

Lessons on COVID-19 from Indigenous and remote communities of the Arctic

To the Editor—The Arctic provides unique insights into the COVID-19 pandemic that are of considerable importance to government policies around the world, yet experiences from the Arctic are missing from the global public-health debate¹.

Arctic remote settlements have limited access to healthcare and possess few healthcare resources with which to fight the disease². In addition, Arctic populations often demonstrate higher rates of hypertension, diabetes, heart

disease, tuberculosis, hepatitis and other conditions^{3,4}. Despite this, in most cases, Arctic regions have fared better in the COVID-19 pandemic than have temperate areas south of the Arctic in the same countries⁵ (Fig. 1a).

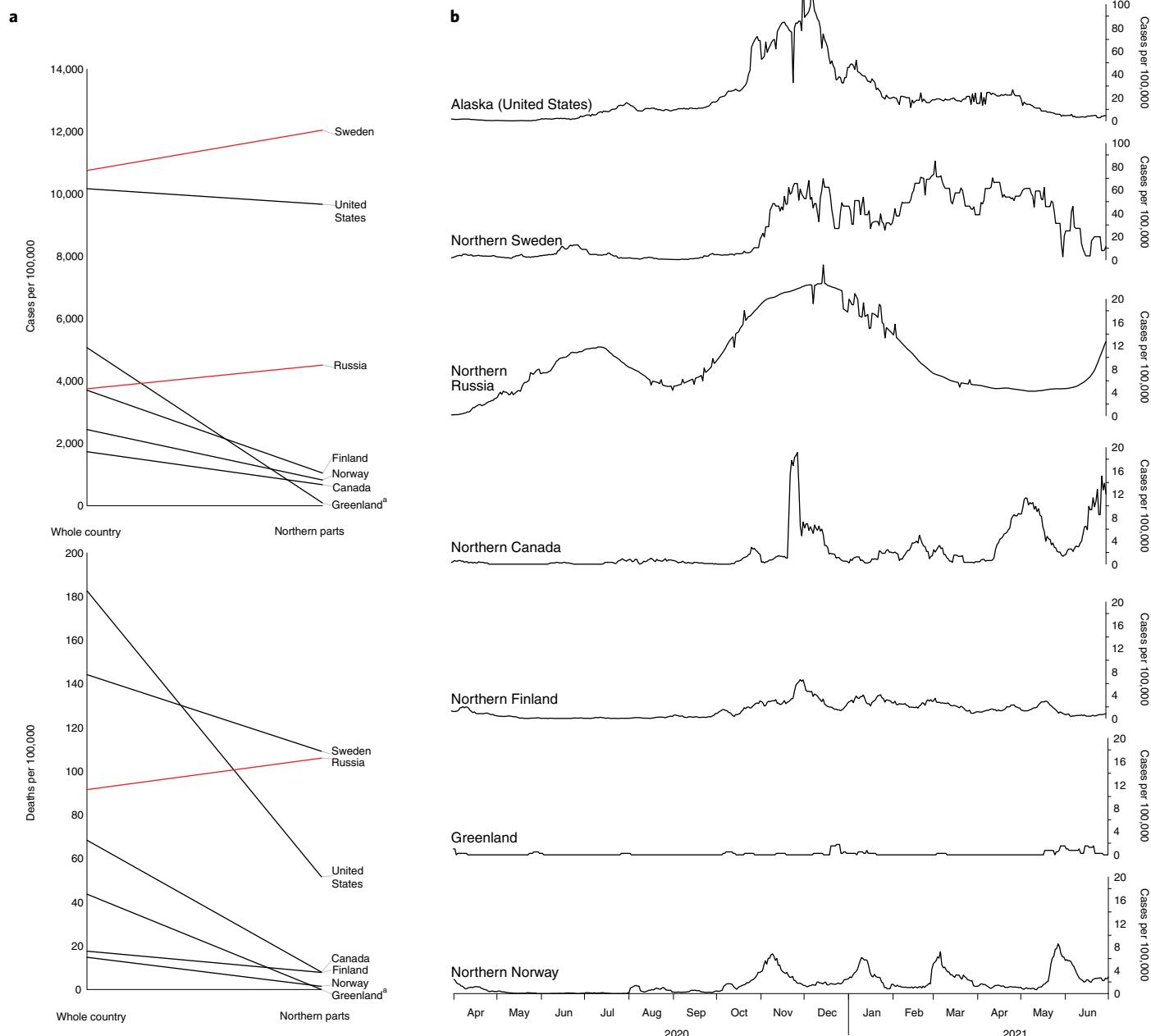


Fig. 1 | COVID-19 in the Arctic. **a**, COVID-19 cases and deaths per 100,000 people in the Arctic versus that in entire countries; data obtained on 1 July 2021. Red lines indicate countries in which cases or deaths per 100,000 were higher in the Arctic than in the entire country. ^aCases and deaths in Greenland are compared with those in Denmark. **b**, Daily change in cases (7-day average per 100,000) in selected Arctic regions. Source: <https://arcticcovid.uni.edu/>.

