

CLIMATE CHANGE CHANGES EVERYTHING

CLIMATE AND HUMAN HEALTH IN THE BARENTS REGION

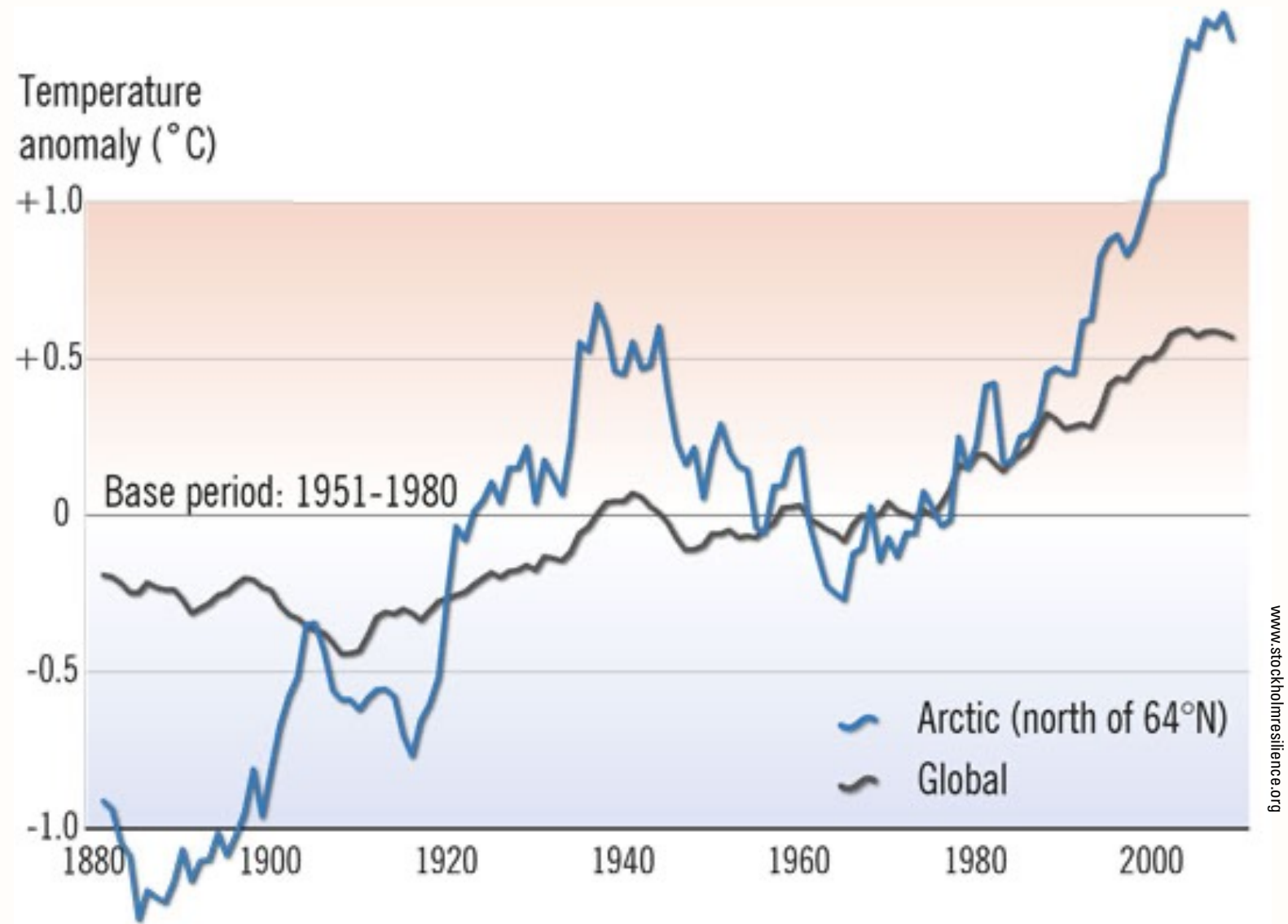


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ARCTIC TEMPERATURE IN THE LAST CENTURY

The Arctic is warming at twice the global average rate.





