Climate change is thawing deadly diseases. Maybe now we'll address it?

Mona Sarfaty

An anthrax outbreak in Russia came from a 75-year-old caribou carcass thawing out. This is only the beginning of this sort of thing happening.

Mona Sarfaty is the director of Program for Climate and Health, Center for Climate Change Communication at George Mason

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Earlier this month, an outbreak of anthrax in northern Russia caused the death of a 12-year-old boy and his grandmother and put 90 people in the hospital. These deadly spores – which had not been seen in the Arctic since 1941 – also spread to 2,300 caribou. Russian troops trained in biological warfare were dispatched to the Yamalo-Nenets region to evacuate hundreds of the indigenous, nomadic people and quarantine the disease.

Americans are likely to associate anthrax with the mysterious white powder that was mailed to news media and US Senate offices in the weeks following 11 September 2001. The bacteria – usually sequestered in biological weapons labs – killed five people and infected 17 others in the most devastating bioterrorism attack in US history.

But in Russia, the spread of illness was not the result of bioterrorism; it was a result of global warming. Record-high temperatures melted Arctic permafrost and released deadly anthrax spores from a thawing carcass of a caribou that had been infected 75 years ago and had stayed frozen in limbo until now. This all suggests that it may not be easy to predict which populations will be most vulnerable to the health impacts of climate change.

In 2013, the National Academy of Sciences hosted a forum on the influence of global environmental change on infectious diseases. In his keynote speech, Dr Jonathan Patz stood in front of a large slide of a mosquito and warned: “Global warming’s greatest threat may also be the smallest.” The forum
focused on many causes of disease, from fungi, bacteria, viruses and mold spores, to vectors like bats and mosquitoes. Climate change can exacerbate the spread of infectious disease by changing the behavior, lifespans and regions of diseases and their carriers.

This can sometimes be hard to prove directly. It can be challenging, for example, to isolate the avenues by which climate change drives emerging infections in warm climates where travel, trade, land use and dense urban living can all lead to the spread of disease. At other times, the signal is bright. Looking way up north in the Arctic – where there are far fewer people, less travel and trade, and fewer infectious diseases – the signal that climate change is a source of disease outbreaks is clear.

It is usually so cold in the tundra that the ground is perennially frozen in deep layers that can date back 3m years. But the usual circumstances no longer apply at the top of the world. The Arctic is warming twice as fast as the rest of the globe. In fact, the area of the anthrax outbreak was 18F (10C) hotter than average, with temperatures reaching 95F (35C). In addition to releasing ancient microbes, melting layers of permafrost also release methane, a greenhouse gas 30 times more potent than carbon dioxide, that in turn causes further warming.

It is not just animal carcasses that are thawing. Indigenous groups living in the tundra do not bury their dead deep underground, opting instead for wooden coffins arranged in above-ground cemeteries. This raises the potential for infections to spread from this source as well.

Could some of the severe infectious diseases that have threatened the planet in the past be reactivated as our northernmost regions thaw? It’s not just climate scientists that are concerned about the health threats of a warming world. Public health experts and physicians are also speaking out. The Lancet Commission released a report in 2015 asserting that climate change could reverse the last 50 years of public health advances.
As risk is added to risk, the signals of our changing climate underscore the urgent need to put climate change solutions in place. Even more than we know, our health may depend on it.

‘In addition to releasing ancient microbes, melting layers of permafrost also release methane, a greenhouse gas 30 times more potent than carbon dioxide, that in turn causes further warming.’ Photograph: Murdo Macleod for the Guardian