

OIE Situation Report for Highly Pathogenic Avian Influenza

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The epidemiology of avian influenza is complex. The virus constantly evolves and the behavior of each new subtype (and strains within subtypes), and the risks they present, can vary, as will the response in different countries.

This report presents an overview of historical and current disease events reported to the OIE by its Members. The epidemiology of the disease in the last 13 years was characterized by two main global panzootics. The first panzootic wave started in 2004, peaked in 2006, and afterward the virus activity progressively decreased up to 2012. Since 2013 a second panzootic wave has been observed, with a maximal activity in 2015. Currently the second panzootic period is ongoing. The objective of this report is to provide an historical background of HPAI epidemiology since 2005, to provide context to the current situation and consider what might happen next.

Current Global Situation (as of 28 February 2018)

1. Is the current highly pathogenic avian influenza (HPAI) situation exceptional and why?

This section presents data for the current global epidemics since the re-emergence of HPAI in domestic birds in 2013 compared with previous years. It presents the cumulative data for the period from 2013 to present and highlights data for the month of January 2018 (as of 28 February).

As shown in Table 1, the HPAI situation in the past five years is considered truly exceptional for at least three reasons: 1) the substantial number of countries and territories affected by HPAI in domestic birds; 2) the substantial number of outbreaks (affected farms, villages, or backyards) in this period; and 3) the high diversity of circulating subtypes during the period, which makes control and eradication complex.

In February 2018, 11 countries and territories (Cambodia, China [People's Rep. of], Chinese Taipei, India, Iraq, Korea [Rep. of], Mexico, Netherlands, Saudi Arabia, South Africa and Vietnam) in 3 world regions (Africa, Americas and Asia) were still affected.

| | January 2013- February 2018 | February 2018 |
|--|-----------------------------|---------------|
| Number of countries and territories affected by HPAI in domestic birds | 68 | 11 |
| Number of outbreaks reported in domestic birds | 6,946 | 37 |
| Number of subtypes reported in domestic birds | 12 | 6 |

Table 1. Selected characteristics of the current global epizootic of HPAI in domestic birds, for the entire epizootic (2013-2018) and the latest situation (February 2018)

2. What are the differences and similarities with the global epidemics which occurred in 2005-2012?

This section presents a comparison of the data between the previous global epidemics, which occurred from 2005 to 2012, and the current global epidemics, which have been ongoing since 2013.

As shown in Table 2, in the current epidemics: 1) the number of countries and territories with domestic birds affected has been slightly higher than in the previous global epidemics; 2) the number of outbreaks reported in domestic birds has been comparable with the previous global epidemics; and 3) the number of circulating subtypes reported in domestic birds has been much higher than in the previous global epidemics.

The main difference between the two global epidemics is the number of circulating subtypes in domestic birds, as the number of subtypes reported in the past five years was three fold higher than the number of subtypes reported in the previous global HPAI epidemics.

| | January 2005- December 2012 | January 2013- January 2018 |
|--|-----------------------------|----------------------------|
| Number of countries and territories affected by HPAI in domestic birds | 65 | 68 |
| Number of outbreaks reported in domestic birds | 8,345 | 6,946 |
| Number of subtypes reported in domestic birds | 4 | 12 |

Table 2. Selected characteristics of the current global epizootic of HPAI in domestic birds (2013-2018) and the previous global epizootic (2005-2012)

3. What are the geographical characteristics of the countries with domestic birds affected?

This section presents information about the geographic distribution of the disease and the reported subtypes. The data are presented using the UN regional distribution.

It presents the cumulative distribution of the disease and subtypes for the period from 2013 to present and highlights the distribution for the month of February 2018 (as of 28 February).

As shown in Figure 1, in January 2013 – January 2018, all regions were affected by HPAI outbreaks in domestic birds, with 68 countries and territories reporting the disease present at least once. The most affected regions were Europe and Asia. Several countries in Africa were affected, while in the Americas the disease was present in the northern part of the region and almost absent from its central and southern part.

