Wildlife conservation status and disease trends: 10 years of reports to the Worldwide Monitoring System for Wild Animal Diseases

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Summary

Disease is an increasingly recognised threat to wild animal populations and the conservation of endangered species. The World Organisation for Animal Health (OIE) Worldwide Monitoring System for Wild Animal Diseases (WAHIS-Wild) serves as the main global information portal for wildlife disease events, compiled via voluntary reporting by countries on non-OIE-listed diseases in wildlife. The first decade of reports to WAHIS-Wild were analysed to identify trends and examine their relevance for conservation. Between 2008 and 2018, a total of 4,229 wildlife disease events were reported, with the majority from the European continent. When standardised for nomenclature changes, 54 unique previous or current non-OIE-listed diseases affecting wild animals were reported. The most common disease events (collectively representing >50% of reports) were chemical poisoning (12.5% of events reported), infection with low pathogenic avian influenza viruses (11.9%), infection with *Salmonella enterica* (10.8%), infection with *Pasteurella* spp. (8.4%) and infection with *Trichomonas* spp. in birds and reptiles (7.5%). Reports reflected disease in 501 unique species, 19.2% of which have some level of elevated extinction risk based on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, and 30.7% of which are protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The findings suggest reporting gaps, including likely geographical and other biases. More systematic reporting of wildlife disease and use of compiled data in biodiversity assessment and decision-making may enhance animal health and conservation coordination to advance One Health outcomes.

Keywords

Biodiversity – Conservation – Disease – OIE – One Health – Reporting – Species stress – Threat – Wildlife.

Introduction

Wildlife diseases are increasingly recognised as a potential threat to the conservation of biodiversity, presenting a direct morbidity and mortality burden and potentially exacerbating other survival pressures on vulnerable species or populations (1, 2). Several major wildlife die-off events have been documented over recent decades (e.g. fungal chytridiomycosis in amphibians globally [3], white-nose syndrome in North American bats [4], morbillivirus outbreaks in marine mammals [5] and severe losses of *Gyps* vulture populations from ingestion of diclofenac-treated carcasses [6]). A global review of wildlife mass mortality events (MMEs) reported in the scientific literature found that 26.0% were primarily attributed to disease, and disease was also often a factor in multiple-stressor MMEs (7). In addition to large-scale, often visible population declines, smaller-scale disease detection and reporting may also provide critical information to anticipate evolving risks and allow prioritisation of measures to mitigate potential or current negative impacts on ecosystems, livestock production and human health. Disease threats to wildlife therefore warrant consideration as part of One Health approaches and broader sustainable development objectives, particularly as part of preparedness for effects of environmental change (8).

Wildlife disease surveillance is thought to be incomplete and under-prioritised across human health, animal health and environmental sectors (9), with need for increased integration of wildlife disease considerations in One Health approaches (10, 11). The World Organisation for Animal Health (OIE) Worldwide Monitoring System for Wild Animal Diseases (WAHIS-Wild), an interface under the World Animal Health Information System (WAHIS), was launched in 2008 for voluntary reporting by countries on non-OIE-listed diseases in wildlife. The interface, which is separate from the main WAHIS portal in terms of search function, is intended to help monitor disease threats to wildlife (including those of potential public health and conservation concern) without impacting international trade of animals or animal products. It is meant to serve, alongside the main platform WAHIS, as the main global aggregator for wildlife disease information.

Given the differing reporting requirements and trade implications for OIE-listed versus non-OIE-listed diseases, it is likely that detection and reporting capacity, mandates, resources, motivations and information needs also vary. Therefore, the authors focused on WAHIS-Wild specifically to assess its scope and utility in its current form to contribute to overarching One Health goals. The need for improved coordination among human, animal and environmental health authorities recognised by the One Health concept reinforces the value of enhanced integration of wildlife disease information into biodiversity conservation, animal health and zoonotic disease decision-making and programmes (12). Non-OIE-listed diseases were reviewed, given the known limitations of wildlife disease monitoring globally and the opportunities for advancing One Health coordination and outcomes, with a focus on utility for the conservation community. Disease reports submitted to WAHIS-Wild over the past decade of reporting were analysed to determine geographical and taxonomic coverage, as well as considerations to inform biodiversity management. Countries may also report additional information to WAHIS-Wild not captured here, e.g. surveillance or absence of disease.

