

# In-country Wildlife Disease Surveillance Survey Report

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[www.woah.org/en/what-we-do/  
animal-health-and-welfare/wildlife-health/](http://www.woah.org/en/what-we-do/animal-health-and-welfare/wildlife-health/)

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# I. Introduction

Wildlife is vital to the long-term preservation of human and animal health and well-being. The world benefits from wildlife, directly for subsistence and indirectly through their contribution to the ecosystem. For example, some wild animals, including species of bats, birds and bees, are responsible for pollinating crops; sea otters maintain kelp forests, which play an important role in countering climate change by capturing carbon; and some wild animal species control the population size of other species, ensuring a sustainable balance in the ecosystem and subsequently safeguarding the health of ecosystems.

In the last 20 years, 60.3% of emerging infectious diseases affecting humans have been of animal origin and most of these (71.8%) came from wildlife [2]. The main causes behind the emergence of new diseases include deforestation and other changes in land use; illegal and poorly regulated wildlife trade; intensified agriculture and livestock production; antimicrobial resistance; and climate change [2].

The 68% decrease in the population of wild vertebrate species over the last 50 years [1] has disrupted the ecosystem balance. Since humans and animals share the same environment, human health, animal health and environmental health are interconnected as 'One Health' [1]. The COVID-19 pandemic sheds further light on the need to address emerging disease risks at the human-animal-ecosystem interface by better integrating wildlife health management at the country level.

Against this backdrop, the aim of the survey analysed in this report is to assess the current situation of epidemiological surveillance in wildlife. The objective with the results of the survey, along with the World Organisation for Animal Health (WOAH) Wildlife Health Framework [A\_Wildlifehealth\_conceptnote.pdf (WOAH.int)], is to address current limitations, needs and insufficiencies through strategies to strengthen epidemiological surveillance and to achieve One Health.

## II. Objective

The main objective of the survey is to gain a better understanding of the wildlife disease surveillance and reporting systems of WOA Members.

For the purposes of the survey, surveillance and reporting include the national wildlife disease reporting network, disease investigation and diagnosis, the reporting of wildlife disease data, and the use of WOA-WAHIS and WAHIS-Wild.

It is also important to consider how wildlife disease surveillance and reporting inform the management of wildlife health events and how different sectors, including the veterinary authority, the wildlife health authority and law enforcement, work together.

The results of this survey will be used to establish a baseline of the current situation of wildlife disease surveillance serving to boost the potential of WOA's networks with a view to supporting the implementation of the Wildlife Health Framework across the five WOA regions.

## III. Methodology

The WOA Collaborating Centre for Research, Diagnosis, and Surveillance of Wildlife Pathogens (USA-Canada), in collaboration with the WOA, designed a questionnaire to gauge the opinions of WOA Members on their surveillance systems for wildlife health events.

The questionnaire, available in the three official languages of the WOA (English, French and Spanish), was sent at the end of September 2021 to the 182 WOA Focal Points for Wildlife (Africa, Americas, Asia and Pacific, Europe, and the Middle East), 103 of which submitted a completed questionnaire before the submission deadline. Ninety-nine responses were received via an online Microsoft Forms platform and four were sent by email in PDF format and entered manually on the platform. All the responses were exported to a Microsoft Excel Database and processed in Microsoft Excel, RStudio and Power BI. Each question was then analysed individually and relative to the other questions to identify correlations and trends.

## IV. Potential bias

- The survey consisted of nine sections and a total of 54 questions. Because it was strategically designed to consistently follow the answers of the participants, each question being conditional on the

preceding questions, a variable number of responses was obtained for each participant. For each question, the number of country Members which answered is indicated in each headline.

- Where double responses to the survey were obtained from the same Member, which occurred three times, the response of the National Focal Points for Wildlife was selected.
- For some regional analysis, the number of respondents (sample size) is too low to detect any trend.
- One answer was received after the deadline and was not included to this analysis.
- For Members having responded in PDF format (3.9%, 4/103), rather than using the online forms survey, two questions did not correspond with the online survey:
  - **Question 2, Section 2**, for which the ‘Conducting wildlife outbreak investigation and surveillance’ option could not clearly be selected in the PDF version;
  - **Question 6b, Section 4**, for which the ‘Local Ministry/Agency of Fisheries’ option was included in the PDF version.
  - **Question 1a**: The question asking respondents to list the activities involved in the role of the WOA National Focal Point and rank them as the most challenging duties. The word ‘challenging’ was interpreted by some respondents as a test successfully achieved but by others as an obstacle to accomplishing their role as a WOA National Focal Point for Wildlife.

- **Questions 2g and 2h**: Both questions were worded similarly and the answers were almost as similar even though the questions initially addressed different topics. The ‘and/or’ option renders questions ambiguous and precludes clear answers.
- **Question 5**: The PDF version was missing question 5, which was available only in the online version of the questionnaire.

## VI Acknowledgments

WOAH would like to thank all the Focal Points for Wildlife that replied to this survey.

## V. Results and analysis

The survey was sent to the 182 WOAHP Members, 103 of which responded to the questionnaire, or 56.5% (103/182) of the total. All the responses to the survey came from the WOAHP Focal Points for Wildlife.

### Section 1: Background information

#### Question 1.

#### Are you the WOAHP National Focal Point for Wildlife for your country?

All the respondents of the survey were WOAHP National Focal Points for Wildlife for their countries.

#### Question 1a.

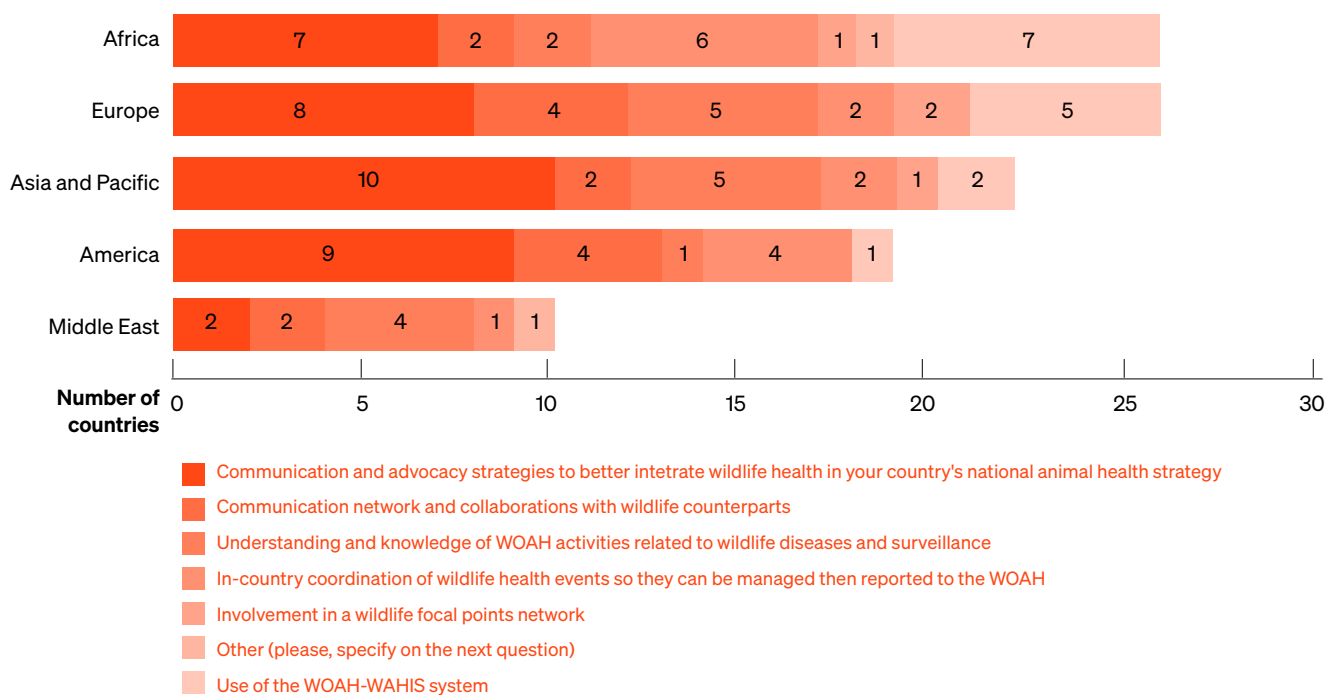
The following list of competencies and activities are associated with the role of the WOAHP National Focal Points for Wildlife (103 answers).

Please rank them in order of the competencies and activities that have been most challenging for performing your duties as a National Focal Point.

Challenging competencies	Countries	%
Communication and advocacy strategies to better integrate wildlife health in your country's national animal health strategy	36	35
Understanding and knowledge of WOAHP activities related to wildlife diseases and surveillance	17	17
Use of the WOAHP-WAHIS system	16	16
In-country coordination of wildlife health events so they can be managed then reported to the WOAHP	15	15
Communication network and collaborations with wildlife counterparts	14	14
Involvement in a wildlife focal points network	4	1
Other (please, specify on the next question)	1	1
<b>Total</b>	<b>103</b>	<b>100</b>

The activity ranked most frequently as the most challenging was 'Communication and advocacy strategies to better integrate wildlife health into the National Animal Health Strategy', selected by more than one-third of the respondents. The understanding of the activities of WOAHP related with wildlife diseases was ranked second most challenging competence for performing the duty as focal point potentially reflecting a gap in the communication of WOAHP's Wildlife Health activities. The third most challenging competence regards the use of the World Animal Health Information System (WAHIS). The use of WOAHP-WAHIS system was considered challenging by 27% of respondents from Africa and by 19% of European respondents.

**Ranked as 1st most challenging competence for performing the duties as national focal point (N=103)**



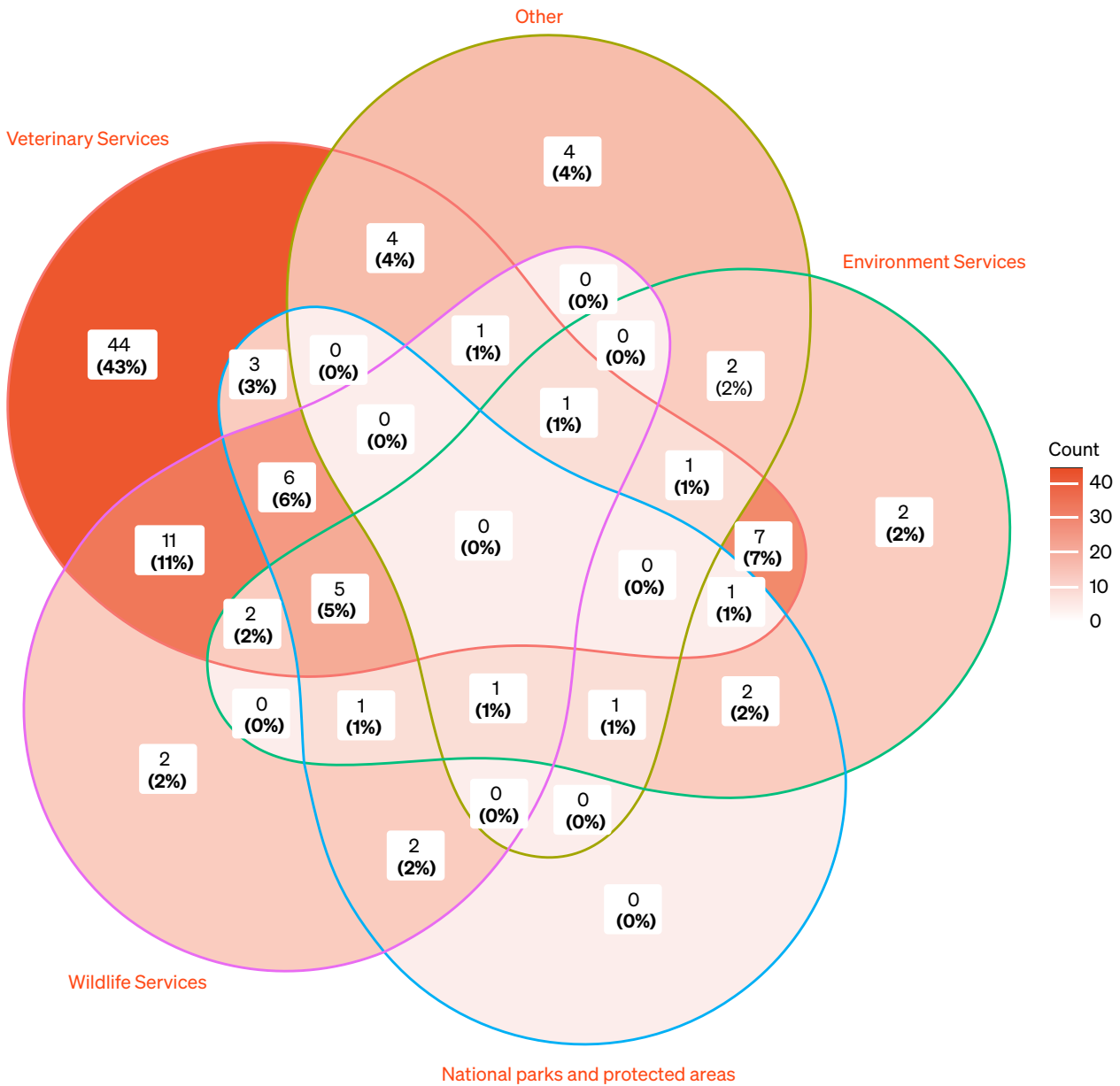
Analysing question 1a. by region, the activity seen as the most challenging for 4 out of 5 of the regions was the ‘Communication and advocacy to integrate wildlife health into the national health strategy’. The African (27%), American (47%), Asian and the Pacific (45%), and European regions (31%) ranked as first challenge the integration of wildlife health into the National Animal Health programme. For the Middle East, the most challenging activity was the ‘Understanding and knowledge of the activities of the WOA related to diseases and surveillance of wild animals’ (4/10 respondents). A poor understanding of WOA activities related to disease and epidemiological surveillance of wild animals also represents a major challenge for 23% of Members in the Asia and the Pacific region and 19% of the Members of the European region. African Members highlighted the challenge posed by the use of the WAHIS system (27%), and mentioned difficulties for in-country coordination (23%). Africa was the only region for which a Member selected ‘Other’ as a main challenge to performance as a NFPW, the Member mentioned that the most challenging duties as a NFPW was the ‘Difficulties in obtaining health information on wildlife’.

Respondents had the possibility to specify other challenging duties not included on the proposed list. Of the 103 participants, 22 specified ‘Other’ activities that have proved challenging in the performance of their duties. For these 22 answers, the other challenges cited by more than 10% of respondents were lack of network (23%), diagnosis limitations (18%), institutional limitations (18%).