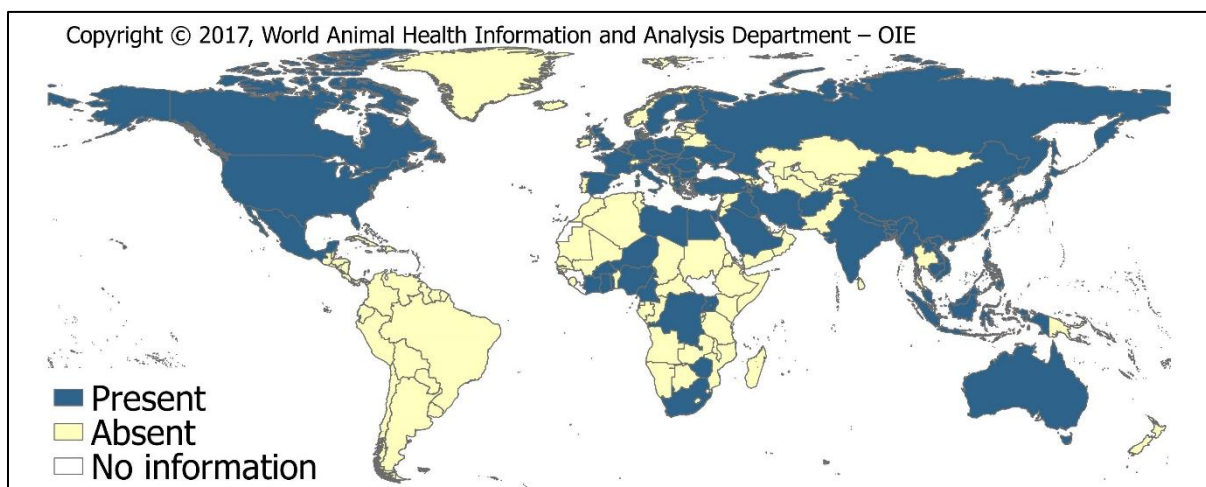


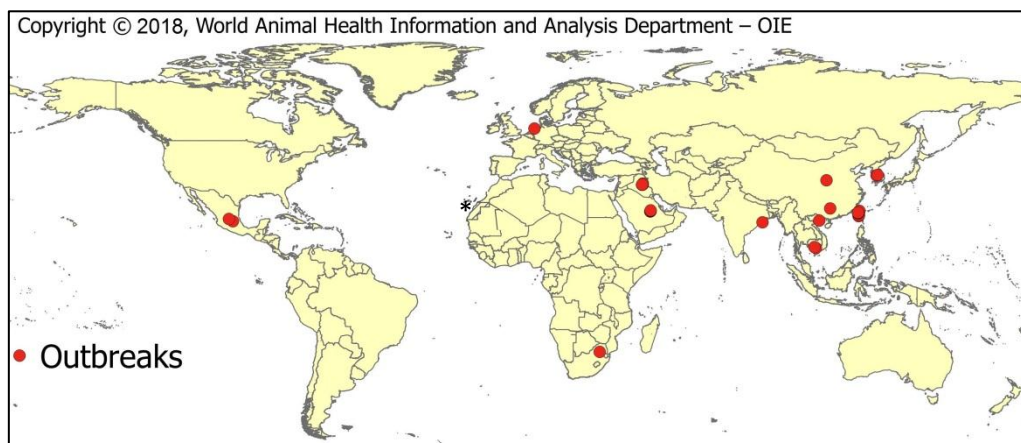
Figure 1. Countries and territories affected at least once by HPAI outbreaks in domestic birds, January 2013- January 2018.

During the period January 2013 – January 2018, 12 different influenza A subtypes were reported, as shown in Table 3. Europe reported the highest virus diversity (7 subtypes), followed by Asia and the Americas (6 subtypes each), Africa (3 subtypes), and Oceania (1 subtype). Subtypes H5N1, H5N2 and H5N8 were the most geographically widespread and commonly reported in four out of five regions.

| Region | Subtypes |
|----------|--|
| Africa | H5N1, H5N2, H5N8 |
| Americas | H5N1, H5N2, H5N8, H7N3, H7N8, H7N9 |
| Asia | H5N1, H5N2, H5N3, H5N6, H5N8, H7N9 |
| Europe | H5N1, H5N2, H5N5, H5N6, H5N8, H5N9, H7N7 |
| Oceania | H7N2 |

Table 3. HPAI subtype distribution at regional level in domestic birds (January 2013- January 2018)

The distribution of the most recent HPAI outbreaks in domestic birds is shown in Figure 2.



