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Animal Health Situation Worldwide

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I. Introduction

Since its creation, WOAH has had a mandate to promote transparent communication of the animal health situation between Members, for the diseases they have identified as priorities. This information is key to supporting Members in risk management and for monitoring progress on coordinated global and regional control and eradication efforts. It is also key to informing experts on the animal health challenges faced by countries and to guiding the updating and production of standards and guidelines.

To achieve this, the Organisation has developed a set of standards, as published in Chapter 1.1. of the WOAH *Terrestrial Animal Health Code* (*Terrestrial Code*) and Chapter 1.1. of the *Aquatic Animal Health Code* (*Aquatic Code*), for notifying listed and emerging diseases and the provision of relevant epidemiological information. Compliance with these standards is an obligation for each WOAH Member. Concretely, the Organisation coordinates the sharing of information collected from its Members and several non-member countries and territories on listed diseases of terrestrial and aquatic animals (121 listed diseases in 2023[1,2] and 122 in 2024[3,4]), as well as on emerging diseases[5,6] (4 in 2023 and 3 in 2024).

In addition, the Organisation coordinates the voluntary exchange of information on 54 other diseases and syndromes[7] deemed important by WOAH's wildlife experts[8]. This is described in notification procedures shared with WOAH's national Focal Points for Wildlife.

Finally, WOAH coordinates the voluntary exchange of additional information that Members consider important and wish to share with others on concerning information beyond the scope of the official notification procedure. This information sharing is done by e-mail and published on disease-specific pages on the WOAH website.

Members also have the option of using the WOAH procedures for official recognition of animal health status for the entire country or a zone within the country, which currently apply to six diseases[9], or self-declaration of the absence of a given disease in their country, zone or compartment, which applies to the remaining listed diseases[10]. These procedures are voluntary. In addition, WOAH Members are invited to provide further information on animal health, such as on the simulation exercises organised to prepare for the introduction of diseases[11], or on their implementation of global disease control strategies.

Finally, a considerable source of information consists of WOAH experts' and partners' reports and publications, via the network of Reference Centres in particular, but also via specialist working groups or inter-agency expertise networks, among others.

[1] Volume 1 of the WOAH *Terrestrial Animal Health Code* 2022
[2] *WOAH Aquatic Animal Health Code* 2022
[3] Chapter 1.3. of the WOAH *Terrestrial Animal Health Code* 2023
[4] Chapter 1.3. of the WOAH *Aquatic Animal Health Code* 2023
[5] Glossary of the WOAH *Terrestrial Animal Health Code* 2023
[6] Glossary of the WOAH *Aquatic Animal Health Code* 2023
[7] WOAH, Names of 54 non-listed diseases affecting wildlife
[8] WOAH, Situation on non-listed disease in Wildlife
[9] WOAH, Official disease status
[10] WOAH, Self-declared disease status
[11] WOAH, simulation exercises

WOAH has a long history of presenting an overview of relevant evolutions in the international animal health situation to its Members at regional and global events, to support their decision-making. In 2023, WOAH formally committed to going one step further in making available most of the data collected by WOAH and its partners, by developing data integration, with the creation of a dedicated department.

This approach to data integration adopted by WOAH during the past year (in particular via the Observatory programme) has been used to help Members update the epidemiological information they have provided through WOAH's World Animal Health Information System (WAHIS) when necessary. In this respect, WOAH wishes to remind its Members of their commitment to share all relevant information falling within the scope of the Organisation's notification standards.

Although all the information used in this report is already publicly accessible via the WOAH website, the report aims to intelligently combine these various sources of information to present Members with the most accurate information possible, while recognising the limitations of the data available on a global scale.

The previous report, presented in May 2023, focused mainly on monitoring the progress of coordinated control and eradication efforts at global and regional level for diseases covered by global strategies. Little change is expected in this area in 2024, and the most relevant analyses will be incorporated into the next edition of the WOAH Observatory's dashboards. For this reason, this year's report focuses primarily on informing Members on selected important events and trends relating to animal health situation worldwide in 2023 and early 2024, relevant for risk management. These trends are contextualised on the basis of the surveillance reported by Members for the various diseases concerned. WOAH collects systematic information from all its Members on whether surveillance has been implemented, but does not collect systematic information on its extent, effectiveness and challenges at national level. This should also be taken into account when interpreting the analyses presented in this report.

The statistics relating to the notification of Members via WAHIS will then be briefly presented.

1. Selected information to support Members in risk management

1.1 Avian influenza

1.1.1 Context

Based on Chapter 1.3 of the *Terrestrial Animal Health Code* (2023), three categories of avian influenza are listed by WOAH: 1) infection with high pathogenicity avian influenza viruses (HPAI) (in poultry, as defined in the disease-specific chapter), 2) infection of birds other than poultry, including wild birds, with HPAI, and 3) infection of domestic and captive wild birds with low pathogenicity avian influenza (LPAI) viruses having proven natural transmission to humans, associated with severe consequences.

HPAI has been a global concern, particularly since October 2020, due to an unprecedented situation marked by:

- its global spread and the increase in the number of countries affected worldwide, including an unprecedented spread to Latin America and the Antarctic region;
- the increase in the number of outbreaks in poultry;
- the increase in the number of losses in the poultry sector (birds killed or culled to combat the disease);
- the increased impact on wildlife and biodiversity;
- the increase in the number of cases detected in domestic and wild mammals.

Since October 2020, the following have also been noted:

- A reduced viral diversity, with a dominant circulating virus of subtype H5N1 clade 2.3.4.4b.
- In some regions, the virus has persisted during periods of the year when it was previously undetected, and its global seasonality has evolved.
- The World Health Organization (WHO) continues to record sporadic human cases.

WOAH is closely monitoring the evolution of avian influenza in the above-mentioned areas and communicating on developments in the global situation and the risks identified by experts, on the basis of information provided by its Members and the scientific community. The aim of this section is to inform WOAH Members of the evolution of avian influenza in the world in 2023 and early 2024 on the basis of the available information, highlighting its biases and limitations.

Updates concerning the information presented in this section are published every 3 weeks by WOAH, in the form of situation reports available on the website and shared via social media.

1.1.2 Surveillance of HPAI

It should be borne in mind that case detection and notification are largely dependent on the surveillance systems in place in the countries concerned. WOAH receives information from its Members through WAHIS six-monthly reports on HPAI surveillance in place for the different categories of birds (poultry; birds other than poultry, including wild birds). However, WOAH does not regularly collect information on surveillance in place for mammals.

Figure 1 shows the percentage of reporting countries/territories in the different WOAH regions that indicated having carried out surveillance in poultry and birds other than poultry, including wild birds, during the period 2020–2023. A total of 162 countries and territories provided information for at least one semester of this period. Overall, 79% of the reporting countries/territories indicated having surveillance in place for both poultry and birds other than poultry, 11% reported having surveillance in place for poultry only and 6% reported having surveillance in place for birds other than poultry only. Overall, 96% of the reporting countries/territories indicated having implemented some form of surveillance for HPAI, which is high compared to other listed diseases. There are some regional disparities: Europe is the region with the highest percentage of countries/territories reporting surveillance and the Middle East is the region with the lowest percentage of countries/territories reporting surveillance. The dominant strategy in all WOAH regions is to implement surveillance in both poultry and birds other than poultry.

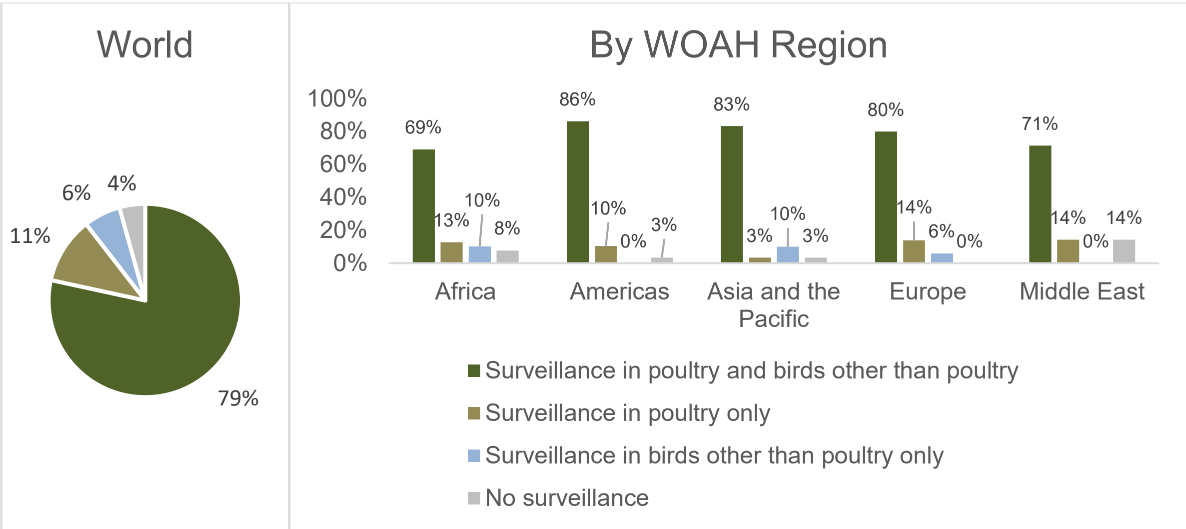


Figure 1. *Percentage of 162 reporting countries/territories in the different WOAH Regions that indicated having carried out surveillance for HPAI in poultry and birds other than poultry during the period 2020–2023*

Figure 2 shows the percentage of countries/territories in the different WOAH regions reporting general or targeted surveillance for HPAI in poultry and wild birds during the period 2020–2023. Overall, the highest percentages were as follows: for poultry, a majority of countries/territories (59%) reported implementing a combination of general and targeted surveillance. For wild birds, general surveillance was the dominant category among countries and territories reporting some kind of surveillance; however, it should be noted that 41% of countries and territories reported no surveillance in wild birds, which could be of concern for early warning, given the importance of wild birds in the global spread of HPAI. As noted above, there were some regional disparities: for poultry, a combination of general and targeted surveillance was the dominant strategy in all WOAH regions, with the exception of the Middle East, where the dominant category (57% of countries/territories) relied solely on general surveillance. For wild birds, in all WOAH regions the dominant category (44% to 64% of countries/territories) did not implement any surveillance in wild birds, with the exception of Europe, where the dominant category (36% of countries/territories) implemented a combination of general and targeted surveillance.

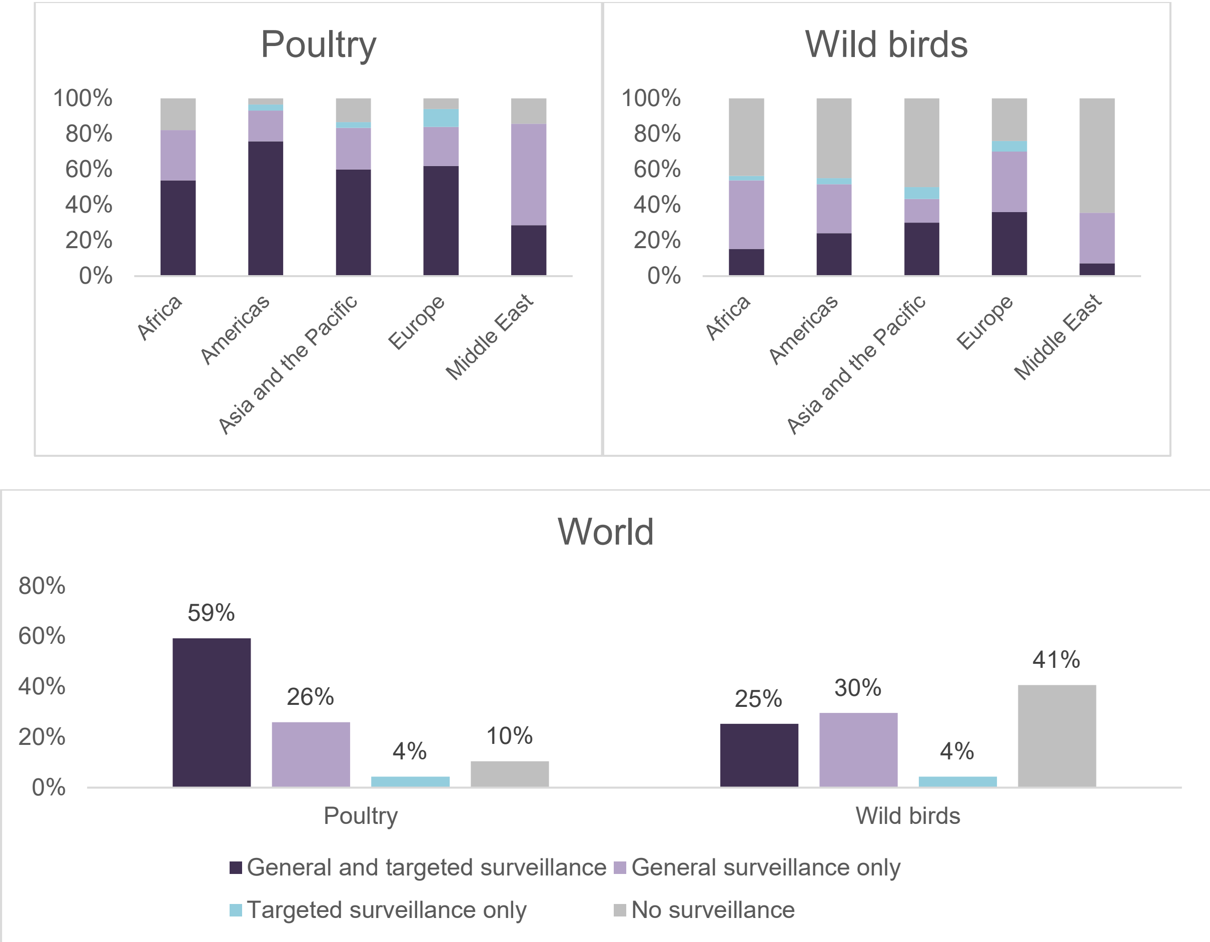


Figure 2. *Percentage of reporting countries/territories in the different WOAH regions that indicated having carried out general or targeted surveillance for HPAI in poultry and wild birds during the period 2020–2023.*

Furthermore, Members that need support for surveillance or disease control can call on the WOAH network of Reference Laboratories. Thus, for avian influenza, based on the annual reports submitted by these laboratories to WOAH for 2022, 43 countries/territories sought assistance that year for diagnostic testing (of which 77% reported HPAI presence to WOAH) and 30 countries/territories received technical consultancy services.

1.1.3 Seasonal pattern

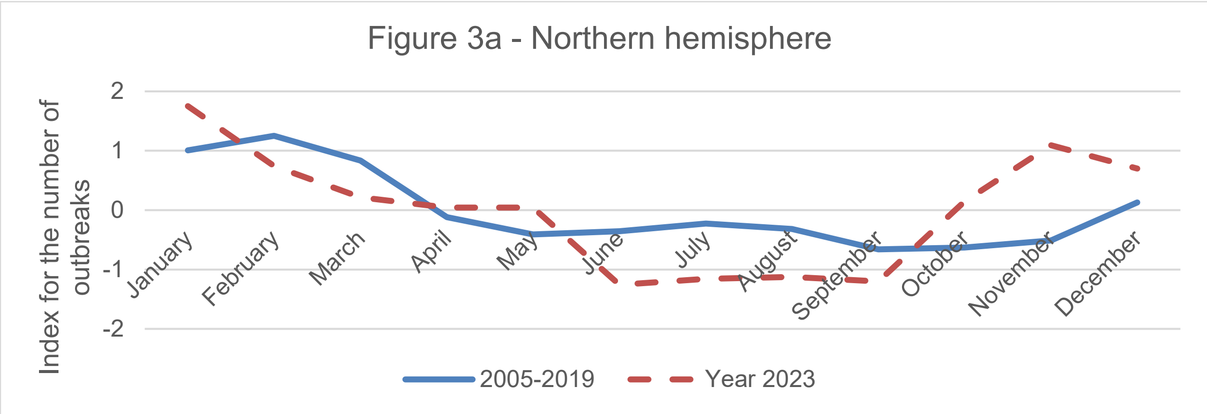
One of the major changes in the dynamics of HPAI in recent years has been its seasonal nature. Traditionally, the global seasonality of HPAI in poultry was as follows: the spread was lowest in September, began to increase in October and peaked in February[12]. This seasonality pattern was mainly influenced by countries in the northern hemisphere. Every year since 2005, the majority of outbreaks have occurred in the northern hemisphere, except, according to WAHIS data, in 2008, 2009 and 2019, the three years in which Indonesia was the country that reported the highest number of poultry outbreaks.

Figure 3 focuses on poultry and shows the seasonality of HPAI separately for the northern and southern hemispheres. For the northern hemisphere (Figure 3a), given that more than 180 outbreaks have been notified each year since 2005, a comparison between the seasonal pattern for 2023 and the seasonal pattern observed between 2005 and 2019 has been provided, based on the number of outbreaks

[12] Awada, L *et al.* 2018. Global dynamics of highly pathogenic avian influenza outbreaks in poultry between 2005 and 2016—focus on distance and rate of spread. Transboundary and Emerging Diseases, 65(6), pp.2006-2016.

notified to WOAH. To compare seasonality between years, the number of outbreaks was centred and scaled by calendar year. The average was then computed for each month of the period between 2005 and 2019. The figure shows that the peak traditionally observed in February at a global level has shifted to January, and that the increase traditionally starting in October has remained in place.

For the southern hemisphere (Figure 3b), as outbreaks have been rarer over time, only the seasonal profile for 2023 is presented, based on the raw number of outbreaks notified to WOAH. In that year, 217 outbreaks were notified by five countries in South America (Argentina, Bolivia, Chile, Ecuador and Peru) and two countries in eastern and southern Africa (Mozambique and South Africa). The graph shows an initial small peak in February (corresponding to the peak in South America); then the spread began to increase again in July and reached a higher peak in September (corresponding to the peak in South Africa).



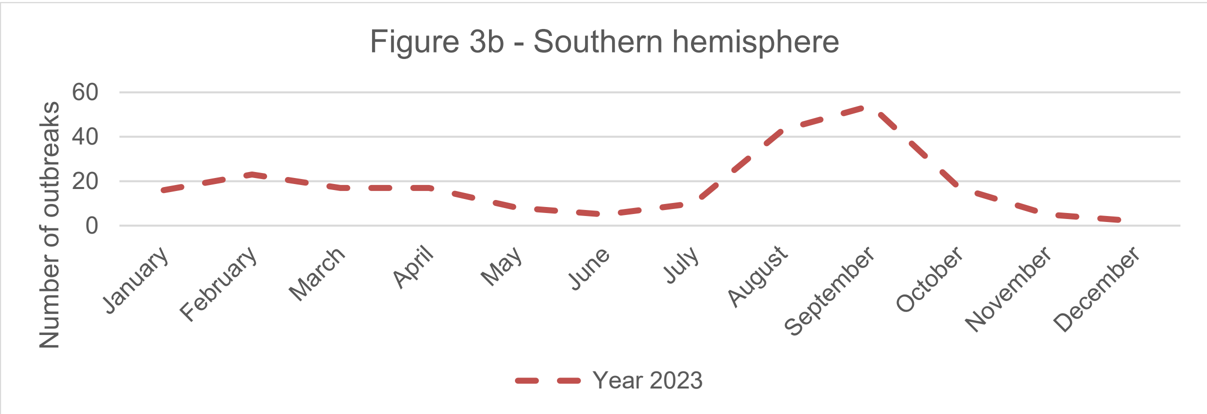


***Figure 3**. Number of HPAI outbreaks in poultry reported to WOAH for 2023, by month and by hemisphere. For the northern hemisphere (3a), the 2023 distribution is compared to the distribution for the period between 2005 and 2019. Values were centred and scaled each year, for comparability; the average was then computed for each month of the period between 2005 and 2019. For the southern hemisphere (3b), only the 2023 distribution is presented, based on the raw number of outbreaks. The comparison with 2005–2019 is not shown as outbreaks were rare in the southern hemisphere during this period*

In Europe, an unprecedented number of HPAI virus detections were reported in wild and domestic birds from June to September 2022, according to the European Food Safety Authority (EFSA). European countries/territories reported 118 outbreaks in poultry and 781 outbreaks in wild birds via WAHIS for the summer of 2022. The number of reported outbreaks in wild birds has been particularly high; whereas there were between 0 and 80 outbreaks each summer (June–September) during the period 2017–2021, the number of outbreaks increased to an unprecedented level in 2022. Between June and September 2023, the number of outbreaks in wild birds remained very high, with 648 outbreaks reported. This shows that, since 2022, the virus has persisted in wild birds in Europe during the summer, whereas it was rarely detected in previous summers.