**Question 1b.**

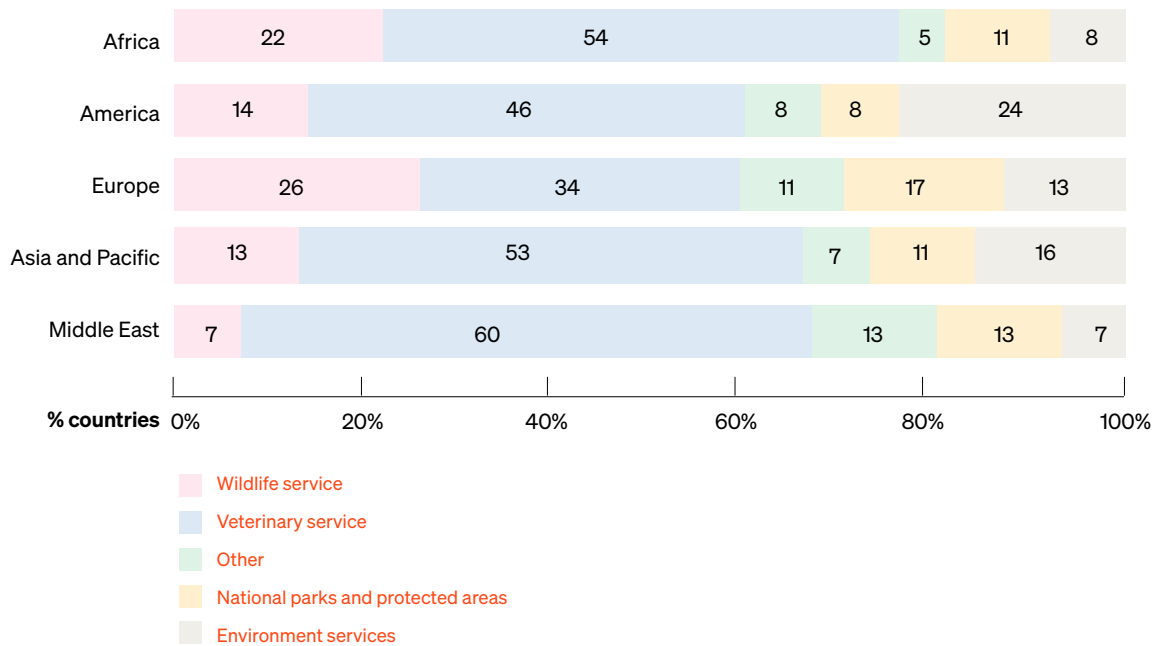
**Who is in charge/lead of wildlife health management (population and disease surveillance, export/import health certificate, etc.) in your Country/State/Territory (you may check more than one box)? (103 answers)**

**Authority in charge of Wildlife Health Management**



The authority selected most often as responsible for overseeing wildlife health was the Veterinary Services, cited 86 times (83%). The wildlife services were selected 32 times (31%), the environmental services 26 times (25%), and national parks and protected areas 22 (21%) times.

The Veterinary Services are the sole responsible for wildlife health management in 43% (44/103) of cases and work in coordination and collaboration with the other authorities in 41% (42/103) of cases, primarily with the wildlife services, accounting for 11% (11/103) of cases. The wildlife services, environmental services, and national parks and protected areas are responsible for wildlife health without the intervention of the Veterinary Services in 16.5% (17/103) of cases.



At a regional level, the Veterinary Services are once again the main responsible of wildlife health management for every region. Asia and the Pacific is the region in which the distribution of authorities in charge of wildlife health management is more distributed between authorities, in this region 1/4 of wildlife management is in the hands of the Wildlife Services. In the Americas, the Environmental Services are in charge of managing wildlife health for almost 1/4 of the Members.

Regarding the 'Other' responses, 15 WOAHA Members said that other national agencies oversee wildlife health management. They reported the following authorities in charge of wildlife health management and disease surveillance in their territory:

- Ministry of Agriculture and Forestry and Wildlife Authority
- Ministry of Health
- Royal Society for the Conservation of Nature
- State Committee on Ecology and Climate
- Ministry of Nature and Tourism
- Ministry of Agriculture, Water and Land
- Health Agencies
- National agency for the regulation and control of zoonoses
- Provincial Wildlife Departments
- Nature Conservation and Forest Services
- Department of Forests and Park Services
- Department of Animal Resources for diagnostics and export/import certificates
- Government Biodiversity Department
- State, Federal, and tribal wildlife management agencies
- Wildlife / Environment sectors



## Section 2: Partner wildlife-disease reporting network

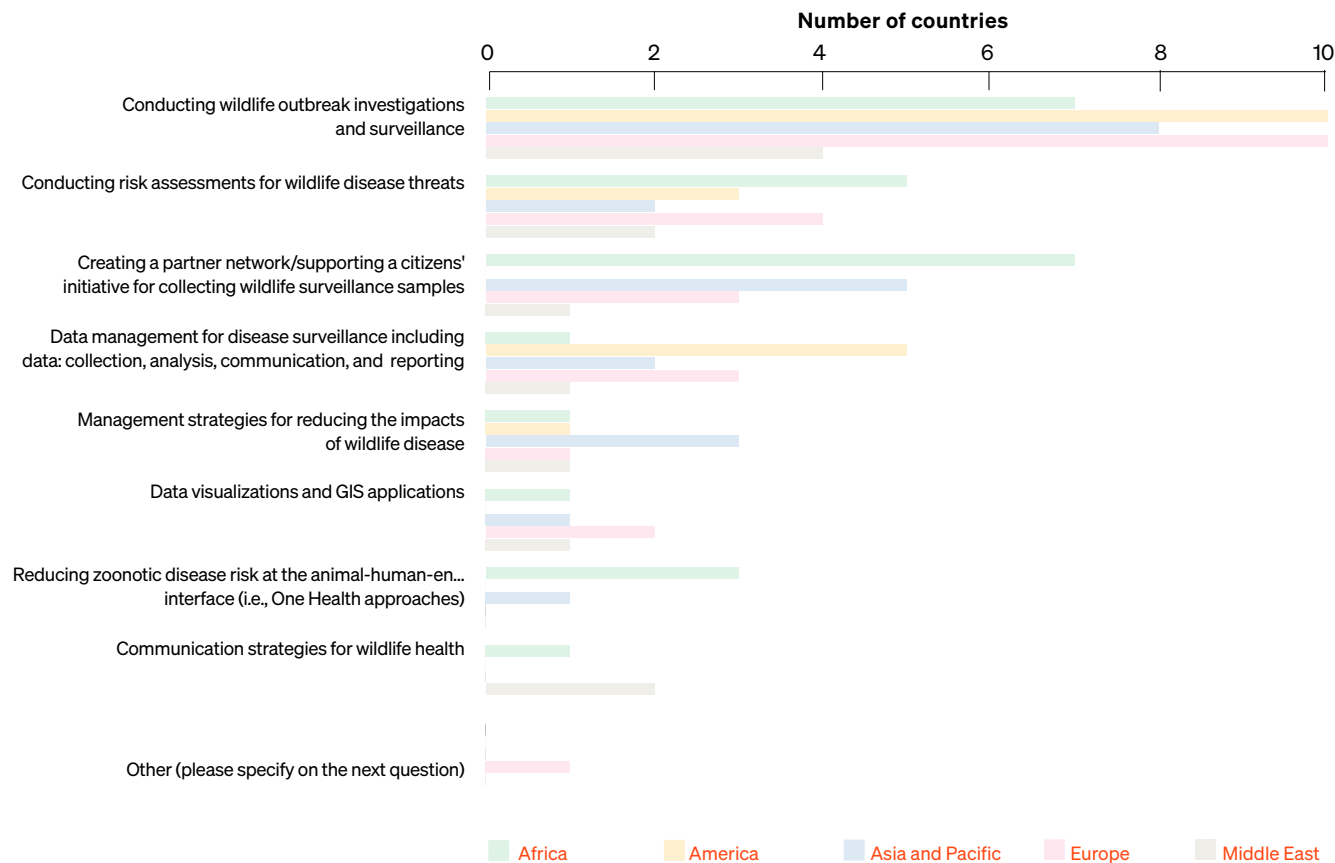
### Question 2.

Wildlife disease surveillance programs vary in their complexity from country to country. Of the following topics please rank them in order of greatest need for your country. The one you think is the biggest need should be ranked 1, the second biggest need 2, etc. A ranking number should only be used once (103 answers).

Ranking as first need for the member	Countries	%
Conducting wildlife outbreak investigations and surveillance	39	38
Conducting risk assessments for wildlife disease threats	16	16
Creating a partner network/supporting a citizen's initiative for collecting wildlife surveillance samples	16	16
Data management for disease surveillance including data collection, data analysis, data communication, and data reporting	12	12
Management strategies for reducing the impacts of wildlife disease	7	7
Data visualization and GIS applications	5	5
Reducing zoonotic disease risk at the animal-human-environment interface (i.e., One Health approaches)	4	4
Communication strategies for wildlife health	3	3
Other (please, specify on the next question)	1	1
<b>Total</b>	<b>103</b>	<b>100</b>

Wildlife disease surveillance programmes vary in complexity from one country to the other as a result of, for instance, political and financial restrictions, practicalities of the sampling and investigation in wild species (Ryser-Degiorgis, 2013).

All regions combined, the most urging need was 'Conducting wildlife outbreak investigation and surveillance', ranked first by 38% (39/103) of the respondents. Tying for second were 'Conducting risk assessment for wildlife disease threats' and 'Creating a partner network/supporting a citizens' initiative for collecting wildlife surveillance samples', both with 16% (16/103).



At the regional level, the main need of the Members was to conduct investigations and surveillance of wildlife outbreaks, this represented the greatest need for all the regions. 'Creating a partner network/supporting a citizens' initiative for collecting wildlife surveillance samples' stands as a particularly important need for the Members of the African region (26.9%, 7/26) and the Asia and the Pacific region 22.7% (5/22). On the other hand, the creation of a network and supporting citizen's initiatives for collecting wildlife surveillance samples did not represent a main need for any of the Members of the Americas region.

A single 'Other' response was given regarding the most important need, by the European region. For the Member concerned, the country's most vital need is to create a 'National team for wildlife integrate monitoring'.

#### Question 2a.

**Does your country have a wildlife disease surveillance programme? (103 answers)**

Does your country have a wildlife disease surveillance programme?	Countries	%
Yes	56	54.4
No	47	45.6
<b>Total</b>	<b>103</b>	<b>100.0</b>

#### Question 2b.

**Does the wildlife disease surveillance program include investigation of wildlife mortality/morbidity events (general surveillance)? (56 answers)**

Does include investigation of wildlife mortality/morbidity events (general surveillance)?	Countries	%
Yes	53	94.6
No	3	5.4
<b>Total</b>	<b>56</b>	<b>100.0</b>

#### Question 2c.

**Does the wildlife disease surveillance program include testing of opportunistically collected and/or 'apparently healthy' wildlife or wildlife specimens for specific diseases (targeted surveillance)? (56 answers)**

Does include testing of opportunistically collected and/or 'apparently healthy' wildlife or wildlife specimens for specific diseases (targeted surveillance)?	Countries	%
Yes	48	85.7
No	8	14.3
<b>Total</b>	<b>56</b>	<b>100.0</b>

More than half of the WOAHP NFPWs (54.4%, or 56/103) claimed that they have a national wildlife disease surveillance programme. For 94.6% (53/56) of the Members with a programme, the latter includes the investigation of wildlife mortality or morbidity events (general surveillance, also called passive surveillance). In addition, for 86% (48/56), the programmes include testing of opportunistically apparently healthy wildlife specimens for specific diseases targeted surveillance (also called active surveillance).

For the other 45.6% (47/103) NFPWs, their countries did not have a national wildlife disease surveillance programme. Overall, 51.5% of the 103 countries surveyed applied passive surveillance to wild animal species. A total of 44.7% applied both active and passive surveillance, 6.8% apply only passive surveillance and 1.9% apply only active surveillance.

**Table 1: Comparison of the % of protected areas and the wildlife disease surveillance programme**

% Protected areas	Number of respondents	Number of 'YES'	Number of 'NO'	% of 'YES'
0-9.9	36	17	19	47
10-29.9	53	31	23	58
>30	13	8	5	62

A comparison of the percentage of protected natural areas in a country with the countries saying they have a national programme of wildlife health surveillance indicates a relationship between both variables, whereby the higher the percentage of protected natural areas in the country, the more likely it is to have a wildlife health surveillance program.

#### Question 2d.

**Please rank the importance of the following sources of wildlife health information for your wildlife disease surveillance programme (56 answers).**

Ranking as first sources of wildlife health information for your wildlife disease surveillance programme	Number	%
National/Central Environmental Ministry/Agency	22	39.3
National/Central Agriculture Ministry/Agency	18	32.1
Academy (Research or field project, Veterinary Department, etc.)	4	7.1
National/Central Health Ministry/Agency	4	7.1
State/Provincial Environmental Ministry/Agency	3	5.4
State/Provincial Agriculture Ministry/Agency	2	3.6
Other (please specify on the next question)	2	3.6
State/Provincial Health Ministry/Agency	1	1.8
<b>Total</b>	<b>56</b>	<b>100.0</b>

For the 56 NFPWs reporting that their country has a wildlife disease surveillance programme, the most important source of wildlife health information was the National/Central Environmental Ministry/Agency for almost 40% (22/56) of the Members with a wildlife disease surveillance programme, followed by the National/Central Agriculture Ministry/Agency, for more than 30% (18/56).

Respondents had the possibility to specify other sources of wildlife health information not included on the proposed list. 'Other' sources of wildlife health information for wildlife disease programmes reported by the respondents were as follows:

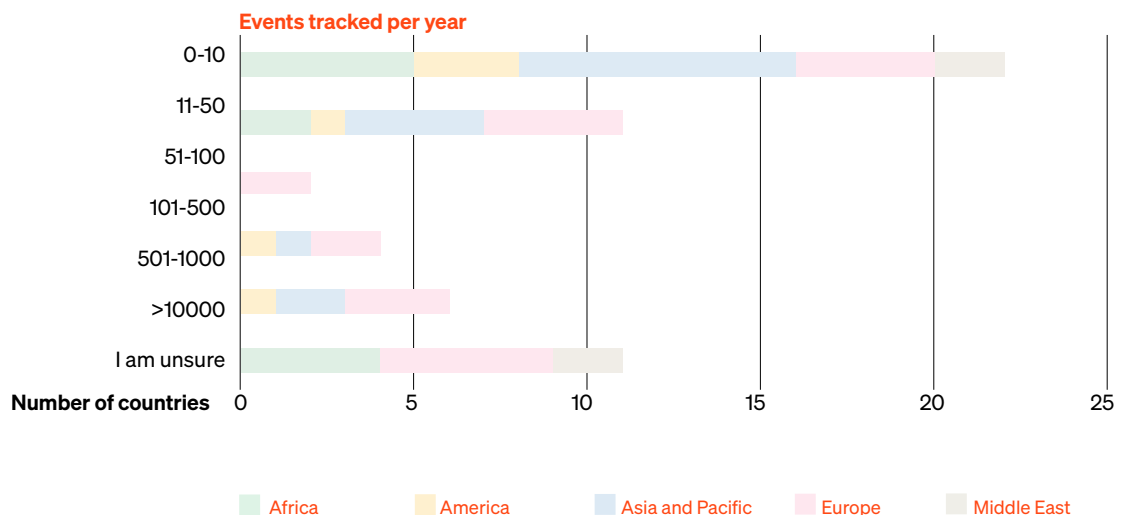
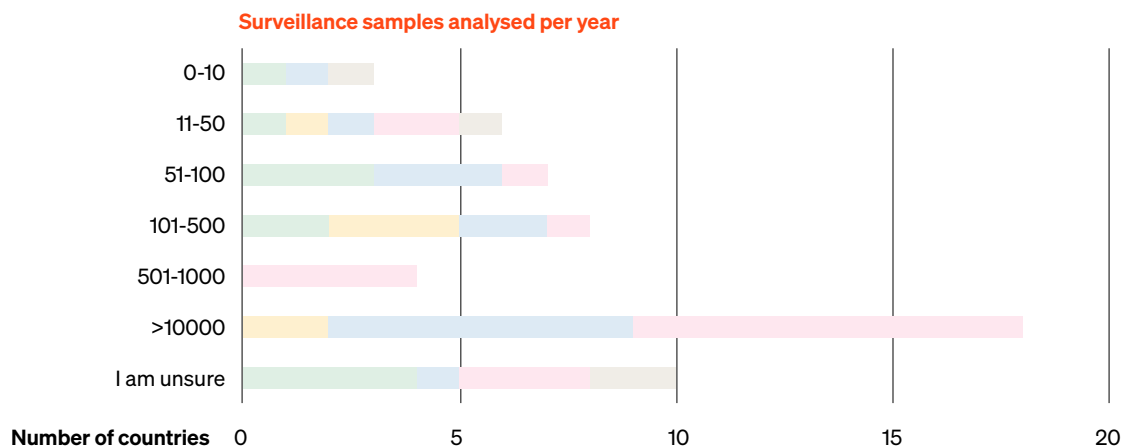
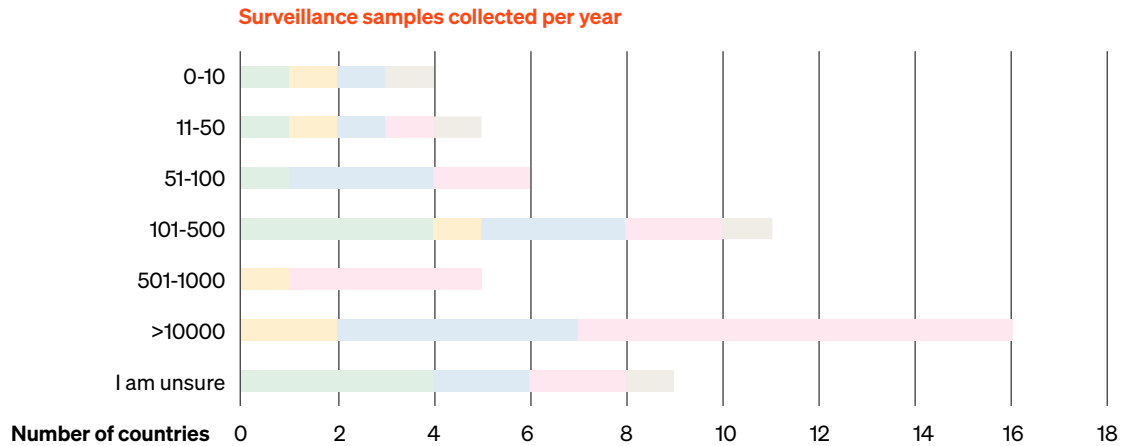
- NGOs (8 responses)
- Hunters (7 responses)
- Local communities (6 responses)
- Private veterinary wildlife hospitals (3 responses)
- Media (3 responses)
- Researchers (1 response)
- Citizen science (1 response)
- Fishermen (1 response)