*Data provided by Morocco

Figure 2. HPAI outbreaks reported for February 2018 in domestic birds (N=33)

Thirty-seven new HPAI outbreaks in domestic birds were reported in February 2018, in Africa, Asia, the Americas and Europe, involving 6 different subtypes. The countries and territories reporting new outbreaks and the aggregated number of poultry killed and disposed of is presented in Table 4.

| Region | Count of countries and territories reporting new outbreaks | List of countries and territories | List of Strains | Aggregated count of poultry killed and disposed of |
|----------|--|---|------------------------------|--|
| Africa | 1 | South Africa. | H5N8 | 0 |
| Americas | 1 | Mexico | H7N3 | 539 |
| Asia | 9 | Cambodia, China (People's Rep. of), Chinese Taipei, India, Iraq, Korea (Rep. of), Saudi Arabia, Vietnam | H5N1, H5N2, H5N6, H5N8, H7N9 | 709 654 |
| Europe | 1 | Netherlands | H5N6 | 37636 |
| Oceania | 0 | | | 0 |
| Total | 12 | | | 747 829 |

Table 4. HPAI subtype distribution at regional level in domestic birds (February 2018)

4. Impact of HPAI on domestic birds?

This section presents data on the impact of the current global epidemics since the re-emergence of HPAI in domestic birds in the world in 2013 compared with previous years. It presents the cumulative number of losses (deaths and killed and disposed of animals) for the period from 2013 to present and highlights data for the month of February 2018 (as of 28 February).

As shown in Table 5, HPAI outbreaks in domestic birds resulted in the loss of approximately 120 million birds during January 2013 – January 2018. More than half (57%) of reported losses occurred in Asia, followed by the Americas (24%) and Europe (12%).

| Region | Losses |
|-----------------|-------------|
| Africa | 8,272,838 |
| Americas | 28,219,734 |
| Asia | 67,685,536 |
| Europe | 13,686,568 |
| Oceania | 490,000 |
| Total | 118,354,676 |

Table 5. Losses (deaths and killed and disposed of animals) due to HPAI outbreaks in domestic birds by region (January 2013-January 2018).

The recent impact of the disease in domestic birds (February 2018), is shown in Table 6.

| Region | Losses |
|-----------------|---------|
| Africa | 8 |
| Americas | 1 926 |
| Asia | 947 992 |
| Europe | 37 866 |
| Oceania | 0 |

Table 6. Losses (deaths and killed and disposed of animals) due to HPAI outbreaks in domestic birds by region (February 2018)

5. Evolution of HPAI in domestic birds?

This section presents the long (since 2005), medium term (since 2013) and recent (February 2018) dynamic of HPAI outbreaks in domestic birds.

Figure 3 shows the number of outbreaks in domestic birds since 2005 by month. Major peaks can be observed in 2006 (N=1,841), 2008 (N=1,954), 2015 (N=2,454) and 2017 (N=1,830).

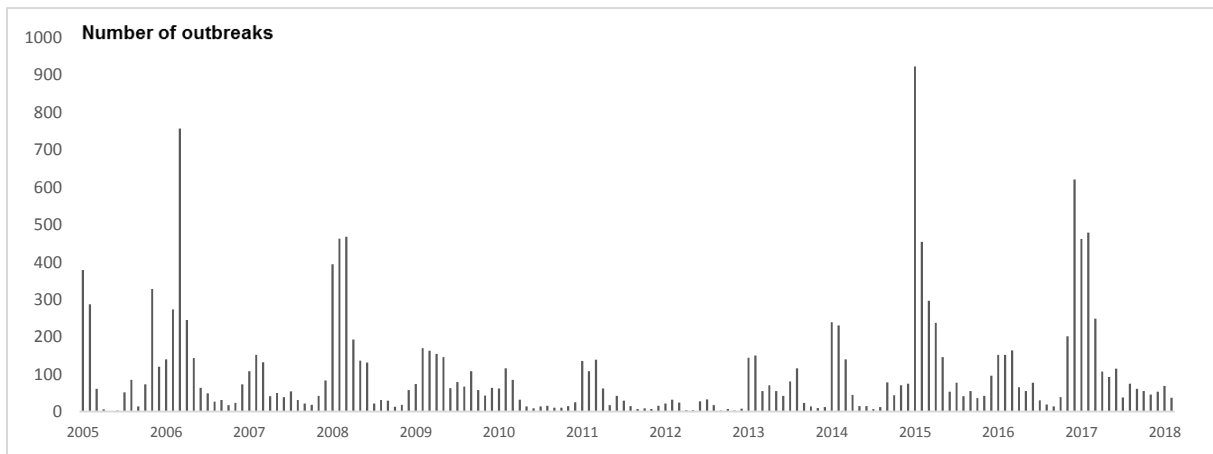


Figure 3. Number of outbreaks reported in domestic birds by month from 1 January 2005 to February 2018 (N=16,065)

