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Research Report

Foresight: Pathogens from the permafrost. Combating the spread of an animal-borne disease with or without Russia

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SWP Comment

NO. 23 JUNE 2024

*Foresight**: Pathogens from the Permafrost

Combating the Spread of an Animal-borne Disease with or without Russia

Michael Bayerlein, Miranda Böttcher, Bettina Rudloff and Pedro A. Villarreal

In the European summer of 2027, the world faces a threat, not only to human health but also to biological diversity and food security. An alarming scenario is emerging: The rapidly thawing permafrost in the Russian tundra has released an unknown form of anthrax that is primarily transmitted by birds. European efforts to collaborate with Russia in combating the spread of this pathogen are being met with resistance.

Two years earlier, in the summer of 2025, the carcasses of birds and mammals were found in several neighbouring Arctic countries. Canadian investigations showed that the animals had been infected with a new variant of anthrax. In the winter of that year, a limited but concerning number of birds and livestock infected with the same pathogen appeared in countries of the so-called Global South, where Arctic birds migrate to spend the winter. Internationally coordinated efforts were launched to identify the origin of the outbreak and contain the spread of the pathogen. An analysis of migratory patterns revealed that many of the dead birds originated from the Russian tundra. Following these findings, Russia reported the discovery of several dead animals in the area in question, but announced that it was a regionally limited phenomenon that posed no global threat.

Uncooperative behaviour by states endangers a global response

In the European winter of 2026, outbreaks of the new form of anthrax occurred again in Southern countries – this time with more infections, but it also led to more extensive countermeasures. The conclusion is that this cycle is likely to repeat every year, threatening a global pandemic or a panzootic, which describes a global outbreak only concerning animals. A global outbreak on this scale could damage biodiversity, endanger food security and pose a serious threat to the world population in the event of a zoonotic spillover of the disease from animals to humans. There have also been initial reports of human fatalities in Russia, which have been denied by Russian authorities.

In the summer of 2027, Europe is leading the effort to find ways to cooperate with Russia. The goal is to eliminate the problem before the pathogen spreads again – and potentially further – during the next

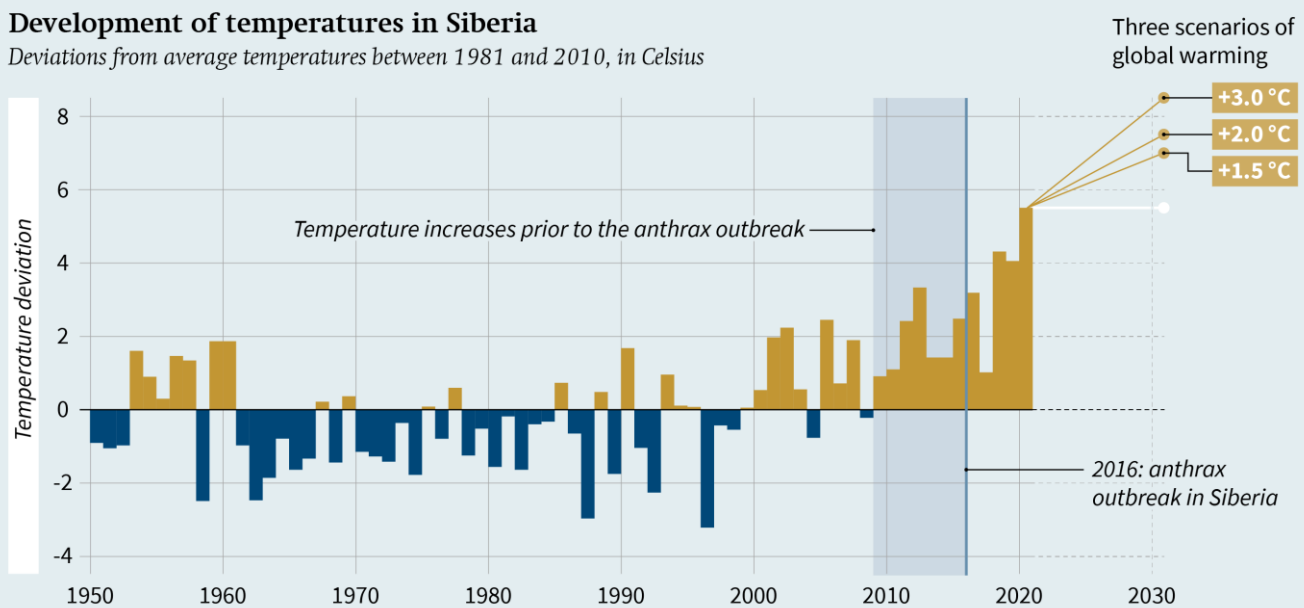
* *Foresight* deals with conceivable events in the future. It offers insights on a fictitious event (not an analysis of real-life developments) with the aim of working through non-linear or unexpected developments.



