

COVID-19

LITERATURE REPOSITORY

Is there a seasonal variation in the spread of COVID-19?

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Discussion

Many respiratory viruses show seasonal variation in prevalence. Previous studies have supported the hypothesis that cold and dry weather conditions, coupled with changes in human immune responses and behaviours, are more conducive for the survival and spread of droplet-mediated viral diseases ^{1,2}. This leads to speculation, echoed by the global media, that COVID-19 follows a seasonal pattern and transmission may attenuate in the coming warmer months in the Northern hemisphere ^{3,4}.

Often compared to the flu, the theory of COVID-19 seasonality largely stems from the well-characterised seasonal pattern of influenza ^{5,6}. In the Northern hemisphere, influenza epidemic spans from November to March and in the southern hemisphere, influenza season falls between May and September ⁵. A 30-year longitudinal study in the USA demonstrated that influenza mortality was as much as 40 times higher during the cooler months than during the warmer months ⁶. The predicted trajectory of COVID-19 transmission was also modelled based on environmental observations with SARS-CoV, a phylogenetically close family of SARS-CoV-2, which caused the 2002-2003 SARS epidemic ^{2,7}. Tan et al reported a significant correlation between environmental temperatures and SARS outbreaks, which began in China in the winter of 2002 and ended by July 2003 ⁸.

Current evidence, however, has not shown consistent temperature or humidity dependence of the COVID-19 pandemic. Luo et al collected daily cumulative incidence data for each province in China from January 23, 2020 (at the time of closure of Wuhan) to February 10, 2020 ³. Data for affected countries including Thailand, Singapore, Japan, and South Korea, as well as other regions in China including Hong Kong and Taiwan were obtained for comparison ³. While weather conditions may have an impact on the transmissibility of COVID-19, sustained transmission and exponential growth were recorded over a range of humidity conditions ranging from cold and dry provinces in China to tropical locations such as Guangxi and Singapore ³. Lu suggests that without implementation of extensive public health interventions, a change in weather alone will not necessarily lead to a decline in incidence rate ³.

A separate study by Jamil et al included epidemiological data released by WHO, European CDC and John Hopkins CSSA of confirmed COVID-19 cases from affected countries worldwide and provinces of China between December 31, 2019 to March 26, 2020 ⁴. The result showed a global R0 of 1.90 +/- 0.07 and transmission rate of COVID-19 was found to be temperature-independent ⁴.



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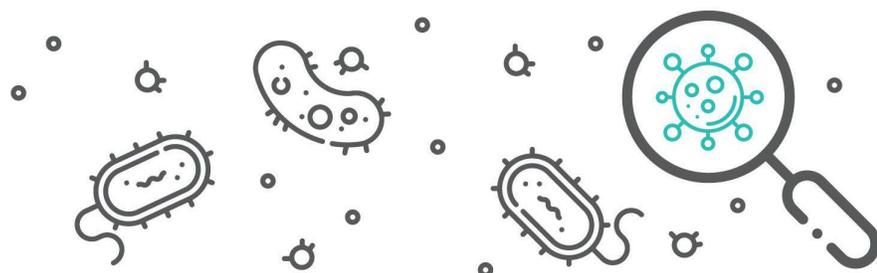
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Conclusions

There is currently limited evidence to show that SARS-CoV-2 behaves like a seasonal respiratory virus. Better understanding of the association of environmental factors and viral transmission can help predict location and timing of future outbreaks. As Australia heads into winter, it is important that we continue to implement effective public health strategies to contain the pandemic.

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