Materials and methods

Listings of disease reports were extracted from the WAHIS-Wild interface (13) that reflect reported disease presence for non-OIE-listed diseases. Temporal, geographical, disease and species trends were described in reporting to the interface (information reported from 2008–2018 and publicly available as of 29 May 2019). To examine the conservation relevance of the reports, information on species extinction status and conservation protection was compiled from the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, version 2019-1 (14) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as of 19 February 2019 (15). Analysis was conducted in Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) and STATA/IC 15.1 (StataCorp LLC, College Station, TX, USA). Disease reports without taxonomic identifiers (family level or lower) were not included as part of this analysis. The source data have been posted to Zenodo (https://doi.org/10.5281/zenodo.3923576).

Results

A total of 4,229 disease reports were listed on WAHIS-Wild for the period between 2008 and 2018 with animal taxonomic identification to at least family level or lower. Of these, 4,018 reports were from species assessed under the IUCN Red List of Threatened Species, representing 501 unique species. Sixty-one countries voluntarily submitted reports. The highest number of reports was from Italy (19.1%), followed by Canada (15.9%), the Netherlands (12.9%), Finland (8.4%), the United Kingdom (6.4%), Spain (5.9%), Hungary (3.6%), France (3.5%), Belgium (2.8%) and Sweden (2.3%). Of the countries reporting events, more than half (34/61) reported disease <10 times over the period. The majority of reports were from the European continent (inclusive of the United Kingdom) (3,254/4,229). Analyses for reporting years, diseases and species are presented below.

Reporting by year

Reporting for 2018 was considered in progress at the time of data collection. For prior years (2008–2017), disease event reporting to WAHIS-Wild ranged from a high of 518 reports (2009) to a low of 303 reports (2017).

Wild animal diseases reported

Reports were filed under 89 wild animal disease names. Some were added, grouped or removed by the OIE from the non-OIE-listed diseases affecting wild animals in the ten-year course of the reporting period evaluated (e.g., removal of *Clostridium piliforme* [Tyzzer's disease] and pestiviruses). When diseases and causal pathogen name are combined, the reports reflect a total of 54 unique previous or current non-OIE-listed diseases affecting wild animals. Diseases vary in their specificity (e.g. infection with specific pathogens versus chemical poisoning).

Most frequent diseases reported

More than half of the disease events reported were associated with five diseases (see percentages in Fig. 1): chemical poisoning (529 events representing 12.5% of total events reported), infection with low pathogenic avian influenza viruses (505 events; 11.9%), infection with *Salmonella enterica* (456 events; 10.8%), infection with *Pasteurella* spp. (356 events; 8.4%) and infection with *Trichomonas* spp. in birds and reptiles (315 events; 7.5%). Of the 54 diseases reported, the majority had fewer than 50 reports over the ten-year period (see number of reports in Table I).