Figure 4 shows the number of outbreaks in domestic birds since 2013 by month. Two major peaks can be observed in the 1st semester 2015 (N=1,828) and in the 1st semester 2017 (N=1,342)

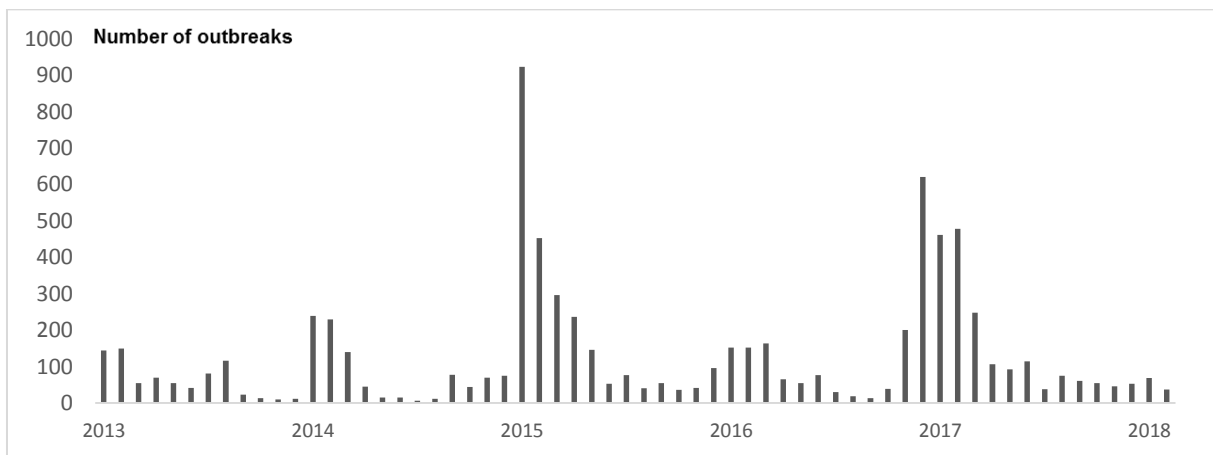


Figure 4. Number of outbreaks reported in domestic birds by month from 1 January 2013 to February 2018 (N=7,720)

Figure 5 shows the recent dynamic of HPAI outbreaks in domestic birds, with a peak in January 2018 (N=69), and a decreasing activity in February 2018 (N=37).