1.1.4 Disease distribution and spread

As mentioned above, since October 2020 the scientific community has been observing an unprecedented spread of HPAI around the world. The spread of the disease to Latin America (an area previously largely historically free of HPAI) at the end of 2022 was a major concern for the international community. Since 2023, HPAI has continued to spread, affecting:

- 10 new countries and territories in Latin America and the Antarctic region: Bolivia, Costa Rica and Guatemala (January 2023); Argentina, Cuba and Uruguay (February 2023); Brazil and Paraguay (May 2023); and the Falkland Islands and South Georgia and the South Sandwich Islands (October 2023).
- 2 new countries in Africa: Gambia (March 2023) and Mozambique (September 2023).

HPAI is continuing to spread at the same rate as in 2022, when 10 previously free countries and territories were affected for the first time. The spread of HPAI in the Antarctic region is of particular concern for wildlife and biodiversity. On 21 December 2023, OFFLU (WOAH/Food and Agriculture Organization (FAO) Network of Expertise on Animal Influenza) published a statement on the continued spread of HPAI H5 in wildlife in South America and its incursion into the Antarctic region. The report summarises the spread and impact of HPAI H5 clade 2.3.4.4b in South America, its incursion into South Georgia and the risk of further spread in the Antarctic region. It points out that 'the HPAI H5 virus is likely to spread further among Antarctic wildlife and infect the 48 species of birds and 26 species of marine mammals that live in this region'. The negative impact of HPAI H5 on Antarctic wildlife could be immense. WOAH is closely monitoring the situation in the Antarctic region and is calling on the animal health community to monitor the situation, as new cases have continued to be reported in Sub-Antarctica since October 2023. In September 2023, the WOAH Director General sent a communication to the Delegates of Members in the Americas located in the southern hemisphere to encourage them to report cases of HPAI in Antarctic wildlife and to provide them with notification procedures to share with the competent agents[13].

The OFFLU report also highlights the risk of HPAI spreading to Oceania. In this respect, it is interesting to note that one country in Oceania (Australia) informed WOAH in 2023 about a simulation exercise targeting HPAI.

Figures 4a and 4b show the worldwide distribution of HPAI new outbreaks in 2023 and early 2024 (as of 8 March) in poultry (Figure 4a) and non-poultry including wild birds and mammals (Figure 4b). A total of 48 countries/territories reported new outbreaks of HPAI in poultry, 71 countries/territories reported

[13] On 12 March 2024, WOAH received an official report confirming that HPAI reached an unprecedented milestone with the first detection on Antarctica's mainland, in its northern tip. The discovery came through the identification of the virus in a South Polar skua collected by Argentinian scientists near Argentina's Antarctic research base in January 2024. This information is not presented in the body of the report, as it was written before the notification was received.

new outbreaks of HPAI in non-poultry including wild birds and mammals and no Members reported the presence of infection of domestic birds and captive wild birds by LPAI viruses with proven natural transmission to humans with severe consequences, in validated reports.

As of 8 March 2024, there were five countries[14] with active self-declarations of freedom from avian influenza (including infection with HPAI viruses), 17 countries[15] with active self-declarations of freedom from HPAI in poultry, two countries[16] with active self-declarations of HPAI-free zones in poultry, and three countries[17] with active self-declarations of HPAI-free compartments in poultry. Details are available on the WOAH website.

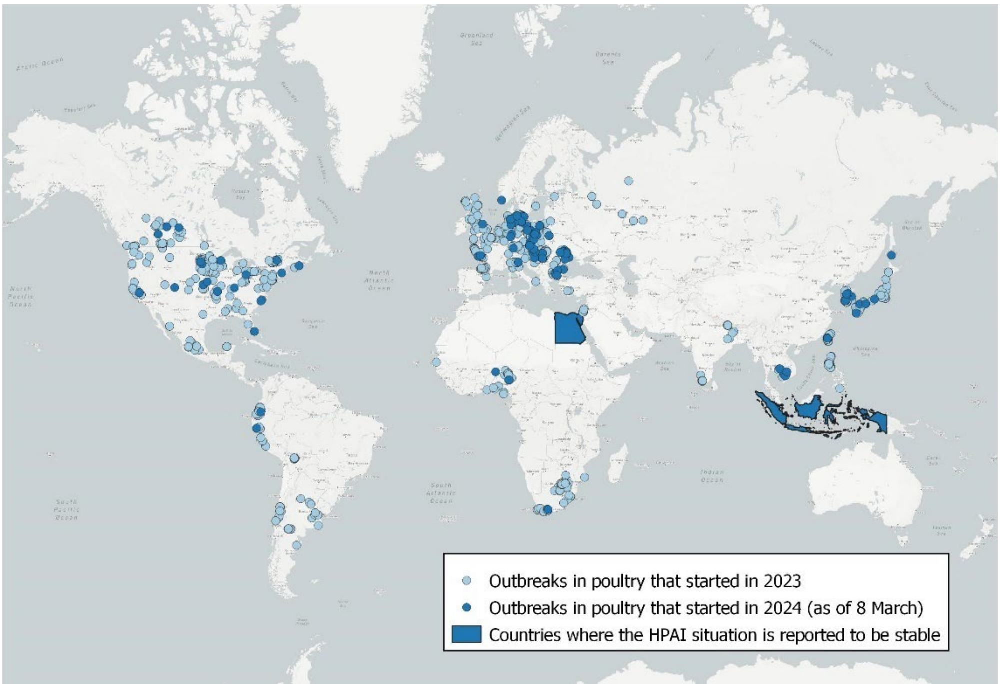


Figure 4a. *Worldwide distribution of HPAI new outbreaks in 2023 and early 2024 (as of 8 March) in poultry.*

[14] Colombia, El Salvador, Honduras, Sri Lanka, Uruguay
[15] Argentina, Chile, Estonia, Finland, France, Guatemala, Ireland, Malaysia, Netherlands, Paraguay, Portugal, Saudi Arabia, Slovenia, Spain, Sweden, Thailand and Ukraine
[16] Türkiye and the United Kingdom
[17] Egypt, India and Indonesia

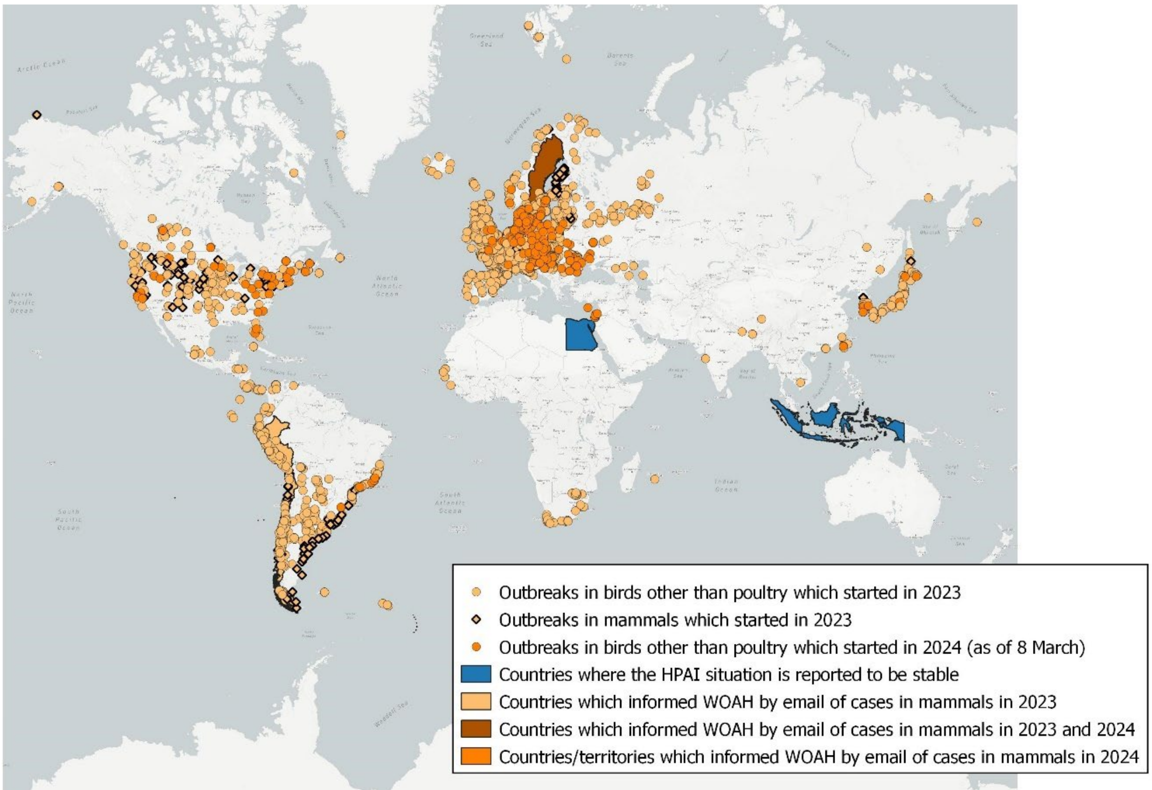


Figure 4b. *Worldwide distribution of HPAI new outbreaks in 2023 and early 2024 (as of 8 March) in non-poultry including wildlife*

1.1.5 Viral diversity

Another major change observed in the past few years is the reduction in the viral diversity of HPAI circulating around the world, with a gradual dominance of subtype H5N1 clade 2.3.4.4b. Experts from WOAH and partner organisations (in particular the OFFLU network and WHO) are monitoring the evolution of circulating clades and produce regular reports. This monitoring of the clades circulating in different regions of the world is important for understanding the evolution of HPAI viruses. WOAH Members are therefore encouraged to provide this information, which is optional in WAHIS reports, to support the efforts of the OFFLU network.

Unlike information on clades, information on the subtype is systematically requested in WAHIS. Figure 5 illustrates the evolution of the percentage of HPAI outbreaks by subtype notified via WAHIS since 2005. The figure shows that between 2006 and 2011, the H5N1 subtype was identified in 94% to 99% of outbreaks. The subtype then remained in the majority between 2012 and 2015, albeit with a reduced percentage (51% to 88%). It was then in the minority between 2016 and 2021 (12% to 43%) and has once again emerged as the predominant subtype since 2022 (more than 85% of outbreaks in 2022). In 2023 and early 2024 (as of 8 March), it accounted for 86% and 93% of outbreaks respectively. Reports published by WHO in September 2023 and February 2024 summarise the clades of HPAI detected in different countries and territories around the world, based on information compiled by international agencies. Of the 58 countries/territories for which clade information was available for outbreaks in animals between February and September 2023, 56 indicated clade 2.3.4.4b. Of the 41 countries/territories for which clade information was available for outbreaks in animals between October 2023 and February 2024, 39 indicated clade 2.3.4.4b. Knowing these trends and changes helps Members in their decision-making on risk management. The precise characterisation of circulating strains is an essential element for monitoring the spread of viruses and the rapid adaptation of vaccine strains used in national programmes.

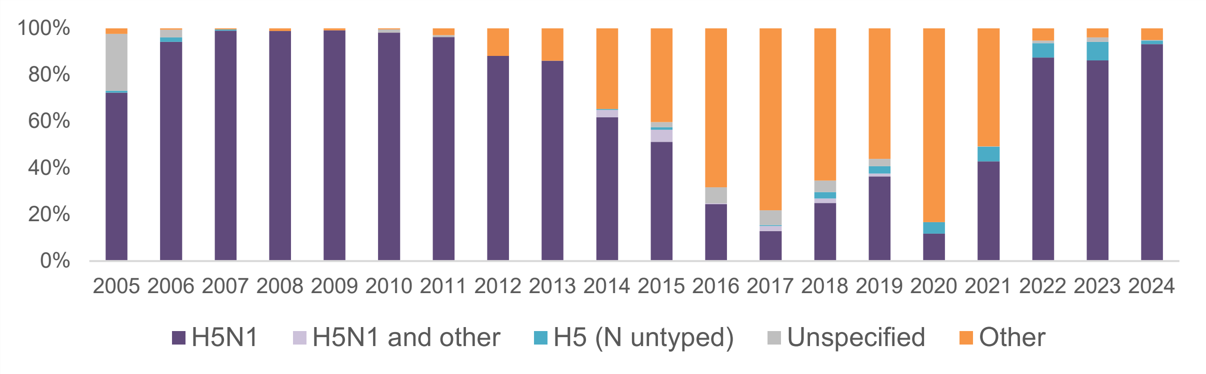


Figure 5. *Percentage of HPAI outbreaks reported through WAHIS, by subtype, between 2005 and 2024 (as of 8 March)*

1.1.6 Impact on poultry

The major spread of HPAI around the world had an unprecedented impact on poultry production in 2022. This impact can be monitored on the basis of the two indicators presented in Figure 6: the number of poultry outbreaks per seasonal wave and the number of poultry losses (animals dead or culled on affected farms). The figure shows that the peak reached in the October 2021–September 2022 wave (more than 3,800 outbreaks and 125 million poultry dead or culled) was the highest in the last 20 years: 1.7 times higher than the October 2016–September 2017 peak in terms of outbreaks, and 2.5 times higher in terms of losses. The following seasonal wave (October 2022–September 2023) also had a considerable impact, but less than the previous one. The number of outbreaks was down by 47% and the number of losses by 27%, which is encouraging. As of 8 March 2024, the downward trend appears to be continuing.

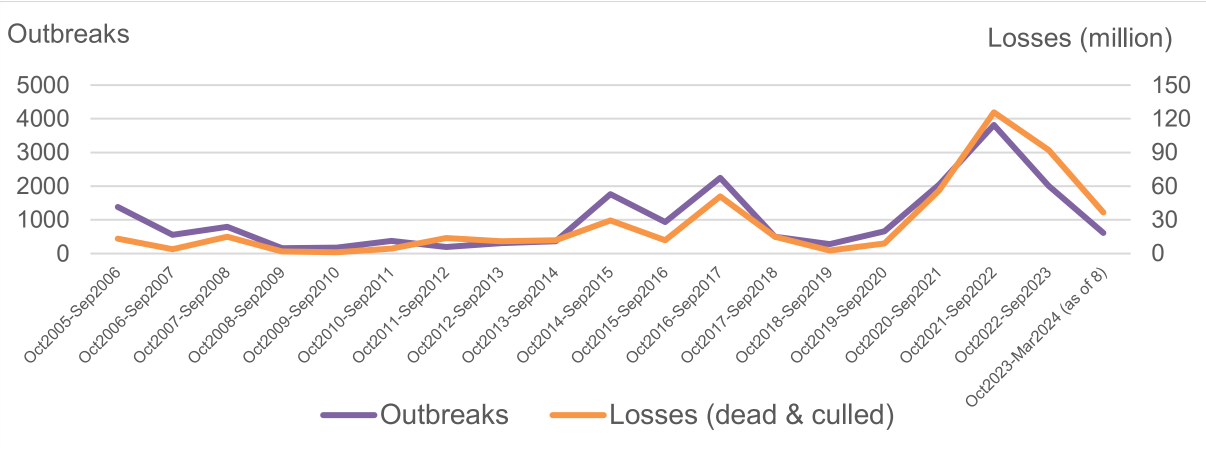


Figure 6. *Number of HPAI outbreaks and losses in poultry, by global seasonal wave, between 2005 and 2024 (as of 8 March)*

To limit losses due to HPAI, vaccination is being considered by some countries. As described in the relevant WOAH standards, vaccination against avian influenza could be considered as part of a broader disease prevention and control strategy. In December 2023, WOAH published a policy brief on the use of vaccination. Of the 139 countries and territories that had submitted one or both of their six-monthly reports on listed terrestrial animal diseases for 2023 by 8 March 2024, seven reported the implementation of official vaccination against HPAI: the People's Republic of China ('China' hereafter), Egypt, Hong Kong, Indonesia, Kazakhstan, Russia and Uzbekistan. WOAH expects this list to grow once all Members have submitted their six-monthly reports for 2023. The effectiveness of vaccinating poultry against HPAI depends on the use of appropriate vaccines at the recommended doses and age.

Antigenic variation in field strains may render vaccines less effective. To support Members who choose to include vaccination in their control strategy, OFFLU publishes the OFFLU-Avian Influenza Matching (AIM) report to provide information on the antigenic characteristics of circulating HPAI viruses to facilitate selection of appropriate vaccines for poultry and update poultry vaccine antigens in places where vaccines are being used. Furthermore, in December 2023, the WOAH Working Group on Wildlife published guidelines on considerations for emergency vaccination of wild birds against high pathogenicity avian influenza in specific situations, to assist the responsible authorities in situations where questions of vaccination of wild birds are raised and consideration is given as part of incident response planning.

Zoning is part of the HPAI prevention and control strategy in many countries. Indeed, of the 139 countries and territories that, by 8 March 2024, had submitted six-monthly WAHIS reports on listed terrestrial diseases for 2023, 68 (49%) reported the implementation of zoning to control avian influenza. In addition, in 2023, WOAH circulated a questionnaire as part of its first Observatory thematic study, which focuses on exploring the objectives, challenges and impact of zoning use in relation to diseases of interest to Members. The associated report shows that 70% of countries affected by HPAI in poultry have used zoning. It also shows that for 81% of the responding Members, implementing zoning had a positive impact on the control of avian influenza. More than a quarter of Members have not yet integrated WOAH standards on zoning into their regulatory framework (27% of responding Members reported partial or no integration) or into their practices (34% of responding Members). The figures are much lower for compartmentalisation, with only 10 countries/territories out of 139 reporting the implementation of this measure via WAHIS for 2023. The Observatory thematic study on the use, challenges and impact of zoning and compartmentalisation, published in January 2024, is the first part of a wider Observatory project on zoning and compartmentalisation.

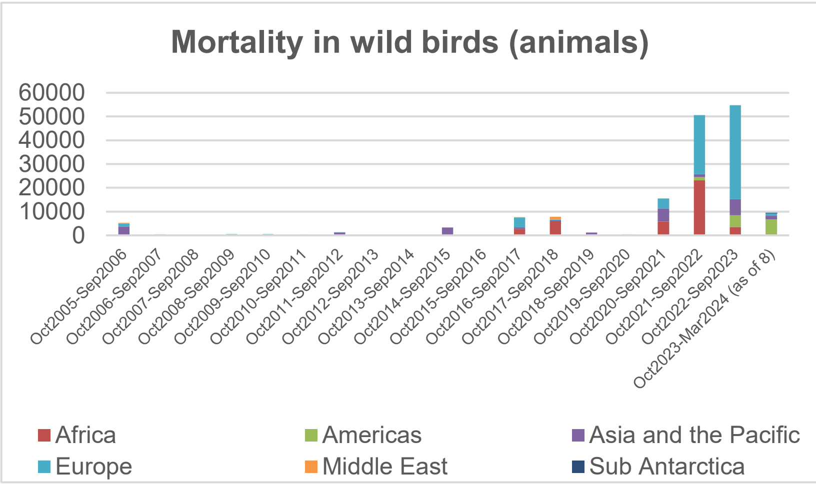
In terms of preparedness, WOAH Members can also ask the Organisation to disseminate on its website announcements on disease introduction simulation exercises taking place in their countries. In 2023 and early 2024 (as of 8 March), six countries informed WOAH of simulation exercises due to take place (Australia, Bolivia, Czech Republic, Guyana, Guatemala and Nicaragua). It is important to note that this list is most likely far from exhaustive, as the WOAH information process is optional for Members.