WHAT DOES "EVERYTHING" ENCOMPASS – SHARED ARCTIC CHALLENGES

- Water and sanitation
- Housing
- Transportation
- Subsistence lifestyles
- Traditional diets
- Infectious diseases
- Mental health

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FACTORS LINKING WATER TO HEALTH

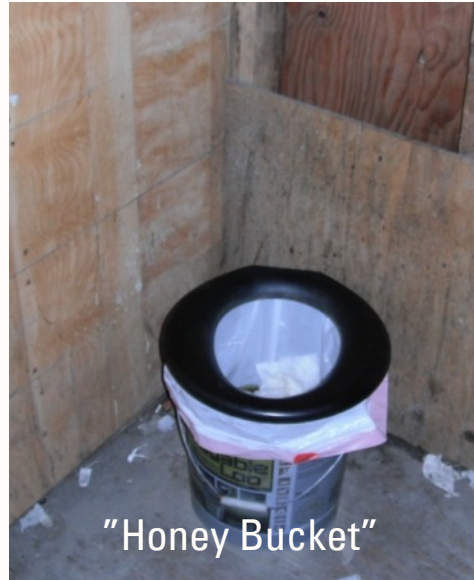
- Water QUALITY
 - Prevents illness from drinking water
 - Water BORNE diseases
 - Cholera, Typhoid fever, dysentery, cryptosporidium, giardia, campylobacter
 - Taste, smell and look good to drink
- Water QUANTITY
 - Drink, cook, wash: hands, body, clothes
 - Prevents infection spread person-to-person
 - Water-WASHED diseases
 - Trachoma, respiratory infections, skin infections



THE MOST BASIC – WATER AND SANITATION



Water storing capacity, 120L



"Honey Bucket"



Sewer collection point

- Water often needs to be hauled and stored at home with limited capacity.
- UN and WHO disaster response minimum: 15 L/person/day.
- Dealing with water needs is time consuming
- Many Arctic rural residents use 12L!

CLIMATE CHANGE EFFECTS ON WATER AND SANITATION

Barents region challenges could be

- Decreased groundwater quality and quantity
- Change in river course that decrease access
- Coastal flooding contaminating surface water with seawater
- Excessive algae or other biological growth in source water
- Changes in water color due to increased humus content
- Increased precipitation and heavy rains
 - Increased overflow discharges
 - Increased leakage from sewer
 - Reduced treatment capacity
- Increased maintenance costs: filter clogging, more chemicals needed



SEWER SERVICE, RUSSIAN ARCTIC, UN DEVELOPMENT REPORT, 2006





Northern Finland Road. Photo: Jan Hjort

PERMAFROST THAW THREATENS INFRASTRUCTURE IN GENERAL

- Permafrost degradation
 - Buckles roads
 - compromises homes
 - changes the landscape
- This disrupts lifestyles, livelihoods, economies, and ecosystems
- Sanitation pipes break and ponds erode
- Fresh water ponds lost or polluted by salt water



HOUSING CHALLENGES

- Improved housing part of what eradicated malaria in Scandinavia 100 years ago
- Again permafrost thaw threatens structural integrity of buildings
- Warm, wet weather do not work well with traditional housing
- Overcrowded houses



Photo: Shutterstock



Fairbanks AK. Photo: Vladimir Romanovsky



RELOCATION OF VILLAGES – NEWTOK, ALASKA

- By Ninglick River, near Bering Sea Coast. Climate change and erosion erase the village..
- New location 15 km away, people are gradually moving.
- Ecological grief – Loss of connection to land, heritage and tradition.