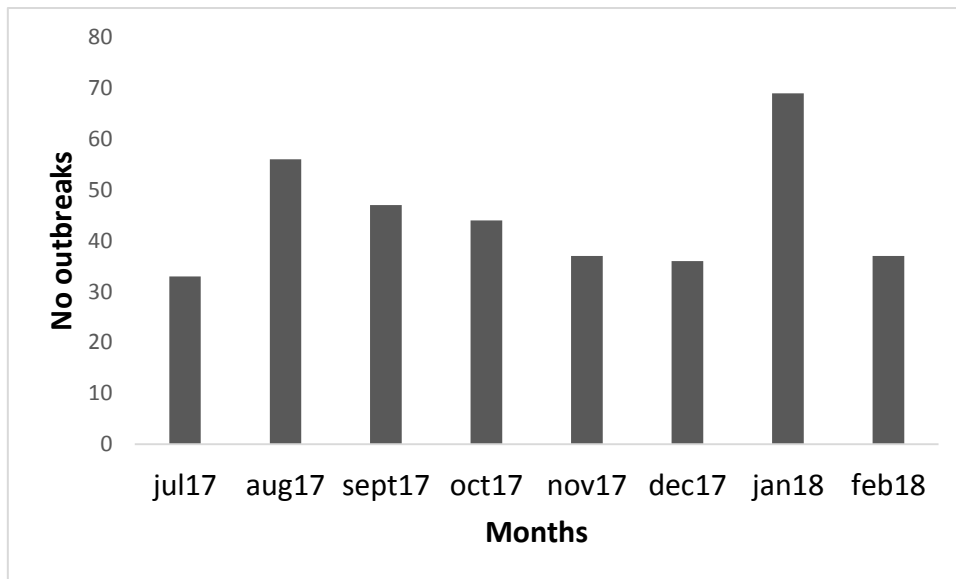
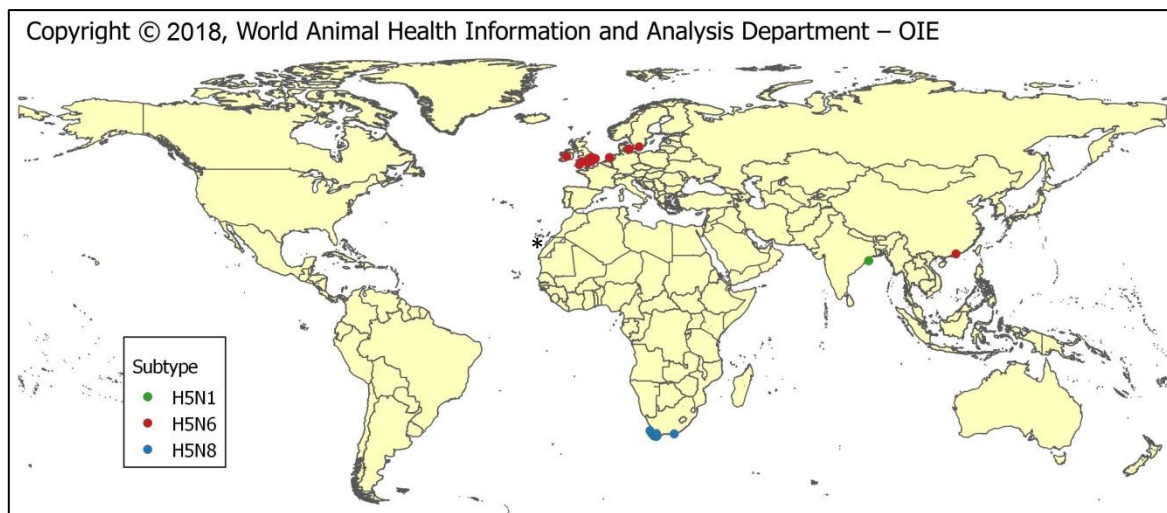


Figure 5. Epicurve showing the number of outbreaks reported in domestic birds by month from 1 July 2017 to February 2018 (N=359)

6. Description of the circulation of HPAI in wild birds in February 2018

This section presents the HPAI outbreaks reported to the OIE in wild birds in February 2018. As shown in Figure 6, eight countries and territories reported HPAI in wild birds (Denmark, Hong Kong (SARC), India, Ireland, Netherlands, South Africa, Sweden and the United Kingdom). The viruses responsible for these outbreaks were pertaining to subtypes H5N1, H5N6 and H5N8.



*Data provided by Morocco

Figure 6. HPAI outbreaks reported for February 2018 in wild birds (N=30)

Understanding the Current Global Situation

1. H7N9

Low pathogenic (LP) H7N9 virus was first detected in poultry in China in 2013 and continues to circulate in several provinces of the country. Since that time the virus also causes sporadic human infections and poses a concern to the public health. As of February 2018, more than 1,600 human infections have been reported to World Health Organization (WHO). Live bird markets remain the main source of the virus spreading among poultry, and from poultry to humans. Until now, five H7N9 influenza epidemic waves have occurred in China.

In February 2017, the LP H7N9 virus mutated to become highly pathogenic (HP) H7N9 virus in poultry. The mutated HP strain spread into other provinces of China in poultry and caused an increase in the number of human infections in the fifth wave.

The Chinese Government conducted extensive surveillance in all provinces to understand the extent of LP and HP H7N9 distribution. There has been closure of live bird markets and farms in affected provinces and stamping out of positive birds. Poultry movement control in affected provinces and biosecurity measures were increased. To limit the spread of infection, the Chinese Government has launched a nationwide vaccination programme in late 2017 in the country.

USA reported a different strain of HPAI H7N9 of North American wild bird lineage in a chicken broiler breeder flock in March 2017. Based on full genome sequence analysis, this virus is not the same as the China H7N9 virus that has impacted poultry and infected humans in Asia. The United States H7N9 is a very different virus, genetically distinct from the China H7N9 lineage. The flock in the USA was depopulated and enhanced surveillance was implemented. The event in the USA was closed on 11 August 2017.