Figure 1

Development of temperatures in Siberia

Deviations from average temperatures between 1981 and 2010, in Celsius



Source: <https://climate.copernicus.eu/temperature-records-siberia-while-wildfires-arctic-surpass-last-years-activity>

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Northern winter and actually causes a pandemic. However, these events are unfolding in a world that has learnt few lessons from the Covid-19 crisis. Geopolitical tensions continue to make it difficult to combat health threats and build robust global health architecture. Moreover, in 2027, the climate change-related release of pathogens is still receiving little political attention.

Release of pathogens through climate change

In 2016, there was an outbreak of anthrax in the Siberian permafrost – the first in Russia in 75 years. A severe heatwave had thawed the infected carcass of a reindeer frozen in the permafrost, leading to the infection of other animals. As a result, 70 people were hospitalised, and one person died. Since 2005, increasingly high deviations from average temperatures have been recorded in Siberia. As Figure 1 shows, the deviations were particularly strong in the seven years leading up to the outbreak in 2016. Considering the projected scenarios of global warming, it is very likely that this trend will continue in the coming years.

Researchers have long been warning that an unknown pathogen could emerge in the permafrost. The focus is often on viruses, as they are generally more resistant than bacteria or other pathogens. However, bacteria can also potentially survive in the permafrost. This is particularly true for anthrax, as the relevant bacterium forms spores that exhibit high resistance to environmental influences and can survive even in a frozen state. Pathogens from the permafrost are also often particularly resistant; they have been known to adapt in specific ways and develop survival mechanisms, and they are being encountered by a population of humans and animals with little to no immunity. With our 2027 scenario, as the warnings from science seem to be coming true, global health governance architecture becomes of great importance.

The state of the global health architecture

Covid-19 revealed the deficiencies in the state of global health architecture. To better prepare the world for future disease outbreaks, the international community has

been negotiating a Pandemic Prevention, Preparedness, and Response Agreement (Pandemic Agreement) since 2021, as well as reforming the International Health Regulations (IHR). In addition to the fair distribution of medical countermeasures in the event of a pandemic, debates in both processes are focussing on how to ensure cooperation among states when an outbreak occurs that threatens other states. Although a substantially weakened Pandemic Agreement was – in our scenario – finally adopted at the World Health Assembly in 2025, three years later, major countries such as Russia, China and the United States have still not ratified it. Therefore, it now carries little weight in the global fight against health threats.

Under the IHR of 2005 amended in 2024, states are required to inform the World Health Organization (WHO) about events that could lead to a public health emergency of international concern. This applies to both known pathogens and new and unknown diseases that potentially pose a threat to international public health. Anthrax is also a notifiable disease according to the “Terrestrial Code” of the World Organisation for Animal Health (WOAH). This means that a country whose authorities detect the presence of anthrax – even in wildlife – must notify the organisation. Although these obligations are clearly spelt out in the IHR and the Terrestrial Code, they are poorly complied with by states. Economic considerations often take precedence here – reports of disease outbreaks can disrupt trade and tourism because other countries may react with trade and travel restrictions. Therefore, there are problematic incentives for states to delay early reporting and hope that the potential dangers associated with the disease outbreak do not materialise. As reported by WOAH, this dynamic also leads to new anthrax outbreaks not being reported in a timely and transparent manner.

The negotiations on the Pandemic Agreement and the amended IHR revolve around this problem. Efforts are being made to introduce new governance mechanisms that

require the sharing of information and prevent negative reactions from other states. However, China and Russia signalled in the negotiations that they are critical of reporting obligations that could be anchored in the treaty and reject any mechanisms to enforce them.