1.1.7 Mortality in wild birds

HPAI also poses a threat to wild birds. Numerous strains of avian influenza have circulated in wild birds as reservoirs over the past two decades, without causing massive mortality. However, since October 2021, significantly higher mortality has been observed worldwide in wild birds, as shown in Figure 7. Between October 2021 and September 2022, countries and territories reported more than 50,000 deaths in wild birds (almost half in Africa and half in Europe), which is unprecedented in the figures reported to WOAH. Between October 2022 and September 2023, the figure increased slightly (55,000 deaths, three-quarters of which were notified by European countries/territories). This is all the more worrying given that 41% of the deaths were reported for 49 species[18] on the International Union

[18] *Accipiter brachyurus, Alectoris rufa, Amazona oratrix, Anser erythropus, Aquila heliaca, Aquila rapax, Ara militaris, Ardenna grisea, Aythya baeri, Aythya ferina, Balearica regulorum, Branta ruficollis, Branta sandvicensis, Bubo scandiacus, Centrocercus urophasianus, Charadrius nivosus, Ciconia boyciana, Eudyptes chrysocome, Falco cherrug, Fratercula arctica, Grus japonensis, Grus monacha, Grus vipio, Gymnogyps californianus, Haematopus ostralegus, Haliaeetus pelagicus, Larosterna inca, Larus audouinii, Marmaronetta angustirostris, Melanitta fusca, Mergus squamatus, Morus capensis, Numenius arquata, Pelecanus crispus, Pelecanus thagus, Phalacrocorax capensis, Phoebastria irrorate, Phoenicopterus chilensis, Platalea minor, Procellaria aequinoctialis, Rhea americana, Rissa tridactyla, Sagittarius serpentarius, Somateria mollissima, Spheniscus demersus, Spheniscus humboldti, Streptopelia turtur, Thalasseus elegans, Vultur gryphus*

for Conservation of Nature (IUCN) Red List, with a status of near threatened, vulnerable, endangered, or threatened with extinction. The impact of the disease on the population of an endangered species, the Cape Cormorant (*Phalacrocorax capensis*) in Namibia and South Africa, during the HPAI outbreaks between October 2017 and September 2022, was particularly severe: more than 26,000 birds died from the disease, equivalent to 11% of the adult population of this species worldwide, according to the latest estimates. It should be noted that for wildlife in general, the figures reported by official institutions to WOAH are most likely greatly underestimated, due to areas without surveillance (as shown in Section 1.1.2), the difficulty of detecting dead animals and obstacles to reporting, such as the fact that wild birds may not fall within the remit of the Veterinary Services and the lack of coordination between the services concerned. According to the statement by OFFLU experts (December 2023), between the first detection of the HPAI H5 virus in South America in October 2022 and November 2023, nearly 600,000 birds died. The experts were in no doubt that these figures represented only a fraction of the total mortality. Only around 10,000 of these deaths have been reported by countries to WOAH.



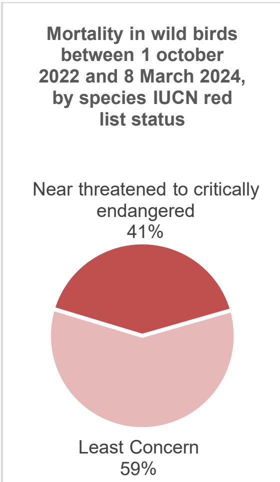
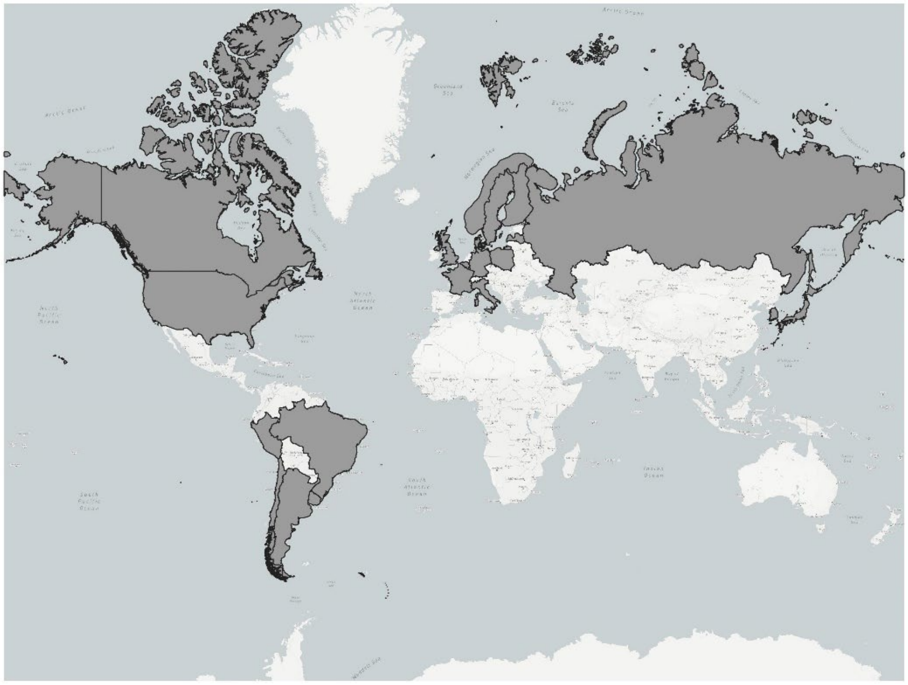


Figure 7. *Number of wild bird deaths due to HPAI reported to WOAH, by global seasonal wave, between 2005 and 2024 (as of 8 March), and IUCN Red List status of wild birds reported dead between 1 October 2022 and 8 March 2024. OFFLU experts considered that these figures most likely represented only a fraction of the total mortality (see statement from December 2023)*

1.1.8 Cases in mammals

Another major change in the situation is the increase in the number of HPAI cases in mammals. The virus has evolved with mutations to adapt to mammalian hosts[19], while retaining the ability to infect birds. This should serve as a reminder that the threat of an influenza pandemic (in humans) persists. Between 1 January 2023 and 8 March 2024, 22 countries and territories in the Americas, Asia and the Pacific, Europe, and Sub-Antarctica informed WOAH of cases in 39 different mammal species: 5 species of farmed fur-bearing mammals, 11 species of wild marine mammals, companion animals (cats and dogs), 19 species of terrestrial wild mammals, and 3 species of terrestrial or marine mammals in captivity. Several cases were reported in species on the IUCN Red List, with a status of near threatened, vulnerable, endangered, or threatened with extinction (in the group of marine mammals: Burmeister's porpoise (*Phocoena spinipinnis*), Chilean dolphin (*Cephalorhynchus eutropia*) and northern fur seal (*Callorhinus ursinus*); in the category of terrestrial wildlife: Eurasian otter (*Lutra lutra*), marine otter (*Lontra felina*), polar bear (*Ursus maritimus*) and southern river otter (*Lontra provocax*), and in the category of wild mammals in captivity: lion [*Panthera leo*]). The map in Figure 8 shows the countries and territories that have reported these cases. The type of mammal reported by countries in each WOAH region is shown in the graph below the map. Cases in all five mammalian categories have been reported in Europe, with 10 countries reporting cases in wild terrestrial mammals. The Americas is the region where the largest number of countries (six) have reported cases in marine mammals. According to the experts, these figures are grossly underestimated. According to OFFLU experts (December 2023): between the first detection of the HPAI H5 virus in South America in October 2022 and November 2023, around 51,000 mammals died. Only around 3,000 of these were reported by countries to WOAH. Furthermore, WOAH does not request specific data on the surveillance carried out in the various countries for HPAI in mammals, but it is very likely that this is not a widespread practice worldwide, which could help to explain the absence of notified cases in certain regions of the world where birds/poultry are affected, such as Africa or the Middle East. On the other hand, it is important that Members that do apply surveillance share information on cases with WOAH and the international community.

[19] Bordes L *et al*. 2023. Highly pathogenic avian influenza H5N1 virus infections in wild red foxes (*Vulpes vulpes*) show neurotropism and adaptive virus mutations. Microbiology Spectrum, 11(1), pp.e02867-22.



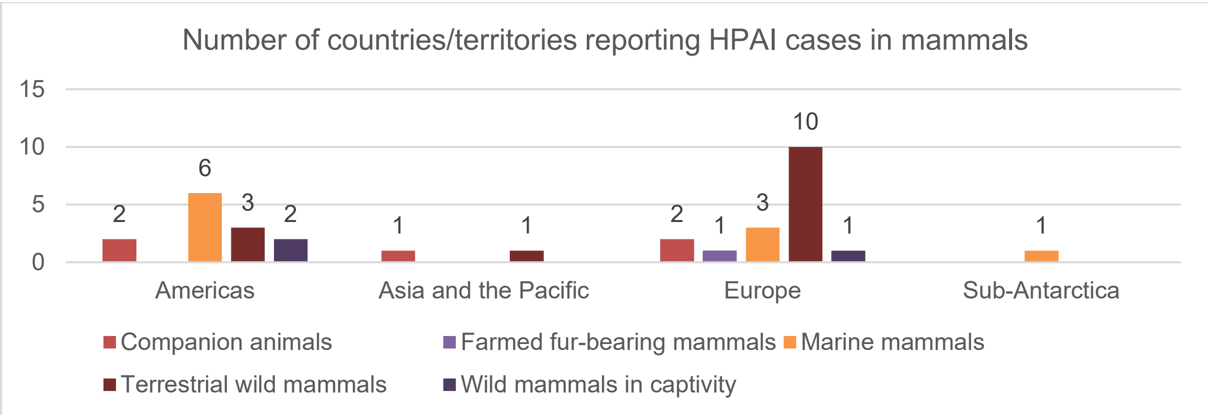


Figure 8. *Countries that reported HPAI cases in mammals to WOAH, between 1 January 2023 and 8 March 2024. The number of countries in each WOAH region reporting HPAI in each category of mammals is shown in the graph below the map*

1.1.9 Cases in humans

Avian influenza is a zoonotic disease, and WHO receives reports of confirmed human cases detected in different countries. In 2023 and early 2024 (as of 8 March), WHO recorded 11 sporadic human cases: in January 2023 in Ecuador, in February 2023 in Cambodia, in March 2023 in Chile and China, in May 2023 in the United Kingdom (2 cases), in November 2023 in Cambodia (2 cases), in January 2024 in Cambodia (2 additional cases) and China. These cases continue to be monitored very closely, given the potential for the virus to evolve. According to WHO, current avian influenza viruses have not demonstrated sustained person-to-person transmission in humans. The primary risk factor for human infection appears to be exposure to infected live or dead poultry or contaminated environments, such as live bird markets. Slaughtering, defeathering, handling carcasses of infected poultry, and preparing poultry for consumption, especially in household settings, are also likely to be risk factors[20].

1.2 Infection with African swine fever virus

The unprecedented global spread of African swine fever (ASF) has been a major concern since 2007, with the disease emerging and spreading in various European, Asian and American countries[21]. The ability of the virus to remain viable in raw or insufficiently cooked pork products has facilitated its spread to sub-Saharan Africa and then to other continents[22]. Since 2005, 80 countries and territories have reported the disease present or suspected (32 in Africa, two in the Americas, 22 in Asia, 23 in Europe and one in Oceania).

Given the current global presence and spread of ASF, and its complex epidemiology, controlling the disease is becoming increasingly challenging.

In July 2020, WOAH and FAO developed a joint initiative for the Global Control of ASF under the umbrella of the FAO/OIE Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) Global Initiative for the control of ASF (Global Initiative). The Global Initiative recognises that global control of ASF requires improving the capability of countries to control ASF through risk assessment and risk communication, and establishing an effective coordination and cooperation framework, which includes timely notification and sharing of important epidemiological information.

1.2.1 Surveillance

Effective control and eradication of ASF requires the timely exchange of accurate and reliable data on the epidemiological dynamics of the disease at a national, regional and international level. In turn, this depends heavily on the surveillance efforts undertaken by countries. Surveillance data for the period 2020–2023 was analysed, as reported by 163 countries and territories to WOAH in their six-monthly reports. In terms of an obligation to notify the disease at national level, only 86% of countries and territories (140/163) declared the disease as notifiable, with regional variations, and a particularly low percentage in Asia (Africa: 85%; the Americas: 97%; Asia: 70%; Europe: 100%; Oceania: 86%). Surveillance activities were considered to have been present during the period, in domestic animals and/or wildlife, if at least one of the following control measures was declared in the six-monthly reports: general surveillance, monitoring, targeted surveillance and screening. At the global level, 48% of the reporting countries and territories reported surveillance activities in both domestic and wild animals, 34% reported surveillance activities in domestic animals only, and 1% in wild animals only; 16% reported no surveillance activities at all. The percentages for the different groups and by region are shown in Figure 9. According to the reported data, Europe was the region with the most intensive surveillance activities, with 100% of countries and territories reporting that they monitor the presence of the disease in domestic animals and/or wildlife, followed by Oceania with 88% of countries and

[20] WHO, October 2023, Influenza (Avian and other zoonotic),
[21] Blome, S *et al.* 2020. African swine fever–A review of current knowledge. Virus Research, 287, p.198099.
[22] Penrith, M.L., 2020. Current status of African swine fever. CABI Agriculture and Bioscience, 1(1), p.11.

territories, Africa (82%), the Americas (77%) and finally Asia (70%). As expected, surveillance activity was mostly focused on domestic animals while surveillance in wildlife was far lower in several regions (e.g. 31% in Africa, 37% in the Americas, 40% in Asia) with the exception of Europe where both domestic animals and wildlife are covered under surveillance activities in 83% of countries/territories.

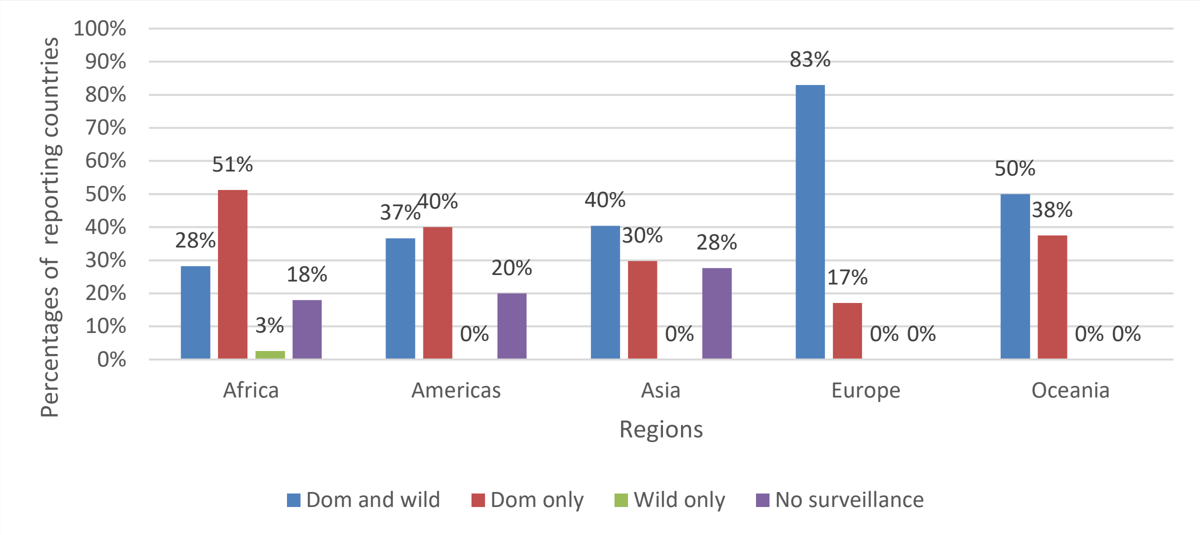


Figure 9. *Percentage of reporting countries and territories that declared some type of surveillance activity in domestic (dom) animals, wildlife (wild), or both, in the period 2020-2023, by geographical region*

Figure 9 highlights the wide regional variation in the use of surveillance activities. In general, the use of surveillance varies considerably between regions, both in domestic animals and in wildlife.

In Africa, surveillance is largely focused on domestic animals only, unlike other regions where there is a much higher likelihood of surveillance in both domestic and wild animals. In Europe, surveillance is extensively reported in both domestic animals and wildlife. In particular, surveillance in wildlife in Europe is widely conducted by most Members, highlighting the significant efforts made by the region to monitor the evolution of the disease in wild boar.

Based on these results, a further analysis was run to assess the level of preparedness of ASF-free countries for disease introduction. In other words, how likely is it that an ASF-free country would be able to detect a disease introduction quickly, given that it already has a surveillance system in place? The results of the analysis are provided in Table 1 and Figure 10 below.

Table 1. *Assessment results on the level of preparedness of ASF-free and ASF infected countries for disease detection*

During the period 2020–2023, 159 countries/territories provided information on their ASF status (countries/territories that reported ASF status as 'no information available' were excluded).	
53 (33%) reported ASF presence	**106 (67%) reported ASF absence**
Surveillance is important in infected countries to properly monitor the evolution and dynamics of the virus, its virulence, its introduction into previously free areas, the consequences for domestic and wild pig populations, and to provide decision-makers with data for disease prevention and control and to evaluate the effectiveness of decisions taken to reduce and limit the impact of the disease.	Disease surveillance is also crucial in free countries for early detection, in order to react quickly and contain any introduction of the virus. The analysis of surveillance activities therefore also takes into account the disease status in the country.
In affected countries/territories, 98% (52/53) reported implementing surveillance activities (see Figure 10)	**In countries with ASF being reported absent, 78% (83/106) reported implementing surveillance activities (see Figure 10)**
In conclusion, infected countries regularly carry out surveillance activities to monitor the disease.	In conclusion, free countries have a significantly higher probability (odds ratio = 14.3) of not carrying out surveillance for disease introduction (Fisher's Exact Test; p<0.001).
Recommendation for Members Even if ASF is absent, WOAH encourages surveillance so that if the virus is introduced, it can be detected promptly and measures can be taken to contain and eradicate the disease before it spreads any further.	

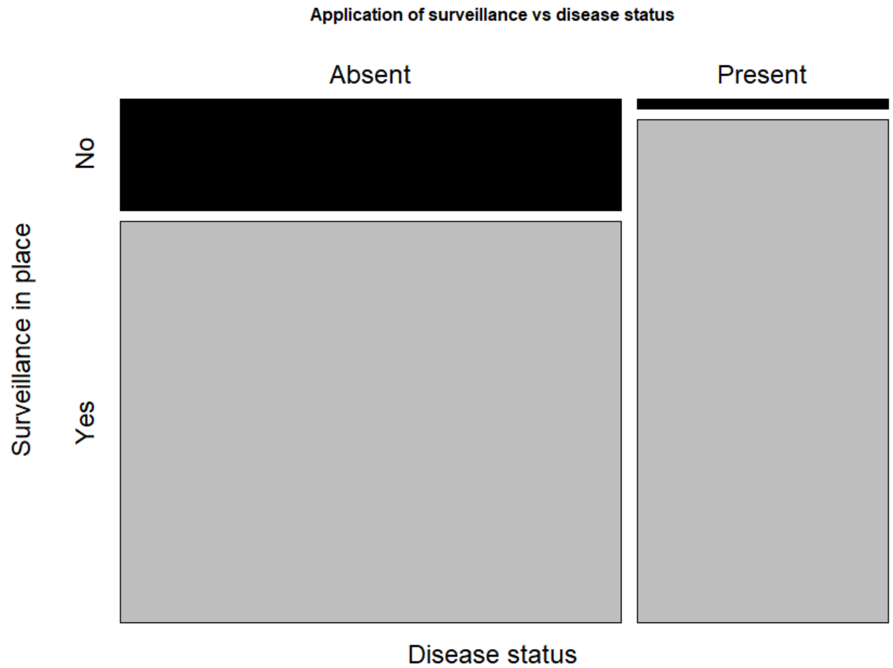


Figure 10. *Mosaic plot showing the use of surveillance activities (yes or no) according to reported African swine fever status (disease present [n=53 countries] or absent [n=106 countries]). The size of the rectangle is proportional to the number of reporting countries and territories for that combination of surveillance and disease status information*

In this context of a number of countries and territories having no official surveillance for ASF in either domestic or wild animals or only partial surveillance (i.e. surveillance activities in domestic animals but not in wild animals), it is important not only for WOAH but also for national Veterinary Services to consider and integrate an epidemic intelligence approach to animal health surveillance and monitoring in order to improve their capacity to detect and respond to the disease.