TRANSPORTATION – MANY FLY-IN ONLY COMMUNITIES IN THE ARCTIC

- Shortage of foods and groceries
- Food is expensive – Nunavut families spend twice the Canadian average on food
- Small runways, many not even paved
- Single- or double props mostly used
- Transportation challenges in shoulder season



Single-prop hydro plane



Double prop school children carrier



SUBSISTENCE LIFESTYLES

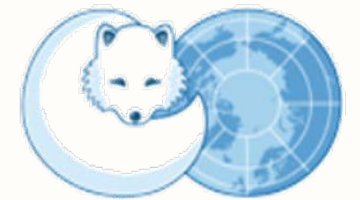


Photo: Grid Arendal

- Longer shoulder season from global warming (unaccessable land)
- Traditional land access difficult due to bogginess and flooding
- Grazing land shift – Anthrax accident in Salekhard
- Animals choose new migrating paths
- Increased work-related hazards

TRADITIONAL FOODS – ARCTIC SUBSISTENCE LIFESTYLES

- Pollutant studies from many parts of the Arctic
- Lead, mercury, and POPs – Persistent Organic Pollutants, accumulate in traditional prey and foods (PCB, DDT, dioxins)
- Especially bad for pregnant women – accumulate in the foetus
- Historical interventions gone wrong – A change to western diet caused malnutrition and lack of minerals and vitamins.



FOOD STORAGE PROBLEMS

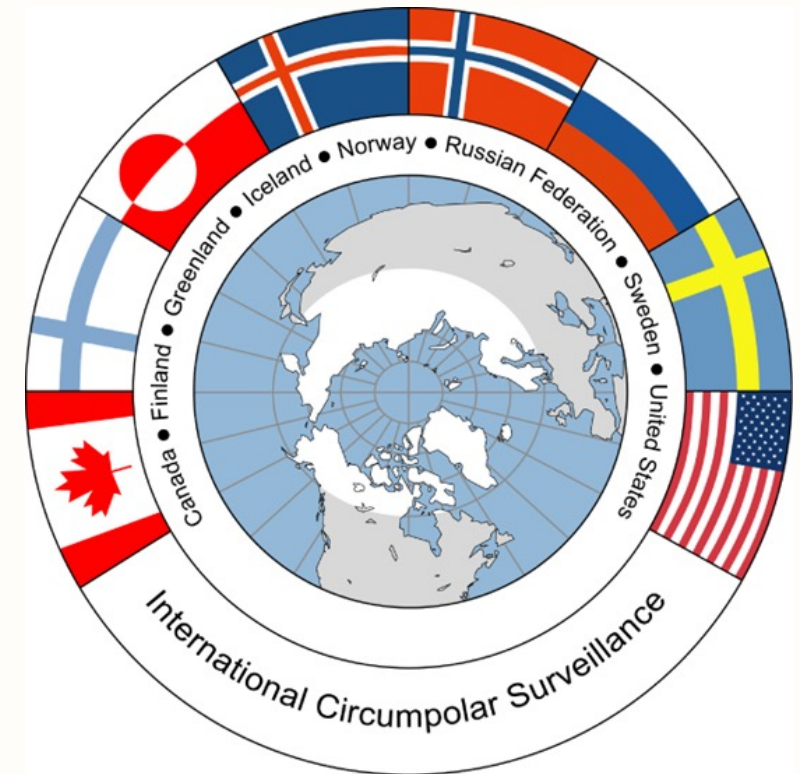
- Climate change
 - Permafrost thaw cause storing problems – botulism and other diseases
 - Melting ice cellars
 - Warm and moist weather make meat and fish mold instead of dry
 - Land, weather and ice conditions are less predictable, hunting and fishing more risky
- Modern society and western lifestyles
 - Traditional foods smells
 - Boarding school children avoid them
 - More water required for washing hands and clothes
 - Western food cooking (pasta etc) require more water



Ice cellar in Nalimsk. Photo: Emile Duce NYT

ICS – INTERNATIONAL CIRCUMPOLAR SURVEILLANCE

- Small, isolated populations in rural areas
- Limited access to health care and modern diagnostic methods
- Uncommon or new illnesses may be unrecognized
- Infections do not respect country borders
- Working groups under a steering committee
 - Five invasive bacterial infections
 - TB
 - HBV
 - HP
 - CCIDWG