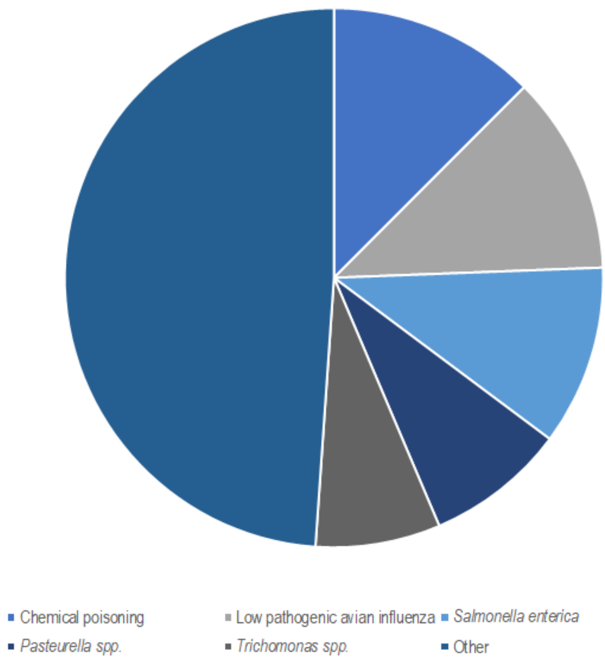

Fig. 1

Reports by aetiology

Table I

Diseases reported to WAHIS-Wild between 2008 and 2018, in order of frequency

Disease name	Number of reports	Percentage of total reports
Chemical poisoning	529	12.51
Infection with low pathogenic avian influenza viruses (all subtypes)	505	11.94
Infection with *Salmonella enterica* (all serovars)	456	10.78
Infection with *Pasteurella* spp.	356	8.42
Infection with *Trichomonas* spp. in birds and reptiles	315	7.45
Infection with *Sarcoptes scabiei*	254	6.01
Botulism	241	5.7
Infection with *Toxoplasma gondii*	212	5.01
Infection with pox viruses	182	4.3
Infection with *Yersinia pseudotuberculosis*	162	3.83
Infection with morbillivirus (canids and felids)[a]	148	3.5
Infection with *Leptospira interrogans* ssp.	84	1.99
Infection with *Listeria monocytogenes*	75	1.77
Infection with circoviruses	75	1.77
Infection with parvoviruses	62	1.47
Infection with *Yersinia enterocolitica*	44	1.04

Infection with avian paramyxoviruses	43	1.02
Infection with European brown hare syndrome virus	35	0.83
Infection with *Plasmodium* spp.	35	0.83
Infection with *Babesia* spp.	33	0.78
Infection with alcelaphine herpesvirus 1 or ovine herpesvirus 2	31	0.73
Infection with *Histomonas* spp.[(b)]	30	0.71
Agent causing chronic wasting disease (CWD)	29	0.69
Infection with *Fasciola gigantica*	25	0.59
Mycotoxicosis	24	0.57
Infection with *Baylisascaris procyonis*	22	0.52
Infection with *Pseudogymnoascus destructans* in bats (white-nose syndrome)	22	0.52
Infection with morbillivirus (marine mammals)	21	0.5
Infection with hantaviruses	20	0.47
Meningeal worms of cervids[(b)]	18	0.43
Infection with *Fascioloides magna*	17	0.4
Pestiviruses[(b)]	15	0.35
Contagious ecthyma[(b)]	14	0.33
Infection with *Borrelia* spp.	13	0.31
Algal toxicosis	11	0.26
Infection with Newcastle disease virus (wild birds)	10	0.24
Infection with feline leukaemia virus (FeLV)	9	0.21
Infection with *Psoroptes* spp.	8	0.19
Infection with flavivirus (causing tick borne encephalitis)	7	0.17
Arbovirosis[(b)]	5	0.12
Infection with *Batrachochytrium salamandrivorans*[(b)]	5	0.12
Infection with elephant endotheliotropic herpesviruses (EEHV)	5	0.12
Infection with *Yersinia pestis*	4	0.09
Infection with encephalomyocarditis virus	4	0.09
Infection with herpesvirus causing fibropapillomatosis in sea turtles	3	0.07
Besnoitiosis[(b)]	2	0.05
Infection with *Clostridium piliforme* (Tyzzer's disease)	2	0.05
Inclusion body disease[(b)]	1	0.02
Inclusion body hepatitis[(b)]	1	0.02
Infection with crocodilepox virus (papillomatosis in crocodiles)	1	0.02
Infection with immunodeficiency viruses (feline, simian)	1	0.02
Infection with *Theileria* spp.	1	0.02
Infection with *Trichinella nelsonei*, *zimbabwei* and *papouae*	1	0.02
Infection with ranaviruses	1	0.02
Total reports	**4,229**	**100**

(a): several events were listed under 'Infection with morbillivirus (canids and felids)' but were reported in non-canid and felid species (from the families Hyaenidae, Mustelidae, Procyonidae, Sciuridae, Ursidae).

(b): not currently designated as one of the non-OIE-listed diseases affecting wildlife.

Disease reports by family and species

As disease reports to WAHIS-Wild often do not specify the scale of the outbreak (number of cases in wild animals) or population significance (percentage infected related to size of population at risk), the analysis was limited to the frequency of reports by animal taxonomic information. The majority of reports (98.7%) were from classes Mammalia and Aves (see Table II), and 128 families were represented in disease reports. More than 50% of reports were from seven families: Anatidae (waterfowl) (14.5% of reports), Canidae (canids) (8.6%), Cervidae (hooved ruminants such as deer) (7.1%), Leporidae (rabbits and hares) (6.4%), Columbidae (pigeons and doves) (5.9%), Accipitridae (e.g. hawks and eagles) (5.5%) and Fringillidae (passerine birds) (5.4%) (see Fig. 2).