WOAH uses several sources of official and unofficial information to evaluate the disease situation and encourage Members to be transparent in reporting disease events. Some of these sources are already included and verified in a semi-automated manner (through news circulating in the media), as well as through the use of a dedicated web-scraping tool such as the Epidemic Intelligence from Open Sources (EIOS) system. Nevertheless, other methods still need to be explored to enable the efficient use of other sources and data to which WOAH has access in the framework of its daily activities and exchanges with its network of experts and Reference Centres. WOAH's current approach, using unofficial media reports and news available on the web, led to five different countries being contacted in 2023 and early 2024 to remind them of their obligations regarding the submission of immediate notifications.

1.2.2 ASF reporting to WOAH since 2007

Before 2007, the presence of the disease was mainly restricted to Africa, with 32 countries reporting its presence. In 2007, ASF genotype II was confirmed in Georgia and from there it gradually spread to neighbouring countries (i.e. Armenia, Azerbaijan, Russia and Belarus), the European Union (2014), Asia (2018), Oceania (2019) and the Americas (2021), becoming panzootic, with the presence of the virus in all geographical regions of the world. Since 2007, 36 countries and territories (one in Africa and the rest outside Africa) have submitted an immediate notification to WOAH, to report their first occurrence of the disease, while 155 immediate notifications have been submitted for the first occurrence of the disease in a new zone by 30 already infected countries and territories (six in Africa and the rest outside Africa). In addition, 436 immediate notifications have been submitted for the recurrence of the disease in a zone by 35 countries and territories (14 in Africa and the rest outside Africa). Lastly, one country (Italy) reported the presence of a new ASF strain in two different zones in the country (genotype II reported in Piedmont in 2022 and in Sardinia in 2023) by means of two immediate notifications. Among the 81 infected countries and territories, the presence of the disease has been reported in domestic pigs in 75 countries and in wildlife in 56 countries. Fifty countries have reported the presence of the disease in both domestic animals and wildlife.

1.2.3 ASF reporting to WOAH in 2023 and early 2024

The results presented in Section 1.2.1 are useful to put into context the official disease situation reported to WOAH through WAHIS and to consider the data submitted in the light of the uneven distribution of surveillance in livestock and wildlife at the global level and potential gaps in reporting. Twenty-three countries and territories submitted immediate notifications during the period (as of 11 March), reporting 106 different ASF events. The majority of the events (83.0%) concerned a recurrence of the disease in a zone (88/106), 9.4% of the events (10/106) concerned the first occurrence in a zone, 6.6% of the events (7/106) concerned the first occurrence of the disease in the country and 1.1% (1/106) concerned the occurrence of a new strain in a zone.

During this period seven countries notified their first occurrence of the disease. Albania reported the disease in wild boar in February 2024 (2 outbreaks). The event was declared resolved the same month. In February 2024, Singapore reported the disease in wild boar, with a total of eight outbreaks; the event was declared closed in the same month. In January 2024, Montenegro reported the disease in wild boar and the event was still ongoing as of 8 March 2024. In June 2023, the disease was reported by Bosnia and Herzegovina (21 June) and Croatia (23 June). Both these events involved domestic pigs and wild boar and were still ongoing as of 8 March 2024, Bosnia and Herzegovina having reported 1,571 outbreaks and Croatia having reported 1,149 outbreaks. In August 2023, ASF was reported in wild boar in Sweden. As of 11 March 2024, the event was still ongoing, with 60 outbreaks having been reported. Lastly, in November 2023, Bangladesh notified its first occurrence of ASF, one outbreak having occurred. The event was declared resolved on 31 of January.

From an epidemiological point of view, the report of a new strain in a zone in Italy is highly relevant. Of particular epidemiological relevance is the identification of ASF genotype II in Sardinia, where the historically circulating serotype was genotype I. The country notified this event in January 2024 (the event having started on 19 September 2023). Extensive surveillance and tracing activities were carried out to try to determine the origin of the virus and assess its possible spread, and the event was reported as resolved. It appears that the genotype did not spread further in the area.

Considering the above and reports of genotype I/II recombinant strains circulating in the Asia and the Pacific region, WOAH stresses the importance of including molecular surveillance in national monitoring plans for ASF. This is important for understanding spread patterns and the association with virulence, as well as for vaccine research and the suitable diagnostic techniques to be used[23].

The global distribution of outbreaks reported in 2023, and early 2024 in domestic animals and wildlife is shown in Figure 11.

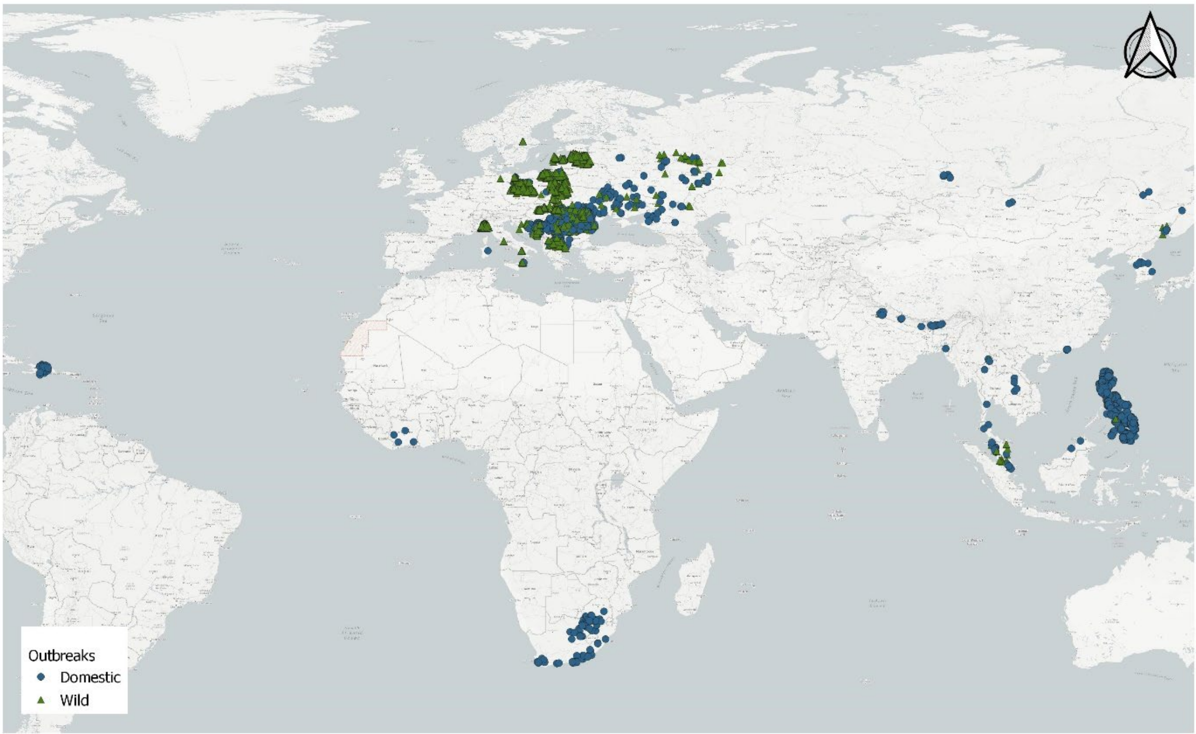


Figure 11. *ASF outbreaks in domestic pigs (blue dots) and wildlife (green triangles) reported through immediate notifications and follow-up reports to WAHIS in 2023 and early 2024 (as of 8 March)*

[23] Zhao D *et al.* 2023. Highly lethal genotype I and II recombinant African swine fever viruses detected in pigs. Nat. Commun. 14, 3096.

1.2.4 Deterioration of the ASF global situation in 2023 (compared to 2022)

Having presented the current situation of ASF in 2023 and early 2024 and its rapidly evolving dynamics, it is important to compare the current situation with the disease situation in the previous year (2022) to provide further background for the interpretation of these data. This will help to put the data presented into context and to try to answer the question: did the situation in 2023 deteriorate or improve?

To this end, a series of simple disease dynamics indicators are used to compare ASF evolution in 2022 and 2023. The results are shown in Table 2.

Table 2. *Evolution of the ASF epidemiological situation between 2022 and 2023 – variations between ASF dynamics indicators. For ease of interpretation, the table indicates whether the disease situation improved or deteriorated, based on the indicators*

Disease dynamics indicators	Year 2022	Year 2023	% variation in 2023	ASF evolution
No. of new events	78	94	+120%	Deterioration
No. of reporting countries	14	21	+150%	Deterioration
No. of events for first occurrence in a country	1	5	+500%	Deterioration
No. of events for first occurrence in a zone	11	9	-22%	Improvement
No. of events for recurrence of the disease	65	79	+121%	Deterioration
No. of outbreaks reported in domestic pigs	1,454	4,969	+342%	Deterioration
No. of outbreaks reported in wildlife	4,969	5,888	+118%	Deterioration
No. of cases reported in domestic pigs	184,878	281,868	+152%	Deterioration
No. of cases reported in wildlife	7,984	8,520	+107%	Deterioration
No. of losses reported in domestic pigs	455,619	897,250	+197%	Deterioration

In summary, almost all the indicators point to a deterioration in the epidemiological situation of the disease in 2023 compared to 2022. In general, more events were reported in 2023 and, in particular, more introductions of the disease in previously unaffected countries were reported: 2023 was a particularly challenging year for ASF control, with the disease spreading to five new countries. This situation is well reflected in the increased number of outbreaks, cases and losses. The improvement in the number of events reported for the first occurrence in a zone may be biased and not reflect reality, as it may be influenced by the reporting behaviour of countries (i.e. countries already infected may not necessarily report each event in a new area as a new notification).

1.2.5 Important epidemiological role of wild pigs

According to the information compiled above, the ASF situation worsened in 2023. The disease remains a problem of domestic animals, with the wildlife situation being a particular concern in Europe. Figure 9 (p. 20) also shows the uneven distribution of surveillance efforts at global level: while the information detected and reported in domestic pigs can be considered quite robust and accurate, the information on wildlife presents significant gaps. This is worrying as it has been widely demonstrated that wildlife plays a significant role in the dynamics of ASF in Africa[24] and Europe[25]. The role of wildlife in the

[24] Jori F *et al.* 2007. The role of wild hosts (wild pigs and ticks) in the epidemiology of African swine fever in West Africa and Madagascar. CIRAD.
[25] Pepin KM *et al.* 2020. Ecological drivers of African swine fever virus persistence in wild boar populations: Insight for control. Ecology and Evolution, 10(6), pp.2846-2859.

epidemiology of ASF, though less documented in Asia and the Pacific, is a particular concern in that region[26]. Many studies collectively suggest that wild pigs are key players in the dynamics of ASF, and understanding the role of wildlife in ASF is crucial for effective disease control[27].

This information, together with the data presented elsewhere in the section on ASF in this section, is a clear indication that Members should improve their surveillance systems for ASF in wildlife.

1.2.6 ASF: a risk for biodiversity

Proper monitoring of ASF in wildlife is important not only to better understand the disease epidemiology and dynamics but also from a biodiversity conservation and ecological point of view.

According to the literature, ASF affects members of the pig family (Suidae). European wild boar and feral pigs are susceptible to the disease, exhibiting clinical signs and mortality rates similar to those observed in domestic pigs. In contrast, African wild pigs such as warthogs (*Phacochoerus aethiopicus*), bush pigs (*Potamochoerus porcus*) and giant forest hogs (*Hylochoerus meinertzhageni*) are resistant to the disease and show few or no clinical signs[28]. The susceptibility of peccaries (*Tayassu* spp.) has not been demonstrated, despite one attempt to infect collared peccaries (*Tayassu tajacu*) in 1969, which was unsuccessful.

On the other hand, knowledge of the susceptibility of Asian endemic wild pig species is very limited[29] (Table 2). Susceptibility has so far only been confirmed in three species: *Porcula salvinia*, *Sus barbatus* and *Sus cebifrons.* This is a serious concern as all three species are listed by the IUCN as endangered.

Table 3. *Asian endemic wild suid species with an endangered IUCN status (NT = near threatened; VU = vulnerable; EN = endangered; CR = critically endangered), the geographical range of the species and the presence of the disease in the country, as reported to WOAH via WAHIS. Wildlife surveillance activities reported in the country are also included in the table*

Species	IUCN status	Geographical range	ASF reported in WAHIS is species range	Cases reported in WAHIS for this species	Surveillance in wildlife reported in WAHIS by the countries concerned
Babyrousa babyrussa	VU	Indonesia	Yes	No	Yes
Babyrousa celebensis	VU	Indonesia	Yes	No	Yes
Babyrousa togeanensis	EN	Indonesia	Yes	No	Yes
Porcula salvania	CR	India, Bhutan	Yes	Yes (Czech Republic zoo animal)	**No**
Sus ahoenobarbus	NT	Philippines	Yes	No	Yes
Sus barbatus	VU	Brunei Darussalam; Indonesia; Malaysia	Yes (Indonesia; Malaysia)	Yes (Malaysia)	Yes
Sus cebifrons	CR	Philippines	Yes	Yes (Hungary in zoo animal and Philippines in wild animals)	Yes
Sus celebensis	NT	Indonesia	Yes	No	Yes
Sus oliveri	VU	Philippines	Yes	No	Yes
Sus philippensis	VU	Philippines	Yes	No	Yes
Sus verrucosus	EN	Indonesia	Yes	No	Yes

[26] Oberin M *et al.* 2022. The potential role of wild suids in African swine fever spread in Asia and the Pacific region. Viruses, 15(1), p.61.
[27] Jori F *et al.* 2009. Role of wild suids in the epidemiology of African swine fever. EcoHealth, 6, pp.296-310.
[28] WOAH, African swine fever.
[29] Luskin MS *et al.* 2021. African swine fever threatens Southeast Asia's 11 endemic wild pig species. Conservation Letters, 14(3), p.e12784.

Table 3 provides important data on the information currently available on ASF presence and endangered wild suid species (and therefore on the potential disease impact), in particular:

- ASF has been reported in all countries where endangered species of wild pigs are present.
- To date, Malaysia has reported cases in wild populations of *Sus barbatus* and Philippines in wild population of *Sus cebifrons*, while European countries have reported cases in zoo animals of *Sus cebifrons* and *Porcula salvinia* species, demonstrating the susceptibility of these species to the virus.
- Two of the species are listed as critically endangered, the highest level of extinction risk used by the IUCN, and both have demonstrated susceptibility to ASF virus (*Porcula salvinia* and *Sus cebifrons*). The reporting of cases in the wild population of *Sus cebifrons* in the Philippines raises concerns about the impact of the disease on the conservation of this species, given the highly fragmented and reduced size of the population.
- Most of the affected countries report that they conduct wildlife monitoring, with the exception of a few countries that host the last surviving individuals of the critically endangered *Porcula salviniai* species, known to be susceptible to ASF (remaining population estimated at around 250 individuals).

1.2.7 Vaccination

Vaccination can be an effective tool for disease control, but there has long been a lack of effective vaccines to control ASF. WOAH published a statement in October 2023 to warn Veterinary Authorities and the pig industry of the risks involved in using substandard vaccines. This statement emphasised the importance of using only high quality ASF vaccines with proven efficacy and safety that have been evaluated and approved by regulatory authorities in accordance with WOAH international standards.

In February 2024, draft standards on the manufacture of safe and efficacious vaccines for ASF were circulated by the Biological Standards Commission to WOAH Members for a second round of commenting. Members and relevant WOAH Reference Laboratories are invited to actively participate in this second round of comments and contribute to the development of these important standards. The standards were drafted after a series of surveys, in-person exchanges with subject matter experts and five technical workshops, including one with key vaccine regulatory bodies. The WOAH Reference Laboratory network was also extensively consulted.

1.2.8 Other tools and services offered by WOAH to control ASF

WOAH has continued to implement activities under the GF-TADs Global Initiative, in collaboration with FAO and other technical partners. In 2023, to facilitate cooperation and dialogue across the regions, the Global Coordination Committee for ASF was launched at the margins of the 90th General Session, bringing together Chairs of the GF-TADs Regional Steering Committees and members of regional Standing Groups of Experts on ASF (SGE-ASF) at meetings of which priority areas in common were collectively identified. These priorities include the development and use of ASF vaccines, strengthening biosecurity and the impact of wild pigs in ASF epidemiology; and these would constitute the focus areas for WOAH in 2024.

In addition, assistance to Members is also provided by laboratory twinning projects. Currently, two twinning projects related to ASF are ongoing:

- United Kingdom (The Pirbright Institute) and Philippines (BAI-VLD-ADDRL), which started in June 2021 and will end in June 2024.
- South Africa (OVI) and Ghana (AVL), which started in September 2023 and will end in September 2026.

1.2.9 Simulation exercises

A way in which countries can improve their preparedness for the introduction and spread of the virus is through the use of simulation exercises.

Since 2002, 58 simulation exercises targeting ASF have been reported to WOAH by 33 different Members, with some of them reporting up to eight exercises. Figure 12 shows their distribution. The majority of simulation exercises were reported by Members in regions of Europe and the Americas.

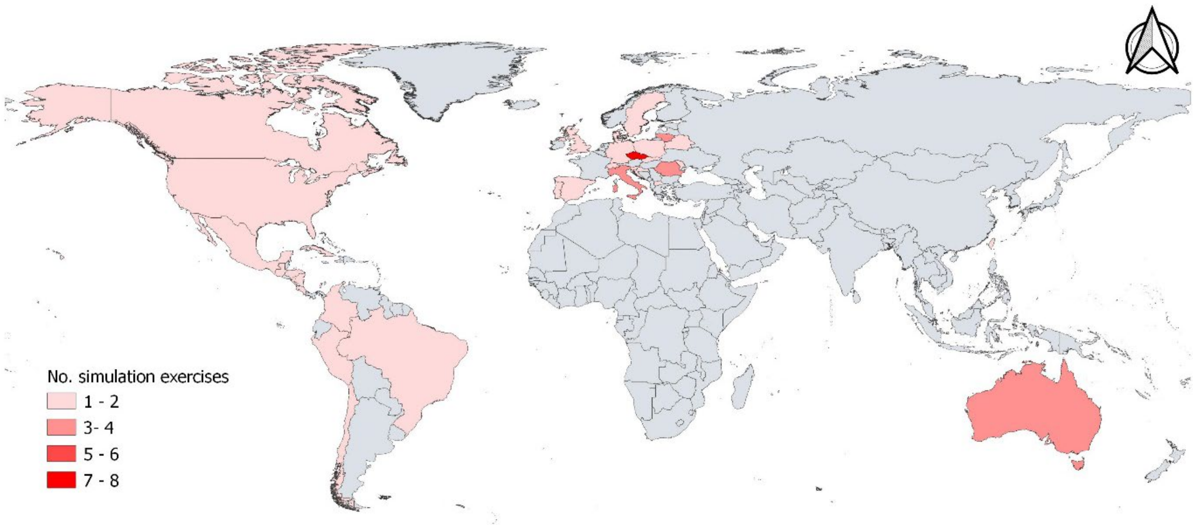


Figure 12. *ASF simulation exercises reported by Members to WOAH for publication during the period 2002–2023. The intensity of the colour is proportional to the number of simulation exercises. Countries shown in grey have never requested WOAH to publish their ASF simulation exercises*

From a temporal point of view, the very first simulation exercises on ASF were reported to WOAH in 2009, with a peak in 2019 (12 simulation exercises). The communication of simulation exercises has followed a statistically significant increasing trend[30] (see Figure 13). This could derive from further efforts by Members to improve their preparedness for disease introduction and containment, and a greater awareness of the opportunity offered by WOAH to publish and share this information with other Members and the general public.

