	0	0	54	58
HR	3	0	11	31	13	5	39	14
HU	20	43	16	28	34	67	274	475
IE	5	1	10	1	2	1	4	1
IT	412	164	108	244	161	423	134	167
LT	6	0	5	0	5	0	6	0
LU	0	0	0	0	0	0	1	0
LV	0	0	0	1	0	1	0	1
NL	51	58	88	97	47	90	54	32
PL	1	0	3	0	12	0	12	43
PT	13	40	5	0	5	11	12	30
RO	74	3	16	1	39	10	119	10
SE	11	68	21	58	38	38	47	71
SI	13	9	20	30	26	11	29	11
SK	10	3	0	0	5	0	8	2
UK	115	4	72	27	60	23	142	67
EU Total	1,057	619	600	715	774	886	3,558	2,600
CH	5	0	5	0	0	0	168	52

Note: 1,755 birds were not identified to species level and could not be classified as Target or Non-target species.

8.2.1.4 Overview of Results by Species

Table A3.8: Detections of HPAI H5N8 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS.

Table A3.9: Detections of HPAI H5N5 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS.

Table A3.10: Detections of HPAI H5 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS.

Table A3.11: Detections of LPAI H5 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS.

Table A3.12: Detections of LPAI H7 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS.

Table A3.13: Detections of all AI types (in brackets) by TS (in bold) and non-TS and the number of those species sampled in each MS.

The aim of these tables is to provide context of AI detections taking into account bird species and the number of birds sampled by MS.

Key to tables

Headings	
HPAI H5N8	LPAI H5
HPAI H5N5	LPAI H7
HPAI H5	All AI
Number sampled	Not sampled

Not presenting data, for illustrative purposes only.

Annex 3 Table 8 Detections of HPAI H5N8 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS (page 1 of 3)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH
<i>Accipiter gentilis</i>	1			4		29 (2)	3 (1)			1	22			4		5				5			1	10			1	87 (3)	
<i>Accipiter sp.</i>						23 (1)										3											2	28 (1)	
<i>Anas acuta</i>	1					3 (2)				5						3						1						13 (2)	
<i>Anas crecca</i>	1					9				7				6		238				1		1	33				5 (1)	301 (5)	
<i>Anas penelope</i>		1				6				1					1 (1)	4				3 (2)							13 (10)	29 (13)	
<i>Anas platyrhynchos</i>	18	20	1	1	17	498 (7)	12	2		55	2	19	2	155		50	10			47	4	5	67	20	17	5	56 (1)	1092 (8)	9 (4)
<i>Anas sp.</i>						312 (45)						1				23		1		6	12 (10)		2				1	358 (45)	4 (2)
<i>Anas strepera</i>						2 (1)				5						4				2		2					1	16 (1)	
<i>Anser anser</i>	1					112 (6)	2	2			1	2		24		3				6		3		3			18 (1)	179 (7)	2
<i>Anser albifrons</i>		2				6	1							12						6							1 (1)	28 (1)	
<i>Anser erythropus</i>														3 (1)									2 (2)					5 (3)	
<i>Anser fabalis</i>						21 (1)						1		6							5							33 (1)	
<i>Anser spp.</i>						93 (10)				2		1				1				3	1							101 (10)	
<i>Ardea cinerea</i>	2 (1)	13		1	2	162 (7)	2			4	1	3	14	5		22				13	1	2	1	1	2			254 (8)	3
<i>Asio otus</i>			1 (1)	6		14					2			5		29				5				3	2			67 (1)	
<i>Aythya ferina</i>	3 (3)					57 (19)										3											2 (1)	65 (23)	7 (6)
<i>Aythya fuligula</i>	14 (13)					433 (264)	29 (28)			1	8 (8)					1				2 (1)				3			6	554 (314)	57 (53)
<i>Aythya marila</i>						10 (9)					1																	11 (9)	
<i>Branta bernicla</i>						3 (1)					1																	4 (1)	
<i>Branta canadensis</i>		4				21 (3)	3					1								2							15 (1)	46 (4)	

Annex 3 Table 8 Detections of HPAI H5N8 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS (continued, page 2 of 3)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH
<i>Branta leucopsis</i>						17 (2)					2	1								8				1				30 (2)	1
<i>Bubo bubo</i>						30					11 (1)					8								14			1	64 (1)	
<i>Bucephala clangula</i>						2 (1)					1													1				4 (1)	3
<i>Buteo buteo</i>	6 (1)	20		6	2	244 (8)	14 (5)			14	1	1	1	17	4	103		1		21 (1)		4		16	9		58	548 (14)	7 (1)
<i>Buteo spp.</i>	1					207 (7)																					9	217 (7)	
<i>Ciconia sp.</i>						10 (1)						1																11 (1)	
<i>Columba livia</i>			1		6	103				9	10 (1)	5		8		45			1			4		14	6			216 (1)	4
<i>Corvus corone</i>	3	3		5							2			4		14				14 (1)			1	2				51 (1)	1
<i>Corvus frugilegus</i>						20 (1)	6				1			32		1					26		3	5		1		95 (1)	
<i>Corvus sp.</i>	1					94 (1)														2								97 (1)	9
<i>Cygnus cygnus</i>			1			8 (1)	9 (1)				38					9							20 (7)	1		1	51	138 (9)	
<i>Cygnus olor</i>	25	13			14	136 (14)	20 (8)		8 (1)		10	24	29 (16)	35 (4)	1	2	11			33	18 (1)		1	10	31 (1)	13	85 (7)	555 (52)	36 (10)
<i>Cygnus sp.</i>	19 (1)					264 (15)						15				7				3						2	9	319 (16)	1
<i>Egretta garzetta</i>			1 (1)			3																	1					5 (1)	
<i>Falco peregrinus</i>	2			1		25				1	1				12	19				2 (1)		1		6			5 (1)	76 (2)	1 (1)
<i>Fulica atra</i>	1	9		1		67 (1)				3		1	13	8		2				17			31				7	160 (1)	4
<i>Gallinula chloropus</i>	4	12		2		34				2		5	1			13				9							9	91 (1)	2 (1)
<i>Haliaeetus albicilla</i>					2	13 (7)	3 (3)				23 (5)			3										66				115 (15)	
<i>Larus argentatus</i>	2 (2)	85					22 (4)			1	3	2 (1)			1	43				109	4 (4)			6			18	296 (9)	
<i>Larus argentatus argentatus</i>						130 (50)																						130 (50)	

Annex 3 Table 8 Detections of HPAI H5N8 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS (continued, page 3 of 3)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH
<i>Larus argentatus michahellis</i>						1						1	28			2						14			2			48	20 (18)
Larus canus	1	4				14 (2)	8 (3)				5									1			10	4		1	1	50 (2)	
<i>Larus fuscus</i>		13				5				4										42 (1)		44						108 (1)	
<i>Larus marinus</i>		2				25 (20)	13 (8)													2								42 (28)	
Larus ridibundus	10 (2)	30	1			98 (12)	8 (1)			3			5	3		21				12		2		3			27 (1)	241 (16)	18 (8)
<i>Larus sp.</i>	7 (2)					205 (38)				16		2		2		3				5	1 (1)		1				1	243 (41)	5 (2)
<i>Mergus sp.</i>						2 (1)				1																		3 (1)	
Netta rufina						3								1														4	3 (2)
<i>Numenius sp.</i>	2 (2)																											2 (2)	
Phalacrocorax carbo	8	4				48 (1)	4			4	3			15		19				14		2	1 (1)	1	6		9 (1)	141 (3)	5
Pica pica	1	2				45	5		4		2	2 (1)		20		61				20 (1)		1	56	8	2			229 (2)	
Podiceps cristatus	3 (1)	5				30 (6)				2				2		2				8								52 (7)	14 (5)
<i>Somateria mollissima</i>						5 (3)	1 (1)																					6 (3)	2
<i>Species unknown</i>														1		44				1								47	5 (1)
<i>Streptopelia decaocto</i>	2		1	2	27	10				16		18 (4)		52		17						5	3		4	3		160 (4)	
Strigidae						25 (1)																						25 (1)	
Tachybaptus ruficollis						8 (3)						1																9 (3)	3 (3)
<i>Tringa ochropus</i>	1 (1)																											1 (1)	

Target species indicated with bold text.

Annex 3 Table 9 Detections of HPAI H5N5 (in brackets) and the number of those species sampled in each MS

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH
Anas penelope		1				6				1					1	4 (1)				3							13	29 (1)	
Anser anser	1					112 (1)	2	2				2		24		3				6		3		3			18	179 (1)	2
Cygnus olor	25	13			14	136	20		8		3	24	29 (2)	35	1	2	11			33 (1)	18		1	9	31	13	85	555 (3)	36

All birds were Target species and are listed in bold text.

Annex 3 Table 10 Detections of HPAI H5 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS (page 1 of 2)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH
<i>Accipiter gentilis</i>	1			4		29 (1)	3			1	8			4		5				5			1	10			1	87 (1)	
<i>Accipiter nisus</i>	6		1	2		186 (1)	7							5	1	33				8			2	8 (1)	1	1	7	267 (1)	3
<i>Anas platyrhynchos</i>	18	20	1	1	17	498 (2)	13	2		55		19	2	155		50	10			47	4	5	67	20	17	5	56	1092 (2)	9
<i>Anser anser</i>	1					112 (1)	2	2				2		24		3				6		3		3			18	179 (1)	2
<i>Aythya ferina</i>	3					57 (3)										3											2	65 (3)	7
<i>Aythya fuligula</i>	14					433 (2)	29			1	8					1				2				3 (1)			6	554 (3)	57
<i>Branta canadensis</i>		4				21 (1)	3					1								2							15	46 (1)	
<i>Branta leucopsis</i>						17 (1)					1	1								8				1				30 (1)	1
<i>Bucephala clangula</i>						2					1													1 (1)				4 (1)	3
<i>Buteo buteo</i>	6	20		6	2	244	14			14	1	1	1	17	4	103		1		21		4		13 (1)	9		58	548 (1)	7
<i>Corvus corone</i>	3	3		5							2			4		14				14			1	2 (2)				51 (1)	1
<i>Cygnus sp.</i>	19					264 (2)						15				7				3						2	9	319 (2)	1
<i>Fulica atra</i>	1	9		1		67 (1)				3		1	13	8		2				17			31				7	160 (1)	4
<i>Haliaeetus albicilla</i>					2	13	3				8			3										66 (4)				115 (3)	
<i>Larus argentatus</i>	2	85					22			1	2	2			1	43				109	4			6 (4)			18	296 (2)	

Annex 3 Table 10 Detections of HPAI H5 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS (continued, page 2 of 2)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH	
<i>Larus argentatus argentatus</i>						130 (3)																							130 (3)	
<i>Larus canus</i>	1 (1)	4				14	10													1			10	4		1	1	50 (1)		
<i>Larus marinus</i>		2				25 (1)	13 (1)													2								42 (1)		
<i>Larus ridibundus</i>	10	30	1			98 (1)	11			3		5	3			21				12		2		3 (2)			27	241 (2)	18	
<i>Mergus merganser</i>	1					5 (1)													1								1	8 (1)	1	
<i>Netta rufina</i>						3 (1)							1															4 (1)	3	
<i>Pica pica</i>	1	2				45 (1)	5		4		1	2		20		61				20		1	56	8 (2)	2			229 (3)		
<i>Strigidae</i>						25 (1)																						25 (1)		

Target species indicated with bold text.

