Annual Report

The surveillance programme for avian influenza (AI) in wild birds in Norway in 2018

Veterinærinstituttet
Norwegian Veterinary Institute

Mattilsynet

The surveillance programme for avian influenza (AI) in wild birds in Norway 2018

Content

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Summary

Surveillance in 2018 did not detect highly pathogenic avian influenza infection in wild birds.

Introduction

The Norwegian Food Safety Authority is responsible for implementing the active surveillance programme for avian influenza (AI) in wild birds. The programme started in 2005 and is based on virological investigations in presumably healthy, live or hunted birds. The Norwegian Veterinary Institute planned, conducted the laboratory investigations and composed this annual report. The programme has been running from 2005-2007, from 2009-2010, and in 2016 and onwards.

Being widespread in birds, AI viruses are highly contagious and can evolve rapidly by mutations. Wild waterfowl such as ducks, geese, swans, waders and gulls are the natural reservoirs for all low pathogenic influenza A viruses. These birds do not usually develop clinical disease, but shed large amounts of virus in their faeces (1). The highly pathogenic avian influenza virus H5N1, on the other hand, is primarily shed via the airways, especially in poultry (2).

In domestic poultry, infection with influenza A viruses causes two main forms of disease distinguished by high and low virulence. Although most low pathogenic AI (LPAI) viruses cause only mild disease in poultry, LPAI strains have the potential to mutate to highly pathogenic AI (HPAI) viruses following introduction to poultry populations. HPAI viruses, on the other hand, induce a serious, highly contagious disease in poultry and other captive birds. All HPAI epidemics recorded so far have been of the hemagglutinin subtypes H5 or H7.

Wild migratory birds have been suggested to play a major role in the dissemination and spread of HPAI viruses over long distances (3, 4). Virus detections in wild birds mainly occur in migratory duck species, swans, sea gulls and birds of prey. HPAI has never been discovered in the wild birds surveillance in Norway.

Aims

The aim of the national surveillance programme for AI in wild birds is to study and understand the threats posed by wild birds in relation to influenza viruses of avian origin, with special emphasis on H5 and H7 viruses.

Materials and methods

In 2018, the programme for wild birds consisted of molecular (PCR) screening of cloacal and oropharyngeal swabs from healthy birds shot during the 2018 hunting season, and from live birds sampled during ringing. Sampling equipment consisted of flocked swabs and tubes containing virus transport medium for viral sampling, and was sent to hunters in the county of Rogaland, Østfold, Hedmark and Trøndelag. Choice of regions was based on relative density of poultry farms in the area, and their overlap with the flyways and resting areas of many species of waterfowl (5). Choice of hunters was based on their proficiency during previous hunting seasons. Sampling equipment was also sent to an ornithologist in the Oslo area, who performed sampling during the process of ringing birds. All samplers were given written instructions on how to collect samples, and were requested to fill in registration forms for individual birds. Directly after sampling, swabs were placed in transport medium and mailed overnight to the Norwegian Veterinary Institute in Oslo. All samples were frozen at −70 °C upon arrival. Altogether, 19 species of wild birds were sampled in 2018 as shown in Table 1.

Avian influenza analyses

Upon arrival in the laboratory, samples were registered and screened using a real-time reverse transcriptase polymerase chain reaction (rRT-PCR). The screening rRT-PCR used was a pan-influenza A virus rRT-PCR (6) recommended by the European Union reference laboratory for AI (Animal Plant and Health Agency, Weybridge; United Kingdom), that can reveal the presence of all subtypes of influenza type A viruses. However, the method does not distinguish which hemagglutinin (HA) or neuraminidase (NA) subtype is present in influenza positive samples. Therefore, the samples found positive in the initial pan-influenza A virus rRT-PCR were further tested, using H5 and H7 specific PCRs (6).

Results and discussion

In total, samples from 507 wild birds were analysed (Table 1, Figure 1) for the presence of influenza A virus. Results showed that 41 (8.1 %) animals were positive for influenza A virus.

Proportions of influenza A virus detected in different species of waterfowl during surveillance were common teal (*Anas crecca*) 17.6 % (13/74), mallard (*Anas platyrhynchos*) 11.6 % (22/189) and Eurasian wigeon (*Anas penelope*) 10.6 % (5/47). Additionally, one out of two samples taken from common mergansers (*Mergus merganser*) was positive for influenza A.

All influenza A positive samples were further tested for the presence of subtype H5 and H7. None of the 41 influenza A positive samples were positive for H5 or H7.

Table 1. Number and species of birds tested in the surveillance programme for avian influenza in wild birds in 2018.

