

SURVEILLANCE OF INFECTIOUS DISEASES IN ANIMALS AND HUMANS IN SWEDEN 2020

Chapter excerpt -
Post mortem examinations in wildlife



Editor: Karl Ståhl

Department of Disease Control and Epidemiology
National Veterinary Institute (SVA), SE-751 89 Uppsala, Sweden

Authors: Charlotte Axén, Mia Brytting, Ioana Bujila, Erika Chenais, Rikard Dryselius, Helena Eriksson, Eva Forsgren, Malin Grant, Gittan Gröndahl, Gunilla Hallgren, Kristina Hammarén Busch, Anette Hansen, Marika Hjertqvist, Mia Holmberg, Cecilia Hultén, Helena Höök, Cecilia Jernberg, Jerker Jonsson, Oskar Karlsson Lindsjö, Ulrika König, Elina Lahti, Emelie Larsdotter, Moa Lavander, Mats Lindblad, Anna Lundén, Margareta Löfdahl, Oskar Nilsson, Maria Nöremark, Anna Ohlson, Ylva Persson, Karin Persson-Waller, Thomas Rosendal, Karl Ståhl, Lena Sundqvist, Robert Söderlund, Magnus Thelander, Karin Troell, Henrik Uhlhorn, Anders Wallensten, Per Wallgren, Stefan Widgren, Ulrika Windahl, Joakim Wistedt, Beth Young, Nabil Yousef, Siamak Zohari, Erik Ågren, Estelle Ågren, Elina Åsbjer

Cover: Juvenile mink in hand. Photo: Elina Kähkönen

Copyright of map data: ©EuroGeographics for the administrative boundaries

Reporting guidelines: Reporting guidelines were introduced in 2018 for those chapters related to purely animal pathogens. The guidelines build on experiences from several EU projects, and have been validated by a team of international experts in animal health surveillance. The aim is to develop these guidelines further in collaboration within the global surveillance community and they have therefore been made available in the form of a wiki on the collaborative platform GitHub (<https://github.com/SVA-SE/AHSURED/wiki>). Feel free to contribute!

Layout: The production of this report continues to be accomplished using a primarily open-source toolset. The method allows the source text, produced by authors, to be edited independently of the template for the layout which can be modified and reused for future reports. Specifically, the chapter texts, tables and captions are authored in Microsoft Word and then converted using pandoc and R to the LaTeX typesetting language. Most figures and maps are produced using the R software for statistical computing and the LaTeX library pgfplots. Development for 2020 has further improved the importing of content from Excel files to automatically build figures in the pgfplots LaTeX library. The tool is available as an R-package on GitHub (<https://github.com/SVA-SE/mill/>). The report generation R-package and process was designed by Thomas Rosendal, Wiktor Gustafsson and Stefan Widgren. In 2020, final typesetting was done primarily by Wiktor Gustafsson with contributions from the report authors.

Print: TMG Tabergs AB.

Except where otherwise noted, the reuse of this document is authorised under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence. This means that reuse is allowed provided appropriate credit is given and any changes are indicated. For any use or reproduction of photos or other material that is not owned by SVA, permission must be sought directly from the copyright holders.

Suggestion citation: Surveillance of infectious diseases in animals and humans in Sweden 2020, National Veterinary Institute (SVA), Uppsala, Sweden. SVA:s rapportserie 68 1654-7098.

This report may be subject to updates and corrections. The latest version is always available for download at www.sva.se.

Post mortem examinations in wildlife

BACKGROUND

The national general wildlife disease surveillance programme is based on pathology and ancillary testing at SVA. The surveillance programme is financed partly by annual state hunting permit fees, and partly by governmental funding. The aim is to monitor the wildlife disease situation in Sweden and to diagnose and acquire knowledge on present and emerging diseases in Swedish wildlife. Results from the disease surveillance provides key information for wildlife management. It is also part of zoonotic and epizootic disease surveillance efforts, including surveillance for new and potentially emerging diseases, and can also serve as an indicator of environmental and ecosystem health. The OIE national focal point for wildlife is located at SVA and reports OIE listed diseases in wildlife, as well as OIE specified non-listed wildlife diseases.

SURVEILLANCE

The public, local authorities, and especially hunters submit wildlife that is found dead, or found sick and then euthanised, to SVA for diagnostic examination. Standard samples are collected for bio-banking from suitable submitted carcasses. Hunter-harvested wild boar and brown bear (*Ursus arctos*) samples for *Trichinella* analysis are not included in these numbers, as these can be tested at various commercial labs as well as SVA. All large carnivores: brown bear, lynx (*Lynx lynx*), wolf (*Canis lupus*) and wolverine (*Gulo gulo*) found dead, euthanised, or hunter harvested must be submitted to SVA for examination, as skinned carcasses or tissue samples.