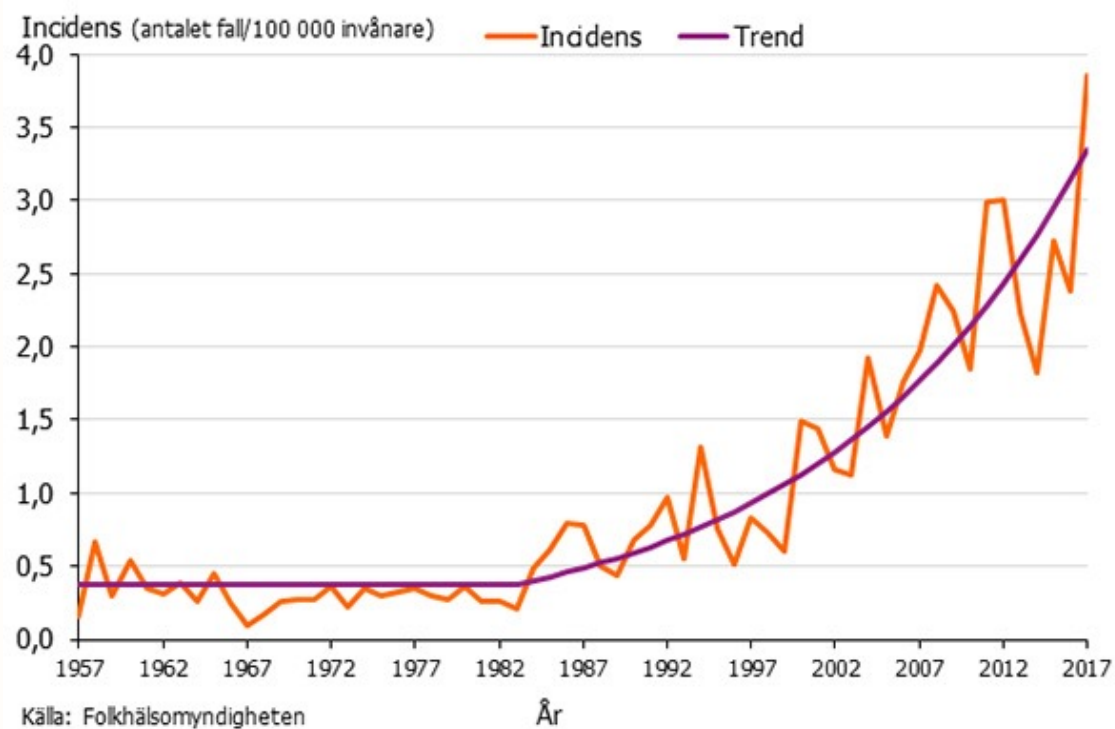
CLIMATE SENSITIVE INFECTIONS – ZOO NOTIC DISEASES

- Some are vector-borne, spread by for example insects
 - mosquitoes
 - tabanid flies
 - ticks
- The vector habitat is often climate dependent