The Arctic covers the vast area in the Northern Hemisphere sparsely populated by 7 million people, encompassing parts of Canada, the Kingdom of Denmark (Greenland and the Faroe Islands), Finland, Iceland, Norway, Sweden, Russia and the United States (Alaska). Although most Arctic residents live in cities and towns, thousands of small villages, many without road access, are scattered across a large territory and are often composed of Indigenous populations. The first case of COVID-19 was registered in the Arctic on 21 February 2020. Since then, more than 580,000 Arctic residents have been infected with SARS-CoV-2 and over 11,000 have died⁶.

The blessing of remoteness coupled with strong isolation measures allowed some communities with high socioeconomic and health vulnerabilities to weather the early stages of the pandemic and to be more prepared for the arrival of COVID-19. This pattern is consistent with the urban–rural gradient in epidemic size observed by others, wherein weak urban–rural connections due to remoteness correlated with a delay in the arrival of COVID-19 in rural areas⁷. The wave of infections during the second half of 2020, however, exposed the curse of remoteness, with an explosive growth of SARS-CoV-2 in places with weak or too quickly relaxed measures, such as rural Alaska and northern Russia (Fig. 1b). The blessing and curse of remoteness is a notable pattern that is probably replicated in other rural areas of the world and indicates that a delayed onset of the pandemic can and should be used to better prepare for the inevitable arrival of the pathogen.

The Arctic is also a home to hundreds of thousands of Indigenous people. Indigenous communities are particularly vulnerable to the COVID-19 pandemic due to tenuous economic conditions, limited healthcare options, crowded housing, food insecurity and existing comorbidities^{4,8}. The disproportionate impact of COVID-19 on elders, who have a special role in Indigenous societies, may lead to the loss of tradition, language and culture. At the same time, Indigenous Arctic residents possess unique sources of resilience embedded in Indigenous knowledge⁹. Generations-long disease-fighting experience and memory of previous pandemics have become relevant today, when bridging Indigenous and western scientific knowledge is viewed as a source of solutions for the COVID-19 crisis³.

A number of Arctic regions with large Indigenous populations, such as Greenland and northern Canada, have seen limited spread of SARS-CoV-2 (Fig. 1a). Indigenous community testimonies collected by the authors of this Correspondence, as well

as existing reports^{3,9}, indicate that strict preventive measures that combined public health– and Indigenous knowledge–driven approaches were able to curtail the spread of COVID-19 in these regions.

Community testimonies demonstrated that although many Indigenous Arctic residents suffered from COVID-19, traditional subsistence practices and Indigenous knowledge provided strong emotional, mental, spiritual and physical support throughout the pandemic. Places of traditional subsistence, such as tundra, rivers, lakes and forests, became zones of safety where Indigenous people were able to continue living without worries about getting infected, as well as avoiding hunger due to the store closures in the settlements.

In addition, remoteness and cultural memory of devastating past epidemics, such as the 1918 influenza pandemic, in Indigenous-dominant regions may have afforded residents there a level of protection not seen in the nearby mining and other industrial settlements. Looser regulations in Alaska and northern Russia, which were often less locally driven and self-determined, may have contributed to a more severe pandemic. However, in rural Alaska, the large number of cases has been alleviated by a rapid vaccination program conducted through collaboration between public and Native health systems⁸. In some areas of Alaska, nearly 50% of residents were vaccinated as early as 1 April 2021 (ref. ¹⁰), providing an exemplar for vaccination programs in Indigenous communities.

Indigenous communities are highly susceptible to pandemic pathogens due to preexisting health conditions, vulnerable socioeconomic status and political marginalization, yet places in which Indigenous knowledge and traditions were combined with effective public-health interventions, such as rapid vaccinations, strong mandates for masking, medical isolation of those testing positive, tracing of cases and curfews affecting social gatherings, may have had an advantage in fighting the pandemic. Indigenous knowledge has provided considerable support through the utilization of cultural and healing practices, such as spending extended time on the land, practicing traditional subsistence activities, and maintaining spiritual and emotional health¹¹. Indigenous knowledge should be investigated as a potential tool for post-COVID-19 rehabilitation³ and for future pandemic responses, especially as part of a One Health approach¹².

Lessons learned in the Arctic may provide important resiliency tools against the spread of COVID-19 among vulnerable populations

in other parts of the world, particularly in remote or Indigenous communities. These lessons can be crucial not just for addressing COVID-19 today, but for public-health strategic planning purposes to mitigate future emerging infectious disease epidemics that could become more frequent in the years to come. □

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A.N.P., M.W., J.D. and T.D., development of the concept; N.G. and A.S., data collection and analysis, visualization; A.N.P., M.W., J.D., M.D. and T.D., data analysis; all authors, manuscript development, editing and revision.

Competing interests

The authors declare no competing interests.