**Question 2e.**

**On average, approximately how many wildlife disease surveillance samples and/or events does your country collect, track, or analyse from within your country per year? (56 answers)**

Regarding the investigation of wildlife mortality/morbidity events, the respondents reporting that their country has a wildlife disease surveillance programme were asked to quantify the collected samples, analysed samples and events tracked in their countries.

**Average number of wildlife disease:**



A comparison of collected samples with analysed samples indicates proportional relationship between both factors. Respondents reporting the annual collection of 'more than 1,000' samples for surveillance came out at 28.6% (16/56), while 32.1% (18/56) affirmed that their country analysed 'more than 1,000' samples. However, the tracking of wildlife disease events reveals a different trend, with only 10.7% (6/56) of the Members tracking 'more than 500' wildlife disease events a year. Most of the responding Members, 39.3% (22/56), indicate to track between 0-10 wildlife disease events per year.

The Europe and Asia and the Pacific regions collect and analyse the largest number of samples. The responses for the America and the Middle East regions are not interpretable given the small number of respondents (respectively 6 and 4).

## Question 2f.

Please list any priority wildlife diseases monitored by your country (56 answers).

Disease	Number of countries	% of citations	Disease	Number of countries	% of citations
Avian influenza	40	19.1	Tularemia	4	1.9
African swine fever	24	11.5	Henipavirus	3	1.4
Rabies	24	11.5	Leptospirosis	3	1.4
Classical swine fever	14	6.7	Paramyxovirus	3	1.4
Bovine tuberculosis	12	5.7	Rabbit viral haemorrhagic disease	3	1.4
Foot and mouth disease	12	5.7	Rift valley fever	3	1.4
Brucellosis	9	4.3	West Nile disease	3	1.4
Chronic wasting disease	8	3.8	Aujeszky disease	2	1.0
Coronavirus	8	3.8	Ebola	2	1.0
Peste des petit ruminants	8	3.8	Ecchinococcus multilocularis	2	1.0
Anthrax	7	3.3	Filovirus	2	1.0
Newcastle disease	6	2.9	Lyssavirus	2	1.0
Trichinella	5	1.9	<b>Total</b>	<b>209</b>	<b>100.0</b>

The table above does not show diseases that were cited by only one country.

The 56 NFPWs having a wildlife disease surveillance programme responded to the question, each one with the freedom to list as many diseases as it deemed relevant. The top three cited diseases were avian influenza (19.1%, or 40/209) which represents 71.4% of Members, African swine fever (11.5%, or 24/209) which represents 43% of the Members and rabies (also 11.5%, or 24/209).

The following 26 wildlife diseases were cited by only one country: African horse sickness; Anaerobic infections; *Batrachochytrium* spp.; Bluetongue; Botulism; Canine distemper virus; Capripox viruses; European brown hare syndrome; Flavivirus; Hantaviruses; Hemorrhagic fevers; Infectious bovine rhinotracheitis; Lassa disease; Listeriosis; Mass mortalities; Monkey pox; Myxomatosis; Nipah virus; Parvovirus; Pasteurellosis; Plague; Porcine reproductive and respiratory syndrome; Sarcoptic mange; Severe fever with thrombocytopenia syndrome; Toxicity event; and White nose syndrome.

In more detail, 89% (209/235) of the diseases reported by Members are zoonotic, domestic animal-related diseases or diseases involving both domestic animals and wildlife. The three diseases applying only to wildlife only are chronic wasting disease, mentioned by eight countries, and white nose syndrome and European brown hare syndrome both of which were cited just once.

**Priority diseases monitored by more than 1 country in each area**



Middle East is not represented due to low number of answers. Avian influenza represents the disease most mentioned as a monitoring priority for 3 out of 4 regions, the Americas, Asia and the Pacific, Europe. The region breaking into this trend is Africa, which mentioned rabies, however the African Members also considered avian influenza as the second most important disease to monitor. The ‘Other’ category is among the first categories for priority monitoring. This category does not represent a particular disease but all those that have been mentioned only once. The extensive mention of ‘Others’ could illustrate the variability of pathogens and their territorial specificity.

Comparing the results of the current survey with those of the 2020 Wildlife Health Survey Report: both surveys were responded to by WOA H Focal Points for Wildlife, but the questions were slightly different. Because the 2020 Wildlife Health Survey asked for a list of priority emerging diseases and diseases with a risk of spillover from wildlife to humans or domestic animals, the answers could solely be zoonotic diseases. In the 2021 survey, the question was focused on wildlife diseases including those affecting exclusively wildlife species. However, only three of the diseases reported are pathologies contracted solely by wildlife (Chronic wasting disease, white nose syndrome and European brown hare syndrome), the others being common to wild and domestic species.

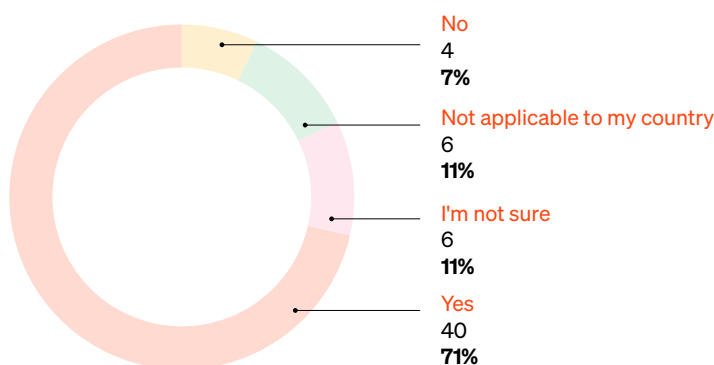
In both surveys, the most cited disease was Influenza / Avian influenza with 30.2% (134/444) of the responses in 2020 and 17% (40/235) of the responses in 2021. Rabies ranked in the top five in both surveys, through for the 2020 survey it was not considered as an emerging disease.

**Table 2: Comparison of questions on wildlife diseases between the 2020 Wildlife Health Survey and the 2021 In-Country Wildlife Disease Surveillance Survey**

QUESTION Wildlife Health Survey - 2020				QUESTION In-country Wildlife Disease Surveillance Survey - 2021			
In the opinion of the veterinary authority, in your country, which emerging diseases at the human/livestock/wildlife interface pose a risk for spillover from wildlife to humans and that should be or are targeted by a surveillance programme?				Please list any priority wildlife disease monitored by your country.			
	Disease or aetiologic agent	Response	%		Disease or aetiologic agent	Response	%
1	Influenza	134	30.2	1	Avian influenza	40	17
2	SARS-Cov-2	90	20.3	2	African swine fever	24	10.2
3	Ebola virus disease	41	9.2	3	Rabies	24	10.2
4	SARS-Cov-1	35	7.9	4	Classic swine fever	14	6
5	Rabies	33	7.4	5	Foot and mouth disease	12	5.1
6	MERS-CoV	21	4.7	6	Tuberculosis	12	5.1
7	Marburg	12	2.7	7	Brucellosis	9	3.8
8	Tuberculosis	11	2.4	8	Peste des petits ruminants	8	3.4
9	Brucellosis	9	2	9	Chronic wasting disease	8	3.4
10	Rift valley fever	7	1.5	10	Newcastle disease	6	2.5
<b>Total # of responses</b>		<b>444</b>	<b>100</b>	<b>Total # of responses</b>		<b>235</b>	<b>100</b>

**Question 2g.**

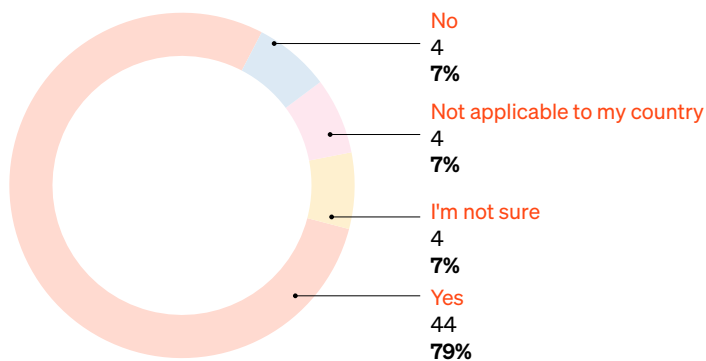
Does your country collect wildlife disease information and/or undertake health monitoring of wildlife intended for commercial or non-commercial use or consumption by pets or humans ('trade' includes capture, handling, transport, wild animal farming, wildlife pets, markets, export)? (56 answers).



Regarding the surveillance of the health of legally traded wildlife, 71% or 40 of the 56 Members with a wildlife disease surveillance programme reported that their countries collect disease information for wildlife intended for commercial or non-commercial use.

**Question 2h.**

**Does your country collect wildlife disease information and/or undertake health monitoring of wildlife imported into your country (not just related to human use or consumption, e.g. exotic species (e.g. for zoos, as pets, or for other purposes)? (56 answers).**



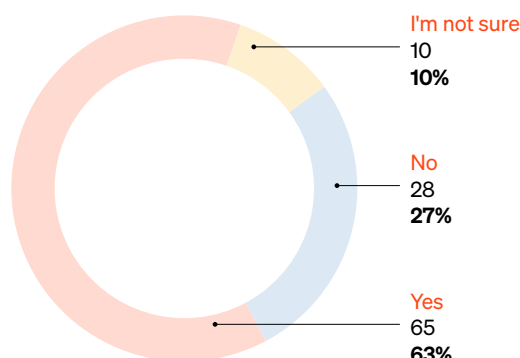
Regarding the surveillance of the health of imported wildlife, 79% (44/56) of the Members collect disease information on the wildlife imported into their country.



## Section 3: Wildlife disease diagnosis

### Question 3.

Does your country have impediments when collecting, handling, and/or transporting wildlife samples from wildlife mortality/morbidity sites for diagnostic testing, and/or for the diagnostic testing in itself? (103 answers).



Disease diagnosis is fundamental to health surveillance (WOAH Terrestrial Animal Health Code). But worldwide, 63.1% (65/103) of Members report having impediments when collecting, handling, and transporting wildlife samples.

### Question 3a.

Please rate the limitations and impediments for collecting, handling, and/or transporting wildlife samples from known wildlife mortality/morbidity sites within your country for diagnostic testing (65 answers).

Options	# Very important and important limitation	% Very important and important limitation
Lack of dedicated budget	49	75
Delays or lack of detection, reporting and notification of wildlife disease events	42	65
Access to carcasses or sick animals due to remote locations	40	62
Access to proper equipment/facilities for storing samples	36	55
Access to biosafety equipment	36	55
Access to proper equipment/options for shipping samples	35	54
Access to proper field equipment	35	54
Available personnel to collect carcasses (e.g., smaller species)	34	52
Access to biosafety training/guidelines	28	43
Access to training on sample collection	25	38
Acquiring international or national (within country) permits for shipping	24	37
Access to carcasses or sick animals due to property ownership	14	22

Of the 65 Members (63.1%, 65/103) having impediments to collecting, handling and/or transporting wildlife samples, 75% (49/65) of the NFPWs mentioned as a 'Very important' and 'Important' impediment the lack a dedicated budget for collecting, handling and/or transporting wildlife samples in the event of a wildlife mortality or morbidity event. Other impediments considered as very important or important by more than 50% of country members were:

- Delays or lack of detection, reporting, and notification of wildlife disease events: 65% (42/65),
- Access to carcasses or sick animals due to remote locations: 62% (40/65),
- Access to proper equipment/facilities for storing samples: 55% (36/65),
- Access to biosafety equipment: 55% (36/65),
- Access to proper equipment/options for shipping samples: 54% (35/65),
- Access to proper field equipment: 54% (35/65),
- Available personnel to collect carcasses: 52% (34/65).

All the ten Members saying that their budget does not have limitations or impediments for the collection of samples are characterized by high or upper-middle income according to the World Bank income classification. Interestingly, out of the 49 countries that declared budget limitations are important and very important impediments, 24 (49%) are considered as high or upper-middle income by the World bank [5].