Annex 3 Table 11 Detections of LPAI H5 (in brackets) by TS (in bold) and non-TS and the number of those species sampled in each MS

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH
<i>Anas crecca</i>	1					9				7 (1)			1	6		283			1		1	33				5	347 (1)	
<i>Anas platyrhynchos</i>	18	20	1	1	17	498 (1)	13	2		55		19	2	155		50	10		47	4	5	67	14	17	5	56	1092 (1)	9
<i>Anas sp.</i>						312 (1)						1				23		1	6	12		2				1	358 (1)	4
<i>Ardea cinerea</i>	2	13		1	2	162 (1)	2			4		3	14	5		22			13	1	2	1	1	2			254 (1)	3
<i>Branta leucopsis</i>						17 (3)					1	1							8				1				30 (3)	1
<i>Cygnus olor</i>	25	13			14	136	20		8		3	24 (1)	29	35	1	2	11		33	18		1	9	31	13	85	555 (1)	36
<i>Larus canus</i>	1	4				14 (1)	10												1			10	3		1	1	50 (1)	

Target species indicated with bold text.

Annex 3 Table 12 Detections of LPAI H7 (in brackets) and the number of those species sampled in each MS

Species	AT	BE	CZ	DE	DK	EL	FI	FR	HR	HU	IE	IT	LT	NL	PL	RO	SE	SI	SK	UK	EU	CH
<i>Cygnus olor</i>	25	13	14	136	20	8	3	24	29	35	1	2	11	33	18 (1)	1	9	31	13	85	555 (1)	36

Annex 3 Table 13 Detections of all AI (in brackets) by TS (in bold) and non-TS and the number of those species sampled in each MS (page 1 of 4)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH	
<i>Accipiter gentilis</i>	1			4		29 (3)	3 (1)			1	22			4		5				5			1	11 (1)			1	87 (5)		
<i>Accipiter nisus</i>	6		1	2		186 (2)	7				3			5	1	33				8			2	8 (1)	1	1	7	267 (2)	3	
<i>Accipiter sp.</i>						23 (1)										3											2	28 (1)		
<i>Alopochen aegyptiacus</i>		6				55 (1)														9								70 (1)		
<i>Anas acuta</i>	1					3 (2)				5						3						1						13 (2)		
<i>Anas clypeata</i>										21 (1)				2		4							4						31 (1)	
<i>Anas crecca</i>	1					9 (1)				7 (3)		1	6			283				1 (1)		1	33				5 (1)	347 (6)		
<i>Anas penelope</i>		1				6 (1)				1					1 (1)	4 (1)					3 (3)						13 (10)	29 (16)		
<i>Anas platyrhynchos</i>	18	20	1	1	17	498 (20)	12	2		55 (7)	2	19	2	155		50 (1)	10			47	4	5	67	20 (2)	17	5	56 (1)	1092 (30)	9 (4)	
<i>Anas sp.</i>						312 (64)						1				23		1		6	12 (10)		2				1	358 (74)	4 (2)	
<i>Anas strepera</i>						2 (1)				5						4				2		2					1	16 (1)		
<i>Anser albifrons</i>		2				6	1						12							6							1 (1)	28 (1)		
<i>Anser anser</i>	1					112 (11)	2	2			1	2		24		3				6		3		3			18 (1)	179 (12)	2	
<i>Anser erythropus</i>													3										2 (2)					5 (3)		
<i>Anser fabalis</i>						21 (1)						1		6								5							33 (1)	
<i>Anser spp.</i>						93 (13)				2		1				1				3	1							101 (13)		
<i>Ardea cinerea</i>	2 (1)	13		1	2	162 (14)	2			4	1	3	14	5		22				13	1	2	1	1	2			254 (15)	3	
<i>Ardea sp.</i>	2					38 (2)				1						1				1						1		44 (2)		
<i>Asio otus</i>			1 (1)	6		14								5		29				5				3	2			67 (1)		
<i>Aythya ferina</i>	3 (3)					57 (43)										3											2 (2)	65 (48)	7 (6)	

Annex 3 Table 13 Detections of all AI (in brackets) by TS (in bold) and non-TS and the number of those species sampled in each MS (continued, page 2 of 4)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH	
<i>Aythya fuligula</i>	14 (13)					433 (401)	29 (28)			1	8 (8)					1				2 (1)				3 (1)			6 (1)	554 (453)	57 (53)	
<i>Aythya marila</i>						10 (9)					1																	11 (9)		
<i>Branta bernicla</i>						3 (1)					1																	4 (1)		
<i>Branta canadensis</i>		4				21 (5)	3					1									2						15 (1)	46 (6)		
<i>Branta leucopsis</i>						17 (6)					1	1									8			1				30 (6)	1	
<i>Bubo bubo</i>						30					10 (1)					8								14			1	64 (1)		
<i>Bucephala clangula</i>						2 (1)					1													1 (1)			4 (2)	3		
<i>Buteo buteo</i>	6 (1)	20		6	2	244 (11)	14 (5)			14	1	1	1	17	4	103		1		21 (2)		4		14 (1)	9		58	548 (20)	7 (1)	
<i>Buteo spp.</i>	1					207 (11)																					9	217 (11)		
<i>Ciconia sp.</i>						10 (1)						1																11 (1)		
<i>Columba livia</i>			1		6	103				9	9 (1)	5		8		45		1				4		14	6			216 (1)	4	
<i>Columba sp.</i>	5					324 (1)				3		22				2										3	8	367 (1)	9	
<i>Corvus corax</i>	1					8	1 (1)							4		2									1		2	19 (1)	1	
<i>Corvus corone</i>	3	3		5							4			4		14				14 (1)			1	2 (2)				51 (2)	1	
<i>Corvus corone cornix</i>						22 (1)	4									102										25		153 (1)		
<i>Corvus frugilegus</i>						20 (1)	6				1			32		1					26		3	5		1		95 (1)		
<i>Corvus sp.</i>	1					94 (2)														2								97 (2)	9	
<i>Cygnus cygnus</i>			1 (1)			8 (1)	9 (1)				38					9								20 (7)	1		1	51	138 (10)	
<i>Cygnus olor</i>	25	13			14	136 (16)	20 (8)		8 (2)		10	24 (1)	29 (18)	35	1	2	11			33 (1)	18 (2)			1	10	31 (1)	13	85 (7)	555 (60)	36 (10)

Annex 3 Table 13 Detections of all AI (in brackets) by TS (in bold) and non-TS and the number of those species sampled in each MS (continued, page 3 of 4)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH	
<i>Cygnus sp.</i>	19 (1)					264 (50)						15				7				3						2	9	319 (51)	1	
<i>Egretta garzetta</i>			1 (1)			3																	1					5 (1)		
<i>Falco peregrinus</i>	2			1		25				1	1				12	19				2 (1)		1		6			5 (1)	76 (2)	1 (1)	
<i>Falco tinnunculus</i>	3			26		96 (1)	3			9	1			3	1	129 (1)				2		2	1	7	6		1	288 (2)	1	
<i>Fulica atra</i>	1	9		1		67 (6)				3		1	13	8		2				17			31				7	160 (6)	4	
<i>Gallinula chloropus</i>	4	12		2		34				2		5	1			13				9							9	91 (1)	2 (1)	
<i>Garrulus glandarius</i>						27 (1)								60		31				3								121 (1)		
<i>Haliaeetus albicilla</i>					2	13 (7)	3 (3)				28 (5)			3										62 (4)				115 (15)		
<i>Larus argentatus</i>	2 (2)	85 (7)					22 (4)			1	3	2 (1)			1	43 (1)				109	4 (4)			4 (2)			18	296 (21)		
<i>Larus argentatus argentatus</i>						130 (63)																						130 (63)		
<i>Larus argentatus argenteus</i>						1 (1)																						1 (1)		
<i>Larus argentatus michahellis</i>						1 (1)						1	28 (1)			2							14			2		48 (2)	20 (18)	
<i>Larus canus</i>	1 (1)	4				14 (3)	9 (4)				5										1			10	4		1	1	50 (8)	
<i>Larus fuscus</i>		13				5 (3)				4											42 (1)		44					108 (4)		
<i>Larus marinus</i>		2				25 (23)	13 (9)														2							42 (32)		
<i>Larus ridibundus</i>	10 (2)	30 (3)	1			98 (19)	8 (1)			3			5	3		21 (1)					12		2		3 (1)		27 (1)	241 (28)	18 (8)	
<i>Larus sp.</i>	7 (2)					205 (55)				16 (1)		2		2		3 (1)				5	1 (1)		1				1	243 (60)	5 (2)	
<i>Mergus merganser</i>	1					5 (1)													1								1	8 (1)	1	
<i>Mergus sp.</i>						2 (1)				1																		3 (1)		
<i>Netta rufina</i>						3 (2)								1														4 (2)	3 (2)	

Annex 3 Table 13 Detections of all AI (in brackets) by TS (in bold) and non-TS and the number of those species sampled in each MS (continued, page 4 of 4)

