

Environmental determinants of COVID-19 transmission across a wide climatic gradient in Chile

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Abstract

Several studies have examined the transmission dynamics of the novel COVID-19 disease in different parts of the world. Some have reported relationships with various environmental variables, suggesting that spread of the disease is enhanced in colder and drier climates. However, evidence is still scarce and mostly limited to a few countries, particularly from Asia. We examined the potential role of multiple environmental variables in COVID-19 infection rate [measured as mean relative infection rate = (number of infected inhabitants per week / total population) × 100.000] from February 23 to August 16, 2020 across 360 cities of Chile. Chile has a large climatic gradient ($\approx 40^\circ$ of latitude, ≈ 4000 m of altitude and 5 climatic zones, from desert to tundra), but all cities share their social behaviour patterns and regulations. Our results indicated that COVID-19 transmission in Chile was mostly related to three main climatic factors (minimum temperature, atmospheric pressure and relative humidity). Transmission was greater in colder and drier cities and when atmospheric pressure was lower. The results of this study support some previous findings about the main climatic determinants of COVID-19 transmission, which may be useful for decision-making and management of the disease.