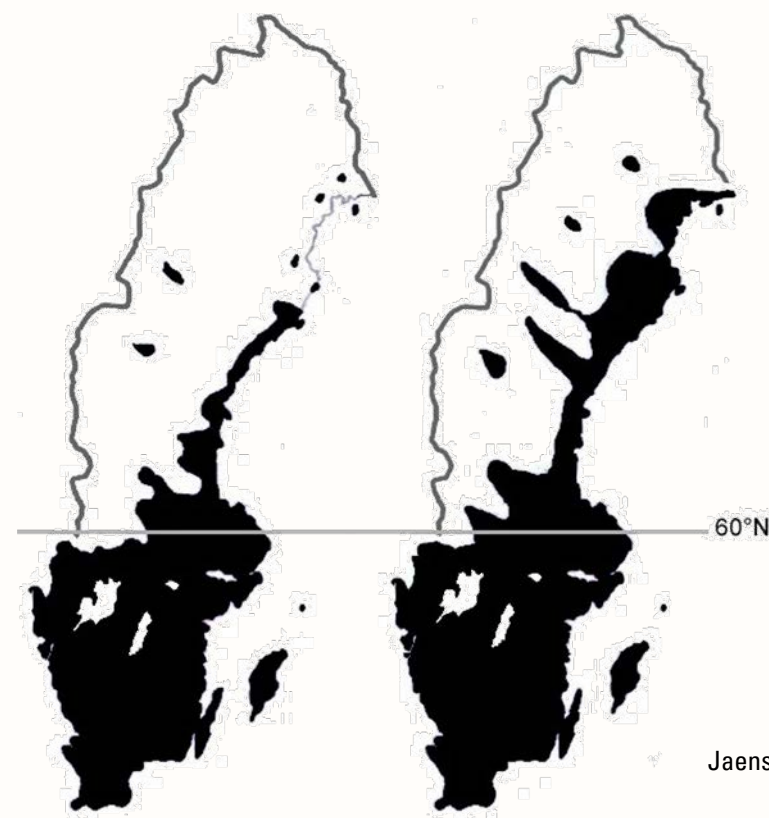


TBE - TICK BORNE ENCEPHALITIS SWEDEN

TBE incidence



Ixodes ricinus spread 1998–2008

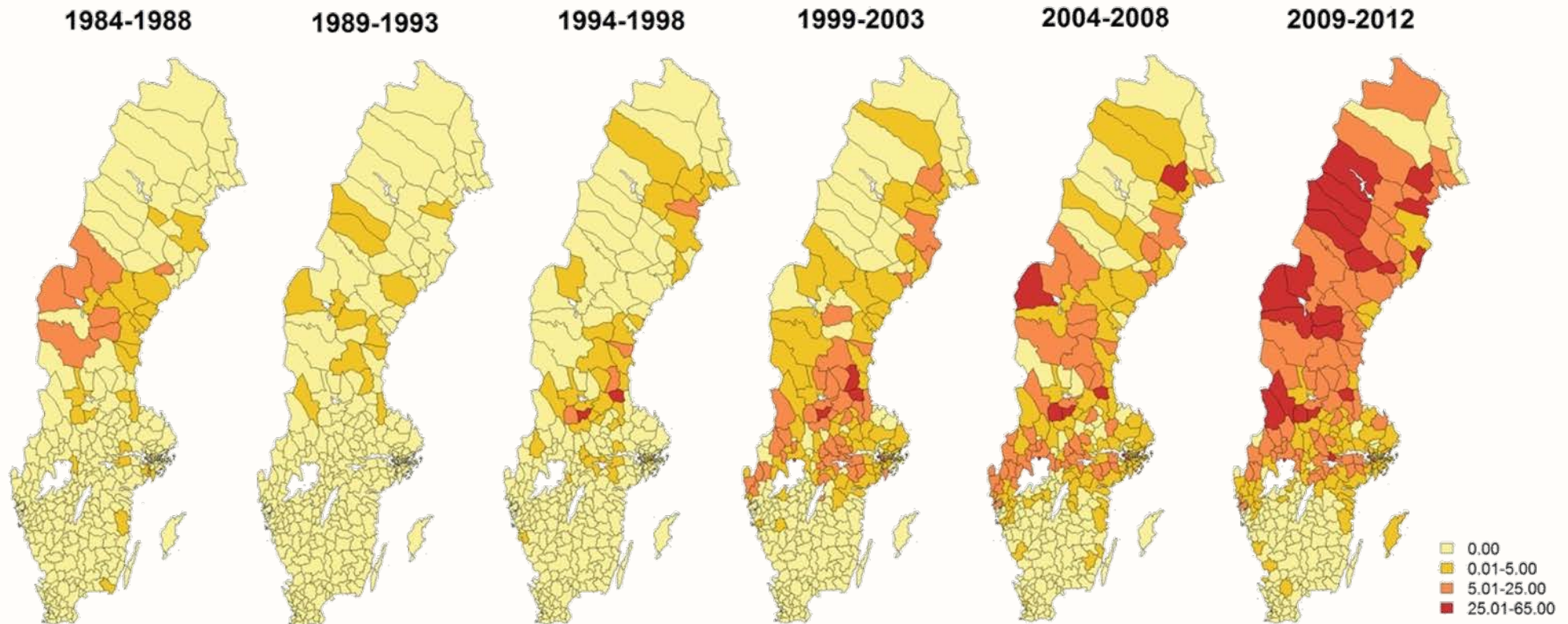


Jaenson et al 2012.