Table II

Reports by class

Class	Count
Aves	2,250
Mammalia	1,925
Reptilia	37
Actinopterygii	9
Amphibia	6
N/A (incognita)	2
Total	**4,229**

N/A: not assessed

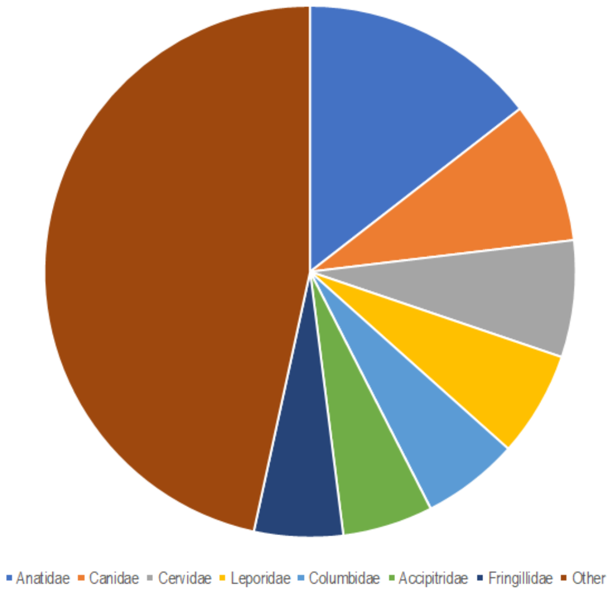

Fig. 2

Reports by family

Disease events were most commonly reported (> 100 reports) in the following species: Red fox (*Vulpes vulpes*) (4.9% of reports), Brown hare (*Lepus europaeus*) (4.2%), Mallard (*Anas platyrhynchos*) (3.9%), Wild boar (*Sus scrofa*) (3.3%), Western roe deer (*Capreolus capreolus*) (2.8%) and Rock pigeon (*Columba livia*) (2.7%).

Reports by species conservation status

The conservation status of species in disease reports was determined using two global listings, one reflective of extinction risk (as assessed by the IUCN Red List of Threatened Species) and one based on trade protection status to avoid over-exploitation (listings under the CITES appendices).

International Union for Conservation of Nature Red List of Threatened Species

Extinction status of species from disease reports was examined using the IUCN Red List of Threatened Species. The Red List classification represents the global extinction threat status for a species; 211 disease reports were excluded on the basis of not being identified to species level (listed as 'incognita' on WAHIS-Wild) or lacking a matching species name on the IUCN Red List (based on manual searching, the same species with alternative or updated taxonomic names were included wherever possible). Of species in WAHIS-Wild disease event reports, 108 species (19.2% of species reported) had an elevated extinction threat status on the IUCN Red List. These included critically endangered species (representing 5 species: European mink [*Mustela lutreola*], White-backed vulture [*Gyps africanus*], Addax [*Addax nasomaculatus*], Egyptian tortoise [*Testudo kleinmanni*], Swift parrot [*Lathamus discolor*]), endangered (28 species), vulnerable (40 species) and near threatened (35 species).

As an indicator of the frequency of disease reports in threatened species, 9.5% (381 of 4,018) were in species with elevated extinction threat status, including critically endangered (6 reports), endangered (119 reports), vulnerable (115 reports) and near threatened (141 reports). The remainder of the reported disease events were in species assessed to be of least concern (*n* = 3,636), data deficient (*n* = 1) or not assessed under the IUCN Red List (*n* = 211) (see Fig. 3).