Species	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK	EU	CH
<i>Numenius sp.</i>	2 (2)																											2 (2)	
<i>Passer sp.</i>	1					23 (1)																						24 (1)	2
<i>Phalacrocorax carbo</i>	8	4				48 (1)	4			4	3			15		19				14		2	1	1	6	9 (1)	141 (3)	5	
<i>Pica pica</i>	1	2				45 (2)	5		4		2	2 (1)		20		61				20 (1)		1	56	8 (2)	2			229 (6)	
<i>Podiceps cristatus</i>	3 (1)	5				30 (10)				2				2		2				8								52 (11)	14 (5)
<i>Scolopax rusticola</i>	1	22 (1)				45	1					1				27				4								101 (1)	
<i>Somateria mollissima</i>						5 (3)	1 (1)																					6 (4)	2
<i>Species unknown</i>							1							1		44				1								47 ()	5 (1)
<i>Sterna sp.</i>						1 (1)																						1 (1)	
<i>Streptopelia decaocto</i>	2		1	2	27	10				16		18 (4)		52		17						5	3		4	3		160 (4)	
<i>Strigidae</i>						25 (2)																						25 (2)	
<i>Tachybaptus ruficollis</i>						8 (4)						1																9 (4)	3 (3)
<i>Tringa ochropus</i>	1 (1)																											1 (1)	

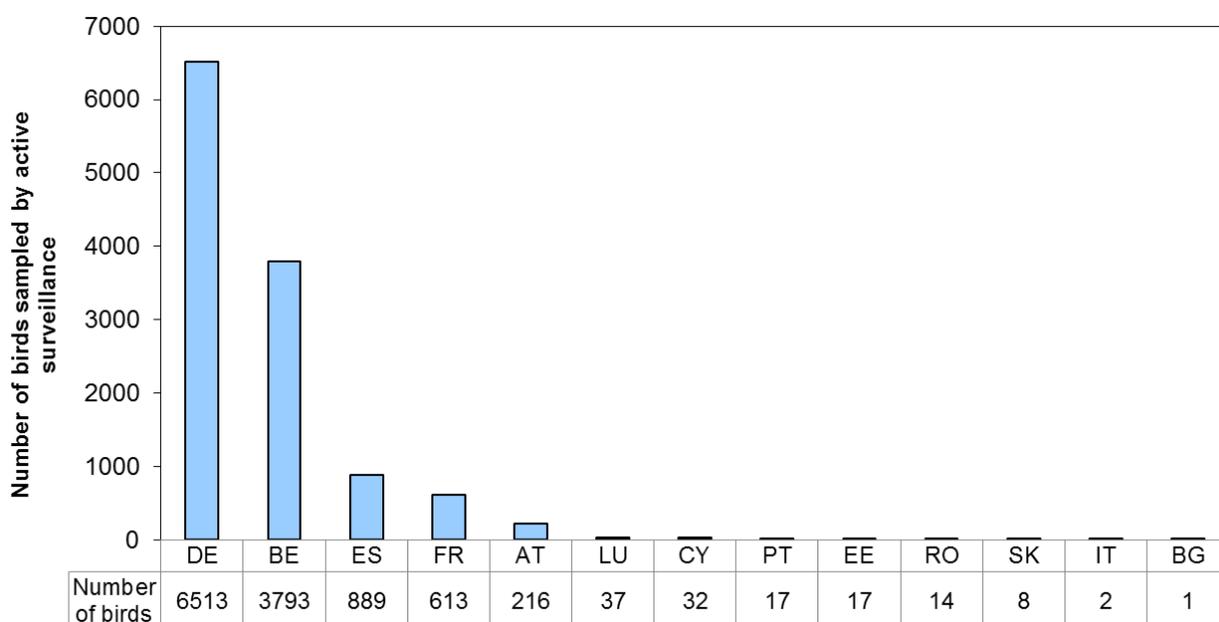
8.2.2 Annex 4 – Sampling by reported active surveillance

8.2.2.1 Overview of reported active surveillance

During 2016, there was no mandatory requirement for Member States to carry out or submit AI surveillance data collected through active surveillance programmes (sampling live healthy birds). A total of 13 Member States (three less than in 2015) submitted active surveillance data in 2016. The data presented in this section of the report does not accurately represent the extent of active surveillance effort carried out across the EU as a whole. The submission of active surveillance data to the European Commission was voluntary in 2016, and other activities were carried out but not reported by Member States.

In total, 12,152 birds were sampled by active surveillance (13.4% more than in 2015). As in 2015, Germany submitted the largest number of birds tested by active surveillance (n=6,513, 53.6%), followed by Belgium (n=3,793, 31.2%). This accounts for over three quarters of the total active surveillance data submitted in 2016.

Annex 4 Figure 1 Total number of birds sampled by active surveillance in 2016 by EU Member States

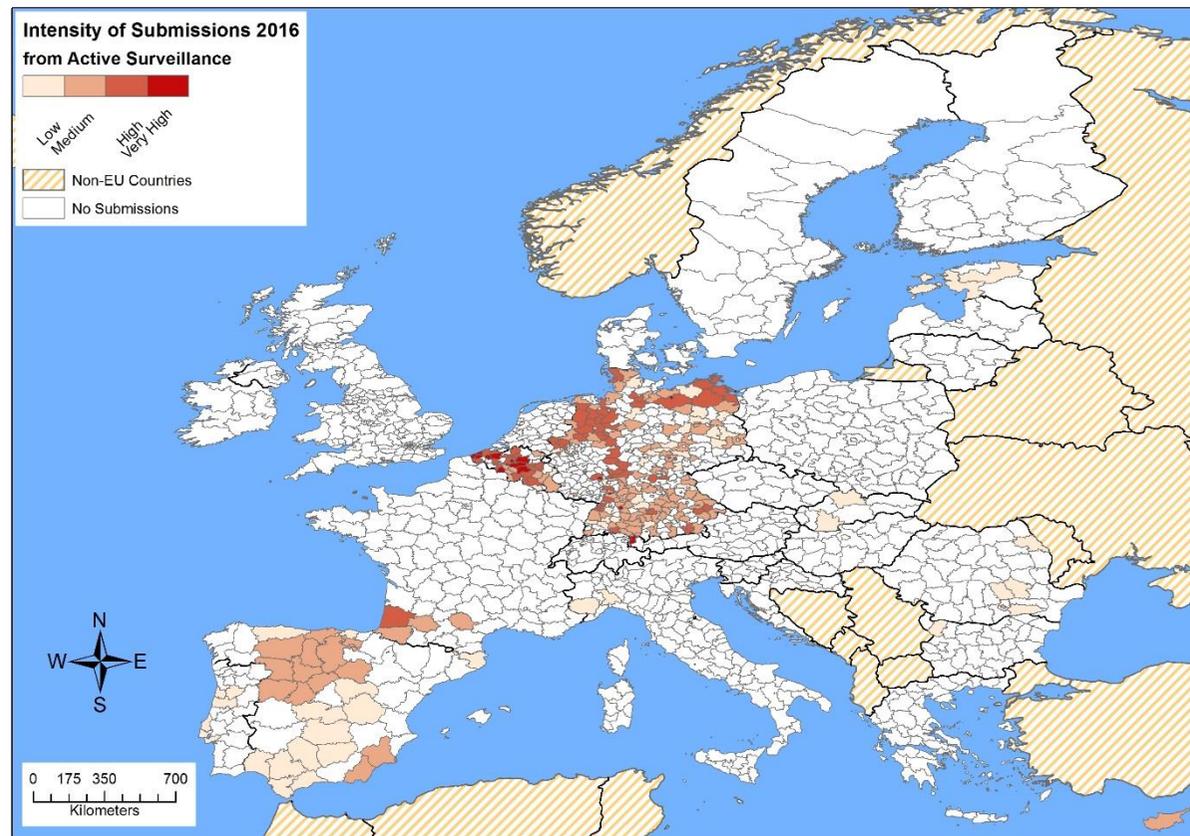


8.2.2.2 Geographical targeting of reported active surveillance

Figure A4.2 illustrates the distribution of active surveillance on a spatial scale by displaying the number of birds sampled per unit area.

Annex 4 Figure 2 Map of the intensity of sampling by active surveillance (birds found dead, injured or live with clinical signs) across Member States in 2016

The classification of intensity of surveillance is grouped by holdings sampled per 100km²
Low: up to 10, Medium: 11 - 100, High: 101 - 500, Very high: >500



8.2.2.2 Seasonal targeting of reported active surveillance

Figure A4.3 displays the percentage of birds sampled by MSs in each quarter, when considering active surveillance data. For the EU overall (13 submitting MSs), over half of all birds were sampled in the 4th quarter (Oct-Dec) (55.1%). Testing was carried out evenly between the remaining three quarters of the year. For individual MSs, the temporal targeting varied. Most MSs carried out the majority of their sampling in the 4th quarter, most notably Bulgaria, Estonia and Portugal (all sampling 100% of birds in the 4th quarter); Spain, Cyprus, Romania and Luxembourg conducted the majority of their sampling during the third quarter (66.0%, 65.6%, 57.1% and 54.1%, respectively); Slovakia carried out all of their sampling in the 1st quarter and France carried out all of their sampling in the 2nd quarter. Austria had a fairly evenly distributed surveillance programme throughout the year.

Annex 4 Figure 3 Percentage of all birds sampled by active surveillance in 2016, by quarter and MS. Raw numbers of birds sampled by quarter and MS are shown in the table below



Figure A4.4 displays the percentage of birds that were sampled by active surveillance in each quarter for all participating MS.

