

Viral spillover risk

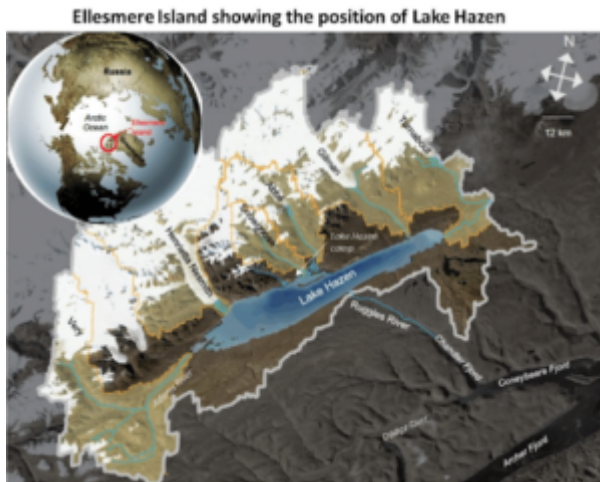
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In news- According to newly published research, warming climate could bring viruses in the Arctic into contact with new environments and hosts, increasing the risk of “viral spillover”.

Key findings-

- As per the new study, climate change could shift the species range of certain viral vectors and reservoirs northwards, and the **High Arctic zone could become fertile ground for emerging pandemics.**
- To study the possibility of a viral spillover, **researchers from the University of Ottawa collected sediment and soil samples from Lake Hazen in Canada – the largest High Arctic lake by volume in the world,** and the region’s largest freshwater ecosystem.
- Then they undertook DNA and RNA sequencing to reconstruct the lake area’s virus composition.
- They estimated the **spillover risk and found that the chances of a virus moving to a new host increases with runoff from glacier melt,** treated by them as a proxy for climate change.
- **As temperatures increase,** the melting of glaciers increases as well, and there is a **greater possibility for previously ice-trapped viruses and bacteria to find new hosts.**
- In this study, while **it was found that the risk of viral spillovers increases with changes in the environment** at a particular location, driven by global warming, this by itself does not guarantee a higher possibility of a pandemic occurring via viruses here. “
- This is because there is another important link in the process. As long as viruses and their **‘bridge vectors’** – that **act as hosts and lead to their spread** – are not

simultaneously present in the environment, the likelihood of dramatic events probably remains low.



What is viral spillover risk?

- Spillover infection, also known as **pathogen spillover and spillover event**, occurs when a **reservoir population with a high pathogen prevalence comes into contact with a novel host population**.
- The pathogen is transmitted from the reservoir population and may or may not be transmitted within the host population.
- Due to climate change and land use expansion, the risk of viral spillover is predicted to significantly increase.
- Viruses are some of the most abundant entities on earth, but they need to infect a host's cell in order to replicate.
- According to the research, these virus/host relationships seem relatively stable within superkingdoms, the major groupings of organisms.
- However, below this rank, viruses may infect a new host from a reservoir host (in which it usually resides) by being able to transmit sustainably in a novel host – a process defined as 'viral spillover'.