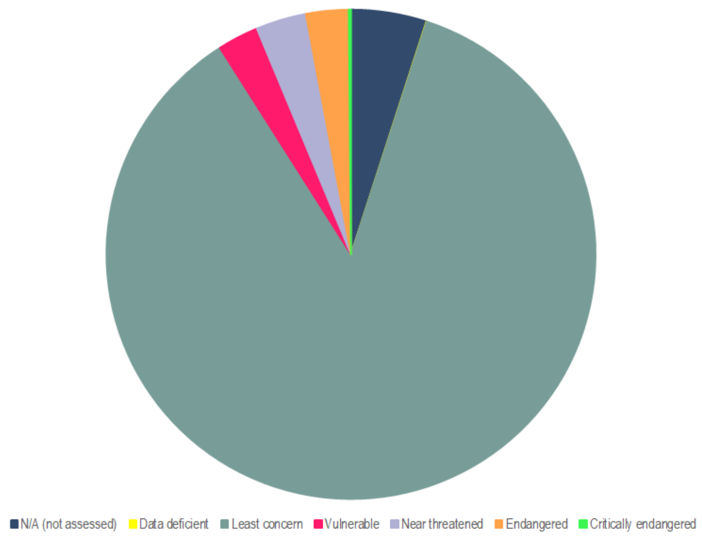

Fig. 3

Reports by International Union for Conservation of Nature (IUCN) Red List Status

Convention on International Trade in Endangered Species of Wild Fauna and Flora

The appendices of CITES were reviewed for species classifications using species' Latin scientific names reported to WAHIS-Wild. The Convention reflects regulations for international trade of endangered wildlife, with the protection level represented by appendices (where Appendix I is the most protective and Appendix III is the least; in select cases 'not classified' [NC] is also used as a classification, as an indicator for prior or partial listing or other special consideration). Species may be endangered but not listed on CITES if trade is not considered a major source of their endangerment. Based on several factors (country-specific wild animal populations and quotas or differentiations for sub-species), a species may hold multiple CITES appendices classifications (e.g. Appendices I and II). In this study, 26.0% of reports ($n = 1{,}101$) occurred in CITES-listed species. Of disease reports occurring in CITES-listed species, the highest protection status assigned was: CITES Appendix I (342 reports), CITES Appendix II (451 reports), CITES Appendix III (303 reports) and not classified (NC) (5 reports). Of unique species reported, 30.7% ($n = 154$) were listed by CITES, with their highest designation as: Appendix I (44 species), Appendix II (91 species), Appendix III (16 species) and not classified (NC) (3 species).

Diseases reported in species threatened with extinction

Excluding WAHIS-Wild reports without identification at species level and those not matched to the IUCN Red List, diseases reported most commonly in species with elevated extinction risk (IUCN Red List near threatened, vulnerable, endangered or critically endangered status) included chemical poisoning (56/510 reports of the disease), infection with *Pasteurella* spp. (50/332), infection with *Toxoplasma gondii* (26/206), infection with *Salmonella enterica* (all serovars) (24/414), infection with *Plasmodium* spp. (19/33), infection with *Sarcoptes scabiei* (17/247) and infection with *Pseudogymnoascus destructans* in bats (white-nose syndrome) (16/18).

Chemical poisoning events

Chemical poisoning was the most commonly reported disease event. The classification is broad and could involve a range of non-natural toxins (specifically excluding algal toxicosis, botulism and mycotoxicosis, which are separate reporting options in WAHIS-Wild) (16), exposure levels, and point and non-point sources. Chemical poisoning was reported in 144 unique species, most commonly (> 10 reports) in Red fox (*Vulpes vulpes*) (6.4% of chemical poisoning reports), Eurasian buzzard (common buzzard) (*Buteo buteo*) (5.7%), Golden eagle (*Aquila chrysaetos*) (3.6%), White-tailed eagle (*Haliaeetus albicilla*) (3.6%), Wolf (gray wolf) (*Canis lupus*) (3.2%), Whooper swan (*Cygnus cygnus*) (2.8), Beech marten (*Martes foina*) (2.7%), Rock pigeon (rock dove) (*Columba livia*) (2.7%), Mute swan (*Cygnus olor*) (2.5%) and Red kite (*Milvus milvus*) (2.3%).

Discussion

The WAHIS-Wild interface is the main global information aggregator for infectious and non-infectious wildlife disease events. Given that reporting by countries is voluntary, this analysis should be interpreted solely as an overview of disease reports submitted over the ten-year period, subject to reporting effort and likely geographical and taxonomic bias, rather than a reflection of global wildlife disease events. Prior papers have discussed factors affecting reporting effort, ranging from surveillance and diagnostic capacity to perceived value of a species, alongside challenges in distinguishing disease from infection status and in the management of infections affecting multiple host species (17, 18). Because of this uneven reporting, this summary should not be used for comparisons of disease occurrence or relative impacts on wildlife. Reports indicated a bias towards mammals and birds, with few reports for fish, reptiles or amphibians. The most commonly reported species were those with Least Concern conservation status, including species that may be considered pests in some contexts. It is unclear whether disease is more likely to be detected in a species because of its presence in certain settings, interactions with other species or known role in other diseases (such as wild boar and African swine fever). However, this analysis also indicates that wildlife disease events are occurring – and being reported – in some species facing extinction threat.