Annex 4 Figure 4 Percentage of birds sampled by active surveillance in 2016 by quarter for EU MS

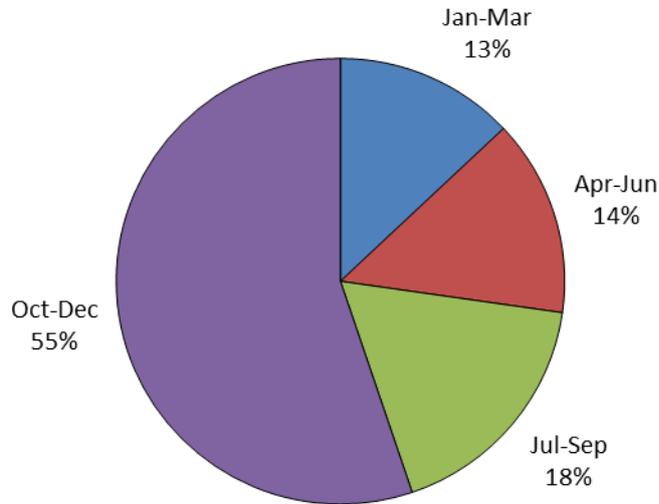
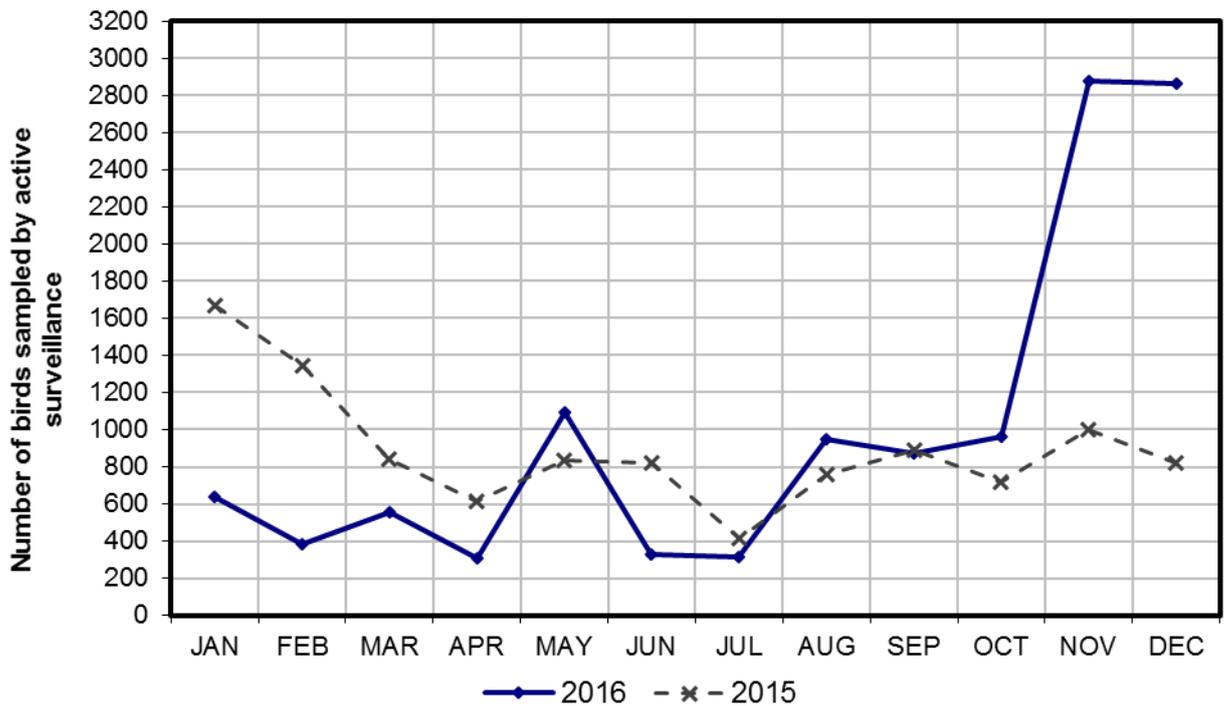


Figure A4.5 displays the overall number of wild birds sampled each month by active surveillance throughout 2016, with the surveillance trend for 2015 presented for cross year comparison. In 2016 reported active surveillance was at its lowest level in July and at its highest level in November and December.

Annex 4 Figure 5 Temporal distribution of the number of birds sampled by active surveillance during 2016



8.2.2.4 Bird species sampled by reported active surveillance

Of the 12,152 birds sampled, a total of 873 (7.2%) were not identified to species level (birds where the species was unknown, or identified only to genus or family). This involved birds in the genera of *Anas* (n=326), *Anser* (n=314), *Cygnus* (n=155), *Larus* (n=96), *Columba* (n=44), *Corvus* (n=24), *Turdus* (n=14) and others (with less than 10 birds). Nine samples were from 'unknown' birds. In total birds of 16 Orders and 150 species were sampled by active surveillance in 2016. Table A4.1 displays the ten most frequently sampled Orders. The most commonly sampled Order was Anseriformes (ducks, geese and swans), followed by Charadriiformes (gulls and waders) and Passeriformes (perching birds). Since 2006, Anseriformes and Charadriiformes have consistently been the most intensively sampled Orders by active surveillance.

Table A4.2 displays the top 15 species sampled by active surveillance in 2016 for the submitting MS. Mallards (*Anas platyrhynchos*) were the most frequently sampled species in 2016 (n=3,943, 32.2%), as in 2006-2015. Greylag Goose (*Anser anser*) (n=1,413, 11.6%) were also sampled in high numbers. Of the 15 most frequently sampled species, nine were Target Species (TS). Common Quail (*Coturnix coturnix*), Egyptian Goose (*Alopochen aegyptiacus*), Common Shelduck (*Tadorna tadorna*) and House Sparrow (*Passer domesticus*) were the only non-TS sampled in high numbers. Table A4.2 also indicates that the top 15 species account for over three quarters of all birds tested in 2016.

Annex 4 Table 1 Wild bird Orders most frequently sampled by active surveillance in 2016

Order	Number sampled	%
Anseriformes	8,880	72.6%
Charadriiformes	941	7.7%
Passeriformes	769	6.3%
Galliformes	483	3.9%
Falconiformes	263	2.2%
Gruiformes	253	2.1%
Columbiformes	220	1.8%
Ciconiiformes	149	1.2%
Strigiformes	117	1.0%
Pelecaniformes	29	0.2%
Total (top 10 Orders only)	12,104	99.0%

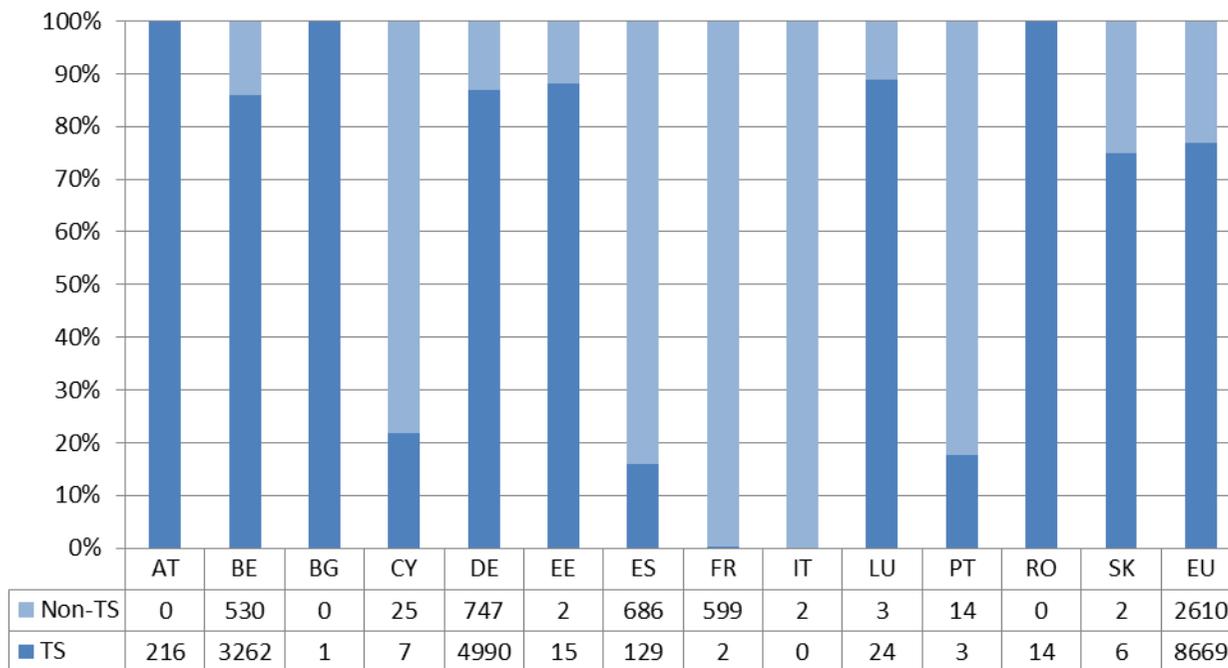
Annex 4 Table 2 Wild bird species most frequently sampled by active surveillance in 2016

Species*	Number sampled	%
<i>Anas platyrhynchos</i>	3,943	32.2%
<i>Anser anser</i>	1,413	11.6%
<i>Larus ridibundus</i>	452	3.7%
<i>Cygnus cygnus</i>	400	3.3%
<i>Coturnix coturnix</i>	377	3.1%
<i>Branta canadensis</i>	357	2.9%
<i>Alopochen aegyptiacus</i>	351	2.9%
<i>Branta leucopsis</i>	345	2.8%
<i>Anas sp.</i>	326	2.7%
<i>Anser spp.</i>	314	2.6%
<i>Anser albifrons</i>	239	2.0%
<i>Tadorna tadorna</i>	238	1.9%
<i>Cygnus olor</i>	226	1.8%
<i>Passer domesticus</i>	203	1.7%
<i>Anser fabalis</i>	166	1.4%
Total (top 15 species only)	9,350	76.4%

*Target species indicated with bold text

Figure A4.6 displays the proportion of birds from the Target Species list that were sampled by active surveillance by each MS submitting data in 2016. Most birds sampled, where the species was reported, were Target Species (76.9%).

Annex 4 Figure 6 Proportion of TS and non-TS sampled by active surveillance in 2016, by Member State. Numbers of birds sampled in each category are shown in the table below.