[30] Sen's slope=0.26; p<0.001

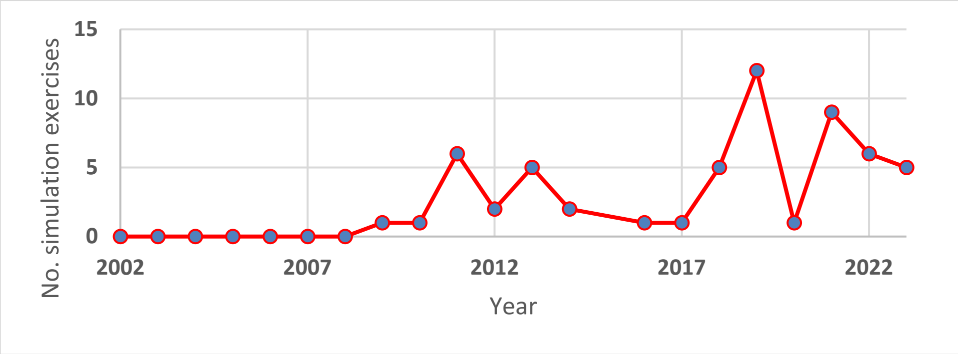


Figure 13. *Temporal variation in the number of announcements of ASF simulation exercises that Members submitted to WOAH for publication during the period 2002–2023*

1.2.10 Self-declarations of freedom

So far, WOAH has received and published 22 ASF self-declarations (still active as of 8 March 2024) from 21 countries.

1.2.11 Zoning and compartmentalisation

Another important way to reduce the impact and spread of ASF at country level is the implementation of zoning and compartmentalisation. The WOAH Observatory dedicated its first thematic study to zoning and conducted a survey to assess the use, challenges, benefits and drawbacks of zoning for three diseases, one of which was ASF.

The survey found that zoning had been used for ASF by 55% of responding Members, and 84% of them considered it to have had a positive impact on ASF control. The main use of zoning for ASF (94% of responding Members) was in response to an outbreak in the country. The main challenges to the implementation of zones were related to staffing levels, enforcement of biosecurity requirements, and laboratory diagnosis. Compared to the other two diseases (avian influenza [AI] and foot and mouth disease [FMD]) covered by the survey, the reported challenges to the implementation of ASF zones appeared to be more severe than the challenges for AI and FMD zones. Further in-depth analysis is ongoing to identify the factors influencing the acceptance of zoning by trade partners. This will be presented at a side event on the margins of the 91st General Session.

Overcoming the barriers to implementation (and acceptance) of zoning requires sustained political will, financial and technical support, capacity building, trust building and effective communication, as well as established coordination mechanisms such as guidelines and bilateral protocols. Members are also encouraged to promote the acceptance of zones by other international organisations, such as the World Trade Organization (WTO), for example through the annual Sanitary and Phytosanitary Measures (SPS) report on the implementation of regionalisation.

1.2.12 Publication of regular ASF situation reports

To inform about the global ASF situation, a tri-weekly update is produced by WOAH and made available on its website. The report provides an update on the recent reporting situation (i.e. the previous 3 weeks), followed by a summary of the main data relating to the period 2022–2024. On average, each report has been viewed by around 800 people (the maximum number for a single report being more than 2,000).

1.3 Infection with foot and mouth disease virus

Infection with foot and mouth disease virus (FMD) was extensively covered in the report presented to the Assembly at the 90th General Session in May 2023 ('Current animal health situation worldwide in regard to selected global strategies and infection with lumpy skin disease virus: analysis of events and trends'). However, to consider the concerns regarding the spread of serotype SAT 2 in the Middle East, this section briefly provides an update on the changes in the global distribution of FMD in 2023 and early 2024 (as of 8 March).

1.3.1 FMD reporting to WOAH in 2023 and 2024

A total of 46 countries/territories reported the presence of FMD in 2023 or early 2024 (as of 8 March). As of 8 March 2024, there were 67 Members[31] recognised as FMD-free where vaccination is not practised, and two Members recognised as FMD-free where vaccination is practised. Twelve Members were recognised as having FMD-free zones: six Members with both zones where vaccination is not practised and zones where vaccination is practised, four Members with only FMD-free zones where vaccination is not practised, and two Members recognised with only FMD-free zones where vaccination is practised. WOAH Members' official FMD status is presented in Figure 14.

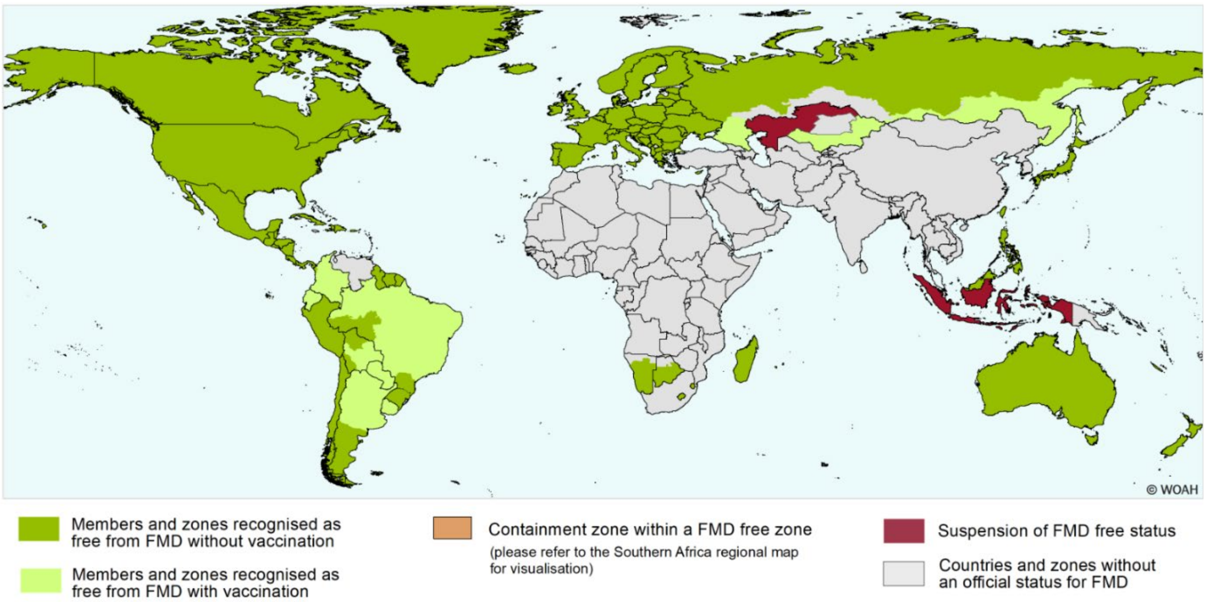


Figure 14. *WOAH Members' official FMD status (last update: March 2024).*

[31] WOAH, Foot and mouth disease.

Between 1 January 2023 and 8 March 2024, 18 immediate notifications relating to FMD were submitted by 12 WOAH Members via WAHIS. In the Africa region, Libya notified recurrences of the disease (serotype O) in March and December 2023. Tunisia notified recurrences of the disease (serotype O) in May and November 2023. Algeria notified the recurrence of FMD (serotype not specified) in December 2023. Malawi and Rwanda reported recurrences of FMD serotype SAT 2 in April and May 2023, respectively. South Africa reported recurrences in January 2024 (serotype SAT 1) and February 2024 (serotype not specified). In the Asia and the Pacific region, China reported four recurrences of serotype O in 2023 (in March, April, May and December, respectively) and the Republic of Korea reported a recurrence of the same serotype in May 2023. Lastly, in the Middle East region, Iraq, Jordan and Oman reported events involving FMD serotype SAT 2 with start dates in January 2023. Türkiye reported the occurrence of SAT 2 in March 2023. This serotype was reported in Jordan, Oman and Türkiye for the first time, while it had not been notified in Iraq since at least 1998, based on the information collected by WOAH. Some of these countries experienced delays in confirming this new subtype (5 to 86 days) and in reporting to WOAH after confirmation (2 to 142 days), particularly those to which SAT 2 spread first. These events occurred outside SAT 2's usual geographical area, which is why it was particularly important to report them quickly.

1.3.2 The specific situation of FMD serotype SAT 2

The detection of new serotypes in countries can be a cause for concern, as it requires rapid adaptation of control strategies. Vaccines need to be adapted to the circulating vaccine strains, which therefore require constant monitoring. The rapid spread of serotype SAT 2 to new areas in early 2023 has attracted the attention of the international community. The map in Figure 15 shows the distribution of serotype SAT 2 notified to WOAH since 2005. During the period under review, SAT 2 was reported for more than 10 years in parts of East Africa (Kenya, Ethiopia, Tanzania, Zimbabwe), West Africa (Benin) and Southern Africa (Botswana, Namibia, South Africa) and for two to nine years in other countries in these regions as well as in Central Africa (Angola, Cameroon, Democratic Republic of Congo). In North Africa and the Middle East, SAT 2 was reported before 2023 in Egypt (in 2012, 2014 and between 2016 and 2020), Palestine (in 2012 and 2013) and Sudan (in 2007, 2009 and 2013). This distribution is likely underestimated as the availability of information depends largely on the typing capacity in the countries affected. WOAH recommends that neighbouring countries and trading partners ensure appropriate surveillance and prevention.

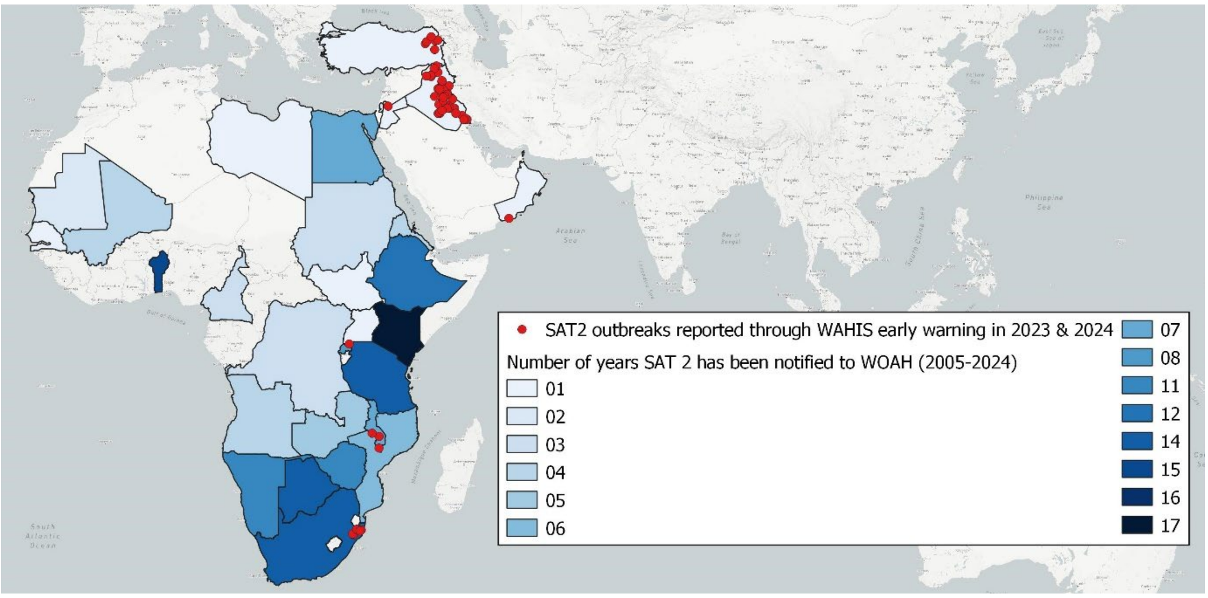


Figure 15. *Countries having notified FMD serotype SAT 2 to WOAH at least once between 1 January 2005 and 8 March 2024 are shown in blue. The shade of blue corresponds to the number of years that SAT 2 has been notified to WOAH during this period. SAT 2 outbreaks reported through the WAHIS early warning system in 2023 and early 2024 (as of 8 March) are indicated by red dots*

1.3.3 FMD surveillance

Figure 16 shows the percentage of countries/territories in the different WOAH regions that reported FMD surveillance in domestic animals and wildlife between 2020 and 2023. A total of 162 countries and territories provided information for at least one semester of this period. Globally, 48% of countries/territories reported implementing general surveillance only, 42% reported implementing a combination of general and targeted surveillance and 3% reported implementing targeted surveillance only. Overall, 93% of countries and territories reported implementing some form of surveillance for FMD, which is high compared to other listed diseases. There are some regional disparities: unlike other regions, the majority of African countries/territories (51%) apply a combination of general and targeted surveillance. It should also be noted that in the Middle East, a high percentage (21%) of countries/territories did not report any surveillance. This percentage must be qualified by the fact that this region has the fewest countries/territories, and that this result is only based on a total of 14 countries/territories that provided information.

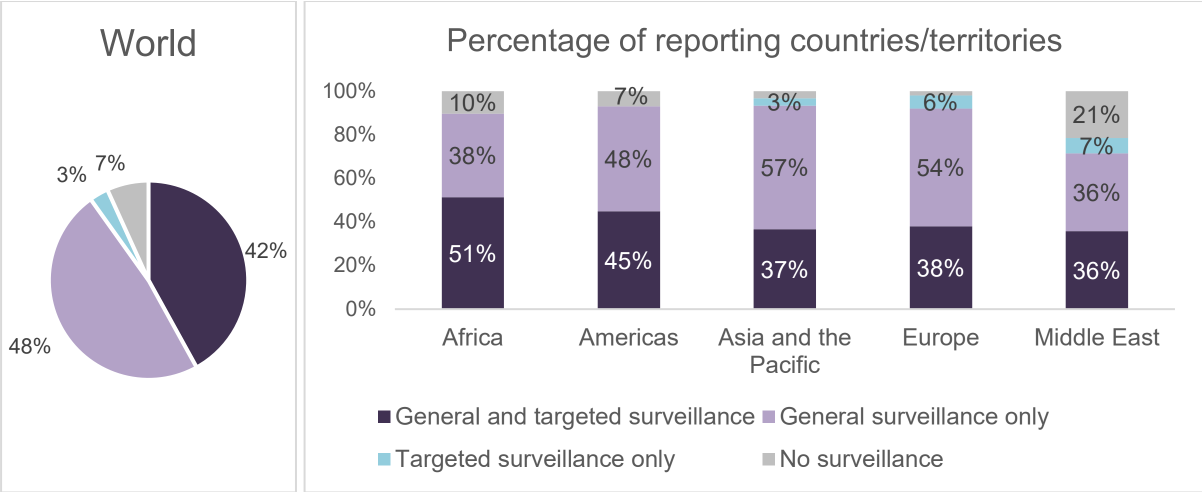


***Figure 16.** Percentage of reporting countries/territories in the different WOAH regions that reported general or targeted surveillance for FMD between 2020 and 2023*

1.3.4 FMD diagnostics and vaccination

Furthermore, countries that need support for surveillance or disease control can call on the WOAH network of Reference Laboratories for FMD. Thus, based on the annual reports submitted by these laboratories to WOAH for 2022, 29 countries/territories sought assistance that year for diagnostic testing (of which 79% reported FMD presence to WOAH) and 11 countries/territories received technical consultancy.

Typing of circulating virus strains is essential for the development and selection of appropriate vaccines for the control of FMD. Vaccination is an important tool for FMD control, as highlighted in the Global Foot and Mouth Disease Control Strategy. Of the 162 countries and territories that provided information for at least one semester between 2020 and 2023, 40% reported the use of official vaccination. In 2016, FAO and WOAH published a set of guidelines for FMD vaccination and post-vaccination monitoring to help countries ensure that vaccination meets its objectives and contributes to sustainable FMD control. In addition, the quarterly reports from the World Reference Laboratory for Foot-and-Mouth Disease (WRLFMD) contain essential recommendations on appropriate vaccine strains, considering evolutions of the epidemiological situation.

1.3.5 FMD serotype C

Resolution No. 30, adopted by the World Assembly of WOAH Delegates in May 2017, concerned serotype C. It highlighted that the WOAH/FAO FMD Reference Laboratory Network had not isolated FMD virus (FMDV) serotype C since 2004, and that the production of FMDV serotype C vaccines and their use in vaccine challenge experiments presented a risk of virus escape. Consequently, WOAH Members, other organisations or laboratories suspecting or identifying the presence of FMDV serotype C were requested to share viral material and information on the virus with the relevant WOAH/FAO Reference Laboratories for confirmation as soon as possible and to report its presence through WAHIS. Since then, FMDV serotype C has not been isolated by the WOAH/FAO FMD Reference Laboratory network, nor has it been reported through WAHIS. WOAH Members are invited to continue implementing Resolution No. 30 of 2017.

1.3.6 Simulation exercises

In 2023 and early 2024 (as of 8 March), eight Members informed WOAH of simulation exercises taking place in their countries (Australia, Ecuador, Guyana, Kazakhstan, New Zealand, Serbia, Türkiye, United Kingdom). It is important to note that this list is far from exhaustive, as the WOAH information process is optional for countries.

1.3.7 Importance of exchanging information as part of the Global Foot and Mouth Disease Control Strategy

WOAH remains committed to promoting transparency in the timely sharing of information on animal diseases, including FMD, and to disseminating this information to the global community. This is essential to support Members in risk management, but also to report on progress in coordinated FMD control efforts globally, in line with the Global Foot and Mouth Disease Control Strategy, and the activities of GF-TADs.

1.4 Relevant epidemiological changes in vector-borne diseases

Vector-borne diseases (VBDs) pose a significant threat to both human and animal health, with some of them being particularly concerning in the last few years[32]. VBDs are a major concern in both developed and developing countries, with the risk of occurrence being particularly high in tropical regions[33], where temperature and humidity conditions are optimal for the presence of most of the vectors. On the other hand, the impact of climate change on the epidemiology of these diseases is also a growing concern, with changes in vector density, activity periods and geographical distribution being observed[34]. In the context of livestock, the economic losses due to VBDs, including vector-borne parasitic diseases, are significant, highlighting the need for effective control measures[35]. VBDs are a very good indicator of climate change, as alterations in climatic conditions are modifying the presence and persistence of vectors and consequently the likelihood of VBD introduction and circulation. Climate change has a significant impact on the transmission of VBDs, allowing them to expand to new areas. The impact of climate change on the transmission of VBDs is a complex topic. The biological and non-biological pathways through which climate change affects VBD transmission are not fully understood[36]. In Europe, climate change has already influenced the spread of VBDs, such as Lyme borreliosis, tick-borne encephalitis and West Nile fever[37]. The potential for the emergence or expansion of VBDs in temperate regions is a concern and it is increasingly corroborated by observational data. However, the transmission potential of these diseases is also influenced by a range of factors, including socio-economics, health-care capacity and ecology[38].