Species	No. tested	InfA negative	InfA positive	H5 positive	H7 positive
Mallard (*Anas platyrhynchos*)	189	167	22	0	0
Common teal (*Anas crecca*)	74	61	13	0	0
Eurasian wigeon (*Anas penelope*)	47	42	5	0	0
Common goldeneye (*Bucephala clangula*)	10	10	0	-	-
Tufted duck (*Aythya fuligula*)	4	4	0	-	-
Common merganser (*Mergus merganser*)	2	1	1	0	0
Red-breasted merganser (*Mergus serrator*)	1	1	0	-	-
Common shelduck (*Tadorna tadorna*)	1	1	0	-	-
Barnacle goose (*Branta leucopsis*)	8	8	0	-	-
Canada goose (*Branta canadensis*)	4	4	0	-	-
Greylag goose (*Anser anser*)	43	43	0	-	-
Pink-footed goose (*Anser brachyrhynchys*)	25	25	0	-	-
Black-headed gull (*Chroicocephalus ridibundus*)	34	34	0	-	-
Lesser black-backed gull (*Larus fuscus*)	26	26	0	-	-
Common gull (*Larus canus*)	21	21	0	-	-
Great black-backed gull (*Larus marinus*)	11	11	0	-	-
European herring gull (*Larus argentatus*)	1	1	0	-	-
Eurasian coot (*Fulica atra*)	5	5	0	-	-
Mute swan (Cygnus olor)	1	1	0	-	-
Total	**507**	**466**	**41**	**0**	**0**

Since 2009, the total number of samples collected in the surveillance programme for avian influenza in wild birds was greatly reduced. In addition, suspension of the programme from 2010 to 2015 impedes the study of temporal trends in AI prevalence in wild birds at annual intervals. However, the prevalence of AI infection amongst wild birds tested in 2018 was relatively low compared to the prevalence in 2009-2010, but slightly higher than in 2016-2017. (Figure 2) (10, 11, 12).

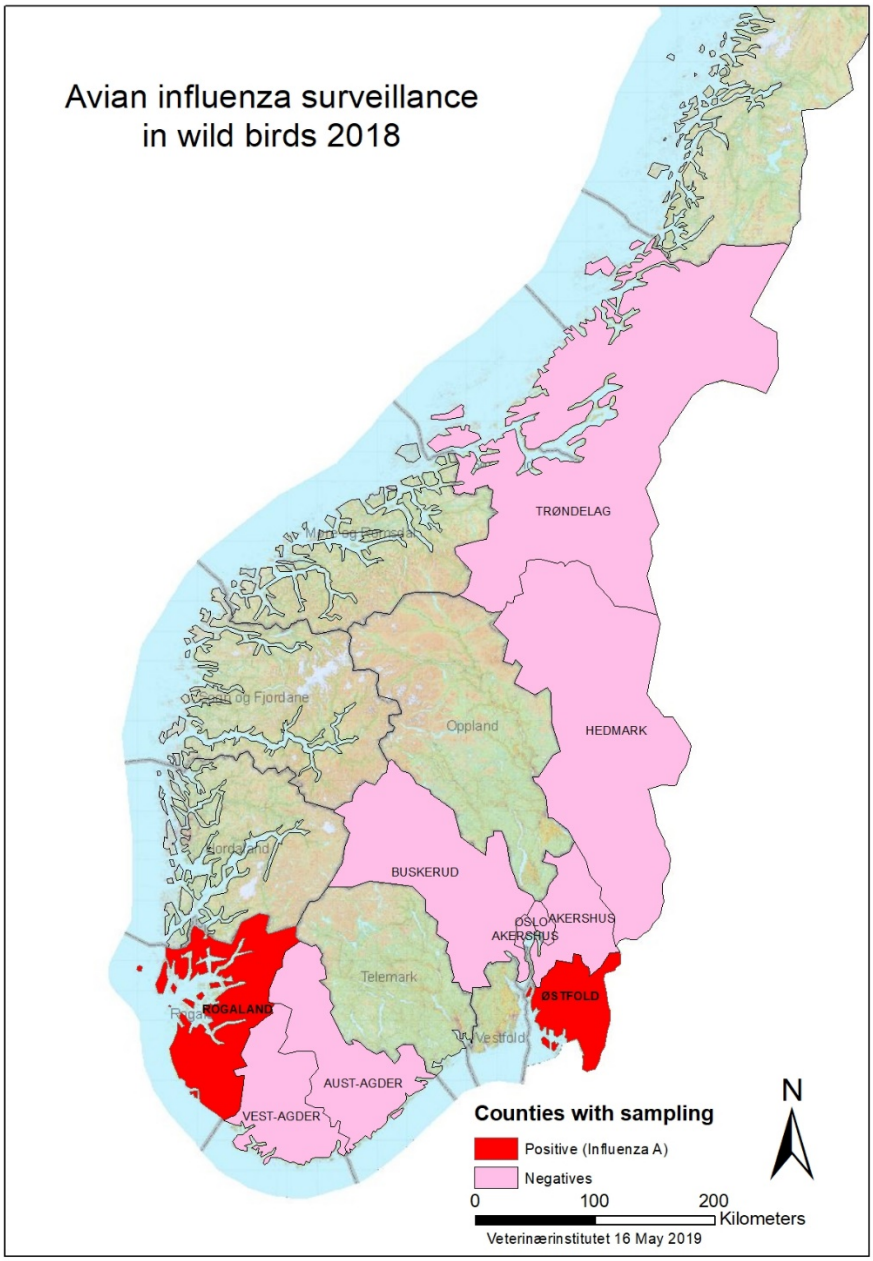

Figure 1. Map showing regions of wild bird sampling during the 2018 surveillance programme for avian influenza in wild birds. Red colour marks counties were birds positive for influenza A were sampled, whereas pink colour marks counties with only negative results.

