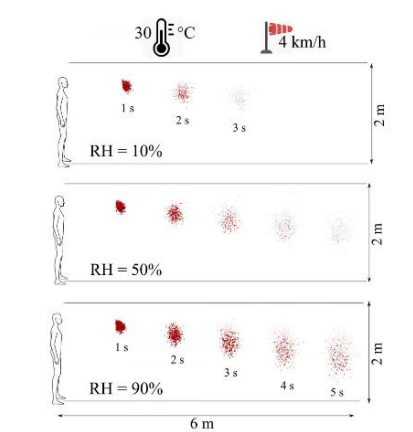


Evaporation is critical to coronavirus transmission

New Delhi, Sept 25 (India Science Wire): Novel coronavirus cases are on the rise throughout the world and the researchers are trying to understand the virus as well as how climate impacts it. As countries like India would soon see winters and viral infections are very common during this season. A recent study published in the journal *Physics of Fluids* explained why the pandemic increased during July in different crowded cities around the world, such as Delhi, which experienced both high temperatures and high relative humidity.

The researchers from University of Nicosia, Cyprus found that evaporation is a critical factor for the transmission of the infectious particles, which are immersed in respiratory clouds of saliva droplets. The team has studied the effects of relative humidity, environmental temperature, and wind speed on the respiratory cloud and virus viability.



CAPTION
Weather impact on virus transmission. Effect of relative humidity (RH=10%, 50% and 90%) on coronavirus respiratory droplet cloud at temperature 30 C and wind speed of 4 kph. Wind direction is from left to right.

It also provides a crucial alert for the possibility of a second wave of the pandemic in the coming autumn and winter seasons, where low temperatures and high wind speeds will increase airborne virus survival and transmission. The results reveal the importance of weather conditions in the virus's viability, which can help guide the design of measures in both indoor and outdoor environments, to reduce airborne virus transmission indoors and public spaces.

"Suppose we have a better understanding of the evaporation and its relation to climate effects. In that case, we can more accurately predict the virus concentration and better determine its viability or the potential for virus survival," said Dimitris Drikakis, lead author, University of Nicosia.

Despite the importance of airborne droplet transmission, research regarding heat and mass transfer around and within respiratory droplets containing the virus has been few. To address the challenge, the researchers developed theoretical correlations for the unsteady evaporation of coronavirus-contaminated saliva droplets. They implemented the theory in an advanced computational fluid dynamics platform and studied the effects of weather conditions on airborne virus transmission.

"We found high temperature and low relative humidity lead to high evaporation rates of saliva-contaminated droplets, thus significantly reducing the virus viability," said Talib Dbouk, co-author.

Additionally, the researchers observed the travel distance and concentration of the droplet cloud continued to be significant, even at high temperatures if the relative humidity is high. The wind speed is another crucial factor that might alter all the rules for the social distancing guidelines. (India Science Wire)

Keywords: evaporation, relative humidity, temperature, weather, novel coronavirus

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