2. H5N1

The Asian lineage HPAI H5N1 virus continued to be reported from countries in Asia and Africa in both poultry and wild birds. The virus has become enzootic in Asia and Africa and continues to cause outbreaks in poultry and sporadic human infections. As of February 2018, 860 human infections have been reported to WHO from 16 Countries and Territories. All cases of H5N1 infection in humans have been associated with close contact with infected live or dead birds, or H5N1-contaminated environments. Countries affected should focus on strengthening biosecurity measures to prevent introduction of disease into flocks and avoid contact between wild birds and poultry.

3. H5N8

The HPAI H5N8 outbreaks continued to be reported from a few countries in Europe, Africa, Middle East, and Asia in poultry and/or wild birds. Some of these countries are located on the migratory route which attracts lot of wild birds suggesting the likely spread of the virus along the route.

Since HPAI H5N8 subtypes cause high mortality in domestic poultry, veterinary services in at-risk countries have recommended increased prevention efforts through bio-security to minimize contact between wild birds and poultry and enhanced surveillance and preparedness. They are also strengthening their wild bird surveillance activities in areas where viruses have been detected and in other areas where there are significant populations of migratory waterfowl.

The majority of wild bird migration across Europe, Africa, and Asia subsides after the winter season. While wintering locations of these migratory birds are often stable, additional movement within a region may be affected by local weather conditions, food resources, access to open water, etc.

4. H5N6

HPAI H5N6 viruses first emerged in China in 2013 and have been reported by several Asian countries. The Asian lineage H5N6 causes severe clinical signs in poultry and associated mortality. The outbreaks in these countries have led to significant destruction of poultry with more than 29 million birds killed and disposed of for control measures by the veterinary authorities. This group of H5N6 viruses has also been associated with human infection, including a number of deaths. A total of 19 laboratory-confirmed cases of human infection with influenza A (H5N6) virus, including six deaths, have been reported to WHO from China since 2014.

In the current period a new variant strain of HPAI H5N6 emerged and these outbreaks are ongoing in Asia and Europe. These viruses are different from the H5N6 viruses associated with the human infections in China. Detection of this new strain of H5N6 virus in migratory bird species pose a potential threat for the dissemination of this virus by wild birds within and outside Asia and Europe.

5. H5N2

H5N2 HPAI outbreaks continue to be reported from Chinese Taipei since its origin in 2012. Russia for the first time in December 2017 reported an outbreak of H5N2 in birds. These H5N2 viruses cause varying levels of pathogenicity in poultry that led to significant losses for the poultry industry.

Key messages

- The Northern Hemisphere winter season is typically associated with an increased risk for avian influenza. In 2017-18 there have been new and reoccurring outbreaks of HPAI H5N8 and H5N6 in Asia, Europe, and the Middle East. Veterinary authorities in these countries have responded to contain outbreaks in poultry with stamping out measures, heightened surveillance, and recommendations to poultry owners to increase biosecurity. However, the new outbreaks in poultry in Iraq, Japan, Korea (Rep. of) and Saudi Arabia indicate the geographic distribution of these subtypes is still increasing, and veterinary authorities must continue to respond to this risk.

- The zoonotic avian influenza viruses that have been detected in China (H7N9 and H5N6) and parts of Africa and Asia (H5N1), pose the most significant public health risks. Veterinary Authorities have struggled to control the situation, which has allowed these viruses to continue to circulate in poultry populations. This creates the risk of reassortment from co-infections of different influenza viruses, and public health risks through exposure of people to avian influenza viruses during rearing and slaughter. Although there are seasonal trends, the risk is year round since the viruses have become established and self-sustaining in bird populations. The role of commercially farmed poultry, backyard poultry, live bird marketing systems, and wild birds of differing species in maintenance of the virus and transmission will have a local context that needs to be understood through epidemiological study.
- The OIE Standards, and the transparency of reporting through the OIE's World Animal Health Information System, provide the framework for Veterinary Services to implement effective surveillance, reporting, and controls for avian influenza. Wild bird surveillance can indicate periods of heightened risk, and at these times measures to improve on-farm biosecurity may reduce the likelihood of exposure of poultry. The Veterinary Services of OIE Members respond to their national situations in accordance with their national policies and their economic and technical resources.

There is no scientific evidence that supports the killing or culling of free-ranging wild birds, or other free-ranging wildlife, to control avian influenza. Detections of avian influenza, including highly pathogenic avian influenza, in wild birds alone do not result in a country losing its status as free from Highly Pathogenic Avian Influenza, and there is no justification for imposition of restrictions on trade in poultry or poultry products for such countries.