# Scientists warn of ancient pathogens re-emerging due to climate change



Scientists are sounding the alarm over the potential for ancient pathogens to resurface as melting ice in the Arctic caused by climate change poses new health risks. Research indicates that thawing permafrost could release dormant 'zombie' viruses, termed 'Methuselah microbes', which have remained inactive for tens of thousands of years. According to Dr Khaled Abass from the University of Sharjah, "Climate change is not only melting ice—it's melting the barriers between ecosystems, animals, and people."

Historically, microbes trapped in the Arctic's frozen terrain have been known to revive, as demonstrated by the isolation of viruses from Siberian permafrost back in 2014. These viruses, including Pithovirus sibericum, which has survived for approximately 30,000 years, displayed the ability to infect living cells after being thawed out. A recent revival of an amoeba virus frozen for 48,500 years in similar conditions reinforces concerns that these ancient pathogens could be harmful once they re-enter the environment.

The threat extends beyond the permafrost itself, spreading to glaciers around the world. Last year, a significant finding in western China revealed 1,700 ancient viruses, with some dating back 41,000 years, hidden deep within a glacier. While these viruses remain dormant as long as they're buried, their release due to climate-related disturbances poses risks to living organisms.

Among the notable pathogens that could emerge is Pacmanvirus lupus, discovered in the intestines of a 27,000-year-old frozen Siberian wolf. This ancient virus is linked to the potential infection of amoebas, which raises concerns about how these long-forgotten viruses could interact with modern ecosystems.

Scientists estimate that around four sextillion cells are released from permafrost each year due to thawing, although they acknowledge that only a small fraction may pose a risk to human health. However, the sheer number of microorganisms escaping into the environment amplifies the likelihood of a hazardous encounter.

Past instances highlight the risks associated with thawing permafrost. In 2016, anthrax spores linked to a long-frozen animal carcass were released, resulting in several hospitalisations and the death of a child. As human contact with these pathogens increases, mostly through wildlife, the potential for zoonotic diseases—those that jump from animals to humans—grows correspondingly. Approximately three-quarters of known human infections are zoonotic, making emerging pathways for these diseases particularly alarming.

Dr Abass noted that "climate change and pollution are affecting both animal and human health," stressing the interconnectedness of these issues as changing Arctic environments may facilitate the transmission of infectious diseases. Furthermore, the Arctic is identified as a region of particular concern, with limited medical infrastructure exacerbating the chances of a widespread outbreak before it can be effectively contained.

The researchers pointed to ongoing concerns related to zoonotic diseases like Toxoplasma gondii and Hantavirus hemorrhagic fever, which have already demonstrated their capacity to spread in the Arctic's unique environment. Dr Abass cautioned that developments in the Arctic "don't stay in the Arctic," suggesting that the health impacts of melting ice may extend well beyond regional borders and contribute to global health challenges.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.livescience.com/planet-earth/arctic/black-swan-pathogens-from-ancient-permafrost-may-be-getting-ready-to-wake-up> - This article supports the claim that thawing permafrost is releasing 'black swan' pathogens, which could pose significant risks to modern ecosystems due to their novelty and the lack of defense mechanisms against them.
2. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10333728/> - This study provides evidence of 'zombie viruses' like *Pandoravirus yedoma*, which remained infectious after being frozen for tens of thousands of years, highlighting the risks associated with thawing permafrost.
3. <https://www.science.org/content/article/permafrost-can-imprison-dangerous-microbes-centuries-will-arctic-thaw-release-them> - This article discusses how permafrost can harbor pathogens like anthrax and other 'zombie viruses', posing potential health risks as climate change accelerates permafrost thawing.
4. <https://www.noahwire.com> - This is the source article that outlines the potential risks of ancient pathogens resurfacing from melting ice, though it is mentioned directly in the prompt without providing additional support through online search results.
5. <https://www.vice.com/en/article/k7w98y/arctic-permafrost-viruses-released-climate-change> - Unfortunately, this specific URL was not found in the search results. However, similar content suggests that articles about the release of viruses due to permafrost thawing are relevant to the topic.
6. <https://www.sciencedaily.com/releases/2022/02/220225110231.htm> - While this specific URL was not found in the search results, it typically would cover scientific findings related to permafrost and its potential to release ancient microorganisms, aligning with the article's themes.
7. <https://www.dailymail.co.uk/sciencetech/article-14583035/Melting-ice-Arctic-zombie-viruses.html?ns_mchannel=rss&ns_campaign=1490&ito=1490> - Please view link - unable to able to access data