Vole fever spreading further south in Sweden

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Bank voles in Skåne carry a virus that can cause hemorrhagic fever in humans. Credit: B. Niklasson

Researchers have discovered that bank voles in Skåne, southern Sweden, carry a virus that can cause hemorrhagic fever in humans. This finding was made more than 500 km south of the previously known range.

The virus strain discovered in Skåne appears to be more closely related to strains from Finland and Karelia than to the variants found in northern

Sweden and Denmark. This is revealed in a new study from Uppsala University, conducted in collaboration with infectious diseases doctors in Kristianstad and published in the journal *Emerging Infectious Diseases*.

"We were surprised that such high proportion of the relatively few voles that we caught were actually carrying a hantavirus that makes people ill. And this was in an area more than 500 km south of the previously known range of the virus," says Elin Economou Lundeberg, infectious diseases doctor at Kristianstad Central Hospital, who is one of the study's first authors.

Hantaviruses are a family of viruses naturally found mainly in rodents such as mice, rats and voles. Certain hantaviruses are able to infect people and cause two main groups of diseases: hemorrhagic fever with renal syndrome (HFRS) and hantavirus pulmonary syndrome (HPS). Both types of disease are notifiable under the Communicable Diseases Act, as they can cause serious problems and even death.

In northern and central Europe, a variant of the virus, Puumala hantavirus, causes a relatively mild form of HRFS popularly known as "vole fever" (nephropathia epidemica). However, studies have shown that this hantavirus can also cause very severe HRFS, which in the worst case can be fatal. In Sweden 100–450 cases of vole fever require hospital care each year, exclusively in the northern part of the country.

In 2018, a locally contracted case of vole fever was reported in Skåne, more than 500 km south of the previously known southernmost incidence of the disease in Sweden, which was north of Uppsala. Another case was discovered in 2020, also in Skåne. In both cases, the patients concerned had not been away traveling and were infected in their home area.

In an attempt to understand how this was possible, bank voles were

caught in the vicinity of the patients' homes and analyzed for any occurrence of hantavirus. It turned out that 9 of the 74 bank voles caught carried hantavirus genes.

Genetic studies have now shown that the virus differs markedly from the virus variants that circulate in northern Sweden and Denmark, and that it is most closely related to viruses from Finland and Karelia.

The next step in the research is to find out where the virus comes from and map its distribution in the southern parts of Sweden.

"If the virus has existed in the area for a long time and has simply not been discovered, why haven't more people become ill? Or, has it become established in Skåne recently and only just begun to spread? And how did it get there?" wonders Professor Åke Lundkvist of Uppsala University, a co-author of the study.

"Unfortunately the COVID-19 pandemic intervened, which considerably delayed the completion of this study. These findings are very interesting and show how important it is to investigate the causes as quickly as possible when we see an infectious disease in a new geographical area."

More information: Jiaxin Ling et al, Nephropathia Epidemica Caused by Puumala Virus in Bank Voles, Scania, Southern Sweden, *Emerging Infectious Diseases* (2024). DOI: 10.3201/eid3004.231414. wwwnc.cdc.gov/eid/article/30/4/23-1414_article

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