In light of these challenges, some countries – including Germany – have emphasised the role that the World Trade Organization (WTO) could play in the fight against the spread of the new anthrax variant. The trade regulations of the WTO as an economic module of global health governance architecture offer a legally enforceable option to reconcile economic issues and disease control. In particular, the Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) and the reporting obligation under the Terrestrial Code provide a legal basis for determining whether the risks posed by anthrax justify imposing trade restrictions.

Global health governance with difficult partners

In 2027, efforts to create a new global health architecture are being blocked due to geopolitical tensions, which complicate inter-governmental cooperation and reduce the effectiveness of international health governance. However, cooperation among all states is necessary to combat global health threats to both humans and animals. During the Covid-19 pandemic, comprehensive cooperation failed due to the systemic rivalry between the West and China (where the virus first emerged). Although the United States, under President Donald Trump, blamed the People’s Republic of China for the pandemic, Beijing denied any responsibility and downplayed the extent of the outbreak in the city of Wuhan and the dangers posed by the virus, especially in the early stages.

This pattern seems to be repeating itself in 2027. Although Russia has acknowledged outbreaks of anthrax in the tundra, it continues to emphasise – as China did in the

case of Covid-19 – that the situation is under control due to its efforts and does not pose a global threat. However, neither WHO, WOHAI nor any other organisations can verify this claim. Moscow is internationally isolated due to its war against Ukraine and has no interest in cooperation, especially not with the West. There is to be no cooperation with the European Union (EU) or Germany as long as Putin remains in power. Due to the war and ongoing Western sanctions, Russia has limited financial resources to combat the outbreak of this animal-borne disease. Furthermore, Moscow is only making half-hearted efforts to protect the ethnic minorities living in the tundra from the disease.

Scientific cooperation with Russia despite the Ukraine war

Due to Moscow’s war against Ukraine, in 2027 there is still an embargo on scientific cooperation with Russia – both in Germany and the EU as a whole. The emergency nature of the spread of previously dormant pathogens could offer a basis for the limited reestablishment of scientific cooperation.

In addition to German politics, European politics has also been significantly affected by the event. Through Greenland, and thus Denmark, the EU is indirectly involved in combating the outbreak on the ground. However, opening communication channels with Russia has proven difficult due to it downplaying the problem and the EU being viewed as a political enemy of Russia against the backdrop of the Ukraine war. China remains closely aligned with Russia in 2027 and is the only major power with direct access to Moscow. Analogous to its approach at the beginning of the Covid-19 pandemic, China is emphasising Russia’s sovereignty and its ability to handle the outbreak without international support. However, given its geographical proximity to the site of the events, Beijing has an interest in preventing further outbreaks. This presents an opportunity for the EU and other WHO member states to seek dialogue

with Russia through Chinese mediation. One possibility could be to dispatch an international health research team under Chinese leadership.

However, in the EU and Germany, there are concerns about whether a research mission led by China would be acceptable and effective, given the experiences from the Covid-19 era. At that time, Beijing agreed to allow a WHO research team to enter the People’s Republic of China only after a lengthy diplomatic process. Half of this group ultimately consisted of Chinese scientists, who advocated for removing the theory of a lab leak from the final report.

Nonetheless, China’s handling of the disease outbreak in our scenario does not necessarily have to follow the same pattern, as long as the investigations are not overshadowed by accusations. Especially when cooperating with difficult partners, it is important to avoid assigning blame, as happened during the Covid-19 pandemic. In this specific case, the focus should therefore be on the necessity of identifying the origin of the pathogen. This is easier in the case of an outbreak caused by the thawing permafrost, as Russia bears no immediate responsibility for this. In addition to WHO investigation teams, the Arctic Council could provide a platform for unbiased cooperation, as could the “Quadripartite”, which consists of four international organisations and implements the One Health approach.

Arctic Council and the One Health approach

Collaboration in the Arctic on all environmental issues, including emergencies, is based on the Arctic Environmental Protection Strategy of 1991, a legally non-binding instrument that forms the foundation of the Arctic Council, which consists of eight member states: Denmark, Finland, Iceland, Canada, Norway, Russia, Sweden and the United States. To investigate phenomena such as disease outbreaks within the territory of a member state, the consent of the

respective government is required. In the case of Russia, significant diplomatic effort may be needed to obtain such consent. Although China is not a member of the Council, Beijing's mediating role could be leveraged here.