[32] Socha W *et al.* 2022. Vector-borne viral diseases as a current threat for human and animal health—One Health perspective. Journal of Clinical Medicine, 11(11), p.3026.
[33] Dantas-Torres F *et al.* 2016. Best practices for preventing vector-borne diseases in dogs and humans. Trends in parasitology, 32(1), pp.43-55.
[34] Beugnet F *et al.* 2013. Impact of climate change in the epidemiology of vector-borne diseases in domestic carnivores. Comparative Immunology, Microbiology and Infectious Diseases, 36(6), pp.559-566.
[35] Narladkar BW. 2018. Projected economic losses due to vector and vector-borne parasitic diseases in livestock of India and its significance in implementing the concept of integrated practices for vector management. Veterinary World, 11(2), p.151.
[36] Parham PE *et al.* 2015. Climate, environmental and socio-economic change: weighing up the balance in vector-borne disease transmission. Philosophical Transactions of the Royal Society B: Biological Sciences, 370(1665), p.20130551.
[37] Semenza JC *et al.* 2018. Vector-borne diseases and climate change: a European perspective. FEMS Microbiology Letters, 365(2), p.fnx244.
[38] Bygbjerg IC *et al.* 2009. Climate-and vector-borne diseases. Ugeskrift for Laeger, 171(44), pp.3175-3178.

The purpose of this section is to share an update on international reporting of VBDs and provide elements to contribute to the evaluation of climate change in the spread of these diseases.

Of the 90 diseases of terrestrial animals currently listed by WOAH, almost a third are vector-borne (entirely or for which vectors play an important role), some of which have shown a significant evolution in 2023 and early 2024. ASF, which can be transmitted by vectors, has not been considered in this section, as it is dealt with in Section 2.

1.4.1 VBD reporting to WOAH in 2023 and 2024 through immediate notifications and follow-up reports

In 2023 and early 2024 (as of 11 March), the VBDs most frequently reported as exceptional epidemiological events, through immediate notifications and follow-up reports, were West Nile fever (12 notifications in 2023), infection with bluetongue virus (8 notifications), infection with lumpy skin disease virus (7 notifications in 2023), and equine infectious anaemia (6 notifications). WOAH also received reports of equine encephalomyelitis (Western) (3 notifications), infection with epizootic haemorrhagic disease virus (infectious) (2 notifications in 2023), rabbit haemorrhagic disease (2 notifications), equine piroplasmosis (1 notification), fowl typhoid (1 notification), infection with *Leishmania* spp. (1 notification), myxomatosis (1 notification), Rift Valley fever (1 notification), and tularemia (1 notification). A map showing the spatial distribution of VBD outbreaks reported to WOAH in 2023 and early 2024 is shown in Figure 17. Twenty-eight countries and territories reported a total of 2,422 outbreaks. Most of the outbreaks were concentrated in the Americas, with a very large event of equine encephalomyelitis (Western) (1,461 outbreaks), followed by Europe with 697 outbreaks, in this case reported for eight different VBDs. Outside these two regions (Europe and the Americas), lumpy skin disease was the most frequently reported VBD (mainly in Asia, with 144 outbreaks).

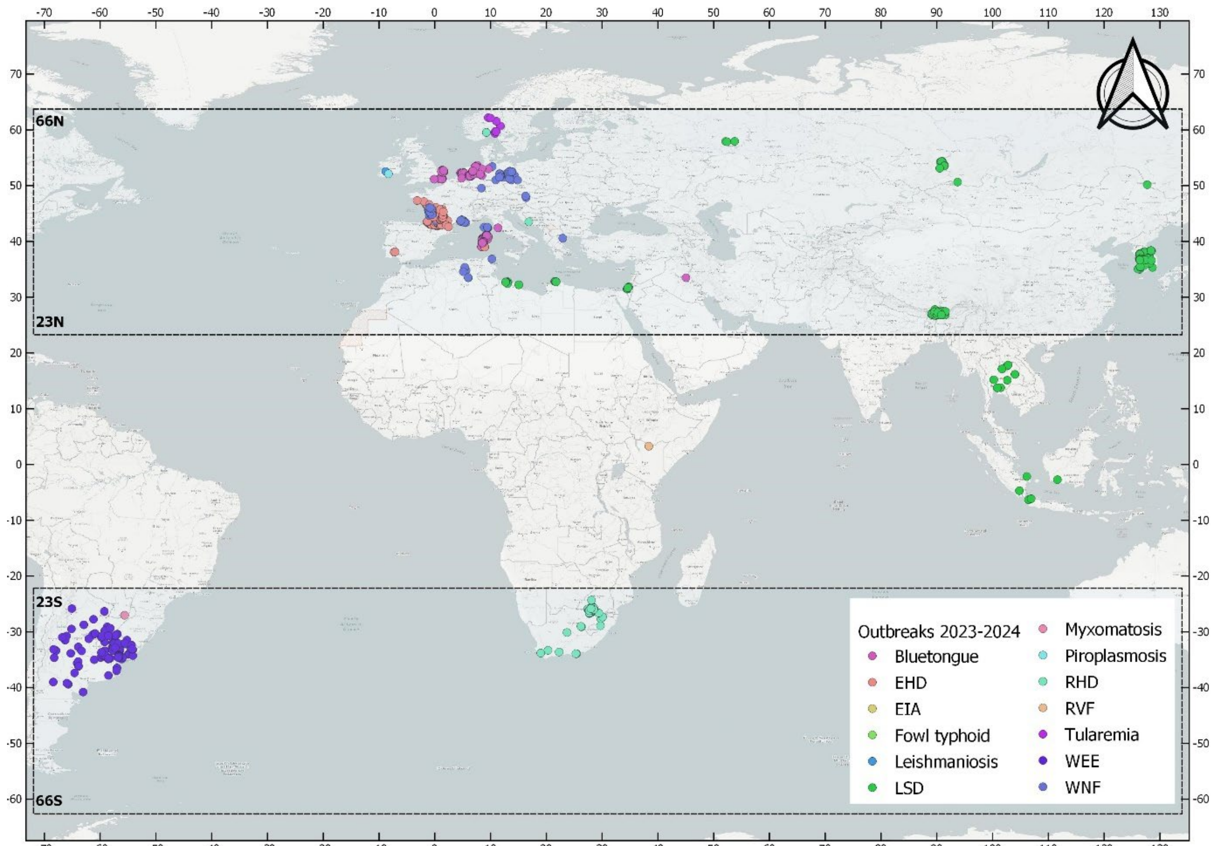


Figure 17. *Spatial distribution of outbreaks reported to WOAH for ten VBDs through immediate notifications and follow-up reports during 2023 and early 2024 (as of 8 March). The limits of the temperate regions (23.5° and 66.5° N/S of the Equator) are shown on the map*

[EHD: epizootic haemorrhagic disease, EIA: equine infectious anaemia, LSD: lumpy skin disease, RHD: rabbit haemorrhagic disease, RVF: Rift Valley fever, WEE: Western equine encephalomyelitis, WNF: West Nile fever.]

1.4.2 Forty percent of reported VBD outbreaks in temperate regions: an impact of climate change?

It is worth noting that 99% of the VBD outbreaks reported as exceptional events in 2023 and early 2024 were detected in temperate regions (i.e. between 23.5° and 66.5° N/S of the Equator).

The latitudes of outbreaks reported through WAHIS in immediate notifications and follow-up reports were extracted to assess changes in the geographical range of reporting of VBDs as exceptional epidemiological events between 2005 and 2023 (n=28,540). The maximum latitude (North and South of the Equator) at which outbreaks were identified for each year was recorded. The trend in reported latitude was analysed using Sen's slope[39], and Spearman correlation test. The analysis showed a significant increasing trend in the maximum latitude at which VBDs were reported over the years (Sen's slope = 0.51; $p<0.01$). Interestingly, the trend in maximum reported latitude follows a similar overlapping upward trend with the global temperature anomalies published by the National Centres for Environmental Information (NOAA) (Figure 18). The temperature anomalies are calculated as the deviation of the yearly temperature with respect to the 1901–2000 average.

[39] Sen's slope is a non-parametric method used to estimate the magnitude and direction of trends in time series data. It represents the rate of change of the data over time

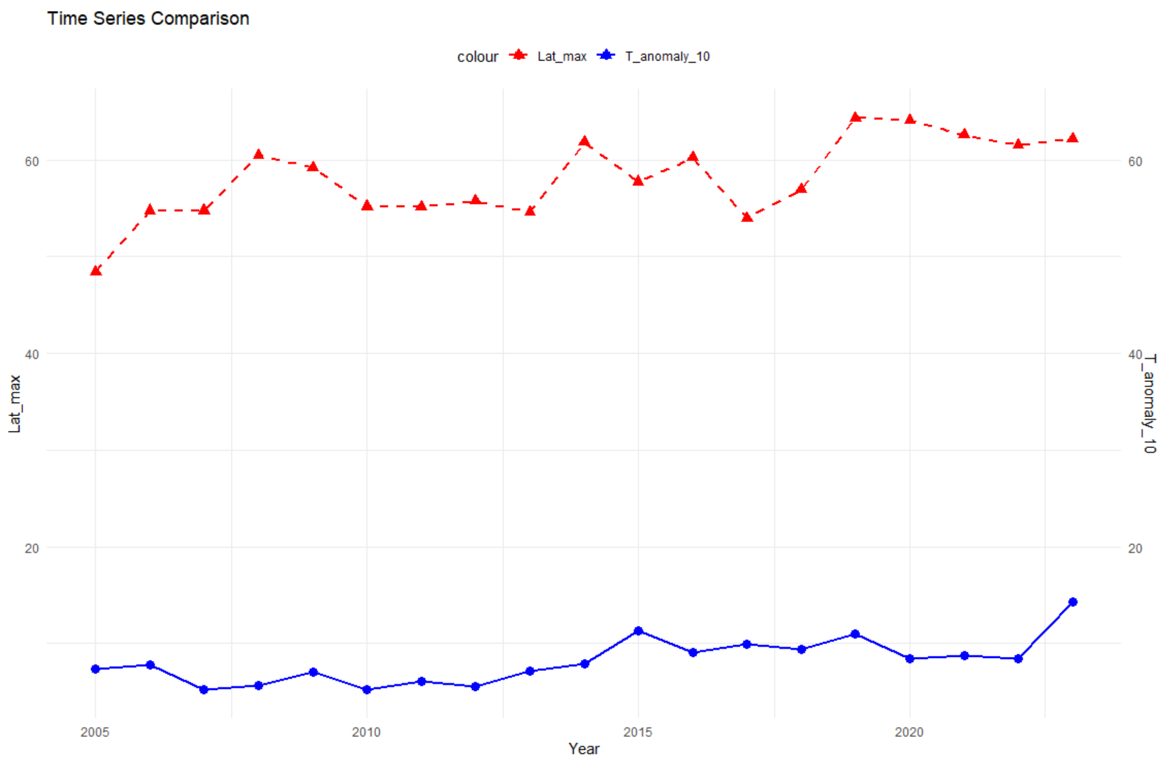


Figure 18. *Time series comparison of the maximum annual latitude at which outbreaks were reported and the global annual anomaly temperature detection for the period 2005–2023. For the comparison, the temperature anomaly values have been multiplied by a factor of 10*

The trend of reported maximum latitude and the trend of temperature anomaly values showed a significant positive correlation (Spearman's rank correlation rho = 0.43; $p<0.05$). A significant positive correlation was also observed between year and maximum latitude (Spearman's rank correlation rho = 0.66; $p<0.001$) and year and temperature anomaly (Spearman's rank correlation rho = 0.74; $p<0.001$). These last results show that the trend is getting stronger every year.

The importance of VBDs for WOAH and disease surveillance is also highlighted by the recently launched WOAH PROVNA project 'Defining Ecoregions and Prototyping an EO-based VBDs Surveillance System for North Africa'. The overall objective of the project is to assist local competent authorities in North Africa (Mauritania, Morocco, Algeria, Tunisia, Libya and Egypt) to identify specific areas where entomological/serological surveillance for VBDs should be carried out. The specific objectives of the project are: i) to define the 'ecoregions' in the study area, to identify areas vulnerable to similar diseases; and ii) to build a tailor-made prototype application (PROVNA), to predict climatic and environmental changes for vector surveillance activities. Additional information on the project can be found on the WOAH website.

To give a more practical perspective on the impact of climate change on the distribution of VBDs and the importance of developing tools to facilitate surveillance in previously unaffected areas, a case study is presented in Section 1.4.3.

1.4.3 The spread of epizootic haemorrhagic disease: an interesting case study

An interesting example of a VBD that has recently expanded its range is epizootic haemorrhagic disease (EHD). EHD is a vector-borne, infectious, non-contagious viral disease of domestic and wild ruminants, primarily white-tailed deer (*Odocoileus virginianus*) and cattle. Sheep, goats and camelids may also be susceptible but usually do not develop symptoms. EDH virus (EHDV) has been isolated from wild and domestic ruminants and arthropods in North America, Ecuador, the Caribbean, French Guiana, Asia, Africa and Australia, and subsequently in countries surrounding the Mediterranean Sea, including Algeria, Israel, Jordan, Morocco, Tunisia and Türkiye[40]. Since 2006, EDH has been reported as an emerging disease by Morocco, Algeria, Tunisia and Israel, to highlight the disease and inform the international community of its spread to new areas. The disease was assessed against WOAH criteria for listing a disease, and it was included in the WOAH list in 2009.

The evolution in terms of countries reporting the presence of EHD since 2009 (year in which the disease was listed by WOAH) is shown in Figure 19. At a global level, 23 countries have reported the presence of the disease since 2009. The evolution in the number of countries affected shows a significant progressive spread of the disease to new areas, particularly with the expansion to countries in Europe since 2022. The apparent decrease in the number of countries reporting the presence of the disease in 2022–2024 must be seen in light of the incomplete information available for the most recent years (not all countries and territories having submitted their six-monthly reports for the most recent years).

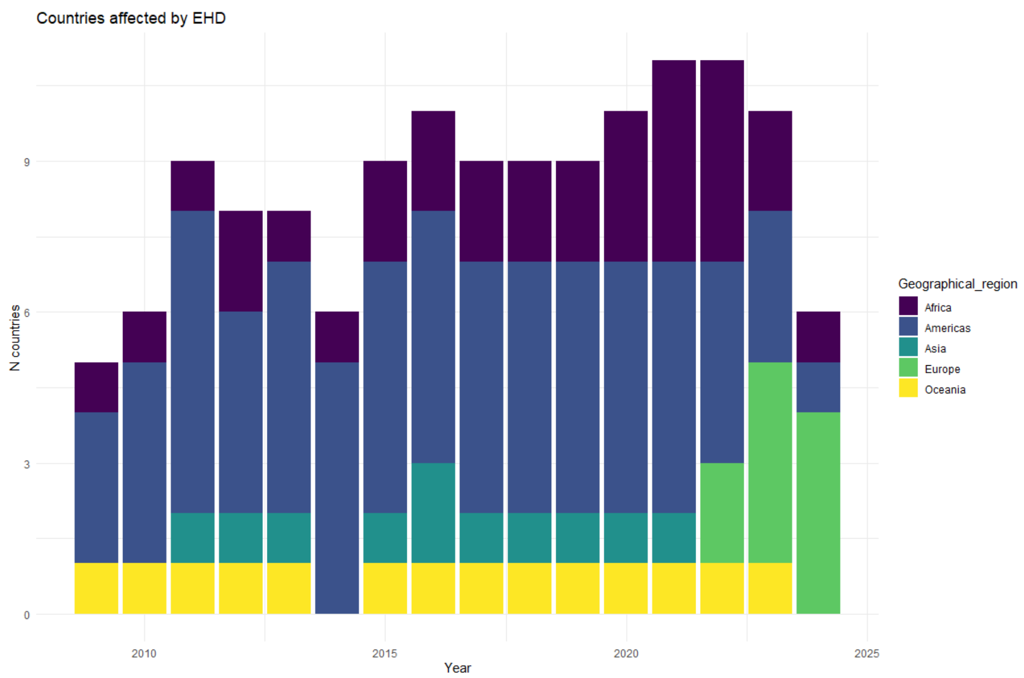


Figure 19. *Evolution of countries reporting the presence of EHD during the period 2009–2024 (as of 8 March). Data for the different geographical regions are shown in the bar chart*

[40] WOAH, epizootic haemorrhagic disease.

In Europe, since 2022, four countries have reported EHD for the first time: Spain (2022), Italy (2022), France (2023) and Portugal (2023). Since 2022, 252 new outbreaks have been reported in Europe. The historical presence of the disease at the global level and the recent expansion of EHD in Europe are shown in Figure 20.

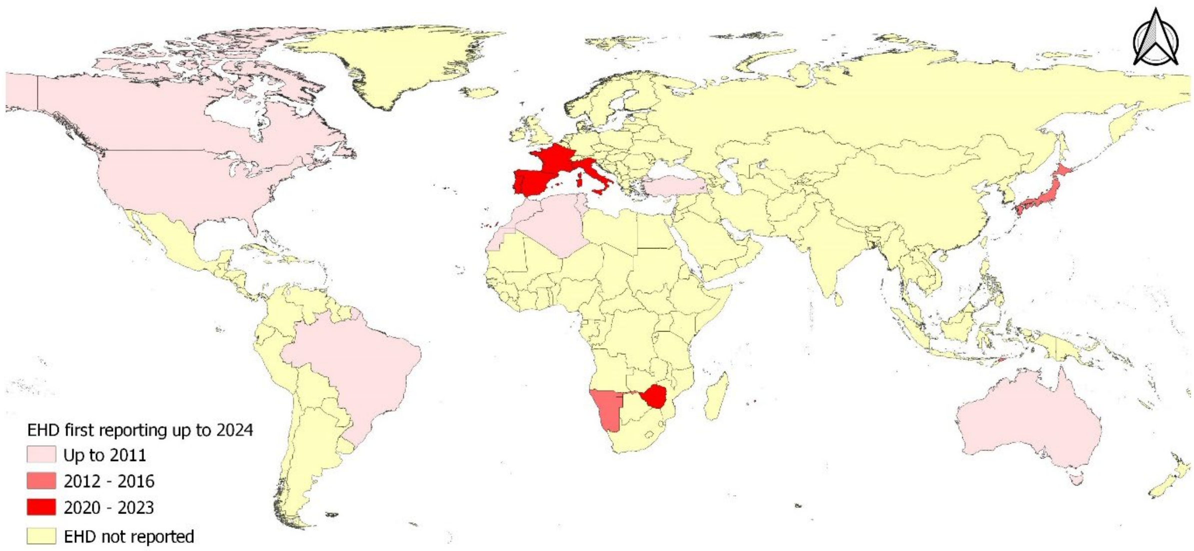


Figure 20. *Global spread of EHD up to 2024. The map categorises countries based on the year of first reporting of the disease*

1.4.4 Self-declaration of disease freedom

During the period 2023–2024 (as of 8 March), only one self-declaration of freedom was submitted for a VBD. In July 2023, Chile submitted a declaration of freedom from equine infectious anaemia in all equids, in accordance with the provisions of Chapter 12.5 and Articles 1.4.6. and 1.6.3. of the *Terrestrial Code*.

In previous years, seven self-declarations of freedom from a VBD had been submitted by seven countries[41] relating to five different VBDs[42]. These self-declarations were still active as of 8 March 2024.

1.4.5 Simulation exercises

During the period 2023–2024 (as of 8 March), simulation exercises were organised on VBDs by two Members. Kazakhstan organised a simulation exercise on African horse sickness in June 2023 and Australia organised a simulation exercise involving lumpy skin disease in September, October and November 2023.