Fifteen of the 65 participants responding to this question also detailed their limitations. ‘Other’ limitations were reported on a voluntarily basis and grouped in the four options above. The complete answers are included in the Appendix to this report, but they can be summarised as:

- Lack of communication between the agencies involved
- Limited communication and collaboration between the agencies involved
- Transport limitations
- Lack of awareness of the need to report the presence of carcasses by the entities in contact with wildlife

### Question 3b.

**Please rate the limitations and impediments for conducting diagnostic tests on wildlife disease samples collected from known wildlife mortality/morbidity sites within your country (65 responses).**

Options	# Very important and important limitation	% Very important and important limitation
Access to resources for testing costs	44	68
Access to species-specific protocols (e.g., cut-offs)	42	65
Access to proper testing equipment and material (reagents)	41	63
Lack of prioritization of wildlife samples testing	38	58
Access to biosafety equipment	33	51
Access to diagnostic laboratories	33	51
Availability of trained personnel	32	49
Access to biosafety training	23	35

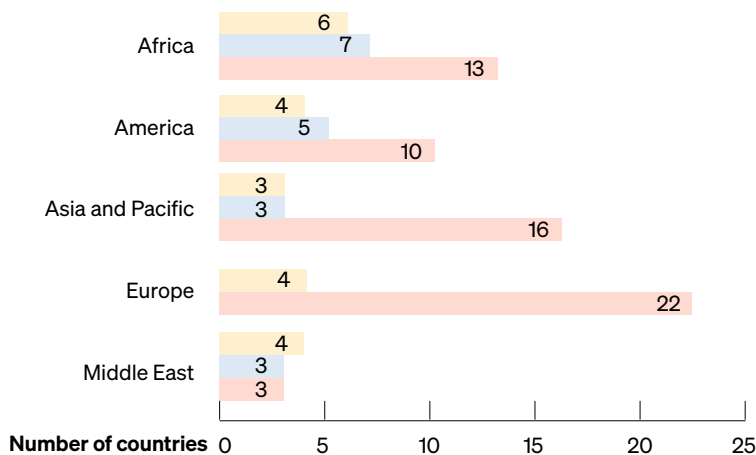
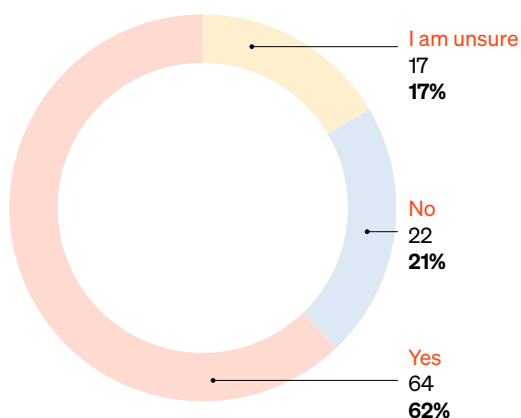
Five out of seven ‘Possible limitations’ are very important or important for more than half of the respondents. The main obstacle for conducting diagnostic tests is the limited ‘Access to resources for testing costs’ for 68% (44/65) of the respondents. This echoes questions 3a where the issue of budget limitation for the epidemiological surveillance of wildlife health was raised by 75% of Members. This demonstrates that the collection, handling and transport of wildlife samples, as well as the performance of diagnostic tests on samples collected from wildlife, stand as a challenge and limitation for the Members. It should be noted that these activities are an indispensable component of the epidemiological surveillance process.

## Section 4: Wildlife disease information management

For surveillance purposes, the collected data must be stored in order to be analysed (WOAH Terrestrial Animal Health Code).

### Question 4.

**Does your country maintain records from, and data related to, known wildlife mortality/morbidity events that have occurred or are occurring within your country? (103 answers).**

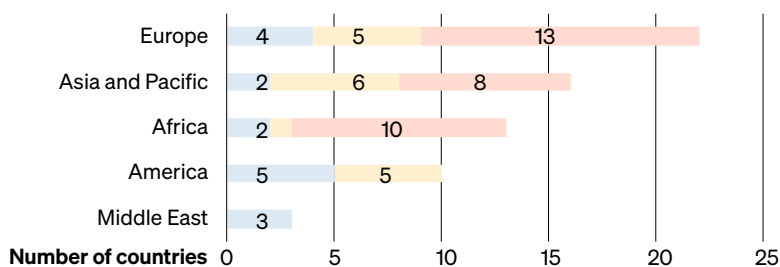
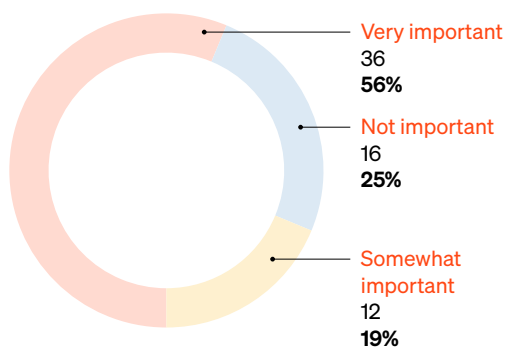


Regarding wildlife disease information management, 62% (64/103) of the respondents affirmed that their country maintains records and data on wildlife morbidity and/or mortality. Among the 21% (22/103) of Members that do not maintain records from wildlife mortality/morbidity events, more than a half (57%, 12/22) belongs to the African and the American regions. Both regions' results indicate that 1/4 of the African and the American region do not maintain records. In the Middle East region, 4/10 Members had no information about data records in their country. The European region was the one with the higher percentage (85%, 22/26) of records maintenance, followed by the Asia and the Pacific region (73% 16/22).

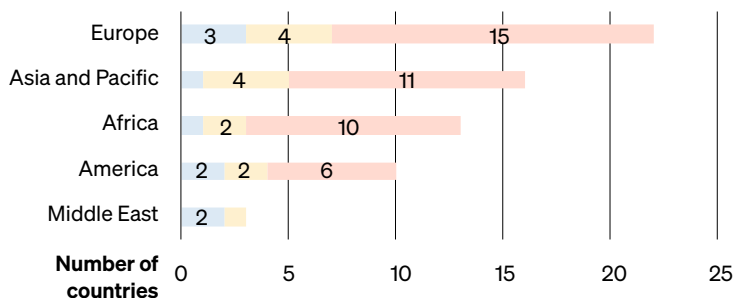
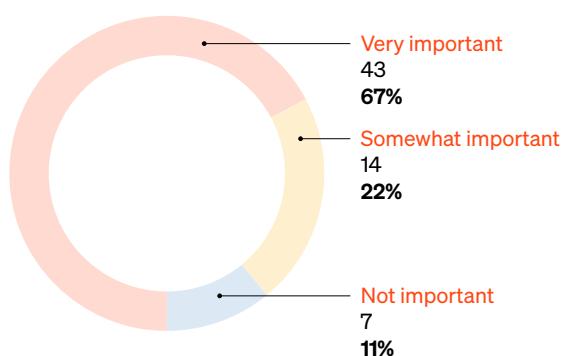
### Question 4a.

**Please rank the importance of the following data management methods for records from, and data related to, known wildlife mortality/morbidity events that have occurred or are occurring within your country (64 answers).**

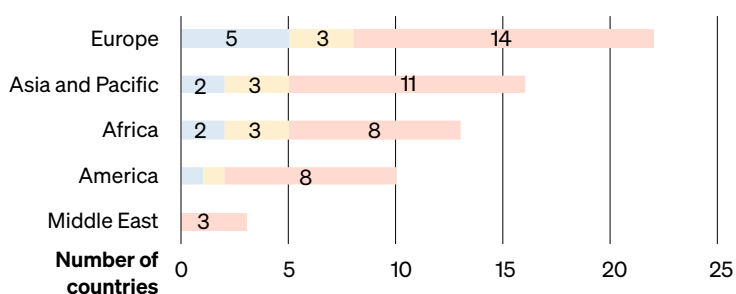
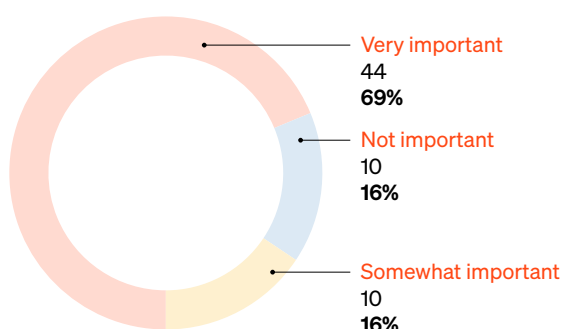
#### Use of paper records (64 answers)



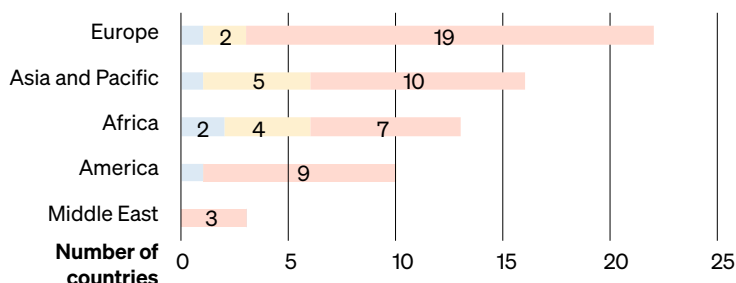
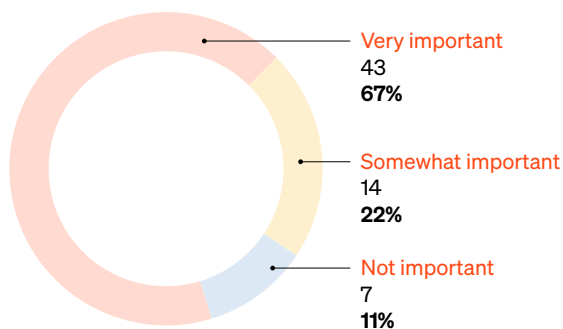
### Use of spreadsheet (64 answers)



### Use of database on local computer (64 answers)

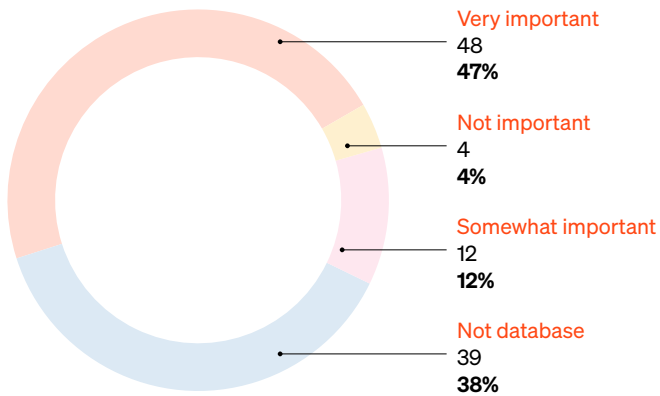


### Use of centralised database (64 answers)

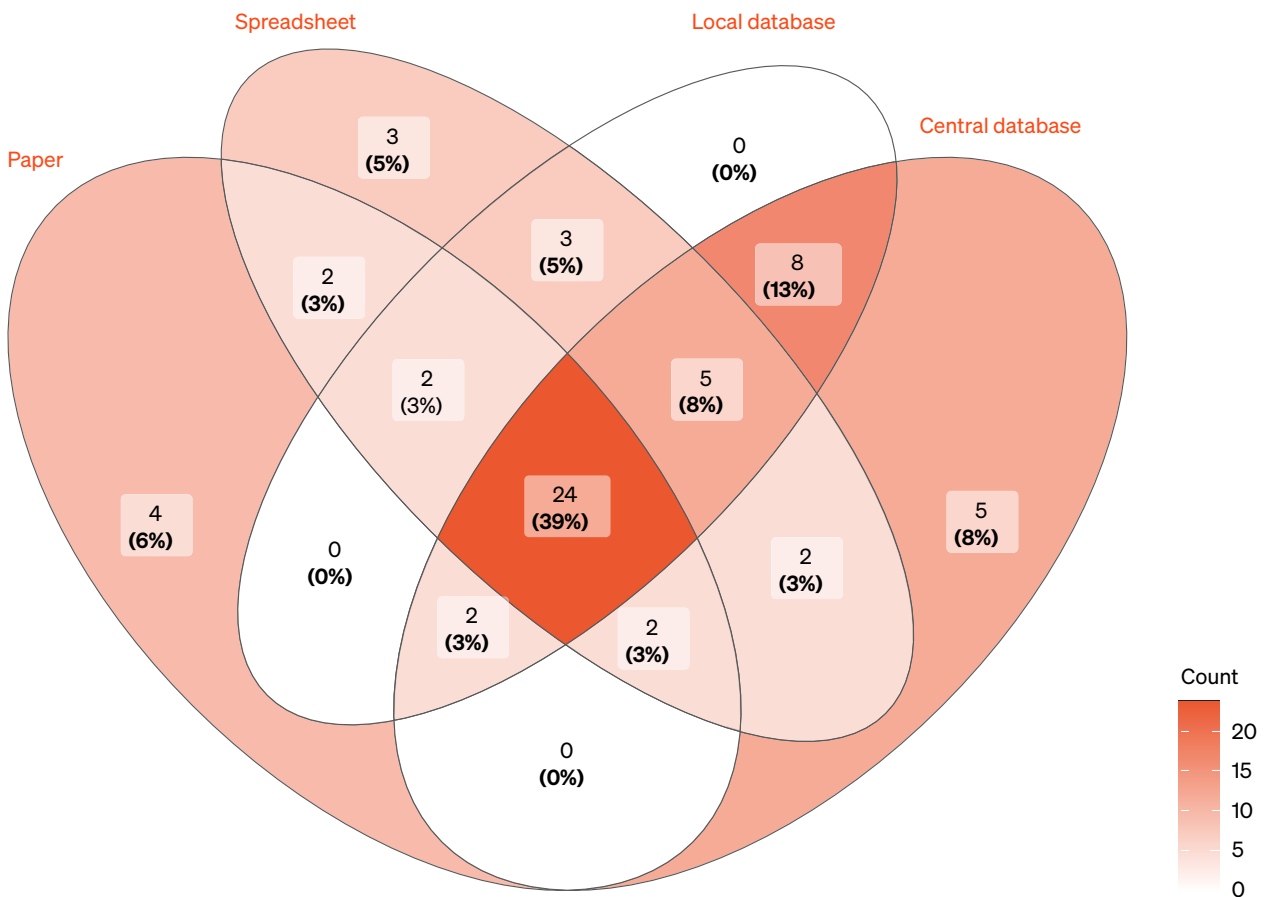


Among the Members maintaining records from wildlife diseases events, 69% (44/64) reported as a 'Very important' method the use of a 'Database on a local computer', followed by the use of a 'Centralized agency database', and the use of a spreadsheet reported also as 'Very important' for 67% (43/64). Paper records is the least used method for maintaining information but still 'Very important' for 56% of the respondents.

With regards to regions, 3/3 of WOAHA Members in the Middle East, 9/10 of those in the Americas and 86% (19/22) of those in Europe claimed that centralised agency databases were a 'Very Important' data management method. The Asia and the Pacific region use all four data collection methods in fairly equal measure to manage their wildlife health events. The main data collection method in Africa is paper records (77%, or 10/13). The importance of paper records varies per region; however, this methodology remains a major data tool for all the regions but the Middle East.



Considering the 103 NFPWs responding to this survey and assuming that the use of a centralized database is the most reliable methodology, 47% (48/103) of the Members do have a reliable data recording system. However, in 53% of the cases (that is 55 respondents) the data was either not recorded (39 respondents) or recorded on an unreliable system. When considering data management methods regarded as important, it is relevant to notice that methods were rarely used in isolation: 39% of the countries considered the use of the four tools suggested as important.



**Question 4b.**

Please indicate if you use your wildlife disease surveillance data for any of the following purposes within your country (64 answers).

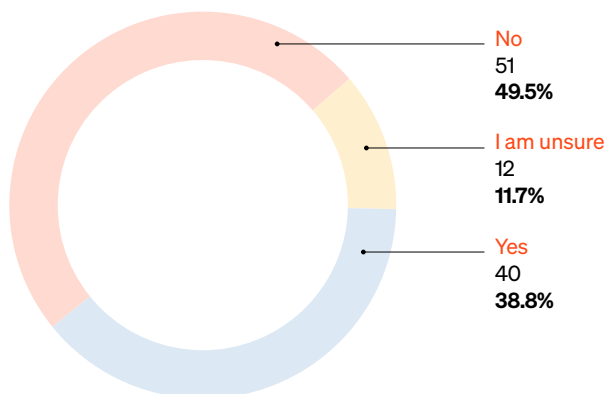
Options	Responses #	%
Provide wildlife disease information at national level	57	89.1
Manage disease outbreaks	46	71.9
Detecting emerging pathogens in wildlife	45	70.3
Provide wildlife disease information to state/provincial/local governmental agencies	43	67.2
Design disease prevention and control interventions	41	64.1
Provide wildlife disease information to the general public	38	59.4
To communicate specific risk and precaution measures to law enforcement official	35	54.7
Scientific research on wildlife health	34	53.1
Monitor trends and changes of diseases known to occur in wildlife in your country	30	46.9
Training purposes	27	42.2
I am unsure	4	6.3

The data collected was mainly used for communication at the central administrative level and management of disease outbreaks.