Data interfaces and outputs should be considered for improved congruence with conservation and public health entities (e.g. with the IUCN, CITES, Global Biodiversity Information Facility [GBIF] and World Health Organization [WHO]), which currently do not systematically consider wildlife disease in their assessment or management. The IUCN Red List now includes disease as a threat factor, but coverage is not robust, likely due to poor information availability on wildlife disease events and limited awareness of disease risks among experts performing species assessment. There are differences in taxonomic nomenclature between WAHIS-Wild and IUCN, potentially due to changes in species classifications not yet reflected in the WAHIS-Wild drop-down menus.

Disease reports did not indicate whether events were identified via active or passive surveillance, and additional information on the context of events (e.g. whether observed in captive or wild settings) may be important for inferring relevance for the health of wild populations. The standard form for annual wild animal disease reporting to WAHIS-Wild is frequently missing critical information on the scale and resolution of wildlife disease events (e.g. incomplete taxonomic information or lacking details on number of animals affected or percentage of population at risk), making it challenging to assess the severity of events and their relevance for species survival. Where information is available, it is not easily extractable from the PDF report to track trends over time to monitor spread and impact. Making information extraction and integration more accessible could enhance utility at global and country levels, particularly to add value to the critically under-served disease monitoring and management landscape for conservation. The future version of the system, OIE-WAHIS, will improve the possibility of data mining and data extraction from the system, to allow a better use of the data. Ideally, development or refinement of national reporting systems will support efficient and complete reporting to WAHIS-Wild to allow for improved data capture and tracking on the scale, scope and impacts of disease.

The importance of including wildlife in multisectoral surveillance coordination is stated in the ‘Biodiversity-Inclusive One Health Guidance’ released under the United Nations (UN) Convention on Biological Diversity (CBD) (19). The need for centralisation and standardisation of data and the importance of detecting trends over time were recently emphasised as key inputs for the success of national wildlife health programmes (20). Where available and utilised, national or external reporting systems may play a pivotal role in tracking disease events and potential threats to wildlife, to provide a more complete picture. Several promising platforms have been developed in recent years: for example, to address the gap in national reporting for wildlife disease surveillance, the United States Geological Survey (USGS) National Wildlife Health Center (NWHC) developed the Wildlife Health Information Sharing Partnership (WHISPers) event reporting system that tracks laboratory-confirmed disease cases, with attribution to infectious, traumatic, nutritional, toxic or other causes (21). The African Wildlife Poison Database, managed by the IUCN Vulture Specialist Group and its partners, collates current and historical information on poisoning of scavengers and other wildlife on the African continent, counting nearly 23,000 reported poisonings as of October 2020 (22).

Apart from WAHIS-Wild, some OIE-listed diseases reported via the main WAHIS platform may also present threats to conservation, as seen with outbreaks of anthrax, rabies in fragile Ethiopian wolf (*Canis simensis*) populations and major die-off events in Saiga antelope (*Saiga tatarica*) associated with *Pasteurella multocida* and peste des petits ruminants (PPR) (23, 24, 25, 26). Therefore, WAHIS may also be considered as a potential source of relevant information for conservation. This review intentionally examined WAHIS-Wild alone, given that reporting to the interface is voluntary and has different implications from OIE-listed diseases reported to WAHIS (i.e. non-OIE-listed diseases do not affect trade status). However, a prior paper discussed the opportunistic nature of wildlife surveillance and reporting for OIE-listed diseases and the need for improved reporting given their many possible wild animal hosts (for example, 528 possible wild animal hosts were identified for 73 terrestrial animal diseases) (27). Improved tracking of wildlife diseases overall across both the WAHIS and WAHIS-Wild systems may help to better elucidate the epidemiological relevance of wildlife for livestock disease and vice versa. The increasingly apparent importance of biodiversity-sensitive domestic animal health interventions (e.g. adequate vaccination coverage to prevent wild animal epidemics, as underscored for PPR) supports the utility of such information to guide the design of programmes consistent with a One Health approach. While not currently a routine component of conservation assessment and prioritisation exercises, robust information from wildlife disease reporting systems could potentially be used in future iterations of national biodiversity strategies, action plans and implementation of other disease prevention and control policies (e.g. to mitigate the burden of chemical exposures).