RESULTS

In 2020, whole carcasses or parts of 2510 free-ranging wildlife were submitted to the Department of Pathology and Wildlife Diseases, not including examined farmed or captive wildlife species. The most important wildlife disease events in 2020 are mentioned below.

The finding of a fourth case of chronic wasting disease (CWD, a prion disease of cervids), in yet another old female moose, but from a second county; Västerbotten. An intensified surveillance during the moose hunt in the local area did not discover any further cases. For more details, see the CWD chapter (page 32).

The beginning of the largest outbreak of avian influenza so far started late in 2020, caused by highly pathogenic H5N8 and H5N5 strains.

The reporting and surveillance of African swine fever virus in found dead wild boar has increased, but so far, the disease has not been found in Sweden. But a re-emerging disease was discovered in wild boar in 2020, when *Salmonella choleraesuis* was found in several areas in Sweden.



The necropsy room at SVA where submitted dead wildlife is examined within the general and the targeted wildlife disease surveillance programmes. The dead wolf in the image is first radiographed and body measurements are taken before skinning and postmortem, to decide cause of death, underlying diseases, as well as routine health surveillance sampling for parasites or other infections. Photo: Bengt Ekberg/SVA.

This bacterium has not been identified in Swedish wild boar previously, but after an outbreak in a domestic pig farm, surveillance has revealed that also wild boar both can carry and be affected clinically by this type of pig-associated *Salmonella*. For details, see the chapter about infectious diseases in wild boars (page 123).

A retrospective study of the intestinal tapeworm *Echinococcus granulosus* in stored samples from necropsied wolves, using a new specific PCR-analysis, identified the first two positive cases in wolves in Sweden. Both wolves had died in 2012. The parasite has previously only rarely been found in intermediate hosts such as moose and semi-domesticated reindeer. The parasite seems to be present at a very low prevalence in wildlife.

A programme for health and disease surveillance of marine mammals has been initiated in 2020, together with the Museum of Natural History, and is financed by the Swedish Agency for Marine and Water Management. A coastal network to report and handle stranded marine mammals has been expanded and a limited number of seals and whales

have been necropsied and sampled to improve knowledge about these key species that also act as indicators of marine ecosystem health.

Use of the SVA online form (rapporteravilt.sva.se) to report sick or dead wildlife has steadily increased. This is an easily available tool for reporting that helps SVA to map the disease situation in wildlife, and to access suitable samples with the help of the public.

DISCUSSION

The general disease surveillance in wildlife is based on citizen science, with the interested public and hunters especially, reporting and submitting samples. A high public interest in wildlife health and conservation continues

to make this work possible, together with state financing. Among scientists and relevant authorities, it is well recognised that wildlife disease surveillance is an integral part of the One Health concept. The surveillance results regarding reportable infectious diseases (Table 39) show that there are only few serious infectious disease threats to wildlife.

REFERENCES

SVA annual report (Årsredovisning) 2020. SVALA-data on wildlife diagnoses 2020. SVA report: Wildlife disease surveillance in Sweden 2020.

Table 39: Reportable infectious diseases in wildlife and number of outbreaks/cases diagnosed at SVA in 2020. Here, individual cases are listed, and may differ from other official numbers of disease outbreaks or number of index cases.

Disease	Cases	Species
Avian pox	1	Hooded crow
Chronic wasting disease	1	Moose
Chytrid disease	1	Moor frog
<i>Echinococcus multilocularis</i>	1	Red fox
European brown hare disease	7	European brown hare
Highly pathogenic avian influenza	6	Barnacle goose (4), Great horned owl (1), Peregrine falcon (1)
Malignant catarrhal fever	1	Moose
Myxomatosis	4	Wild rabbit
Pasteurellosis	1	Fallow deer
Pigeon paramyxovirus	5	Rock pigeon
Pseudotuberculosis	8	European brown hare
Rabbit haemorrhagic disease	5	Wild rabbit
Salmonellosis	69	Black-headed gull (4), Bullfinch (8), Porpoise (1), Red poll (2), Siskin (23), Wild boar (31)
Sarcoptic mange	5	Lynx (3), Red fox (1), Wild boar (1)
Toxoplasmosis	3	European brown hare
Trichomoniasis	15	Bullfinch (1), Chaffinch (4), Greenfinch (4), Hawfinch (4), Rock pigeon (1), Siskin (1)
Trichinosis	15	Lynx (6), Wild boar (9)
Tularaemia	30	European brown hare (10), Mountain hare (20)
Total	178	