Note: 873 birds were not identified to species level and therefore were not classified as Target or Non-Target Species

8.2.2.5 H5 HPAI Positives by reported active surveillance

8.2.2.5.1 Overview of HPAI results

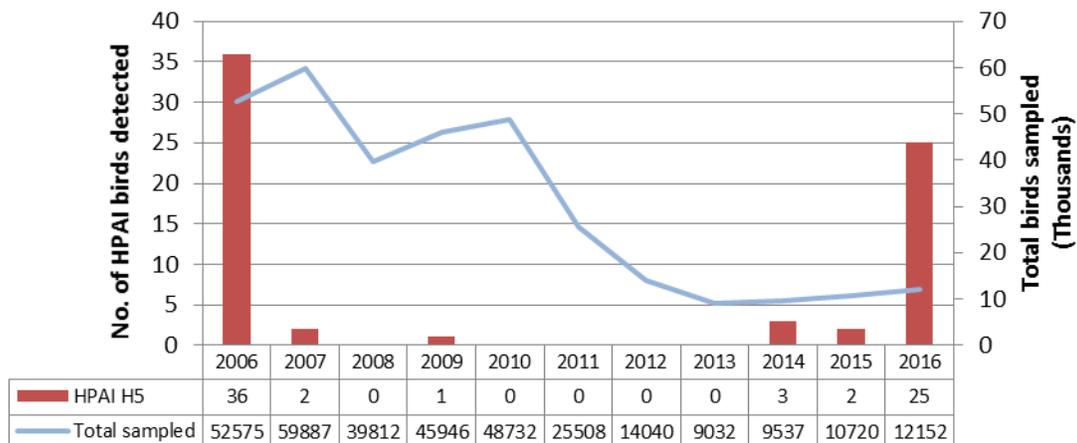
In 2016, HPAI H5N8 was detected by active surveillance in 22 birds; two birds in Austria and 20 birds in Germany. In addition three birds were reported to be infected with HPAI H5, but the N type was not determined in Germany (n=3) (Table A4.3).

Detections of HPAI reported through active surveillance were isolated from a wide range of wild bird species; however the detections were all temporally clustered in November and December. Of the 22 birds with a confirmed HPAI H5N8 infection, 17 did not exhibit clinical signs (live without clinical signs or hunted without clinical signs), while five birds were hunted with clinical signs. H5N8 HPAI cases were observed in Germany in 2014 and 2015. Prior to 2014, the most recent outbreak of H5 HPAI detected via active surveillance was a single incident in Germany in January 2009 (Figure A4.7).

Annex 4 Table 3 Total number of birds tested by active surveillance and number positive for HPAI H5N8 and HPAI H5 by Member State in 2016

Member State	Number of birds sampled	Number of HPAI H5N8 detections	% HPAI H5N8 (proportion of total sampled)	Number of HPAI H5 detections	% HPAI H5 (proportion of total sampled)	Percentage of sampled birds with any HPAI H5 detection
AT	216	2	0.9%	-	-	0.9%
DE	6,513	20	0.3%	3	0.05%	0.4%
EU	12,152	22	0.2%	3	0.02%	0.2%

Annex 4 Figure 7 Number of HPAI infected birds detected and total birds sampled by active surveillance: 2006-2016

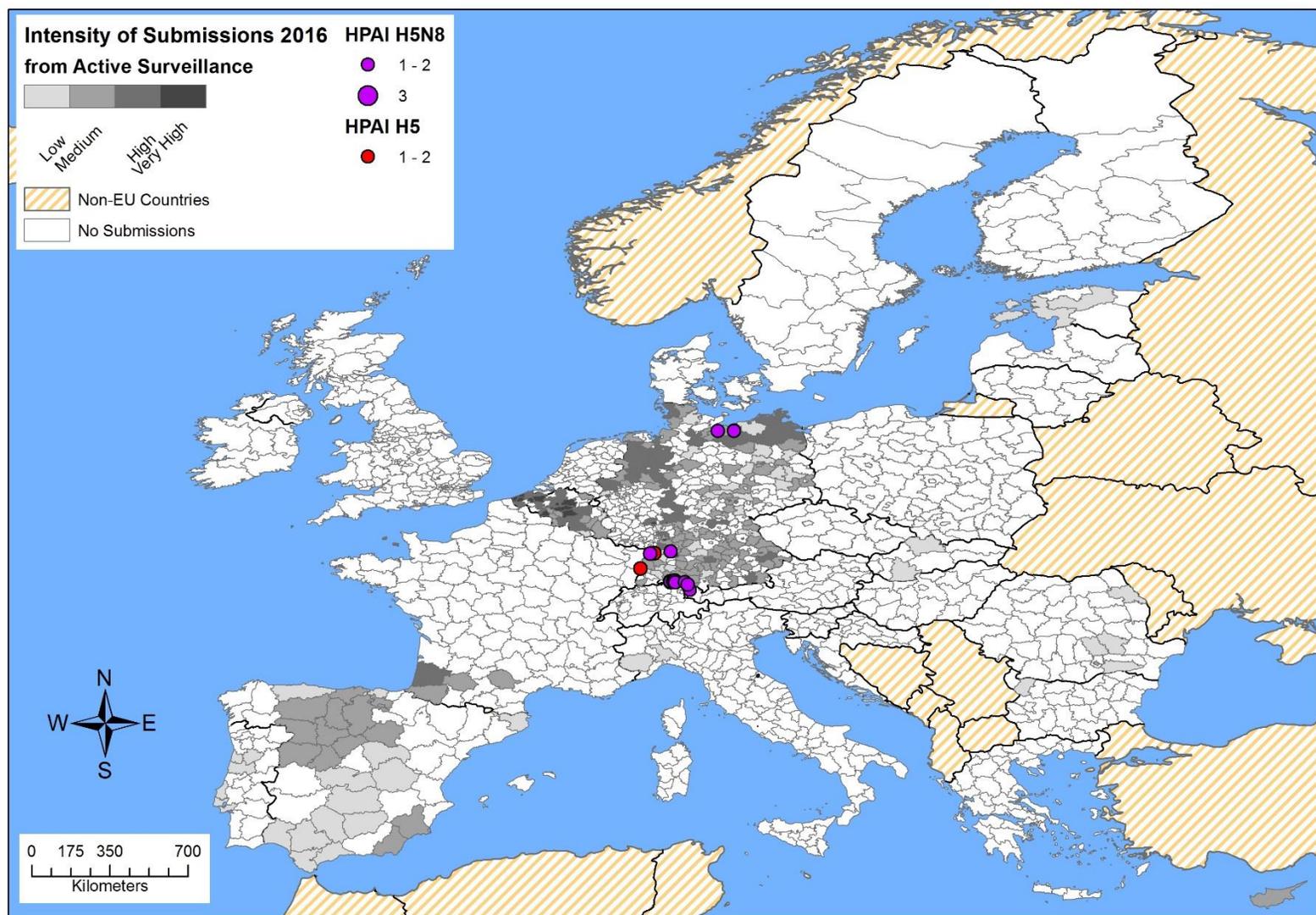


8.2.2.5.2 Geographical distribution of HPAI detections by reported active surveillance

Figure A4.8 displays the location of the HPAI H5N8 and HPAI H5 incidents detected in wild birds through active surveillance activities. The map also shows the location of LPAI H5, LPAI H7, other LPAI and 'Other Positive' findings in wild birds, discussed in the section on LPAI.

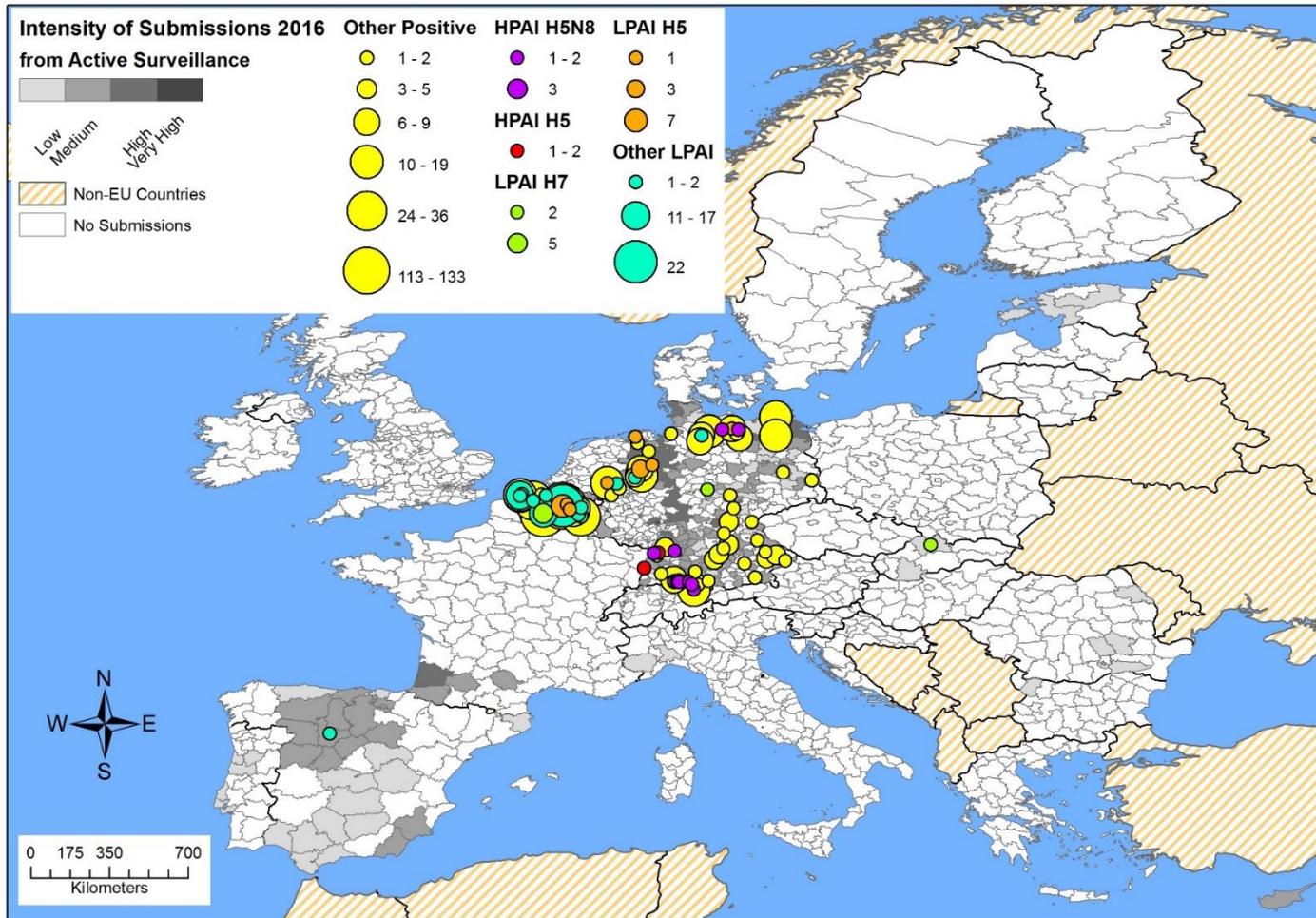
Annex 4 Figure 8a Intensity of sample submission from active surveillance and distribution of HPAI H5N8 and HPAI H5 detections in wild birds in EU MS in 2016