There are several limitations of this review. First, it should not be interpreted as representative of the scope of wildlife disease events globally. In addition to geographical bias in reporting, the authors suspect that there was also taxonomic and disease bias, though they did not have grounds to assess the extent of under-reporting given that there is no other central wildlife disease database, and many events would not routinely be detected or determined without dedicated efforts. Second, the findings were not compared with those reported in research publications, which may provide additional event information (though they may also be subject to bias in surveillance and reporting effort). Third, although in some cases it was suspected that reports reflected disease in captive settings (e.g. where non-native species were reported by a given country), the reports do not track captive, feral or wild status. In practice, this is highly relevant because the setting has the potential to affect both detection and management of disease. Fourth, although information for some non-OIE-listed diseases is potentially important for several sectors, monitoring activities may have different intent and utility among authorities that could affect international reporting expectations (e.g. investigation of apparent disease in wildlife for conservation management versus pathogen surveillance in wildlife as part of public health early warning systems). Lastly, while wild animal populations are not static, IUCN Red List and CITES listings are not reviewed in real-time and reflect a snapshot of global status at a given time; therefore, for disease events associated with localised population declines, national endangered species listings may be a more meaningful indicator. Similarly, while given equal weight in the analysis, disease events may or may not have meaningful impacts at a population level.

Overall, this review of the first ten years of reporting to WAHIS-Wild provides both a basis for immediate coordination with the conservation sector, particularly to address disease events with clear relevance (e.g. chemical poisoning), and further opportunities for study and optimisation of the interface. There are many possible reasons for reporting bias, which could relate to capacity, operations and prioritisation for wildlife disease surveillance and information management. Outside of OIE-listed diseases, for which Veterinary Services typically prioritise monitoring and management, other diseases occurring in wildlife may or may not have existing surveillance efforts, laboratory screening capabilities for event determination, or a dedicated wildlife disease authority and database. Depending on disease and species, activities may fall to piecemeal efforts from sporadic research activities rather than strategically designed national systems. These factors and operational needs could potentially be identified through a survey of OIE delegates to help target deficits and encourage more complete reporting. Additionally, efforts are needed to establish routine information sharing and coordination channels for disease events with relevance for conservation, livestock production or public health. For example, making full data records available by species with additional fields, including case numbers, spatial information and captive/feral/wild status, could assist in biodiversity assessment and planning. The addition of a combined 'search option' for WAHIS and WAHIS-Wild would allow for more seamless tracking of wildlife disease information. Ultimately, the findings of this study suggest that greater attention is needed to support a global systematic approach to monitoring disease in wildlife and integrating with multiple sectors; WAHIS-Wild offers a centralised existing platform that can have utility for One Health collaboration and impact for the next decade and beyond.

Conclusion

Wildlife disease events reported to WAHIS-Wild between 2008 and 2018 show species identified as vulnerable to extinction being affected, as well as species afforded special protection status to avoid over-exploitation. Reporting indicates dedicated effort but uneven geographical and taxon coverage. Chemical poisoning events represent a substantial portion of reports. The findings of this study suggest that existing wildlife disease information can potentially advance synergies with the conservation community, including better quantification of burden and informing species threat assessments at global level. At national levels, the WAHIS-Wild database provides a platform for wildlife disease information tracking, and the reporting channels (involving coordination between National Focal Points for Wildlife and Chief Veterinary Officers) may promote awareness in government authorities that may be missed when information is solely reported to external databases or scientific literature. More routine supply of wildlife disease surveillance information may allow countries to reap value through risk assessment and prioritisation of diseases of potential threat to wildlife (28). With the current focus on establishing and operationalising national and regional One Health coordination bodies and environment sector involvement, information sources such as WAHIS-Wild may offer a starting point for integration and use of wildlife disease data for optimal health and conservation outcomes.

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