Despite these diplomatic challenges, the Arctic Council deserves special attention from both operational and substantive perspectives. Initially, cooperation with Russia was suspended after its invasion of Ukraine. However, in February 2024, the Council announced that the working groups would resume their activities virtually with all member states, including Russia. Thus, the Arctic Council can serve as a forum for cooperation with Moscow and as a model for similar collaboration in other organisations.

In terms of content, the primary goal of the Council is sustainable development and environmental protection in the Arctic Circle. Health issues are not the main focus of the cooperation. However, the Council has learnt from the Covid-19 pandemic that the ecosystem must be viewed as a whole – for a healthy environment, healthy people and healthy animals, as well as to effectively address the risks of climate change. For this reason, the Council is now also pursuing a project called “One Arctic, One Health”. Since 2020, this project has aimed to strengthen circumpolar knowledge and practices regarding disease outbreaks, natural disasters and similar phenomena. Specifically, the goal is to establish special One Health contact points in each Arctic state and in each organisation of the so-called Permanent Participants of the Arctic Council (a group of six organisations comprised of the indigenous peoples from the seven member states) to quickly process information-exchange requests when investigating and managing disease outbreaks.

In addition to the Arctic Council, the Quadripartite is significant. It is a collaboration of WHO, WOA, the Food and Agriculture Organization and the United Nations Environment Programme. In this context, however, Russia has also been isolated since the beginning of the Ukraine war, not only

due to ongoing sanctions but also because Moscow has been considering withdrawing from WHO. Nevertheless, the Quadripartite, with its thematic focus, would be the central forum to combat the anthrax outbreak at the intersection of environmental protection and climate change, as well as animal and human health. Similar to the Arctic Council, the Quadripartite could be used as a kind of depoliticised platform for collaboration with Russia. The second Action Track of the Quadripartite's Joint Action Plan offers particularly relevant entry points. This track focusses on reducing the risks of emerging zoonotic epidemics and pandemics. The aim is to achieve this through a monitoring system that would prevent the spread of anthrax to humans.

Collaboration with civil society and the private sector

To contain the outbreak in the tundra and provide for the civilian population living there, non-state actors such as Doctors Without Borders are also becoming involved. They are seeking permission from Moscow to despatch their aid teams to the area. The primary goal is to vaccinate individuals using a vaccine that is adapted to the unknown strain of anthrax. However, efforts are currently failing because Russia has imposed restrictions on the work of international non-governmental organisations (NGOs) in the country. Additionally, Moscow insists on using only a vaccine that has been developed specifically by the state-run Gamaleya Institute of Epidemiology and Microbiology in Moscow, however the vaccine has not yet been independently tested. NGOs refuse to work with this vaccine because the results of studies on its effectiveness – similar to the case with the Russian Covid-19 vaccine, Sputnik V – are either inconclusive or not sufficiently transparent.

Furthermore, development aid NGOs, together with humanitarian aid organisations such as the World Food Programme, are warning of possible food shortages.

They point to the risks to the food supply posed by the outbreak. Anthrax is known as a disease that afflicts grazing animals. Therefore, it could be a direct threat to agricultural livestock if spread by birds to farm animals. Potential consequences include massive losses of livestock and, consequently, declines in the production of animal products. Depending on the infected region and its significance for the international food supply, food shortages could also occur outside of Russia. This danger is exacerbated by typical trade policy responses – when there are fears of supply shortages, countries often limit food exports beyond the directly affected product.

The NGOs launched a campaign at the end of 2025 to mobilise the public and exert political pressure on the involved governments. Through platforms such as Twitter/X, Instagram and TikTok, they have disseminated targeted information, graphics and videos demonstrating that the released anthrax threatens global biodiversity. This effort has raised awareness of the importance of sustainable and effective international cooperation to develop solutions for containing the pathogen and preventing a pandemic.

The private sector – including farmers, food producers and retail suppliers – are echoing the concerns of civil society NGOs. Memories of the economic losses caused by restrictions on trade during the Covid-19 pandemic are still fresh. At the same time, farmers' associations are demanding compensation for expected sales losses. Overall, there is significant societal pressure being put upon (Western) political decision-makers to take measures to prevent a pandemic.