## Section 5: Data reporting to WOAAH

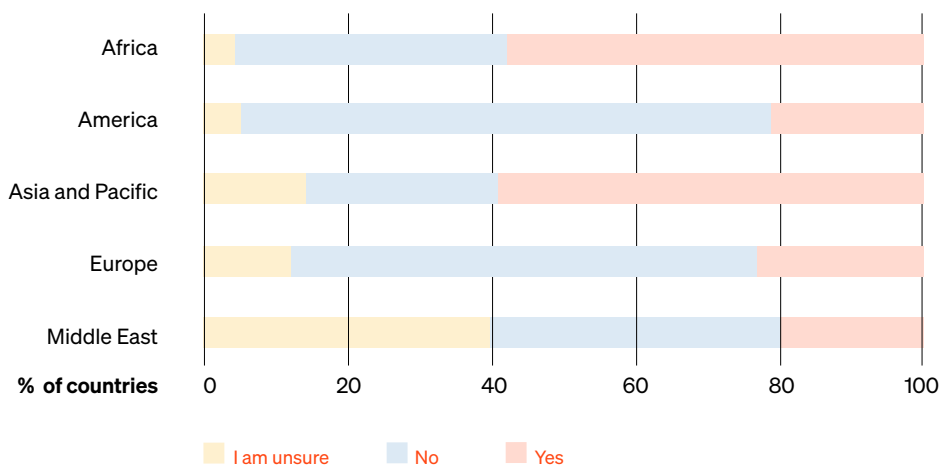
### Question 5.

Do you have any limitations or impediments entering your country's wildlife disease surveillance information in WOAAH-WAHIS for both listed and non-listed WOAAH diseases? (103 answers).



In terms of reporting information on wild animals' health to WOAAH, 49.5% (51/103) of the WOAAH NFPWs have no limitations or impediments when entering their country's wildlife disease surveillance information in WOAAH-WAHIS for both listed and not-listed WOAAH diseases. However, 38.8% (40/103) of Members claimed that they do have limitations or impediments in entering data into the WOAAH data collection system.

**Limitations or impediments to entering your country's wildlife disease surveillance information in WOAAH-WAHIS for both listed and not-listed WOAAH diseases?**

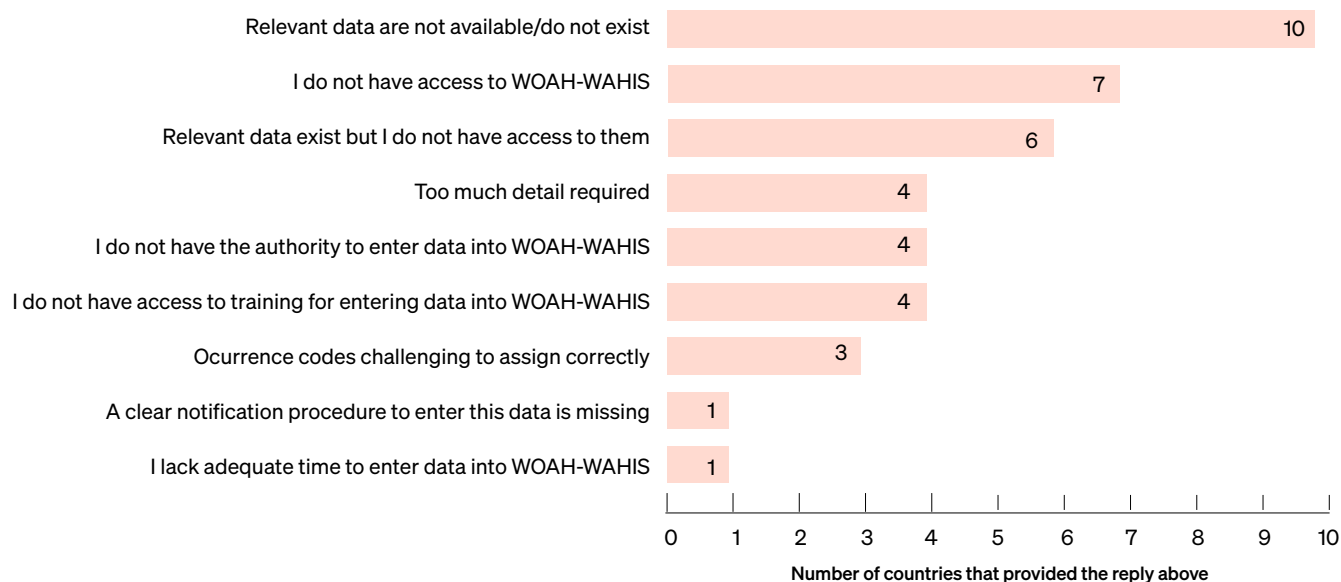


The region with the most limitations when entering data in the WOAAH-WAHIS system is the Asia and the Pacific region, 59% of the respondents saying they had problems entering data in the system, closely followed by the African region, with 58%. The region with the fewest impediments to entering the data into the WOAAH-WAHIS system was the Americas region where only 21% of the countries mentioned to have limitations or impediments, and, not far behind the European region with 23%. A third of the Middle East respondents did not have the relevant information or were unsure if this represents a limitation for their country. The answers from the middle east are uneasy to interpret given the low number of respondents.

### Question 5a.

Please rank the importance of the following limitations and impediments to entering your country's wildlife disease surveillance information in WOA-H-WAHIS for both listed and not-listed WOA-H diseases.

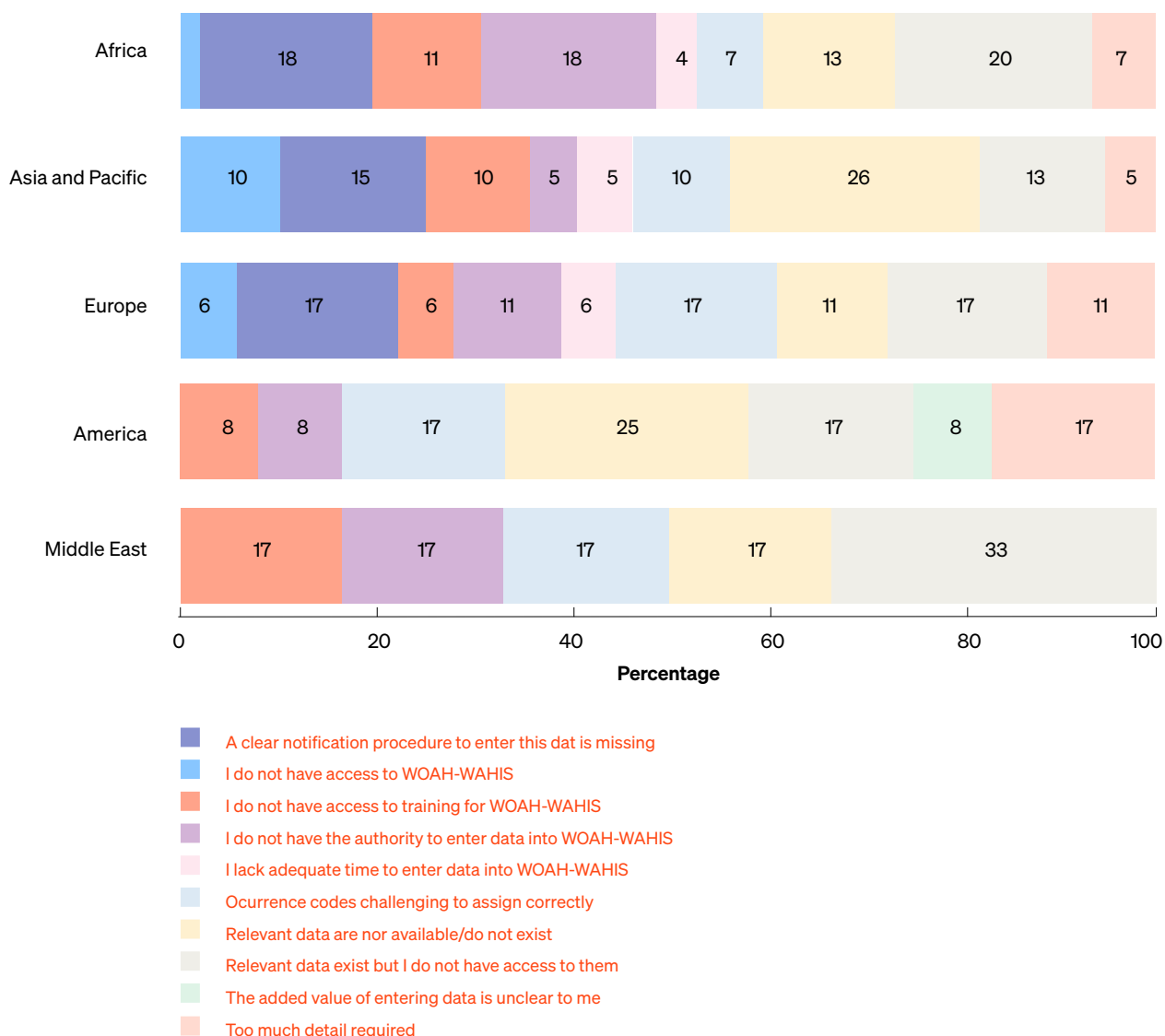
The 40 Members reporting limitations or impediments in entering wildlife disease surveillance information in the WOA-H-WAHIS system were asked to rank their difficulties.



The main hindrances in entering wildlife health data concern the availability of data, for 25% (10/40) respondents, of the relevant data is not available or do not exist or the data exist but they had no access to it (15%, 6/40). The most commonly cited obstacle to WOA-H-WAHIS data entry was the restricted access to the system, mentioned by 17.5% (7/40) of the NFPW. Further difficulties concern the amount of required details, the authority to enter to the system and the need of training, all the mentioned options represents a limitation for at least 10% of the respondents. When analysing these findings, it is important to recall that the survey targeted National Focal Point for Wildlife, while the disease notification in WAHIS is normally handled by the National focal point for Notification. Furthermore, the WAHIS-wild platform was unavailable at the time of the study, and reporting of non-listed diseases in wild species was interrupted. Nevertheless, these findings call for improved in-country data flow as a result of efficient networking among wildlife health chain actors, the focal point for notification, and the focal points for wildlife, as well as clarification of the role in the notification to WOA-H of diseases (listed and non-listed) occurring in wild species. These findings further highlight the need to streamline the reporting method.



### The most important impediments to enter wildlife health data into the WAHIS

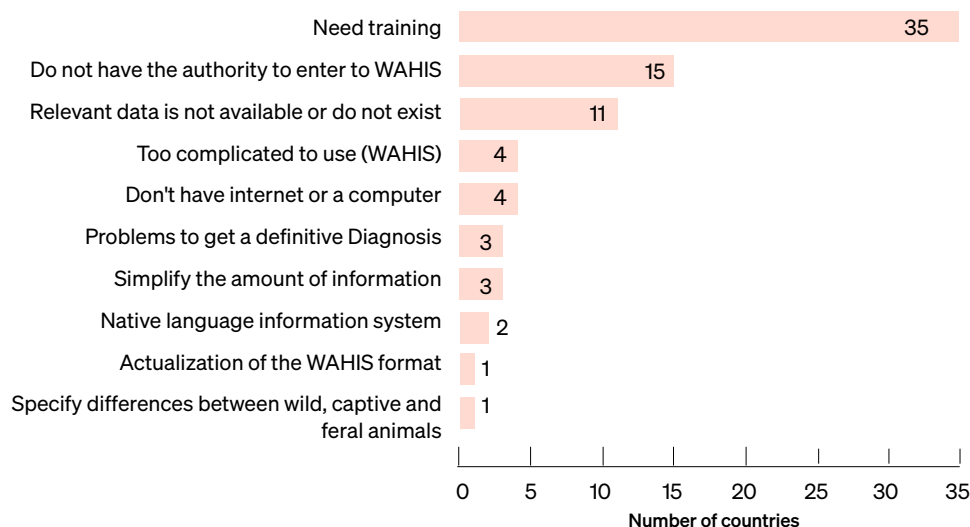


To see the trend of responses by region, responses ranked first, second, and third important limitation were added up. The results of this analysis demonstrate disparities between regions. For the Africa region, the greatest data entry difficulties concern accessing the data and having the authority to upload the data to the system. In Asia Pacific, the main impediment is the lack of data, which is also reported in the Americas, together with access to data and technical difficulties linked with WAHIS. In Europe, the lack of data, of authority and of clear notification procedure are reported. Given the small number of response from the Middle East region, the percentage have to be considered with great care.

**Question 5b.**

**What would you need to facilitate data submission to WOAH-WAHIS? (75 answers).**

**Member's need to facilitate data submission to WOAH-WAHIS**



Asked to suggest improvements on a voluntary basis, the Members provided 75 responses on facilitating the use of WOAH-WAHIS. Almost half (46.6%, or 35/75) expressed the need for training sessions on the WOAH-WAHIS platform, some of them saying that a tutorial or virtual training sessions would be helpful. A number of Members (20%, or 15/75) reported that Focal Points for Wildlife should be able to enter data. For 14.6% (11/75) of the respondents, uploading information to the system was hindered by not having the relevant data. Because the open format of this question, the interpretation of these results may differ between observer.

## Section 6: Wildlife Disease Management

**Questions 6 (103 answers, each country could assess 11 to 12 different types of agencies).**

### Questions 6a.

If there is a significant wildlife morbidity/mortality event within your country affecting **only wildlife species**, please check the box next to the agencies within the affected area that would need to be informed.

Wildlife only event	Number	%
Local	170	25
National	285	42
Regional	223	33
<b>Total</b>	<b>678</b>	<b>100</b>

### Questions 6b.

If there is a significant wildlife morbidity/mortality event within your country affecting **both domestic animal and wildlife species**, please check the box next to the agencies within the affected area that would be informed.

Wildlife and domestic species	Number	%
Local	219	29
National	306	40
Regional	233	31
<b>Total</b>	<b>758</b>	<b>100</b>

### Questions 6c.

If there is a significant wildlife morbidity/mortality event within your country involving **wildlife that has zoonotic potential**, please check the box next to the agencies within the affected area that would be informed.

Wildlife disease with zoonotic potential	Number	%
Local	198	26
National	324	42
Regional	246	32
<b>Total</b>	<b>768</b>	<b>100</b>

We proposed three case scenarios to the Members:

- A significant wildlife morbidity/mortality event in your country affecting **wildlife species only**.
- A significant wildlife morbidity/mortality event in your country affecting **both domestic and wildlife species**.
- A significant wildlife morbidity/mortality event in your country involving wildlife that has a **zoonotic potential**.

And different kinds of authorities: local, regional, national levels authorities with administrative bodies related to Environment, Agriculture, Public Health, Fishery services. In the three case scenarios suggested, the national authorities were contacted in priority.