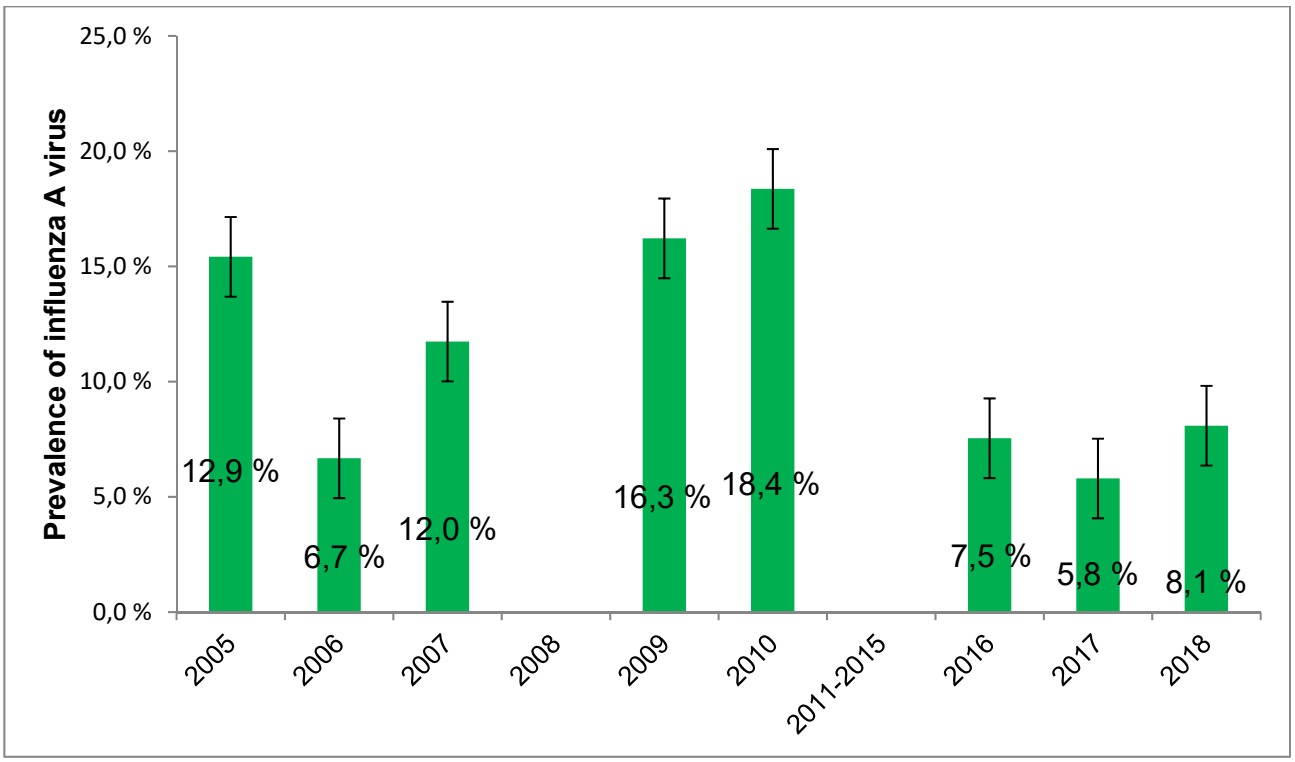

Figure 2. Prevalence of influenza A virus in ducks and gulls in the surveillance programme for avian influenza in wild birds from 2005-2018.

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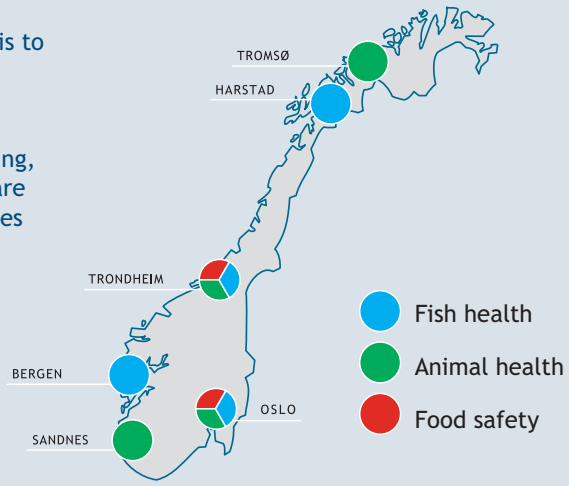

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