## Viral spillover risk

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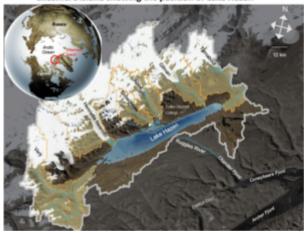
<u>In news-</u> According to newly published research, warming climate could bring viruses in the Arctic into contact with new environments and hosts, increasing the risk of "viral spillover".

## **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.

Ellesmere Island showing the position of Lake Hazen



## 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'.