**Which agencies are informed of events related to wildlife, wild and domestic species, and events in wild species with a zoonotic potential?**

<b>Wildlife only event</b>	<b>Number</b>	<b>%</b>
Agriculture	225	33
Environment	220	32
Fishery	88	13
Public Health	145	21
<b>Total</b>	<b>678</b>	<b>100</b>

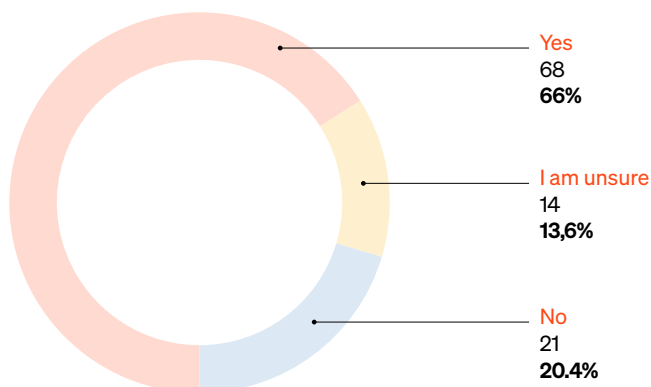
<b>Wildlife and domestic species</b>	<b>Number</b>	<b>%</b>
Agriculture	238	31
Environment	220	29
Fishery	131	17
Public Health	169	22
<b>Total</b>	<b>758</b>	<b>100</b>

<b>Wildlife disease with zoonotic potential</b>	<b>Number</b>	<b>%</b>
Agriculture	238	31
Environment	210	27
Fishery	93	12
Public Health	227	30
<b>Total</b>	<b>768</b>	<b>100</b>

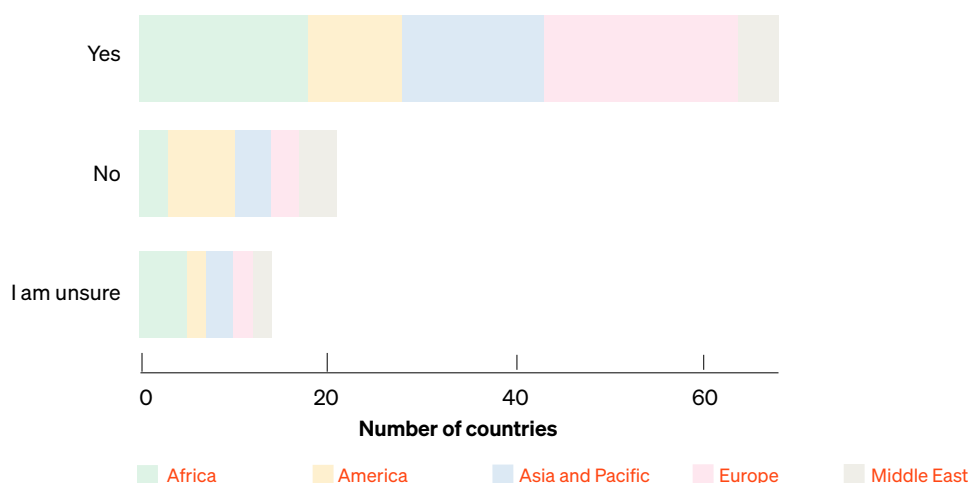
Whenever a significant wildlife morbidity/mortality event occurs affecting wildlife species or both wildlife and domestic species, the NFPWs mainly notified the agriculture agency, followed by the environmental agency. When the event involves a wildlife health pathogen with a potential zoonotic risk, 31% (238/768) of the NFPWs first inform the agriculture agency, followed this time by the public health agency 30% (227/768).

### Question 7.

Has your country ever implemented a response to manage a wildlife health event (e.g. wildlife disease, toxicity, etc.)? (103 answers).



Regarding the use of collected data, once a wildlife health event has been detected, 66% (68/103) of Members reported that they implement a response to manage the event. One out of five Members (20.4%, 21/103) reported that they have never done so.



The Members having responded to the most wildlife health events are located in Europe 80.7% (21/26) and Africa, 69% (18/26). In 4 out of 5 regions had a high percentage of positive responses, with more than half of the Members of all the regions having implemented a response to manage a wildlife health event. The small number of respondent from the Middle East generates low confidence in the analysis of the answers.

### Question 7a.

What types of responses has your country previously used or is using to manage a wildlife event? (68 answers)

Options	Number of responses	%
Carcass removal	48	70.5
Vaccination of domestic animals	46	67.6
Enhanced biosecurity of livestock areas in areas surrounding the event	40	58.8
Public Health measures (vaccination of humans, communication campaigns...)	39	57.3
Movement restrictions or spatio-temporal separations (e.g., fencing)	29	42.6
Vaccination of wildlife	28	41.1
Enhanced control of illicit wildlife trade, smuggling and trafficking of specific species	26	38.2
Density reduction using hunters	23	33.8
Vector (e.g., tick, mosquito) control	23	33.8
Culling	19	27.9
Dispersal/hazing of wildlife away from humans/domestic animals	15	22.0
Infield medication/treatment of wildlife in surrounding areas	14	20.5
Translocation of wildlife	13	19.1
Environmental treatment (pesticides, herbicides, etc.)	11	16.2
Habitat modification (e.g., controlled burning, forestry practices, etc.)	5	7.3
Selective breeding of wildlife	5	7.3

Among the 68 Members having implemented a response to manage a wildlife health event, the most frequent type of response selected by NFPWs was the 'Carcass removal', at 70.5% (48/68), followed by the 'Vaccination of domestic animals', at 67.6% (46/68). Other common response activities reported by Members also included 'Enhanced biosecurity of livestock in areas surrounding the wildlife event' and 'Public health measures (vaccination of humans, communication campaigns, etc.)', both at approximately 58%. Three of the top five responses to a wildlife health event are predominantly focused on actions relating to domestic animals or humans.

Of all the types of responses to a wildlife health event, the management measures targeting wildlife species include:

- Vaccination of wildlife 39.7%
- Infield medication/treatment of wildlife in surrounding areas 20.5%
- Environmental treatment 16.8%
- Selective breeding of wildlife 7.3%

**Question 7b.**

**Please rate the importance of the impediments to managing wildlife disease in your country, where feasible responses exist (68 answers).**

The survey explored the impediments to managing a wildlife health event. The principal impediment for 76.5% (52/68) of the WOAHA Members was the budget allocated to managing wildlife health events. As in previous questions, this financial shortfall is associated with an inadequate infrastructure for 60.2% (41/68) of Members, as well as a lack of human resources and a lack of training and equipment, both at 58.8% (40/68).

	Very important and important		Somewhat important		Minor or not important	
Cost of management	52	76.5%	10	14.7%	6	8.8%
Appropriate infrastructure	41	60%	14	20.5%	13	19.1%
Lack of human resources to perform management	40	58.8%	14	20.5%	14	20.5%
Lack of training or equipment to perform management	40	58.8%	16	23.5%	12	17.6%

For half of all Members, the lack of legal framework and enforcement as well as the public opposition to management represented minor impediments to managing wildlife disease.

	Minor or not important		Somewhat important		Very important and important	
Lack of support from law enforcement services	35	51.4%	14	20.6%	19	27.9%
Lack of legal authority	34	50%	16	23.5%	18	26.4%
Lack of regulation or law enforcement	32	47%	12	17.6%	24	35.3%
Public opposition to management	31	45.5%	25	36.7%	12	17.6%

## Section 7: WOAAH-WAHIS System

The new WAHIS-wild system was created in 2020 to make animal health information more accessible, to make reporting easier for Members, and to enable for user-friendly data visualisation.

### Question 8.

Have you used the new WOAAH-WAHIS system? (103 answers).

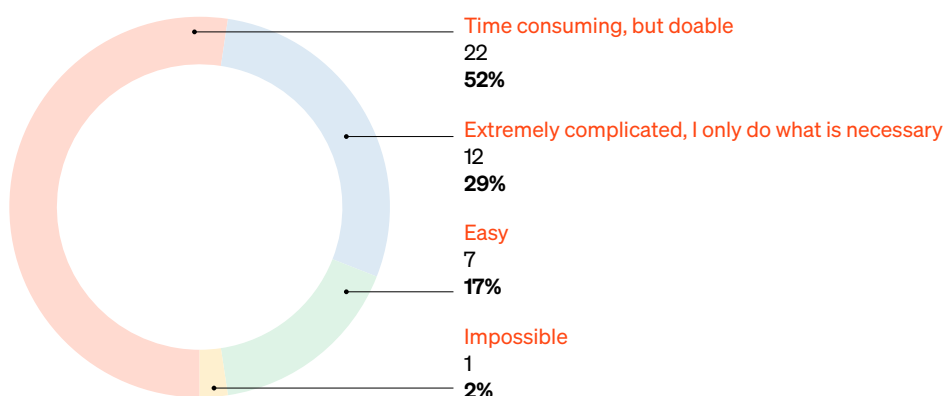
Use of the new WOAAH-WAHIS system	Countries	%
Yes	61	59.22
No	42	40.78
<b>Total</b>	<b>103</b>	<b>100.0</b>

More than half of the WOAAH National Focal Points for Wildlife (59.2%, 61/103) have yet to use the new WOAAH-WAHIS system.

### Question 9.

How easy is it for you to get the information you need to and from WOAAH-WAHIS about WOAAH listed diseases in wildlife? (42 answers).

52% (22/42) of the Focal Points having used the new WOAAH-WAHIS system felt that obtaining the required information from the system was time-consuming but doable, while 29% (12/42) thought that it was extremely complicated and only use it when necessary. Only one respondent mentioned that getting information from the WOAAH-WAHIS system was impossible.



### Question 10.

Do you have any suggestions for additional data for wildlife that could be entered in WOAAH-WAHIS to facilitate and improve the epidemiological overview of an event? (7 free answers).

QUESTION	
Do you have any suggestions for additional data for wildlife that could be entered in WOAAH-WAHIS to facilitate and improve the epidemiological overview of an event?	
1	It is <b>impossible to obtain information on WOAAH non-listed diseases in wildlife.</b>
2	Ability to note whether and how detection is novel in general terms. Example: disease present and detected in a new host/location/time of year; <b>option to add details.</b>
3	I think we need to start <b>recording climate change-related</b> disease events such as heavy rains, extreme environmental temperatures, etc.
4	We have had few opportunities to use WOAAH-WAHIS regarding wildlife health. Thus far, we have not identified a <b>need to enter additional data.</b> The WOAAH-WAHIS-Wild platform had yet to be released, so it was not possible to check the data entry options.
5	<b>The sorting of countries based on a disease</b>



QUESTION	
<b>Do you have any suggestions for additional data for wildlife that could be entered in WOA-H-WAHIS to facilitate and improve the epidemiological overview of an event?</b>	
6	A field/category is required to report whether a county is free of the agent or the agent is absent from the country. Countries should be able to <b>report occurrence independently for domestic animals and wildlife</b> . A country should be able to report if a disease agent has never been reported in wildlife or domestic animals EVEN if it has been reported in the other category. Forcing countries to report the absence of disease and provide a date or declare that the date of the last occurrence is unknown leads to the entry of inaccurate information and, in turn, the sharing of inaccurate information and the misinterpretation of disease occurrence in countries.
7	Why limit the reporting to a list of wildlife diseases? I think countries should have the <b>flexibility to report what they believe is important</b>

### Question 11.

#### How does your country use wildlife health information available in WOA-H-WAHIS and WOA-H-WAHIS-Wild? (42 answers).

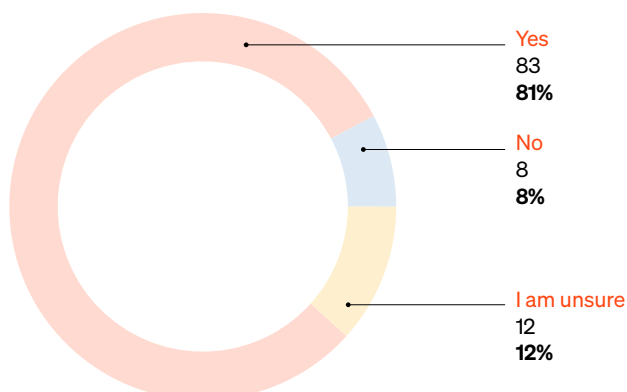
Options	Number of responses	%
Obtain knowledge on the presence/absence of infectious or non-infectious agents in wildlife to identify current and potential sanitary risks	32	76.2
Inform preparedness for potential introduction of disease from neighbouring countries	30	71.4
Inform disease risk assessments for animal movements/translocations/species management	28	66.6
Monitor occurrences of infectious or non-infectious causes of mortality or morbidity in wildlife	26	61.9
Validated reports on infectious or non-infectious agents in wildlife globally	26	61.9
Inform domestic animal health preparedness and response activities and/or plans	23	54.7
Monitor new and emerging occurrences of mortality or morbidity in wildlife	22	52.4
Monitor trends and changes in the occurrence of infectious or non-infectious agents in wildlife globally	22	52.4
Inform the design of domestic animal health disease prevention and control interventions	22	52.4
Inform prioritisation of national/regional surveillance activities	20	47.6
Inform wildlife health preparedness and response activities and/or plans	18	42.8
Inform the design of wildlife health disease prevention and control interventions	17	40.5
Inform human health preparedness and response activities and/or plans	16	38.1
Inform the design of human health disease prevention and control interventions	12	28.5
Identify taxonomic groups/species previously unrecognized as susceptible to infectious agents	9	21.4

Although only 40.8% (42/103) of the Members claimed that they have used the new WOA-H-WAHIS system (see question 8 above), 76.2% (32/42) of those users said that they use WOA-H-WAHIS information to remain informed of potential health risks ('Obtain knowledge on the presence/absence of infectious or non-infectious agents in wildlife to identify current and potential sanitary risks'). WOA-H-WAHIS information is used by 71.4% (30/42) of Members regarding to preparedness for the potential introduction of disease from neighbouring countries, while 66.6% (28/42) of the respondents reported that WOA-H-WAHIS information was used when assessing disease risks for animal movements, translocations and species management. Nine of the potential use suggested for the data collected by WOHIS collected more than 50% of country votes, showcasing the wide range of applications for the data collected at the global level. WOA-H-WAHIS information was used the least for the taxonomic identification of species susceptible to certain pathogens 21.4% (9/42).

## Section 8: Legal and illegal wildlife trade

### Question 12.

Is the veterinary authority of your country involved in regulating the legal wildlife trade? (103 answers).



Wildlife trade brings into play a variety of laws from distinct areas of legislation with a view to protecting wildlife populations and preventing the spread of infectious diseases to animal trade. Restrictions on international movement apply to numerous wildlife species. For example, at the international level, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was created to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species, while the Nagoya Protocol supports the fair and equitable sharing of the profits generated by the utilisation of genetic resources, thereby contributing to the conservation of biological diversity and the sustainable use of biodiversity. For the domestic regulation of the legal wildlife trade, 81% (83/103) of the Focal Points for Wildlife affirmed that the veterinary authority is the national agency overseeing this duty.

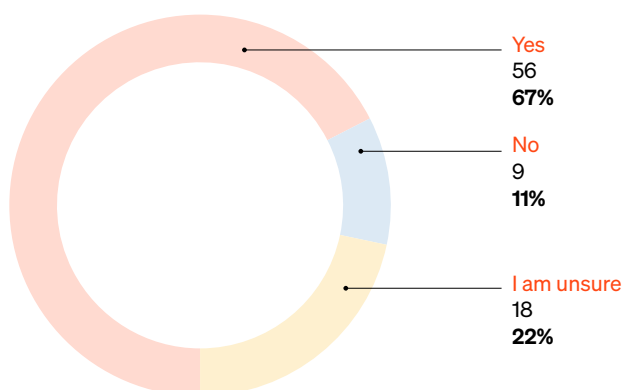
### Question 12a.

