

## **Climate-sensitive infections in Greenland and northern Sweden: A serological study**

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### **Background:**

The Arctic is the part of the world most affected by climate change. These climate changes are likely to push the geographical boundaries of climate-sensitive infections northwards. Most climate-sensitive infections are zoonoses. We determined seroprevalence of a range of zoonoses in Greenland and Northern Scandinavia, which is relevant to travelers.

### **Materials and methods:**

Seven zoonoses representing different routes of infection were selected as part of the NORFORSK-supported CLINF project. Blood samples from 260 adults from 2013 from four parts of Greenland and from 200 adults from Umeå municipality, northern Sweden, were tested for IgG-antibodies against agents causing tularemia, brucellosis, Q fever, rickettsiosis, leptospirosis, Tick-borne encephalitis (TBE) and Lyme borreliosis, the latter two only for Sweden.

### **Results:**

In Greenland, less than 1% had antibodies against tularemia, brucellosis and Q-fever, while 7% had antibodies against rickettsiosis and 21% against leptospirosis. In Sweden, all were negative for Q fever, 1-5% tested positive to brucellosis (1%), Lyme disease (2%), tularemia (3%), leptospirosis (4%) and TBE (5%), whereas 12% tested positive to rickettsiosis. A further analysis of 200 sera from West Greenland from 1998 showed that 12.5% were seropositive for rickettsiosis and only 2.5% for leptospirosis.

### **Conclusions:**

We found that rickettsiosis and leptospirosis are common zoonoses in Arctic areas, that they are probably underdiagnosed diseases and that incidence of leptospirosis has most likely increased significantly in Greenland over time. In Northern Sweden, tick-borne diseases are present, although these diseases are usually not observed due to the limited tick population in the region.