TULAREMIA – SWEDISH INCIDENCE 1984–2012

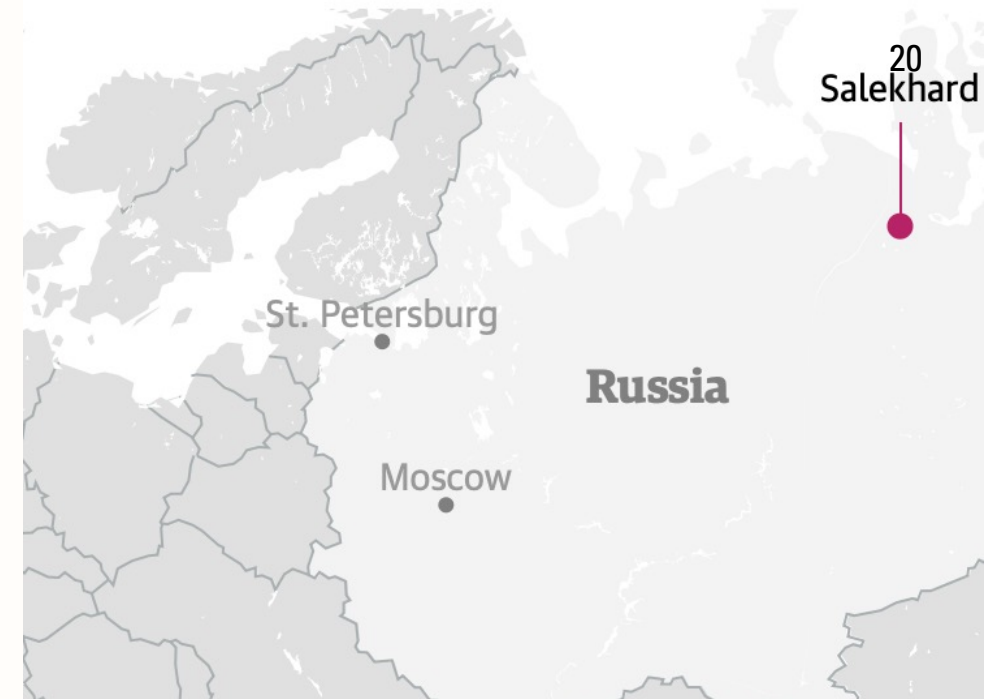
Tularemia-incidence per 5-year interval 1984–2012. Incidence rose from 0.26 to 2.47 / 100 000 from first to second half of study period. Climate change induced?



ANTHRAX FROM THAWING PERMAFROST

In summer 2016, Yamal Peninsula in Russia:

- 72 nomadic Nenets herders hospitalized, including 41 children
- One 12-year-old boy died
- Over 2300 reindeer died as well
- Climate change effects
 - Unusually warm weather
 - Released frozen carcasses
 - Heat stressed reindeer
 - Close grazing
 - Herders forced to use traditional “forbidden grazinglands”



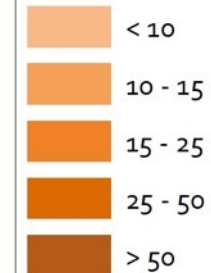
MENTAL HEALTH – SUICIDE PREVENTION

Examples of ongoing intervention projects

- RISING SUN – Reducing the Incidence of Suicide in Indigenous Groups – Strengths United through Networks
- Project CREATeS – Circumpolar Resilience Engagement and Action Through Story



Deaths by suicide
per 100,000 inhabitants
in 2012-2016



Incidence 2016 for
comparison

- Sweden 12
- Canada 11
- Nunavut males 114



THANK YOU!