Support for the Global South: Vaccines and food supply

The outbreak of anthrax in Russia is increasingly affecting countries in the Global South, particularly the African continent and South-East Asia. Migratory birds are infecting local populations of wild birds as well as domesticated chickens and other

livestock, creating significant challenges. Culling large animal populations would be extremely risky, as it would endanger food security and the incomes of the local populations.

Supporting the countries of the Global South also involves the development and broad distribution of vaccines. New vaccines are needed for both animals and humans. Pharmaceutical companies in the United States and the EU are demanding access to the source of the bacterial infection – the thawing permafrost in Russia – in order to develop these vaccines. They fear that Chinese companies might gain privileged access to the Russian tundra and establish a monopoly on vaccine production. Following the Covid-19 pandemic, there was a significant discussion during the negotiations on the Pandemic Agreement about “access and benefit-sharing”. This discussion focussed on access to pathogens and sequencing data in exchange for medical countermeasures and financial compensation.

Although the Pandemic Agreement does regulate fair benefit-sharing for vaccines for humans, it has only been ratified by a few states. Therefore, quick access to the new pathogen must be secured through other means if Russia demands reciprocity. One possibility would be to assure Moscow that a certain portion of the products developed on the basis of shared pathogens – such as tests and medical countermeasures – would be provided at cost price.

Role of trade and the WTO

The WTO provides a framework for open trade, which has come under significant pressure due to geopolitical tensions. Export bans are permitted under vaguely defined criteria, which anyhow have rarely been requested so far. Emerging epidemics further reduce the already low political will to tighten these regulations. Many states are interested in maintaining their political flexibility in the event of new crises, allowing them to independently

implement measures such as export restrictions to ensure the security of supply. Germany and the EU continue to strengthen approaches such as the G20's "Agricultural Market Information System" (AMIS), which enhances market transparency and helps avoid restrictions by providing a clear picture of the supply situation. However, the input of relevant data is increasingly being hindered.

WTO rules also pertain to the setting of standards for SPS (sanitary and phytosanitary) risks such as animal-borne diseases, which must be reported to WOAHP under the Terrestrial Code. Such diseases can justify bans on imports from affected regions – an option that has been increasingly used since the first signs of the new anthrax emerged in 2025. Agreements for the mutual recognition of control systems, which are particularly common in the veterinary sector, are being suspended more frequently, further hindering trade and weakening international trust.

Policy options for Germany and the EU

The German government's 2023 National Security Strategy highlights the "One Health" approach as part of its pandemic prevention strategy. This approach describes the close integration of risk assessments for humans, animals and the environment. The primary concern here is to address pandemic risks that affect the health of animals and the environment before they threaten humans. A One Health monitoring system designed in this way could be deployed in permafrost regions. It would help identify risks before pathogens spread among animals or spill over to humans. Such a system is also important after an outbreak, as it forms the basis for measures to monitor the spread. The system should be multilateral

and include all states in the northern polar circle, including Russia. This would require the resumption of scientific collaboration with Russia, at least to a limited extent, such as in working groups. Additionally, Germany and the EU have other options for action:

- There needs to be more collaboration between climate experts and those in human and animal health sectors; this is one of the key prerequisites for anticipatory governance. Ice cores obtained for climate change research could serve a dual purpose. They could also be analysed by health experts to determine what types of pathogens are hidden in the ice. The same applies to thawing carcasses of dead animals.
- At the WTO level, existing regulations should be more closely integrated, as laid out in the veterinary-relevant SPS Agreement, WOAHP's Terrestrial Code, the Agreement on Agriculture (regarding possible support measures for affected farmers), the General Agreement on Trade in Services (for health-related measures) and the Agreement on Trade-Related Aspects of Intellectual Property Rights. Even though the multilateral system currently only has weak international support, the EU should continuously work to strengthen and better structure it.
- Food supply risks should be monitored, as is already done in the new dashboard for food aid needs, which Germany initiated due to Russia's war against Ukraine. In particular, the vulnerability of countries with many livestock farmers should be addressed. At the same time, the well-established risk management approaches used by of vulnerable countries should be supported.

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