The classification of intensity of surveillance is grouped by holdings sampled per 100km²
 Low: up to 10, Medium: 11 - 100, High: 101 - 500, Very high: >500



Annex 4 Figure 8b Intensity of sample submission from active surveillance and distribution of all AI detections in wild birds in EU MS in 2016

The classification of intensity of surveillance is grouped by holdings sampled per 100km²
 Low: up to 10, Medium: 11 - 100, High: 101 - 500, Very high: >500



8.2.2.5.4 Order and species of wild birds positive for HPAI detections by reported active surveillance

HPAI H5N8 was most commonly reported in Anseriformes (n=16, 0.2%) followed by Charadriiformes and Falconiformes (n=2, 0.3% and n=2, 1.1%, respectively) in the 2016 reported active surveillance (Table A4.4).

Annex 4 Table 4 Number of birds tested by active surveillance and number positive for HPAI H5N8 and HPAI H5 by Order in 2016

Order	Total number tested	Number positive for HPAI H5N8	Number positive for HPAI H5	% positive for any HPAI
Anseriformes	8,897	16	1	0.2%
Charadriiformes	950	2	1	0.3%
Falconiformes	290	5	1	2.1%
Passeriformes	777	1	-	0.1%
Podicipediformes	12	1	-	8.3%
Total active surveillance	12,231	22	3	0.2%

For active surveillance, 10 species and two species aggregates were found positive for HPAI H5N8 or HPAI H5 in 2016 (Table A4.5). The species with the highest number of detections were Mallard (*Anas platyrhynchos*) (n=14, 0.4%). All other species had only a single detection of HPAI H5N8 or HPAI H5. Detailed information regarding the number of birds tested by MS for bird species that tested positive for HPAI H5N8, HPAI H5, LPAI H5, LPAI H7 and all AI is displayed in Annex 5 (Section 8.2.3 Active surveillance data, supplementary tables and figures).

Annex 4 Table 5 Number of birds tested by active surveillance and number positive for HPAI H5N8 and HPAI H5 by species in 2016

Species	Total number tested	Number positive for HPAI H5N8	Number positive for HPAI H5	% positive for any HPAI
<i>Anas platyrhynchos</i>	3,943	14	-	0.4%
<i>Aythya fuligula</i>	111	1	-	0.9%
<i>Buteo buteo</i>	49	1	-	2.0%
<i>Buteo spp.</i>	7	-	1	14.3%
<i>Corvus corone</i>	28	-	1	3.6%
<i>Corvus corone corone</i>	31	1	-	3.2%
<i>Haliaeetus albicilla</i>	10	1	-	10.0%
<i>Larus argentatus argentatus</i>	82	-	1	1.2%
<i>Larus canus</i>	21	1	-	4.8%
<i>Larus sp.</i>	96	1	-	1.0%
<i>Mergus merganser</i>	3	1	-	33.3%
<i>Podiceps cristatus</i>	10	1	-	10.0%
Total active surveillance	12,152	22	3	0.2%

8.2.2.6 LPAI Positives by reported active surveillance

8.2.2.6.1 Overview of LPAI results by reported active surveillance

In total 674 birds tested positive for AI when considering active surveillance data (excluding HPAI positives).

LPAI H5 was detected in nine birds from Belgium and seven birds from Germany. LPAI H7 was detected in five birds from Belgium, two birds from Germany and two birds from Slovakia. LPAI of other subtypes (LPAI Other) were detected in 68 birds from Belgium (n=64), Germany (n=3) and Spain (n=1). The "Other Positives" (pathotype unidentified, but PCR positive to AI) were detected in 581 birds in 4 MS (Table A4.6).

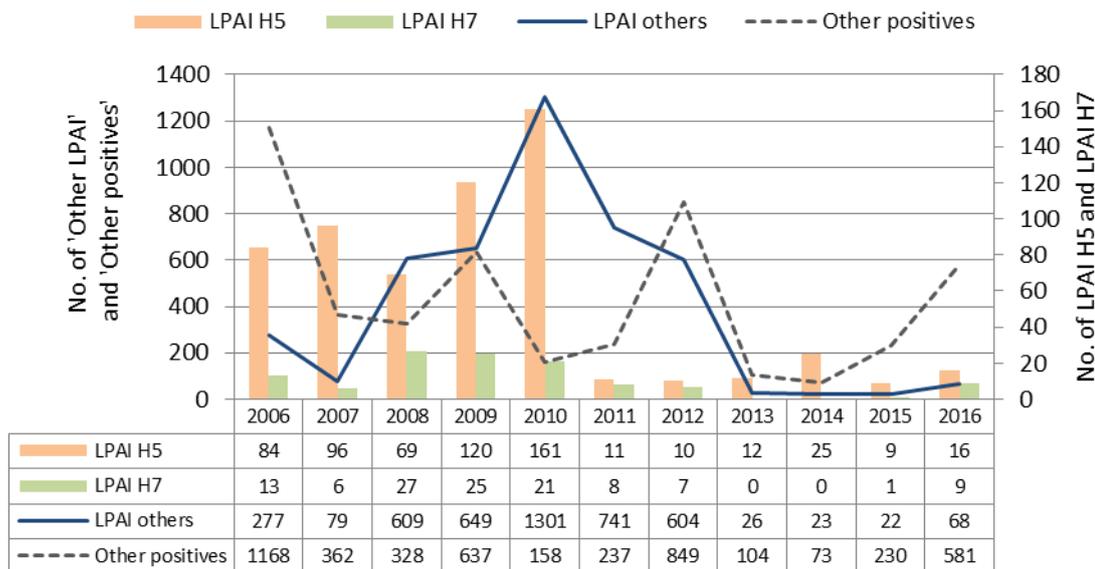
Overall a very low proportion of birds sampled by active surveillance tested positive for LPAI H5 in 2016 (0.13%). This is similar to findings in previous years, ranging from 0.04%-0.29% in 2007-2013: 2007 (0.13%), 2008 (0.14%), 2009 (0.23%), 2010 (0.29%), 2011 (0.04%), 2012 (0.07%), 2013 (0.13%), 2014 (0.26%) and 2015 (0.15%) (Figure A4.11).

Similarly, the proportion of birds testing positive for LPAI H7 in 2016 was very low (0.07%). This is consistent with previous years when there have been very low (<0.1%), or no detections of LPAI H7 by active surveillance: 2006 (0.02%), 2007 (0.01%), 2008 (0.05%), 2009 (0.06%), 2010 (0.04%), 2011 (0.03%), 2012 (0.05%), 2013-2014 (none), 2015 (<0.1%).

Annex 4 Table 6 Total number of birds tested by active surveillance and number positive for LPAI H5, LPAI H7, other LPAI subtypes and 'Other Positives' by Member States in 2016

Member State	Number of birds sampled	Number of LPAI H5 detections	Number of LPAI H7 detections	Number of "LPAI other" detections	Number of "Other positives" detections
AT	216	-	-	-	12
BE	3,793	9	5	64	415
DE	6,513	7	2	3	154
ES	889	-	-	1	-
SK	8	-	2	-	-
Total	12,152	16	9	68	581

Annex 4 Figure 11 Number of AI detections (non-HPAI) during 2006-2015 through active surveillance



8.2.2.6.2 Geographical distribution of LPAI detections by active surveillance

Figure A4.8 displays the geographical distribution of LPAI H5 and LPAI H7 positives (Annex 4, Section 8.2.2.5).

8.2.2.6.3 Temporal distribution of LPAI H5 and LPAI H7 detections by reported active surveillance

Figure A4.12 displays the number of LPAI H5 and H7 detections made by each reporting MS by week number. Figure A4.13 displays the number of LPAI H5 and H7 detections and the number of birds sampled by reported active surveillance by week number in 2016. All detections were made during autumn and winter months (between September and January).

8.2.2.6.4 Order and species of wild birds positive for LPAI H5 and H7 detections reported by active surveillance

All LPAI H5 and LPAI H7 detections were made in Anseriformes. "Other Positives" and Other LPAI positives were both additionally detected in Charadriiformes, Falconiformes, Galliformes, Gruiformes and Passeriformes (Table A4.7).

Annex 4 Table 7 Number of birds tested by active surveillance and number positive for LPAI H5, LPAI H7, other LPAI subtypes and 'Other Positives' by Order in 2016

Order	Total sampled	Number of LPAI H5	Number of LPAI H7	Number of "LPAI other"	Number of "Other positives"
Anseriformes	8,800	16	9	48	495
Charadriiformes	941	-	-	17	74
Falconiformes	263	-	-	-	3
Galliformes	483	-	-	1	-
Gruiformes	253	-	-	2	7
Passeriformes	769	-	-	-	2
All orders	12,152	16	9	68	581

Further details and tables regarding reported active surveillance sampling and results for target-species and other species by MS can be found in Annex 5, Section 8.2.3.

Of the 16 birds in which LPAI H5 was detected, 13 were made in Mallards (*Anas platyrhynchos*), a single detection was obtained in an Egyptian Goose (*Alopochen aegyptiacus*), a Whooper swan (*Cygnus cygnus*) and an unspecified Goose (*Anser spp.*). All detections of LPAI H7 were made in Mallards (*Anas platyrhynchos*). In total, 23 species tested positive for AI (Table A4.8).

