

LETTER

COVID-19: A relationship to climate and environmental conditions?

Dear Editor,


Since December 2019, coronavirus (CoV) disease 2019 (COVID-19) has spread rapidly throughout the world, and World Health Organization declared it a health emergency.¹⁻³ A significant number of infectious diseases, including human CoVs, display seasonal patterns in their incidence. Environmental factors such as temperature and humidity play an important role in progression and spread of severe acute respiratory syndrome (SARS)-CoV infection with the virus retaining its viability for over 5 days at temperatures of 22°C to 25°C and relative humidity (RH) of 40% to 50%. Higher temperatures and higher RH (38°C, and >95% RH) have been found to reduce virus viability.^{4,5}

COVID-19, caused by SARS-CoV-2, started in low temperature areas of China, with major outbreaks following in South Korea, Japan, Iran, and Northern Italy. It is noteworthy that the new epicenters of virus showed similar temperature and latitude and were all along the 30° to 0°N zone. The diseases then spread to higher temperature areas like India, Thailand, and Middle East, which can be attributed to the global traveling. Weather patterns in COVID-19 (5°C-11°C and 47%-70% RH) are similar to those of SARS-CoV mentioned above and known laboratory conditions that favor CoV survival (4°C, 20%-80% RH).⁵ Nevertheless, the dynamics of viral transmission depend on many other factors like physical property of the virus, outdoor and indoor environments, population densities, hygiene, space, and genetic predispositions, which may be the reason for its spread in relatively warmer areas.^{6,7} The presence of central air-conditioning, which tends to maintain a lower ambient room temperature, may play a role in virus spread in closed spaces irrespective of the outside temperature. Lack of hygiene, close contact as seen in high density population areas, poor living conditions with lack of ventilation may be predisposing factors for viral transmission in warmer areas.^{6,7}

The seasonality and dynamics of COVID-19 are not well understood, and further studies are needed to identify the environmental conditions that favor its spread. Epidemiological models incorporating climate and weather processes and/or stimulating scenarios of human interactions may help identify populations at risk and improve surveillance and control measures.

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