Does Law Enforcement collaborate with the Veterinary Authority for these activities and in what way? (58 answers)

Fifty-eight of the respondents further explained how the law enforcement services work in tandem with the veterinary authority. However, the interpretation of the answers is subject to variability due to the open nature of the question. They collaborate primarily on transportation (borders, ports, roads), with 56.9% (33/58) of the Members reporting that this joint effort mainly concerns customs and borders, the aim being to protect against and regulate all trading activities in the Members' country or internationally. The law enforcement services, and the veterinary authority also work together on sanitary certificates, certificates and permits for the export and import of wildlife, import and Export Wildlife Certificates/ Permits, according to 22.4% (13/58) of the respondents. The Members claimed that the objectives of the collaboration with the law enforcement services included supervising, sanctioning and sentencing illegal activity and overseeing risk analysis.

### Question 12b.

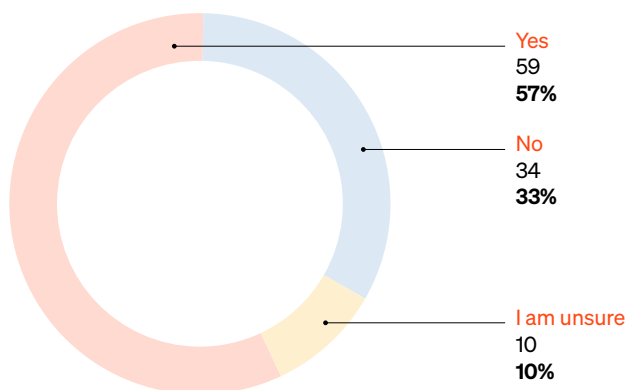
Are there established policies and procedures for this collaboration? (83 answers).



Of the 83 countries which claimed that the veterinary authority is involved in the legal trade of wildlife, 67.5% (56/83) of the collaborative efforts between law enforcement and the veterinary authorities were based on an established policy and/or procedure.

### Question 13.

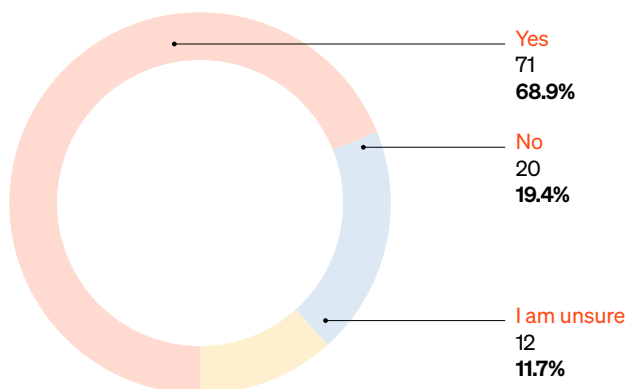
**Is the Veterinary Authority in your country involved in handling the illegal wildlife trade (sanitary inspection of confiscated animals, quarantine, etc.)? (103 answers).**



Just as important as the surveillance of legal wildlife trade is the issue of illegal wildlife trade. According to 57% (59/103) of the Members, the veterinary authority is responsible for handling illegal wildlife trade. The remainder (43%, or 44/103) reported that the veterinary authority is not involved or that they do not know.

### Question 13a.

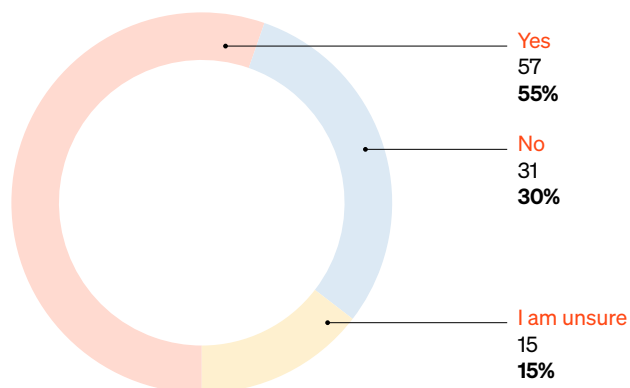
**Does Law Enforcement collaborate with the veterinary authorities for these activities and if yes in what way? (103 answers).**



Of the 69% (71/103) of NFPW Members responding that the law enforcement services collaborate with the veterinary authority, most of their joint efforts concern borders, coasts, and customs legislation. Several of the respondents also mentioned that the two institutions work together on monitoring, confiscations and sanctions relating to cases of illegal wildlife trade. One-third of WOAHA Members (32/103) reported that there was no collaborative relationship between law enforcement and the Veterinary Services or that they were not sure about the connection between the agencies.

**Question 13b.**

**Are there established policies and procedures for the collaboration and exchange of information between the veterinary and law enforcement sectors? (103 answers).**



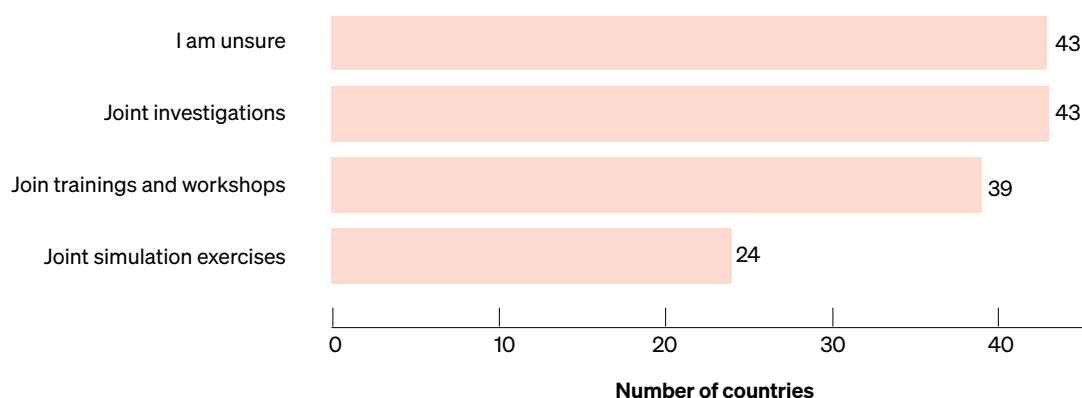
One-third (31/103) of the Members do not have any formally established procedures for the collaboration and exchange of information between the veterinary and law enforcement sectors, while 15% (15/103) have no information on the subject. Among the Members reporting a collaboration strategy between the veterinary authority and law enforcement (55%, 57/103), the relationship between the organisations is focused on border legislation and illegal wildlife trade procedures.

**Question 14.**

**Does the Veterinary Authority and Law Enforcement in your country undertake (103 answers).**

Joint investigations were carried out by Veterinary authorities and Law enforcement in 41.7% of the countries surveyed (43/103), whereas 37.9% of countries (39/103) undertook joint trainings and workshop and 23.3% (24/103) carried out joint simulation exercises.

Interestingly, a large proportion of the national focal points for wildlife surveyed (41.7%, 43/103) did not have information about joint exercises between law and veterinary authorities.



## V. Conclusions (for the 103 countries surveyed)

# 83%

**Veterinary Services of WOAH Members are involved in the management of wildlife health**

# 54%

**Members have a wildlife disease surveillance programme**

**Top-three most monitored wildlife disease:**

- 1- Avian influenza**
- 2- African swine fever**
- 3- Rabies**

- For most of the WOAH regions worldwide, **the most challenging competency** involved in the role of the National Focal Points for Wildlife was **'Communication and advocacy strategies to better integrate wildlife health in the national animal health strategy'**.
- The **Veterinary Services of WOAH Members are involved in the management of wildlife health**, either alone, for 43% (44/103) of the respondents, or in coordination and collaboration with the other authorities (including the environmental services, wildlife services, national parks and the services responsible for protected areas), for 83% (86/103).
- For all the regions, **the most pressing need for wildlife disease surveillance programs was 'Conducting wildlife outbreak investigation and surveillance'** (38%, or 39/103 of the NFPWs).
- **More than half of the WOAH NFPWs** (54%, or 56/103) claimed that they **have a national wildlife disease surveillance programme**. Most of the Members with a programme 95% (53/56) carry out general surveillance, while 86% (48/56) apply targeted surveillance.
- For the 56 respondents reporting that their country has a wildlife disease surveillance programme, **the main source of wildlife health information was the national/central environmental ministry/agency** for almost 40% (22/56), followed by the national/central agriculture ministry/agency for more than 30% (18/56).
- **The top-three most monitored wildlife diseases by country were avian influenza, African swine fever and rabies**. The three diseases applying solely to wildlife were chronic wasting disease, cited by 8 countries, white nose syndrome and European brown hare syndrome, cited just once.
- **63% (65/103) of Members report impediments in collecting, handling and transporting wildlife samples**. For a large majority (75%, 49/65), the most significant impediment was the lack of a dedicated budget for collecting, handling and/or transporting wildlife samples. The situation was similar for conducting diagnostic tests on wildlife disease samples collected from the field, with 68% Members with recognised impediments for sample management blaming a budget limitation.

# 62%

**maintain records and data on wildlife morbidity and/or mortality**

# 66%

**Members had implemented a response to manage the event once a wildlife health event has been detected**


# 81%

**the veterinary authority was the authority involved in regulating legal wildlife trade**

- Regarding wildlife disease information management, **62% (64/103) of the respondents affirmed that they maintain records and data on wildlife morbidity and/or mortality.** Altogether, 47% (48/103) of the Members record data on a sustainable and reliable system. However, in 53% of the cases (55/103), the data was either not recorded or recorded on an unreliable information system. The main purpose of the data recorded by the 64 Members with recording system was to provide wildlife disease information to their relevant national authorities 89% (57/64), manage disease outbreaks (72%, 46/64), and detect emerging pathogens in wildlife (70%, 45/64).
- **49.5% (51/103) of the NFPWs said they have no limitations or impediments to entering their country's wildlife disease surveillance information in WOA-H-WAHIS** for both listed and not-listed WOA-H diseases. But 39% (40/103) of the respondents reported such limitations or impediments. Among the latter, the most important impediments are data availability (20%) and the access to the WAHIS system (17.5%). To facilitate the use of WOA-H-WAHIS, almost half of the Members (47%, 35/75) expressed the need for training sessions on the WOA-H-WAHIS platform, while 20% (15/75) acknowledged access limitation to WAHID by the national Focal Points for Wildlife and 15% (11/75) expressed the need to have access to data.
- **Once a wildlife health event has been detected, 66% (68/103) of Members said that they had implemented a response to manage the event.** The most frequent type of response to a wildlife health event selected by the NFPWs was 'Carcass removal' (70.5%, 48/68), followed by the 'Vaccination of domestic animals' (68%, 46/68). The main hindrance to managing a wildlife health event (for 76.5% (52/68) of the Members) is the budget allocated to the management of wildlife health events.
- For 81% (83/103) of NFPWs, **the veterinary authority was the authority involved in regulating legal wildlife trade.** Fifty-eight of the responding NFPW Members explained how the law enforcement services work together with the veterinary authority. They collaborate primarily on transport activities (borders, ports, roads), [57% (33/58)]. For 57% (59/103) of the Members, the veterinary authority is responsible for handling the illegal wildlife trade.

# VI. Appendices

## a) Appendix 1: Wildlife Health Survey Questionnaire



**World Organisation  
for Animal Health**  
Founded as OIE

**In-Country Wildlife Disease Surveillance Survey**

**Objective:** The main aim of the survey is to gain an understanding of OIE Member Countries wildlife disease surveillance systems. There are also a number of questions exploring reporting on diseases of wildlife through OIE-WAHIS and WAHIS-Wild and information on the veterinary authority role relating to legal and illegal wildlife trade. The information will be used to inform future training workshops and the OIE wildlife health framework to meet the needs of the OIE National Focal Points for Wildlife across the five OIE regions.

**Target:** OIE National Focal Points for Wildlife

**Presentation of the survey results:** A summary of the key findings of the survey will be sent to all the OIE National Focal Points for Wildlife by email. Any further analysis, if undertaken, will also be provided. Your responses will remain anonymous in the presentation of results.

**Please Specify Information Describing the OIE Focal Point for Wildlife (OPFW) for your Country:**

Name of Country: \_\_\_\_\_

Name of the Agency/Ministry/University employing the OPFW: \_\_\_\_\_

Position held by OPFW (e.g., Chief Veterinarian Officer, wildlife biologist, professor): \_\_\_\_\_

Specialty of the OPFW (e.g., wildlife disease ecology, domestic animal disease): \_\_\_\_\_

**Section 1. Background information**

**Question 1.** Are you the OIE Focal Point for Wildlife for your Country?

Yes (if yes, please proceed to Question 1a)  
 No (if no, please proceed to Question 1b)

**Question 1a.** The following list of competencies and activities are associated with the role of the OIE National Focal Points for Wildlife. Please rank them in order of the competencies and activities that have been most challenging for performing your duties as a National Focal Point. The most challenging should be ranked 1, the second most challenging 2, etc. A ranking number should only be used once.

Focal point competencies and activities	
Understanding and knowledge of OIE activities related to wildlife diseases and surveillance	
Use of the OIE-WAHIS system	
Communication network and collaborations with wildlife counterparts	
Communication and advocacy strategies to better integrate wildlife health in your country's national animal health strategy	

1

Involvement in a wildlife focal points network	
In-country coordination of wildlife health events so they can be managed then reported to the OIE	
Other (please specify):	

**Question 1b.** Who is in charge/lead of wildlife health management (population and disease surveillance, export/import health certificate, etc.) in your Country/State/Territory (you may check more than one box)?

Veterinary Services  
 Wildlife Services  
 National parks and protected areas  
 Environment Services  
 Other (please specify)

**Section 2: Partner wildlife disease reporting network**

**Question 2.** Wildlife disease surveillance programs vary in their complexity from country to country. Of the following topics please rank them in order of greatest need for your country. The one you think is the biggest need should be ranked 1, the second biggest need 2, etc. A ranking number should only be used once.

Conducting wildlife outbreak investigations and surveillance	
Creating a partner network/supporting a citizens' initiative for collecting wildlife surveillance samples	
Data management for disease surveillance including data collection, data analysis, data communication, and data reporting	
Communication strategies for wildlife health	
Management strategies for reducing the impacts of wildlife disease	
Data visualization and GIS applications	
Conducting risk assessments for wildlife disease threats	
Reducing zoonotic disease risk at the animal-human-environment interface (i.e., One Health Approaches)	
Other (please specify):	

**Question 2a.** Does your country have a wildlife disease surveillance program?

Yes (if you check yes, please answer questions 2b through 2h)  
 No (if you check no, proceed to question 3)

2

**Question 2b.** Does the wildlife disease surveillance program include investigation of wildlife mortality/morbidity events (general surveillance)?

Yes  
 No

**Question 2c.** Does the wildlife disease surveillance program include testing of opportunistically collected and / or "apparently healthy" wildlife or wildlife specimens for specific diseases (targeted surveillance)?

Yes  
 No

**Question 2d.** Please rank the importance of the following sources of wildlife health information for your wildlife disease surveillance program. The most important source should be ranked 1, the second most important source 2, etc. If a source is not used in your country, it does not need to be ranked. A ranking number should only be used once.