[41] Austria, Egypt, El Salvador, Hungary, New Zealand, Spain and Uruguay
[42] Bluetongue virus (Inf. with), equine infectious anaemia, fowl typhoid, rabbit haemorrhagic disease, *Theileria equi*

1.5 Relevant epidemiological changes in bee diseases

Honeybees were domesticated before recorded history. Nearly one million tonnes of honey are produced worldwide each year, with China being the world's largest producer at nearly 400,000 tonnes. In addition to producing honey, bees are essential for ecosystem services such as pollinating crops (from field crops to tree fruits and nuts, and berries). Three-quarters of the world's crops, worth an estimated €150 billion, require insect pollination, and bees are the most important insect pollinator. Colony collapse disorder (CCD) is a term coined to describe the disappearance or death of entire colonies, and the combination of viral, bacterial and parasitic infections with chemical factors such as insecticides can worsen the health of hives.

Six diseases affecting bees are listed by WOAH. All bees are susceptible to all six of these diseases, but some populations are more resistant than others.

During the period 2023–2024 (as of 8 March), WOAH received two immediate notifications relating to bee diseases: one for *Aethina tumida* (small hive beetle) and the other for *Melissococcus plutonius* (European foulbrood).

The small hive beetle, *Aethina tumida*, is a scavenger and parasite of honeybee colonies. The beetle is native to Africa but has been introduced to the United States of America, Egypt, Canada and Australia through the commercial movement of bees. Considered a minor pest in its native range, it has become a major problem in areas where is has been introduced. Both adult beetles and larvae feed on bee brood, larvae, pollen and honey. The adult female lays her eggs inside the hive. The larvae hatch and feed on brood, pollen and honey, then leave the hive to pupate in the soil, where the adults emerge and fly off to find new hives. Spread can therefore be rapid, as the adults have a range of several kilometres. In severe infestations, bees may abandon the hive. Diagnosis is made by identifying adult beetles in the hive. Treatment is possible with insecticides that kill the beetle and not the bees, but there is a risk of residues in the honey.

Aethina tumida was reported by Mauritius in August 2023 (event started in January 2023), as the first occurrence in the country. Two outbreaks have been reported, and the event is still ongoing.

Since 2005, 28 Members and non-members have reported the presence of the disease. In terms of immediate notifications, since 2005, eight countries and territories have reported the disease as the first occurrence in the country: Brazil (2015), Belize (2016), Eswatini (2018), Colombia (2020), Guatemala (2021), Bolivia and Reunion (2022) and Mauritius (2023). In addition, eight Members reported the occurrence of the disease as the first occurrence in a zone (meaning the spread of the disease to a new area in an already infected country): Mexico (2007), Mexico and the United States of America (2010), Mexico and Cuba (2012), El Salvador (2013), Italy and Nicaragua (2014), Costa Rica (2015) and Paraguay (2022). This trajectory shows a significant expansion of the disease over the last 20 years, mainly in the Americas.

European foulbrood (EFB) of honeybees is caused by the bacterium *Melisococcus plutonius*. Like American foulbrood (AFB), EFB bacteria kill the larvae, leaving empty cells in the comb. The disease is spread by mechanical contamination of honeycombs and therefore tends to persist from year to year. It can also be spread by bees that have survived infection as larvae and shed the bacteria in their faeces. *Melissococcus plutonius* is globally distributed, and its virulence is mainly dependent on its genotype, with host background also playing a role[43]. The pathogenesis, epidemiology and variants of *M. plutonius* have been extensively studied, with recent advances in the understanding of the disease and its control measures[44]. Further research is needed to fully understand the distribution and impact of *M. plutonius* in honeybee colonies.

Melissococcus plutonius was reported by Bolivia, as the first occurrence in a zone, in September 2023; two outbreaks have been reported and the event was still ongoing as of 8 March 2024.

Since 2005, 63 Members and non-members have reported the presence of the disease, which is much more widespread globally than *Aethina tumida*. In terms of immediate notifications, since 2005 the disease has been reported by one nation as its first occurrence in the country (Bolivia, in 2022) and by three countries as the first occurrence in a zone: Chile (2009), Ecuador (2015) and Bolivia (2023). The dynamics observed in terms of disease progression are very similar to those observed for *Aethina tumida*, with expansion into new countries and areas, mainly in the Americas.

The historical spread of the two diseases, in terms of events reported as the first occurrence in a country or zone, is shown in Figure 21. The map highlights the progressive expansion of the two diseases into new areas.

[43] Lewkowski O *et al.* 2019. Virulence of *Melissococcus plutonius* and secondary invaders associated with European foulbrood disease of the honey bee. MicrobiologyOpen, 8(3), p.e00649.
[44] de León-Door AP *et al.* 2021. Pathogenesis, Epidemiology and Variants of *Melissococcus plutonius* (ex White), the Causal Agent of European Foulbrood. Journal of Apicultural Science, 64(2), pp.173-188.

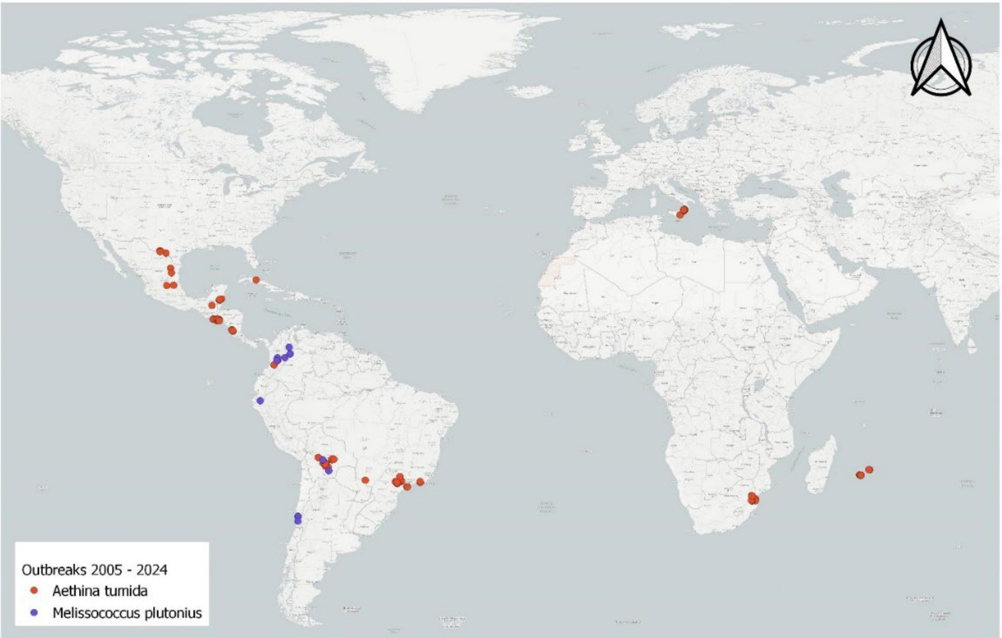


Figure 21. *Global historical occurrence of* Aethina tumida *and* Melissococcus plutonius *reported through immediate notifications and follow-up reports in the period 2005–2024 (as of 8 March). Outbreaks shown on the map indicate the spread of the disease to new countries and territories*

1.6 Relevant epidemiological changes in listed aquatic animal diseases

This section aims to provide a summary of the major epidemiological changes occurring in 2023 and early 2024 (as of 8 March) for WOAH-listed aquatic animal diseases. Updates concerning the information presented in this section on aquatic animal diseases are published every quarter by WOAH, in the form of situation reports (in English) available on the website and shared on social media.

To put this information into context, Figure 22 shows aquatic animal production and capture fisheries quantities by WOAH region and animal category. It is based on the most recent figures recorded by FAO, for the period 2017–2021. It is clear that Asia and the Pacific is the dominant region for global aquaculture production in all categories. For capture fisheries, the picture is more nuanced, although the Asia and the Pacific region also has the highest figures.

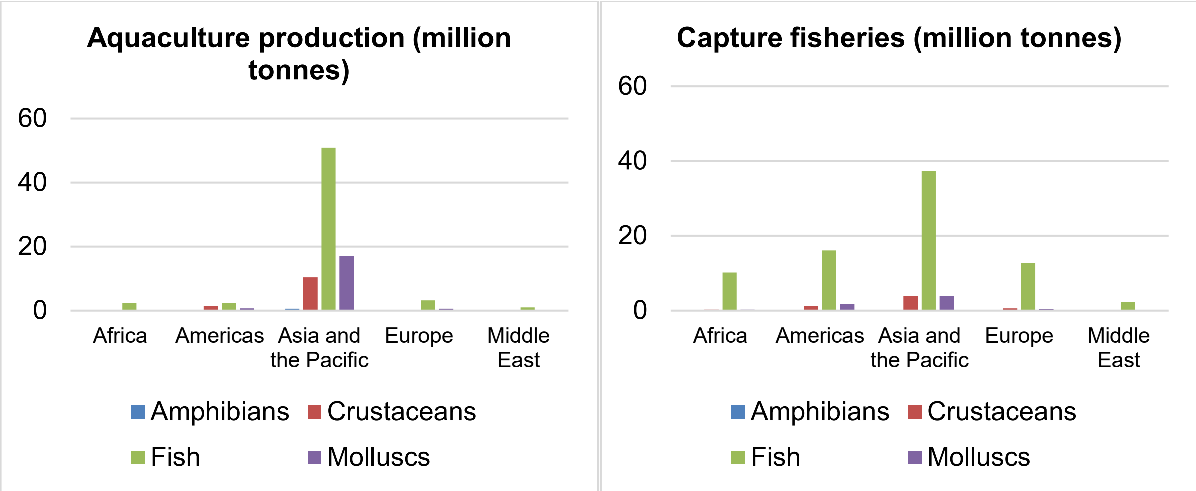


Figure 22. *Aquaculture production and capture fisheries quantities, by WOAH region and animal category, based on the most recent figures recorded by FAO for the period 2017–2021*

Animal health information provided by the official authorities is highly dependent on whether surveillance activities are in place in the respective countries. Figure 23 shows the median percentage of listed aquatic animal diseases under surveillance, by WOAH region and by animal category, based on information provided by the 128 countries/territories having submitted at least one six-monthly report for aquatic animal diseases, for the period 2020–2023. In all regions, the median percentages of listed diseases under surveillance measured for production animals (noted as farmed animals on the graph) are much higher than those measured for capture animals (noted as wild animals on the graph), which are close to 0%. For farmed aquatic animals, the median percentages of listed diseases under surveillance in the Africa region and the Asia and the Pacific region are all above 80%. The bias associated with missing reports must be taken into account when interpreting these results. In fact, only 25 countries/territories submitted a report for the Africa region, and 26 for Asia and the Pacific, for the period analysed. For the Americas region, the median percentages of listed diseases under surveillance are higher for crustaceans and fish than for the other categories. In the Europe region, the highest percentages are observed for fish and molluscs. The median percentages for the Middle East region are all close to 0%.

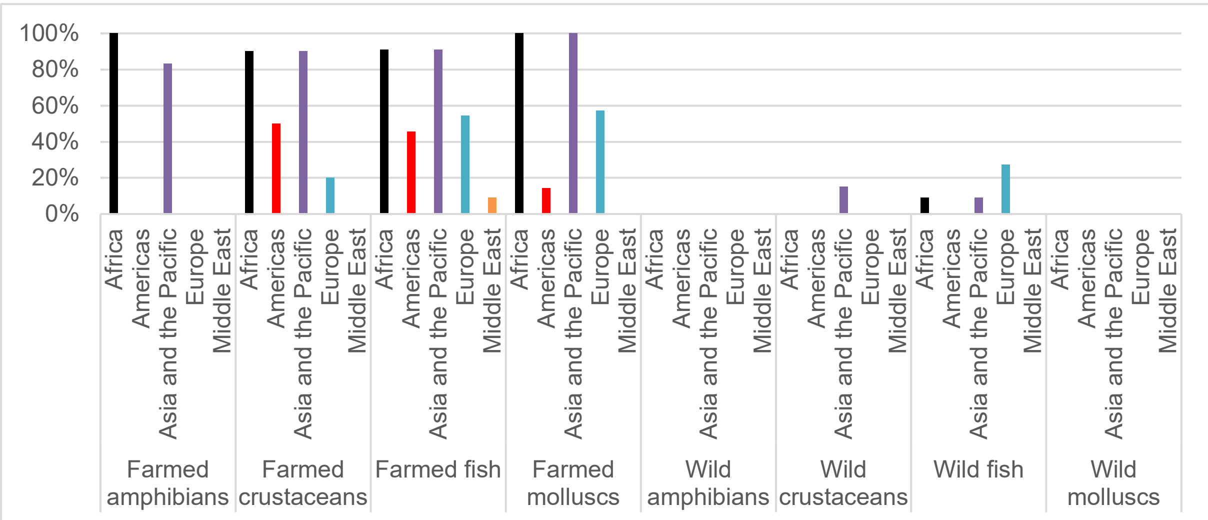


Figure 23. *Median percentage of listed aquatic animal diseases under surveillance, by WOAH region and by category of animals, for the period 2020–2023*

1.6.1 Aquatic animal disease reporting to WOAH in 2023 and 2024

After contextualising the surveillance capacities in the different WOAH regions for the animal categories of interest, this section describes the immediate notifications sent to WOAH in 2023 and early 2024 (as of 8 March). Most of the immediate notifications were related to diseases in farmed fish (category in which production quantities are the highest and surveillance is the most implemented). South Africa notified the recurrence of infection with koi herpesvirus in January 2023. Romania notified the recurrence of infection with viral haemorrhagic septicaemia virus in January 2023, followed by Italy in November 2023. Romania reported the first occurrence in the country of infection with *Gyrodactylus salaris* in June 2023. Georgia reported the first occurrence in the country of infection with infectious haematopoietic necrosis virus in July 2023. The recurrence of infection with the same pathogen was then notified by Italy (twice, in October and December 2023) and Belgium (in October 2023). The United Kingdom notified the recurrence of infection with infectious salmon anaemia virus genotype HPR0 in November 2023. Singapore notified the first occurrence of infection with Tilapia lake virus in December 2023.

In June 2023, the Republic of Korea declared that the country was free from infection with salmonid alphavirus. This was the only self-declaration of freedom received by WOAH in 2023 or early 2024 for an aquatic animal disease.

Very few immediate notifications were received for diseases in wild fish. South Africa reported the recurrence of infection with koi herpesvirus in January 2023. Mozambique notified the first occurrence in the country of infection with *Aphanomyces invadans* (epizootic ulcerative syndrome) in July 2023.

In farmed amphibians, Chinese Taipei reported the recurrence of infection with ranavirus in April 2023. Belgium notified the recurrence of infection with *Batrachochytrium salamandrivorans* in wild amphibians in January 2024. Amphibians are the category of aquatic animals for which global production is the lowest, and the surveillance levels are also among the lowest.

In wild crustaceans, Italy and the United Kingdom notified the recurrence of infection with *Aphanomyces astaci* in July and September 2023, respectively. Italy then notified a recurrence of the infection in farmed crustaceans in October 2023.

Finally, in farmed molluscs, Chinese Taipei reported the recurrence of infection with *Perkinsus olseni* in April 2023. The United States of America notified the first occurrence of the same disease in wild molluscs in September 2023.

1.6.2 Simulation exercises

In 2023 or early 2024, WOAH was not informed of any simulation exercises conducted for listed diseases of aquatic animals. However, sharing this information is not an obligation for Members, and there may well have been simulation exercises of which WOAH was not informed.

1.6.3 Barriers to transparent reporting of aquatic animal diseases

Aware of the need to build more sustainable aquatic animal health systems, WOAH launched its first Aquatic Animal Health Strategy in May 2021. This strategy aims to improve the health and welfare of aquatic animals worldwide, contributing to sustainable economic growth, poverty reduction and food security, and thereby supporting the achievement of the Sustainable Development Goals.

In line with this strategy, in 2022 WOAH launched a survey of its Members to identify the barriers to transparent reporting of aquatic animal diseases and full implementation of the standards set out in the *Aquatic Code* and the *Manual of Diagnostic Tests for Aquatic Animals* (*Aquatic Manual*). Lack of material, financial and human resources, as well as gaps in national regulations, were seen as the most significant barriers to transparency in disease reporting by those interviewed. The report will be published shortly on the WOAH website and will include a number of recommendations for WOAH and its Members to address these barriers.

1.7 Statistics on reporting emerging diseases to WOAH

Since 2005, WOAH has received 191 notifications of emerging diseases. Of these, 157 concerned terrestrial animal diseases and the remaining 34 concerned aquatic animal diseases. A peak in notifications was recorded in 2021, while the number of notifications for 2023 and early 2024 (as of 8 March) was very low (n=2).

The trend in the number of events reported to WOAH for emerging terrestrial animal diseases and aquatic animal diseases during the period 2005–2023 is shown in Figure 24.

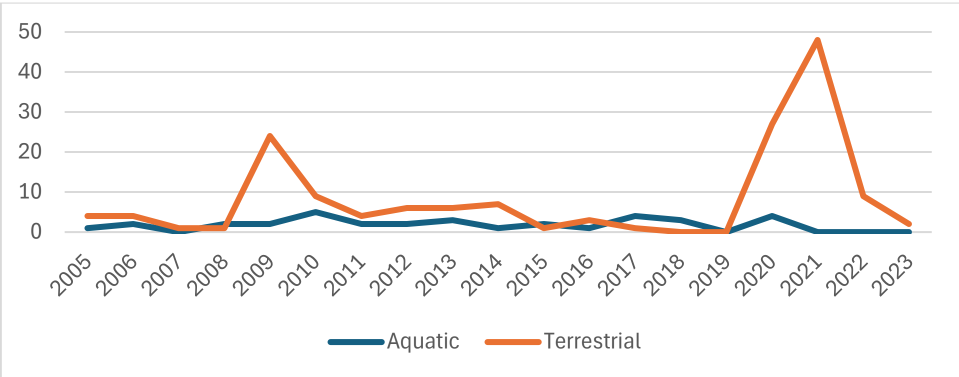


Figure 24. *Number of events reported to WOAH for emerging diseases of aquatic animals (blue line) and terrestrial animals (orange line) during the period 2005–2023.*

The two diseases with the highest number of reported events were SARS-CoV-2 in animals (n=85) and influenza A H1N1 (n=32). These two diseases alone accounted for 61% of the emerging disease events notified during the period 2005–2023 and were responsible for the peaks observed in 2009 (Influenza A H1N1) and 2021 (SARS-CoV-2 in animals). On the other hand, no notifications of emerging diseases in aquatic animals were received in the last three years (2021–2023), despite the Aquatic Animal Health Standards Commission having determined that three diseases met the definition for an emerging disease. Whether this was due to a lack of understanding by Members of the mechanism for reporting emerging diseases or other barriers to reporting are an issue that WOAH will be exploring in order to provide Members with the appropriate support.

1.8 Summary and conclusions

Part A of the report focused on informing Members on selected important events and trends relating to 2023 and early 2024 (as of 8 March) in the animal health situation worldwide, of relevance for risk management. It covered avian influenza notifiable to WOAH, ASF, FMD, vector-borne diseases, bee diseases, listed aquatic animal diseases, and diseases meeting the WOAH definition of 'emerging disease'. This report was based on data integration principles, to present Members with the most accurate information possible, while recognising the limitations of the data available on a global scale.