Annex 4 Table 8 Number of birds tested by active surveillance and number positive for LPAI H5, LPAI H7, other LPAI subtypes and 'Other Positives' by species in 2016

Species	Total sampled	Number of LPAI H5	Number of LPAI H7	Number of "LPAI other"	Number of "Other positives"
<i>Alopochen aegyptiacus</i>	351	1	-	-	-
Anas crecca	55	-	-	1	4
Anas platyrhynchos	3,949	13	9	44	437
<i>Anas sp.</i>	326	-	-	-	3
Anser albifrons	239	-	-	-	3
Anser anser	1,414	-	-	1	2
Anser fabalis	166	-	-	-	5
<i>Anser spp.</i>	314	1	-	1	17
<i>Arenaria interpres</i>	6	-	-	1	5
Aythya ferina	21	-	-	-	1
Buteo buteo	51	-	-	-	1
<i>Calidris maritima</i>	2	-	-	-	2
<i>Corvus corone corone</i>	31	-	-	-	1
<i>Cygnus columbianus bewickii</i>	18	-	-	-	2
Cygnus cygnus	404	1	-	-	6
Cygnus olor	226	-	-	-	7
Cygnus sp.	155	-	-	1	8
<i>Fringilla coelebs</i>	22	-	-	-	1
Fulica atra	140	-	-	2	4
<i>Gallinago gallinago</i>	11	-	-	-	1
<i>Gallinula chloropus</i>	44	-	-	-	3
<i>Haliaeetus albicilla</i>	26	-	-	-	2
<i>Larus argentatus</i>	89	-	-	15	25
<i>Larus argentatus argentatus</i>	82	-	-	-	2
Larus ridibundus	454	-	-	1	37
<i>Larus sp.</i>	96	-	-	-	2
<i>Phasianus colchicus</i>	28	-	-	1	-
Total sampled	12,152	16	9	68	581

Target species indicated with bold text.

8.2.3 Annex 5 – Active surveillance data, supplementary tables and figures

8.2.3.1 Diagnosis

This section reports the samples collected and the associated test results. The 2007 guidelines (EC 2007) recommend oro-pharyngeal (tracheal) and cloacal swabs to be collected from healthy free living birds and cloacal and oro-pharyngeal swabs and/ or tissues from dead or shot birds. Similarly, the 2010 guidelines (EC 2010a) recommended that cloacal and tracheal/oro-pharyngeal swabs and/or tissues from wild birds found dead or moribund should be sampled. The totals for the 2016 testing regimes for active surveillance are shown below.

Annex 5 Table 1 Number and proportion of samples collected by active surveillance by Status of bird, 2016

Sample Type	Status of bird			Active surveillance total
	Hunted with clinical signs	Hunted without clinical signs	Live without clinical signs	
Cloacal	12	656	5648	6,316
Faecal	-	20	1576	1,596
Other	3	71	293	367
Tissue	6	97	9	112
Tracheal	25	200	210	435
Cloacal and Tracheal	36	1679	1611	3,326
EU Total	82	2,723	9,347	12,152

The majority of healthy live caught birds were sampled by cloacal swabs only (67.6%). For hunted birds (with and without clinical signs), cloacal and oral-pharyngeal (tracheal) swabs were taken most often (n=1715/2805, 61.1%) (Table A5.1).

8.2.3.2 AI Positives

Tables A5.2 and A5.3 show the test results of samples collected by bird status that tested positive for HPAI H5N8 and HPAI H5, respectively. Samples were exclusively found positive via PCR testing, with virus isolation not performed.

For the 674 birds testing positive to LPAI or AI where the pathogenicity was not determined, 77.9% of samples tested positive at PCR and virus isolation was not performed (n=674/802), while 11.8% of samples were positive at PCR, but negative for virus isolation. Both virus isolation and PCR were positive for 9.3% of samples, and only virus isolation was reported positive for five cloacal samples from live healthy birds (where PCR was reported negative) (Table A5.4).

Annex 5 Table 2 Test-results for HPAI H5N8 positive birds by type of sampled collected from active surveillance in 2016

Status of bird	Sample type	Total number of birds sampled	Total number of birds positive	PCR+ VI+	PCR+ VI-	PCR+ VI NP	PCR- VI NP	PCR- VI-
Hunted with and without clinical signs	Cloacal	668	3	-	-	3	-	-
	Cloacal & Tracheal	1,715	16	-	-	16	-	-
Live without clinical signs	Tracheal	210	2	-	-	2	-	-
	Cloacal & Tracheal	1,611	1	-	-	1	-	-

Annex 5 Table 3 Test-results for HPAI H5 positive birds by type of sampled collected from active surveillance in 2016

Status of bird	Sample type	Total number of birds sampled	Total number of birds positive	PCR+ VI+	PCR+ VI-	PCR+ VI NP	PCR- VI NP	PCR- VI-
Hunted with and without clinical signs	Cloacal	668	1	-	-	1	-	-
	Cloacal & Tracheal	1,715	2	-	-	2	-	-
	Tracheal			-	-	2	-	-

Annex 5 Table 4 Test-results for LPAI positive birds (including LPAI H5, H7, other LPAI and 'other positives') by type of sampled collected from active surveillance in 2016

Status of bird	Sample type	Total number of birds sampled	Total number of birds positive	PCR+ VI+	PCR+ VI-	PCR+ VI NP	PCR- VI+
Hunted with and without clinical signs	Cloacal	668	54	4	3	47	-
	Other	74	2	-	-	2	-
	Tissue	103	4	2	-	2	-
	Tracheal	225	3	1	1	1	-
	Cloacal & Tracheal	1,715	99	-	-	99	-
	Tracheal			-	-	99	-
Live without clinical signs	Cloacal	5,648	444	66	71	302	5
	Faecal	1,576	27	-	-	27	-
	Tracheal	210	12	-	-	12	-
	Cloacal & Tracheal	1,611	29	3	14	12	-
	Tracheal			-	6	23	-

8.2.3.3 Type of Surveillance by Quarter

Table A5.5 presents the number of live (without clinical signs) and hunted (with and without clinical signs) birds sampled through active surveillance in 2016, by MS and quarter. When considering the submitted data as a whole, over half of all sampling for both hunted and live birds was carried out in the 4th quarter (55% for both surveillance strategies). In quarter 2 very few hunted birds were sampled (2% only), but surveillance was carried out relatively evenly for both live and hunted birds for the remainder of the year.

Table A5.6 displays the number of target species and non-target species sampled by active surveillance in each quarter by MS.

Annex 5 Table 5 Number of birds (hunted and live healthy birds) tested through active surveillance by Member State and quarter, 2016

Member State	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
	Hunted	Live	Hunted	Live	Hunted	Live	Hunted	Live
AT	-	63	-	50	-	39	-	64
BE	-	444	-	430	318	559	163	1,879
BG	-	-	-	-	-	-	-	1
CY	-	1	-	8	-	21	-	2
DE	313	613	14	520	219	362	1,339	3,133
EE	-	-	-	-	-	-	17	-
ES	102	23	-	101	249	338	34	42
FR	-	-	22	591	-	-	-	-
IT	-	-	-	-	1	-	1	-
LU	-	9	-	-	-	20	-	8
PT	-	-	-	-	-	-	1	16
RO	-	-	-	-	2	6	4	2
SK	6	2	-	-	-	-	-	-
EU Total	421	1,155	36	1,700	789	1,345	1,559	5,147

Annex 5 Table 6 Number of target species (TS) sampled in each quarter by Member State

Member State	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
	TS	Non-TS	TS	Non-TS	TS	Non-TS	TS	Non-TS
AT	63	-	50	-	39	-	64	-
BE	339	105	422	8	800	76	1,701	341
BG	-	-	-	-	-	-	1	-
CY	-	1	2	6	5	16	-	2
DE	814	39	399	133	527	45	3,250	530
EE	-	-	-	-	-	-	15	2
ES	4	118	63	34	46	492	16	42
FR	-	-	2	599	-	-	-	-
IT	-	-	-	-	-	1	-	1
LU	1	3	-	-	15	-	8	-
PT	-	-	-	-	-	-	3	14
RO	-	-	-	-	8	-	6	-
SK	6	2	-	-	-	-	-	-
EU Total	1,227	268	938	780	1,440	630	5,064	932

8.2.3.4 Overview of Results by Species

Table A5.7 displays the detections of HPAI H5N8 reported by species and the number of those species sampled in each MS.

Table A5.8 displays the detections of HPAI H5 reported by species and the number of those species sampled in each MS.

Table A5.9 displays the detections of LPAI H5 reported by species and the number of those species sampled in each MS.

Table A5.10 displays the detection of LPAI H7 reported by species and the number of those species sampled in each MS.

Table A5.11 displays the detections of all AI types reported by species and the number of those species sampled in each MS.

The aim of these tables is to provide context of AI detections taking into account bird species and the number of birds sampled by MS.

Key to tables

Headings	
HPAI H5N8	LPAI H5
HPAI H5N5	LPAI H7
HPAI H5	All AI
Number sampled	Not sampled

Not presenting data, for illustrative purposes only.

Annex 5 Table 7 Detections of HPAI H5N8 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS

Species	AT	BE	BG	CY	DE	EE	ES	LU	PT	SK	Total
Anas platyrhynchos	216 (2)	2024	1		1647 (12)	5	43	1		6	3943 (14)
Aythya fuligula		92			19 (1)						111 (1)
Buteo buteo		1		1	31 (1)		11	3	2		49 (1)
<i>Corvus corone corone</i>		17			14 (1)						31 (1)
<i>Haliaeetus albicilla</i>					10 (1)						10 (1)
Larus canus		18			2 (1)		1				21 (1)
<i>Larus sp.</i>					86 (1)		10				96 (1)
<i>Mergus merganser</i>					1 (1)	2					3 (1)
Podiceps cristatus		8			2 (1)						10 (1)

Target species indicated with bold text.

Annex 5 Table 8 Detections of HPAI H5 (in brackets) that were reported by TS (in bold) and non-TS and the number of those species sampled in each MS

Species	AT	BE	BG	CY	DE	EE	ES	FR	LU	PT	SK	Total
Anas platyrhynchos	216	2024	1		1647 (1)	5	43		1		6	3943 (1)
<i>Buteo spp.</i>					7 (1)							7 (1)
<i>Larus argentatus argentatus</i>					82 (1)							82 (1)

Target species indicated with bold text.