National/Central Environmental Ministry/Agency	
National/Central Agriculture Ministry/Agency	
State/Provincial Agriculture Ministry/Agency	
State/Provincial Environmental Ministry/Agency	
National/Central Health Ministry/Agency	
State/Provincial Health Ministry/Agency	
Hunter/Hunting Organizations	
State/provincial fishery Ministry/Agency	
National/Central fishery Ministry/Agency	
Academia (Research or field project, Veterinary Department, etc.)	
Non-governmental Conservation Organizations	
Local Communities/General Public	
Local Governments	
Media	
Other (please specify):	

**Question 2e.** On average, approximately how many wildlife disease surveillance samples and/or events\* does your country collect, track, or analyse from within your country per year? If you know both the number of samples and events for your country, please indicate that by checking the appropriate number in each of the boxes below.

\*This question relates only to the investigation of wildlife mortalities/morbidities, where an event is a single or group of epidemiologically related outbreaks for a given disease, infection, or infestation.

Sample collection	Events	Sample analysis
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3

<input type="checkbox"/> 0-10 <input type="checkbox"/> 11-50 <input type="checkbox"/> 51-100 <input type="checkbox"/> 101-500 <input type="checkbox"/> 501-1000 <input type="checkbox"/> >1000 <input type="checkbox"/> I am unsure	<input type="checkbox"/> 0-10 <input type="checkbox"/> 11-50 <input type="checkbox"/> 51-100 <input type="checkbox"/> 101-500 <input type="checkbox"/> >500 <input type="checkbox"/> I am unsure	<input type="checkbox"/> 0-10 <input type="checkbox"/> 11-50 <input type="checkbox"/> 51-100 <input type="checkbox"/> 101-500 <input type="checkbox"/> 501-1000 <input type="checkbox"/> >1000 <input type="checkbox"/> I am unsure
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**Question 2f.** Please list any priority wildlife diseases monitored by your country.

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I am not sure if my country monitors for any specific wildlife diseases

**Question 2g.** Does your country collect wildlife disease information and/or undertake health monitoring of wildlife intended for commercial or non-commercial use or consumption by pets or humans (Trade includes capture, handling, transport, wild animal farming, wildlife pets, markets, export)?

Yes  
 No  
 Not applicable to my country  
 I am not sure

**Question 2h.** Does your country collect wildlife disease information and/or undertake health monitoring of wildlife imported into your country (not just related to human use or consumption, e.g. exotic species (e.g. for zoos, as pets, or for other purposes)?

Yes  
 No  
 Not applicable to my country  
 I am not sure

**Section 3: Wildlife disease diagnostics**

**Question 3.** Does your country have impediments when collecting, handling and/or transporting wildlife samples from wildlife mortality/morbidity sites for diagnostic testing, and/or for the diagnostic testing in itself?

Yes (if you check yes, proceed to questions 3a and 3b)  
 No (if you check no, proceed to question 4)  
 I am unsure (if you check "I am unsure", proceed to question 4)

4

Question 3a. Please rate the limitations and impediments for collecting, handling and/or transporting wildlife samples from known wildlife mortality/morbidity sites within your country for diagnostic testing.

	Very important	Important	Somewhat important	Minor limitation	Not a limitation
Delays or lack of detection, reporting and notification of wildlife disease events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to carcasses or sick animals due to remote locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to carcasses or sick animals due to property ownership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to proper field equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Available personnel to collect carcasses (e.g., smaller species)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to training on sample collection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to proper equipment/options for shipping samples	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to proper equipment/facilities for storing samples	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to biosafety equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to biosafety training/guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquiring international or national (within country) permits for shipping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of dedicated budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 3b. Please rate the limitations and impediments for conducting diagnostic tests on wildlife disease samples collected from known wildlife mortality/morbidity sites within your country.

	Very important	Important	Somewhat important	Minor limitation	Not a limitation
Access to proper testing equipment and material (reagents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of trained personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to diagnostic laboratories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to resources for testing costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to biosafety equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to biosafety training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5

Access to species-specific protocols (e.g., cut-off)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of prioritization of wildlife samples testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6

#### Section 4. Wildlife disease information management

Question 4. Does your country maintain records from, and data related to, known wildlife mortality/morbidity events that have occurred or are occurring within your country?

- Yes (If you check yes, proceed to questions 4a and 4b)
- No (If you check no, proceed to question 5)
- I am unsure (If you check "I am unsure", proceed to question 5)

Question 4a. Please rank the importance of the following data management methods for records from, and data related to, known wildlife mortality/morbidity events that have occurred or are occurring within your country. The most important method should be ranked 1, the second most important method 2, etc. If a method is not used in your country, it does not need to be ranked. A ranking number should only be used once.

Paper records	
Spreadsheets (e.g., Excel)	
Database hosted on a local computer	
Centralized agency database	
Other (please specify):	
I am unsure	<input type="checkbox"/>

Question 4b. Please indicate if you use your wildlife disease surveillance data for any of the following purposes within your country. Please check all that apply. If you are unsure of how wildlife disease surveillance data is managed within your country, please check the "I am unsure" box.

Provide wildlife disease information to national/central governmental ministries/agencies (e.g., Environmental Ministry, Ministry of Agriculture, etc.)	<input type="checkbox"/>
Provide wildlife disease information to state/provincial/local governmental agencies	<input type="checkbox"/>
Provide wildlife disease information to the general public	<input type="checkbox"/>
Detecting emerging pathogens in wildlife	<input type="checkbox"/>
Monitor trends and changes of diseases known to occur in wildlife in your country	<input type="checkbox"/>
Design disease prevention and control interventions	<input type="checkbox"/>
To communicate specific risk and precaution measures to law enforcement officials (border control, customs, park rangers, etc.)	<input type="checkbox"/>
Manage disease outbreaks	<input type="checkbox"/>
Scientific research on wildlife health	<input type="checkbox"/>
Training purposes	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>
I am unsure	<input type="checkbox"/>

7

Question 5a. Please rank the importance of the following limitations and impediments to entering your country's wildlife disease surveillance information in OIE-WAHIS for both listed and not-listed OIE diseases. The most important impediment should be ranked 1, the second most important impediment 2, etc. If one of the following potential impediments is not an impediment for your country, it need not be ranked. A ranking number should only be used once. If you have no impediments, please check the box at the bottom of the list instead of providing rankings.

Relevant data exist but I do not have access to them (e.g., data ownership or intellectual property prevent access)	
Relevant data are not available/do not exist	
I do not have access to OIE-WAHIS	
I do not have the authority to enter data into OIE-WAHIS	
I do not have access to training for entering data into OIE-WAHIS	
I lack adequate time to enter data into OIE-WAHIS	
The added value of entering data is unclear to me	
Occurrence codes challenging to assign correctly (e.g., disease known to occur and be present, but no testing has been conducted during the reporting period)	
A clear notification procedure to enter this data is missing	
Too much detail required (e.g., when disease is endemic and little to no testing has occurred)	
Other (please specify):	
I am unsure	<input type="checkbox"/>
I have no impediments	<input type="checkbox"/>

Question 5b. What would you need to facilitate data submission to OIE-WAHIS?

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Question 6a. If there is a significant wildlife morbidity/mortality event within your country affecting only wildlife species, please check the box next to the agencies within the affected area that would need to be informed and check if you currently know which person within each agency to contact. Note: Ministry/agency of the environment refers to those overseeing wildlife management activities. Ministry/agency of agriculture refers to those overseeing livestock health such as veterinary services.

	Yes	I know the specific person(s) in this agency to contact	I am not sure	Not applicable to my country
National/Central Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>			

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Question 6b. If there is a significant wildlife morbidity/mortality event within your country affecting both domestic animal and wildlife species, please check the box next to the agencies within the affected area that would be informed and check if you currently know which person within each agency to contact.

Note: Ministry/agency of the environment refers to those overseeing wildlife management activities. Ministry/agency of agriculture refers to those overseeing livestock health such as veterinary services.

	Yes	I know the specific person(s) in this agency to contact	I am not sure	Not applicable to my country
National/Central Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>			

10

Question 6c. If there is a significant wildlife morbidity/mortality event within your country involving wildlife that has zoonotic potential, please check box next to the agencies within the affected area that would be informed and check if you currently know which person within each agency to contact.

Note: Ministry/agency of the environment refers to those overseeing wildlife management activities. Ministry/agency of agriculture refers to those overseeing livestock health such as veterinary services.

	Yes	I know the specific person(s) in this agency to contact	I am not sure	Not applicable to my country
National/Central Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State/Provincial Ministry/Agency of fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National/Central Ministry/Agency of fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Ministry/Agency of Public Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>			

**Section 5. Wildlife disease management**

Question 7. Has your country ever implemented a response to manage a wildlife health event (e.g. wildlife disease, toxicity, etc.)?

- Yes (if you check yes, proceed to questions 7a and 7b)
- No (if you check no, proceed to question 8)
- I am unsure (if you check "I am unsure", proceed to question 8)

11

Question 7a. What types of responses has your country previously used or is using to manage a wildlife event?

Density reduction using hunters	<input type="checkbox"/>
Culling	<input type="checkbox"/>
Vaccination of wildlife	<input type="checkbox"/>
Vaccination of domestic animals	<input type="checkbox"/>
In field medication/treatment of wildlife in surrounding areas	<input type="checkbox"/>
Movement restrictions or spatio-temporal separations (e.g., fencing)	<input type="checkbox"/>
Dispersal/hazing of wildlife away from humans/domestic animals	<input type="checkbox"/>
Vector (e.g., tick, mosquito) control	<input type="checkbox"/>
Translocation of wildlife	<input type="checkbox"/>
Environmental treatment (pesticides, herbicides, etc.)	<input type="checkbox"/>
Enhanced biosecurity of livestock areas in areas surrounding the event	<input type="checkbox"/>
Habitat modification (e.g., controlled burning, forestry practices, etc.)	<input type="checkbox"/>
Carcass removal	<input type="checkbox"/>
Selective breeding of wildlife	<input type="checkbox"/>
Enhanced control of illicit wildlife trade, smuggling and trafficking of specific species	<input type="checkbox"/>
Public Health measures (vaccination of humans, communication campaigns...)	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>

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Question 7b. Please rate the importance of the impediments to managing wildlife disease in your country, where feasible responses exist.

	Very Important	Important	Somewhat Important	Minor limitation	Not a limitation
Cost of management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to necessary equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of legal authority	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of support from law enforcement services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of regulation or law enforcement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of knowledge of risks and impact to justify management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of appropriate management methods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of human resources to perform management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of training or equipment to perform management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public opposition to management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recognition by relevant authorities as priority issue to address	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section 6. OIE-WAHIS system**

Question 8. Have you used the new OIE-WAHIS system?

- Yes
- No

Question 9. How easy is it for you to get the information you need to and from OIE-WAHIS about OIE listed diseases in wildlife?

- Impossible
- Extremely complicated, so I only do what is necessary
- Time consuming, but doable

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- Easy

Question 10. Do you have any suggestions for additional data for wildlife that could be entered in OIE-WAHIS to facilitate and improve the epidemiological overview of an event?

OIE Listed diseases in wildlife	OIE non-Listed diseases in wildlife

Question 11. How does your country use wildlife health information available in OIE-WAHIS and OIE WAHIS-Wild? (select all that applies)

- Monitor occurrences of infectious or non-infectious causes of mortality or morbidity in wildlife
- Monitor new and emerging occurrences of infectious or non-infectious causes of mortality or morbidity in wildlife
- Obtain knowledge on the presence/absence of infectious or non-infectious agents in wildlife to identify current and potential sanitary risks
- Validated reports on infectious or non-infectious agents in wildlife globally
- Monitor trends and changes in the occurrence of infectious or non-infectious agents in wildlife globally
- Inform disease risk assessments for animal movements / translocations / species management
- Inform prioritisation of national / regional surveillance activities
- Inform the design of wildlife health disease prevention and control interventions
- Inform the design of domestic animal health disease prevention and control interventions
- Inform the design of human health disease prevention and control interventions
- Inform preparedness for potential introduction of disease from neighbouring countries
- Identify taxonomic groups / species previously unrecognised as susceptible to infectious agents
- Inform domestic animal health preparedness and response activities and/or plans
- Inform human health preparedness and response activities and/or plans
- Inform wildlife health preparedness and response activities and/or plans
- Other: \_\_\_\_\_

**Section 7: Legal and illegal wildlife trade**

Question 12. Is the Veterinary Authority of your country involved in regulating the legal wildlife trade? (Exportation and importation)

- Yes (if yes, please proceed to questions 12a. and 12 b.)
- No (if no, please proceed to question 13)
- I am unsure (if you check "I am unsure", proceed to question 13)

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Question 12a. Does Law Enforcement collaborate with the Veterinary Authority for these activities and in what way?

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Question 12b. Are there established policies and procedures for this collaboration?

- Yes
- No
- I am unsure

Question 13. Is the Veterinary Authority in your country involved in handling the illegal wildlife trade (sanitary inspection of confiscated animals, quarantine, etc.)?

- Yes (if yes, please proceed to Questions 13a and 13b)
- No (if no, please proceed to Question 14)
- I am unsure (if you check "I am unsure", proceed to question 14)

Question 13a. Does Law Enforcement collaborate with the veterinary authorities for these activities and if yes in what way?

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Question 13b. Are there established policies and procedures for the collaboration and exchange of information between the veterinary and law enforcement sectors?

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Question 14. Does the Veterinary Authority and Law Enforcement in your country undertake:

- Joint simulation exercises
- Joint trainings and workshops
- Joint investigations (poaching, poisoning, mass mortality events)
- I am unsure

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## b) Appendix 2: Other results

Member responses	Option to which it could belong
In our country, the state does not provide a budget for monitoring wildlife diseases.	Lack of dedicated budget
Limited collaboration with the Department of Wildlife and National Parks, as the custodians and competent authority for wildlife.	Lack of collaboration between agencies
Lack of transport and communication pathways.	Access to proper field equipment
Lack of infrastructure for obtaining diagnoses.	Access to proper field equipment
Limited capacity to develop and establish wildlife animal health surveillance programmes with the requisite diagnoses. The remoteness of limits access to sick animals or samples.	Access to carcasses or sick animals due to remote locations
Even if we do educate hunters on taking and transporting samples, it remains difficult for them to do so.	Access to training on sample collection
Insecurity, poorly-maintained or non-existent roads, remoteness of sites.	Access to proper field equipment
Those in contact with wildlife are often not aware of the possible need to report the presence of carcasses, due to a lack of information.	Lack of collaboration between agencies
One of the obstacles is the inaccessibility of many habitats of wild animals, making it difficult to detect carcasses and select materials.	Access to carcasses or sick animals due to remote locations
The staff in charge of wildlife surveillance is not always equipped.	Access to proper field equipment
Laboratory diagnosis.	Access to proper equipment/facilities for storing samples
Long holidays hinder the access to carcasses, so the samples sometimes rot before being submitting to the laboratory.	Available personnel to collect carcasses (e.g., smaller species)
The country has never been able to take wildlife samples.	
Early reporting of wildlife mortalities can be limited as it often depends on the public finding the carcasses and their readiness to make an appropriate report to the Scheme.	Available personnel to collect carcasses
Lack of contact with the institutions that carry out research on wild populations, lack of specialised laboratories for wildlife diagnoses, and lack of standardised tests for wildlife in laboratories.	Lack of collaboration between agencies

Question 3a: 'Other' Please rate the limitations and impediments for collecting, handling and/or transporting wildlife samples from known wildlife mortality/morbidity sites within your country for diagnostic testing.

## VII. References

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- [3] Ryser-Degiorgis, M. P. (2013). Wildlife health investigations: needs, challenges and recommendations. *BMC veterinary research*, **9** (1), 1-17.
- [4] WWF (2020) Living Planet Report 2020 - Bending the curve of biodiversity loss. Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland
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