HPAI has been a global concern since October 2020 due to an unprecedented situation in terms of its spread, its impact, and wildlife conservation issues. The section highlighted the changes in the global seasonality of HPAI observed in 2023 compared to pre-existing traditional seasonal patterns (the peak of HPAI in poultry having shifted to January and the usual increase in outbreaks during the second semester now occurring earlier, in July/August). The section showed that, while the spread of HPAI to new countries/territories continued in 2023 at the same rate as in 2022, the impact on poultry was much lower: the number of outbreaks in poultry during the October 2022-September 2023 seasonal wave fell by 47% and the number of losses fell by 27% compared to the period from October 2021 to September 2022. However, the impact on wildlife remained considerable. Between October 2022 and September 2023, overall mortality of wild birds increased, and 41% of the reported deaths were in 49 species on the IUCN Red List, with a status of 'near threatened', 'vulnerable', 'endangered' or 'threatened with extinction'. The spread to the Antarctic region is also of great concern. The virus has evolved with mutations to adapt to mammalian hosts, while retaining the ability to infect birds. This reminds us that the threat of an influenza pandemic (in humans) persists, even if the human cases detected remain sporadic. In view of the significant changes observed in the epidemiology of HPAI viruses in recent years, WOAH, in collaboration with FAO through GF-TADs, has initiated a review of the global strategy for the prevention and control of HPAI.

The section on ASF covered the global spread of the disease and the challenges associated with its control and eradication. Since 2005, ASF has spread to 80 countries and territories, affecting both domestic pigs and wildlife. Considering ASF dynamics in 2023 compared to 2022, indicators suggest a worsening situation in 2023, with more events reported, including introductions in previously unaffected countries. Global surveillance data for 2020–2023 indicate variations in surveillance activities among regions, with Europe having the most intensive surveillance. The analysis emphasises the need for effective surveillance to detect and respond to disease outbreaks promptly. The role of wildlife in ASF dynamics is discussed, urging members to improve surveillance systems for wildlife. The potential impact of ASF on biodiversity is also highlighted, along with the risk that the disease could contribute to the local and global extinction of already threatened wild suid species. In this situation, alternative disease control approaches need to be explored, including vaccination. WOAH warns against the use of substandard vaccines and has circulated draft standards for safe and efficacious ASF vaccines. In conclusion, the data presented in this section serve to emphasise the urgent need for enhanced global efforts to control and eradicate ASF.

The spread of FMD serotype SAT 2 in the Middle East in 2023 is a particular concern. The section presented the global distribution of FMD in 2023 and early 2024 and discussed the importance of serotyping for effective selection of control tools, in particular vaccination. The section also highlighted Resolution No. 30 adopted by the World Assembly of WOAH Delegates in 2017 regarding serotype C, which has not been isolated by the WOAH/FAO Reference Laboratory C network since 2004.

The section on VBDs discussed the significant threat these diseases pose to human and animal health globally. In 2023 and early 2024 the spatial distribution of outbreaks was concentrated in the Americas, followed by Europe. Notably, a high number of outbreaks were reported as exceptional epidemiological events in temperate regions. The analysis of the reported latitude of outbreaks revealed a significant increasing trend, indicating the expansion of VBDs to higher latitudes. Positive correlations were found between reported maximum latitude, temperature anomaly, and time, suggesting a strengthening trend. A case study on EHD illustrates the dynamic nature of disease distribution, with expansion to new areas, including Africa since 2006 and Europe since 2022, with recent outbreaks in Spain, Italy, France and Portugal. The data presented in this section show that climate change is increasingly responsible for the spread of both prioritised and neglected diseases, with important consequences for public health, animal health and biodiversity conservation. WOAH therefore reminds its Members of their role in helping to reduce the spread of diseases, not only by providing good quality, accurate, complete and timely data to WOAH, but also by improving surveillance activities at the national level, raising awareness of the importance of these diseases through dedicated communication campaigns, and improving the application of prevention and control measures, such as control at the borders and inside the country, zoning and biosecurity, etc.

The section on aquatic animal diseases provided a summary of the major epidemiological changes occurring in 2023 and early 2024 (as of 8 March) for listed aquatic animal diseases. Most of the immediate notifications received related to diseases in farmed fish, the category of aquatic animals in which production quantities are the highest and surveillance is the most implemented. This section also highlighted the work done by WOAH to identify and address barriers to reporting, in line with its Aquatic Animal Health Strategy.

The section on emerging diseases presented statistics that highlighted the great variability in the data provided on emerging diseases since 2005, with very little information provided for aquatic diseases, and, more generally, very little information on any emerging diseases in 2023 and early 2024. One of the main findings of this section was also the fact that two diseases only (SARS-CoV-2 in animals and influenza A H1N1) generated most of the notifications on emerging diseases reported to WOAH since 2005.

WOAH remains committed to promoting transparency in the timely sharing of accurate information on animal diseases, and to disseminating this information to the global community. This is essential to support Members in risk management. Members are also reminded of the importance of simulation exercises, self-declarations of freedom, global collaboration, twinning projects, as well as the proper use of international standards for disease control and prevention (e.g. zoning and compartmentalisation) in reducing the impact of listed diseases.

2. Statistics on reporting by Members through the WAHIS system

2.1 Early warning module

The data presented in this section cover the 12-month periods between 9 March of one year and 8 March of the following year. Figure 25 shows that the numbers of immediate notifications (INs) submitted between 2015 and 2024 increased gradually over time, with a peak of 568 in 2022. In contrast, the numbers of follow-up reports (FURs) submitted dramatically increased between 2018 and 2024 (from 860 to 2,525). Please note that FURs without quantitative data (i.e. FURs submitted without any change in the epidemiological situation) were excluded from this analysis.

Outbreaks of HPAI and ASF dominated the submissions during this period, and their outbreaks tended to last longer before being resolved than did those of other diseases, which may partially explain the increase in FUR submissions since 2018. Nevertheless, improved reporting by Members must also have contributed to the increase.

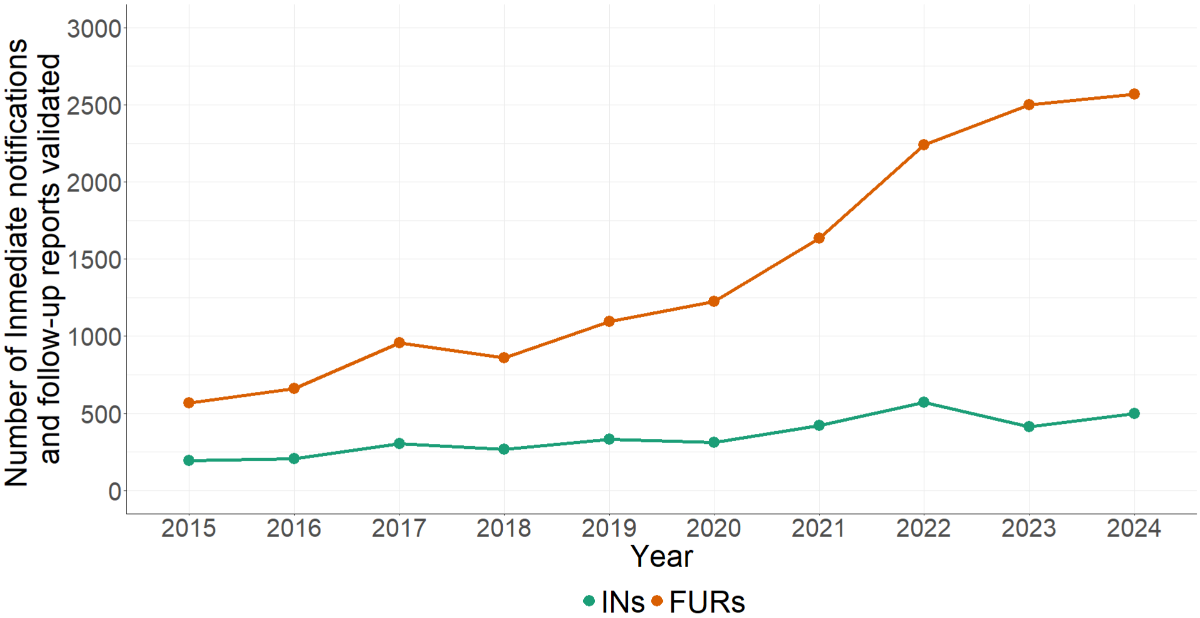


Figure 25. *Numbers of immediate notifications (INs) and follow-up reports (FURs) submitted between 2015 and 2024*

The top three diseases per WOAH region for which the most INs were submitted between 9 March 2023 and 8 March 2024 included HPAI (in both poultry and non-poultry) in four of the five regions, the exception being the Middle East. Other diseases of regional importance included FMD, equine encephalitis (Western), ASF, bluetongue and glanders (Table 4).

Table 4. *Top three diseases per WOAH region for which immediate notifications were received between 9 March 2023 and 8 March 2024*

	Africa	**Americas**	**Asia and the Pacific**	**Europe**	**Middle East**
1	FMD	HPAI (non-poultry & wild birds)	HPAI (poultry & wild birds)	HPAI (non-poultry & wild birds)	Bluetongue
2	HPAI (non-poultry & wild birds)	HPAI (poultry)	HPAI (poultry)	HPAI (poultry)	Glanders
3	HPAI (poultry)	Equine encephalitis (western)	ASF	ASF	FMD

An analysis of ongoing events per WOAH region during the period 1 January 2005 and 8 March 2024 identified 124 events for which FURs had not been submitted for at least 3 months. The median time in months since the most recent FUR submission for these events was 7 for the Americas, Europe and the Middle East, but was 25 for Africa, and 44 for Asia and the Pacific. Importantly, more than a year has elapsed since submission of the most recent FUR for 57% of these events (Figure 26). WOAH requests that Members review their ongoing events in WAHIS and, where relevant, submit FURs to provide an update on the epidemiological situation of these events.

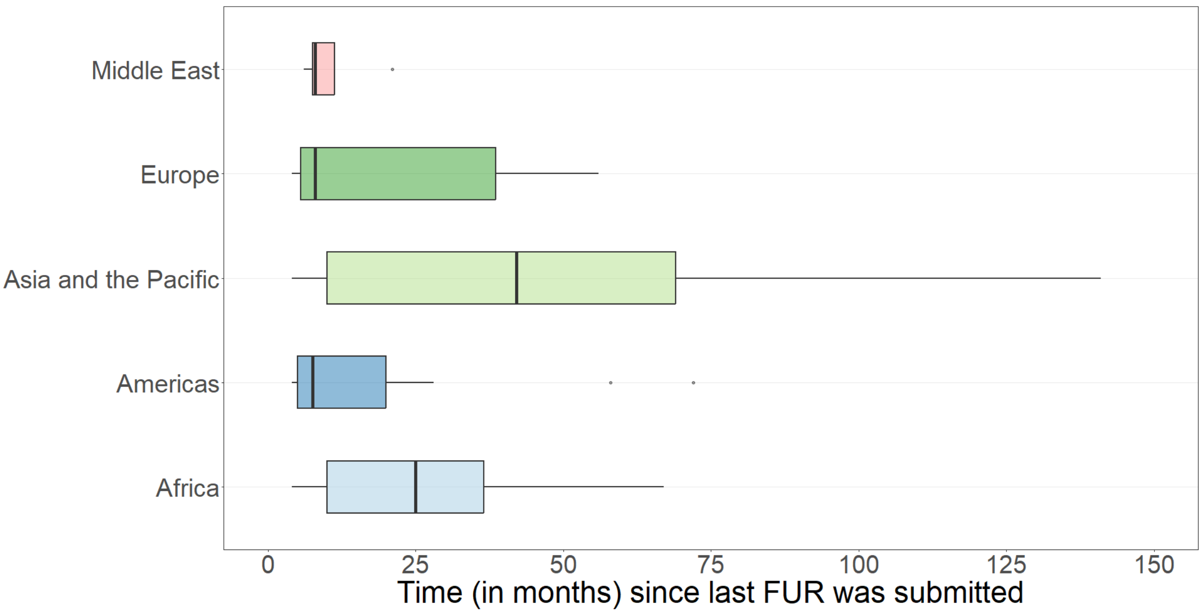


Figure 26. *Box plot showing time (in months) since last follow-up report submitted per region for ongoing events during the period between 1 January 2005 and 8 March 2024*

An analysis of the time (in days) between confirmation of disease and submission of the corresponding IN to WOAH for the years 2018 to 2023 found that the median time was 3 days per year (with exception of 2021, which was 5 days) but greater variations in time to IN submission occurred in the years 2019 to 2021 which coincides with the transition period between the old and new versions of WAHIS (Figure 27). The optimised early warning module was launched in September 2022 and has significantly improved the reporting experience of users and the speed of verification and validation of reports by WOAH.

Members are reminded that the availability of up-to-date information on the animal disease situation supports decision-making for trade in animals and animal products, and also facilitates policy-making for the implementation of control strategies for transboundary infectious diseases. In addition, it supports the fulfilment of WOAH's mandate of ensuring transparency in the global animal disease situation.

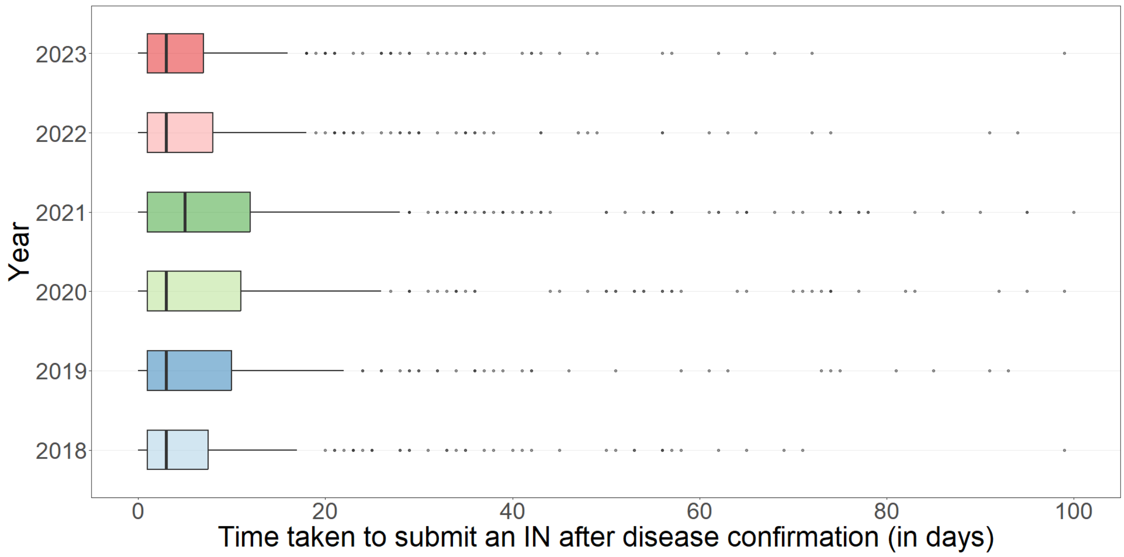


Figure 27. *Box plot showing time (in days) between confirmation of a disease event and submission of the corresponding immediate notification to WOAH for the years 2018 to 2023*

2.2 Monitoring module

As of 8 March 2024, the percentage of Members submitting at least one six-monthly report (SMR) either for terrestrial or aquatic animal diseases to WAHIS has declined since 2018 (see Figure 28). WOAH acknowledges that the launch of the new WAHIS and the transition associated with this launch has represented a significant change for Members in adapting to a new system and learning a new way of submitting SMRs.

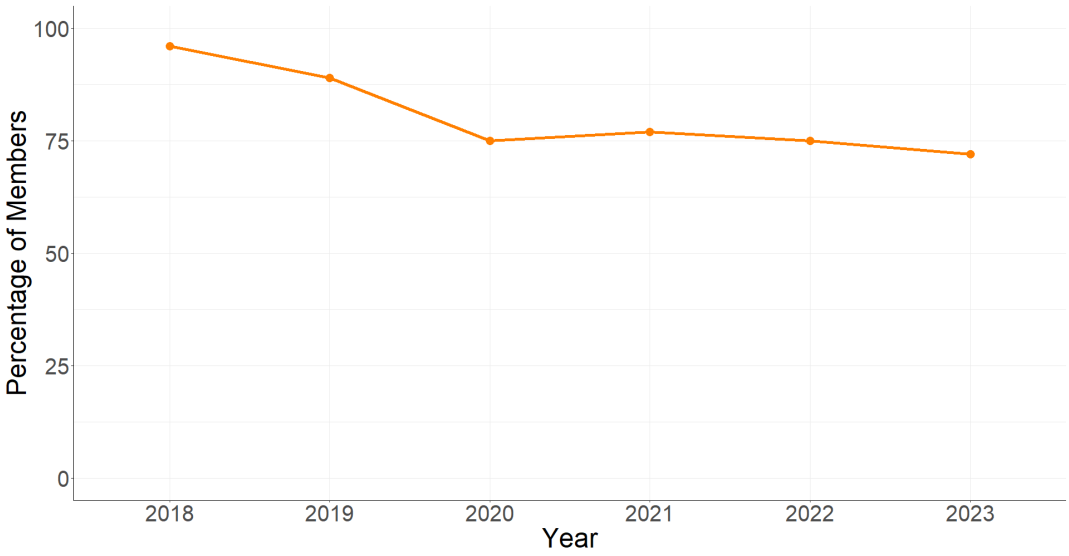


Figure 28. *Percentage of Members with submitted six-monthly reports (SMRs) for terrestrial or aquatic animal diseases by year between 2018 and 2023 (up to 8 March 2024)*

WOAH is currently focusing on improving the reporting experience of its Members by further developing WAHIS. In this regard, the new SMR reporting module is expected to be delivered by the second quarter of 2024, and it is expected to improve the efficiency of reporting of WOAH's Members and the user experience of both reporting and consulting users.

As of 22 March 2024, it was noted that over 78% of Members had already submitted at least one SMR for 2023 of the four required (two each for aquatic and terrestrial animals; see Figure 29). While the reporting situation for 2023 is incomplete, WOAH is confident that the ongoing strategies put in place by the World Animal Health Information Analysis Department (WAHIAD) for supporting and communicating with Animal Disease Notification Focal Points will improve the reporting situation in the coming months. In particular, WAHIAD is targeting support for Members that have not submitted any terrestrial or aquatic SMR since the launch of the new WAHIS.

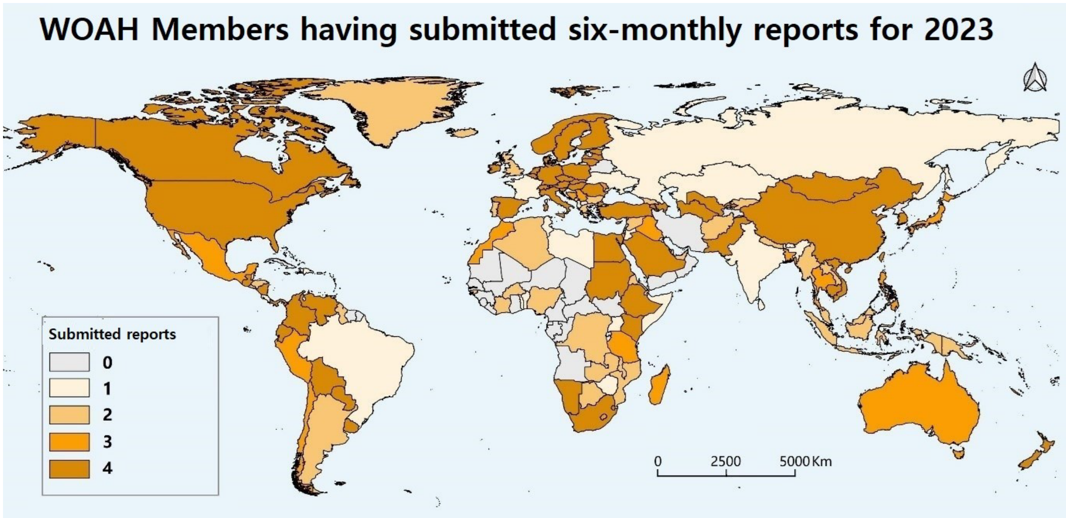


Figure 29. *WOAH Members having submitted aquatic and terrestrial six-monthly reports for 2023, by 22 March 2024*

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