Annex 5 Table 9 Detections of LPAI H5 (in brackets) that were reported in TS (in bold) and non-TS and the number of those species sampled in each MS

Species	AT	BE	BG	DE	EE	ES	FI	LU	RO	SK	Total
<i>Alopochen aegyptiacus</i>		65		283 (1)		3					351 (1)
<i>Anas platyrhynchos</i>	216	2024 (9)	1	1647 (4)	5	43		1		6	3943 (13)
<i>Anser spp.</i>				314 (1)							314 (1)
<i>Cygnus cygnus</i>				389 (1)			3	10	1		404 (1)

Target species indicated with bold text.

Annex 5 Table 10 Detections of LPAI H7 (in brackets) and the number of those species sampled in each MS

Species	AT	BE	BG	DE	EE	ES	LU	RO	SK	Total
<i>Anas platyrhynchos</i>	216	2024 (5)	1	1647 (2)	5	43	1		6 (2)	3943 (9)

Target species indicated with bold text.

Annex 5 Table 11 Detections of all AI types (in brackets) that were reported in TS (in bold) and non-TS and the number of those species sampled in each MS (page 1 of 2)

Species	AT	BE	BG	CY	DE	EE	ES	FR	LU	PT	RO	SK	Total
<i>Alopochen aegyptiaca</i>		65			283 (1)		3						351 (1)
Anas crecca		21 (2)			32 (3)	2							55 (5)
Anas platyrhynchos	216 (14)	2024 (387)	1		1647 (114)	5	43 (1)		1			6 (2)	3943 (518)
<i>Anas sp.</i>		1			315 (3)				10				326 (3)
Anser albifrons					236 (3)	3							239 (3)
Anser anser					1406 (3)	2			5				1413 (3)
Anser fabalis					166 (5)								166 (5)
<i>Anser spp.</i>					314 (19)								314 (19)
<i>Arenaria interpres</i>		6 (6)											6 (6)
Aythya ferina		12			8 (1)		1						21 (1)
Aythya fuligula		92			19 (1)								111 (1)
Buteo buteo		1		1	31 (2)		11		3	2			49 (2)
<i>Buteo spp.</i>					7 (1)								7 (1)
<i>Calidris maritima</i>		2 (2)											2 (2)
<i>Corvus corone corone</i>		17			14 (2)								31 (2)
<i>Cygnus columbianus bewickii</i>		18 (2)											18 (2)
Cygnus cygnus					389 (7)				10		1		400 (7)
Cygnus olor		67 (6)			149 (1)		1		4				221 (7)
Cygnus sp.					155 (9)								155 (9)
<i>Fringilla coelebs</i>					2 (1)			20					22 (1)
Fulica atra		97 (6)			43								140 (6)
<i>Gallinago gallinago</i>		3 (1)			7		1						11 (1)
<i>Gallinula chloropus</i>		42 (3)			2								44 (3)
<i>Haliaeetus albicilla</i>					10 (3)								10 (3)
<i>Larus argentatus</i>		85 (40)											85 (40)

Annex 5 Table 11 Detections of all AI types (in brackets) that were reported in TS (in bold) and non-TS and the number of those species sampled in each MS (continued, page 2 of 2)

Species	AT	BE	BG	CY	DE	EE	ES	FR	LU	PT	RO	SK	Total
<i>Larus argentatus argentatus</i>					82 (3)								82 (3)
Larus canus		18			2 (1)		1						21 (1)
Larus ridibundus		306 (37)			143 (1)	1	2						452 (38)
<i>Larus sp.</i>					86 (3)		10						96 (3)
<i>Mergus merganser</i>					1 (1)	2							3 (1)
<i>Phasianus colchicus</i>		4 (1)			24								28 (1)
Podiceps cristatus		8			2 (1)								10 (1)

Target species indicated with bold text.

8.2.4 Annex 6 - Scientific and English names of wild bird species

Annex 6 Table 1 All target species (in bold) as well as all other bird species that tested positive for AI in 2016, giving English and Latin names* (page 1 of 2)

Species	Name
<i>Accipiter gentilis</i>	Northern Goshawk
<i>Accipiter nisus</i>	Eurasian Sparrowhawk
<i>Accipiter sp.</i>	Hawk
<i>Alopochen aegyptiacus</i>	Egyptian Goose
<i>Anas acuta</i>	Northern Pintail
<i>Anas clypeata</i>	Northern Shoveler
<i>Anas crecca</i>	Eurasian Teal
<i>Anas penelope</i>	Eurasian Wigeon
<i>Anas platyrhynchos</i>	Mallard
<i>Anas querquedula</i>	Garganey
<i>Anas sp.</i>	Dabbling Duck
<i>Anas strepera</i>	Gadwall
<i>Anser albifrons</i>	Greater White-fronted Goose
<i>Anser albifrons albifrons</i>	Greater White-fronted Goose (European race)
<i>Anser anser</i>	Greylag Goose
<i>Anser brachyrhynchus</i>	Pink-footed Goose
<i>Anser erythropus</i>	Lesser White-fronted Goose
<i>Anser fabalis</i>	Taiga Bean Goose
<i>Anser sp.</i>	Goose
<i>Ardea cinerea</i>	Grey Heron
<i>Ardea sp.</i>	Heron
<i>Arenaria interpres</i>	Ruddy Turnstone
<i>Asio otus</i>	Long-eared Owl
<i>Aythya ferina</i>	Common Pochard
<i>Aythya fuligula</i>	Tufted Duck
<i>Aythya marila</i>	Greater Scaup
<i>Branta bernicla</i>	Brent Goose
<i>Branta canadensis</i>	Canada Goose
<i>Branta leucopsis</i>	Barnacle Goose
<i>Branta ruficollis</i>	Red-breasted Goose
<i>Bubo bubo</i>	Eurasian Eagle-Owl
<i>Bucephala clangula</i>	Common Goldeneye
<i>Buteo buteo</i>	Common Buzzard
<i>Buteo lagopus</i>	Rough-legged Buzzard
<i>Buteo spp.</i>	Buzzard
<i>Cairina moschata</i>	Muscovy Duck
<i>Calidris maritima</i>	Purple Sandpiper
<i>Ciconia ciconia</i>	White Stork
<i>Ciconia sp.</i>	Stork
<i>Circus aeruginosus</i>	Eurasian Marsh Harrier
<i>Columba livia</i>	Common Pigeon
<i>Columba sp.</i>	Pigeon
<i>Corvus corax</i>	Northern Raven
<i>Corvus corone</i>	Carrion Crow
<i>Corvus corone cornix</i>	Hooded Crow
<i>Corvus corone corone</i>	Carrion Crow
<i>Corvus frugilegus</i>	Rook
<i>Corvus sp.</i>	Crow

*Birds are named according to the Target Species list presented in Commission Decision 2010/367/EU (EC (2010)). For the sake of consistency with the legislation, taxonomic updates incorporated into the EU Bird List in 2015 have not been incorporated into this report.

Annex 6 Table 1 All target species (in bold) as well as all other bird species that tested positive for AI in 2016, giving English and Latin names* (continued, page 2 of 2)

Species	Name
<i>Cygnus columbianus bewickii</i>	Bewick's Swan
<i>Cygnus cygnus</i>	Whooper Swan
<i>Cygnus olor</i>	Mute Swan
<i>Cygnus sp.</i>	Swan
<i>Egretta garzetta</i>	Little Egret
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Falco tinnunculus</i>	Common Kestrel
<i>Fringilla coelebs</i>	Common Chaffinch
<i>Fulica atra</i>	Eurasian Coot
<i>Gallinago gallinago</i>	Common Snipe
<i>Gallinula chloropus</i>	Common Moorhen
<i>Garrulus glandarius</i>	Eurasian Jay
<i>Haliaeetus albicilla</i>	White-tailed Eagle
<i>Larus argentatus</i>	European Herring Gull
<i>Larus argentatus argentatus</i>	Scandinavian Herring Gull
<i>Larus argentatus argenteus</i>	North-western Herring Gull
<i>Larus argentatus michahellis</i>	Mediterranean Herring Gull
<i>Larus canus</i>	Mew Gull
<i>Larus fuscus</i>	Lesser Black-backed Gull
<i>Larus marinus</i>	Great Black-backed Gull
<i>Larus ridibundus</i>	Black-headed Gull
<i>Larus sp.</i>	Gull
<i>Limosa limosa</i>	Black-tailed Godwit
<i>Marmaronetta angustirostris</i>	Marbled Teal
<i>Mergus albellus</i>	Smew
<i>Mergus merganser</i>	Common Merganser
<i>Mergus sp.</i>	Merganser
<i>Milvus migrans</i>	Black Kite
<i>Milvus milvus</i>	Red Kite
<i>Netta rufina</i>	Red-crested Pochard
<i>Numenius sp.</i>	Curlew
<i>Passer sp.</i>	Sparrow
<i>Phalacrocorax carbo</i>	Great Cormorant
<i>Phasianus colchicus</i>	Common Pheasant
<i>Philomachus pugnax</i>	Ruff
<i>Pica pica</i>	Eurasian Magpie
<i>Pluvialis apricaria</i>	Eurasian Golden Plover
<i>Podiceps cristatus</i>	Great Crested Grebe
<i>Podiceps nigricollis</i>	Black-necked Grebe
<i>Porphyrio porphyrio</i>	Purple Swamphen
<i>Scolopax rusticola</i>	Eurasian Woodcock
<i>Somateria mollissima</i>	Common Eider
<i>Sterna sp.</i>	Tern
<i>Streptopelia decaocto</i>	Eurasian Collared Dove
<i>Strigidae sp.</i>	Owl
<i>Tachybaptus ruficollis</i>	Little Grebe
<i>Tringa ochropus</i>	Green Sandpiper
<i>Vanellus vanellus</i>	Northern Lapwing

*Birds are named according to the Target Species List presented in Commission Decision 2010/367/EU (EC (2010). For the sake of consistency with the legislation, taxonomic updates incorporated into the EU Bird List in 2015 have not been incorporated into this report.

