

# SURVEILLANCE OF INFECTIOUS DISEASES

IN ANIMALS AND HUMANS IN SWEDEN 2022

*Chapter excerpt:  
Strangles*



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**Cover:** A cultivation of *Salmonella* at the Public Health Agency of Sweden.  
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**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 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 to the LaTeX typesetting language using a custom package written in the R software for statistical computing. The package uses the pandoc document conversion software with a filter written in the lua language. Most figures and maps are produced using R and the LaTeX library pgfplots. Development for 2022 has focused on generalising the R package to accommodate conversion into formats other than LaTeX and PDF, with a focus on markdown files which can be published as HTML websites using the Quarto publishing system. The report generation R package and process was designed by Thomas Rosendal, Wiktor Gustafsson and Stefan Widgren.

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# Strangles

## BACKGROUND

Strangles is a very contagious disease in horses, caused by *Streptococcus equi subsp. equi* (*S. equi*), belonging to Lancefield's group C streptococci. The disease causes substantial losses for the Swedish equine industry, mainly from long standstills, which often lead to severe economic crisis for the infected establishment. There are several examples of strangles leaving riding schools in the threat of bankruptcy, often avoided by acute municipal aid. Strangles normally resolves without antibiotic treatment but can cause severe complications or persistent infection. To control and eradicate strangles in a population, systematic surveillance by testing is necessary, and it is crucial that the equine industry implements preventive biosecurity strategies for high-risk-situations. In 2022, a new vaccine against strangles in horses was launched in Sweden. It may be the missing tool to substantially reduce the number of horses affected with the disease, but at this point, only a minor part of Swedish horses has been vaccinated.

## DISEASE

Strangles affects horses, as well as donkeys and zebras. Common clinical signs include fever, nasal discharge, depression, cough and enlarged submandibular or cervical lymph nodes with abscesses. Other signs associated with strangles may include: inappetence, dysphagia, painful movements, ruptured abscesses, dyspnoea and swollen limbs; and less commonly: spread of infection to other organs, so-called "bastard strangles". Complications of strangles may be severe and lead to death.

So-called "atypical strangles" with mild clinical signs is probably more typical than previously understood, which may lead to large outbreaks due to delayed diagnoses. Also, recent findings indicate that subclinical infections with *S. equi* after an acute outbreak may be far more common than previously understood, and microbiological confirmation of the absence of *S. equi* can be required to rule out the horse being a carrier.

## LEGISLATION

Strangles is a notifiable animal disease in Sweden (SJVFS 2021:10). It is notifiable both on clinical suspicion and when it is confirmed.

## SURVEILLANCE

In Sweden, surveillance for strangles is passive. Sampling and diagnostic testing are performed on clinical suspicion. Typically, samples from upper airways or ruptured

abscesses are submitted for bacterial analysis (culture or qPCR).

A yearly summary of notified, confirmed cases of strangles per county is produced by the Swedish Board of Agriculture (SBA).

Several research projects aiming at a better understanding of strangles epidemiology and transmission have been performed or are ongoing in Sweden, at the Swedish University of Agricultural Sciences (SLU) and the National Veterinary Institute (SVA).

## RESULTS

In 2022, there were 66 officially reported index cases of strangles in Sweden, each representing an outbreak in a farm. A survey from 2016–2017 and an ongoing survey 2022–2023 indicate that the majority of outbreaks are coupled to newly arrived, often imported horses. The ongoing tracing study has identified many variant strains of *S. equi*, often changing over time, presumably due to continuous introduction of new strains into Sweden.

## DISCUSSION

The passive surveillance results indicate that strangles is a constant problem in the Swedish horse population. New studies indicate that newly arrived horses, often from international trade, are involved in most of the investigated acute outbreaks. A programme for serosurveillance and tracing the spread of strangles, by DNA characterisation of different isolates, together with vaccination of horses, would provide effective tools for control. Antibodies induced from vaccination with the new vaccine do not interfere with the serological test.

Veterinary practitioners should be made aware that the probability of detecting *S. equi* in an infected horse is influenced by several factors: site of specimen collection (nasal passage, nasopharynx, guttural pouch or abscess), method of sampling (flocked swab, rayon swab, or wash), and type of diagnostic test (culture or qPCR), as well as target gene for the PCR and the DNA amplification method that is performed. Timing of sampling is also crucial.

## REFERENCES

Swedish Board of Agriculture, Statistics of index cases of notifiable animal diseases, <https://www.jordbruksverket.se/>  
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