Weather Effects on Coronavirus Pandemic

Chloe Wilson*

Editorial Office, Journal of Climatology & Weather Forecasting, London, United Kingdom

Corresponding Author*

Chloe Wilson
Editorial Office,
Journal of Climatology & Weather Forecasting, London,
United Kingdom.
E-mail: climatology@epubjournals.com

Received: 03-Feb-2022, Manuscript No. JCWF-22-15942; **Editor assigned:** 05-Feb-2022, PreQC No. JCWF-22-15942 (PQ); **Reviewed:** 19-Feb-2022, QC No. JCWF-22-15942; **Revised:** 21-Feb-2022, Manuscript No. JCWF-22-15942 (R); **Published:** 25-Feb-2022, DOI: 10.35248/ 2332-2594.22.10(2).335

Abstract

The unique coronavirus (SARS-CoV-2) has spread around the world, prompting the World Health Organization to proclaim a pandemic. While influenza viruses have a seasonal pattern, it is unknown if COVID-19 is affected by the weather. In this paper, we look at the weather patterns in all of the COVID-19-affected regions around the world. Our findings show that between 3 and 17 °C, and 1 and 9 g/m3, roughly 85 percent of COVID-19 reported cases (out of approximately 29 million tests completed) occurred in places with temperatures between 3 and 17 °C and absolute humidity between 1 and 9 g/m3. Similarly, outside of these limits, hot and humid locations have only reported about 15% of cases, or about 0.5 million cases (out of approximately 7 million tests performed). This implies that COVID-19's global spreading could be influenced by the weather. However, in US and European cities (above 45 N), this role may be limited because mean temperature and absolute humidity levels may not approach these levels even during the peak summer months. Since the beginning of March, most hot and humid countries have been experiencing temperatures >35 °C and absolute humidity >9 g/m3, and thus the effect of weather, however minor, has already been accounted for in the COVID-19 spread in those regions, and they must take strict social distancing measures to prevent COVID-19 from spreading further. Our research found that the effect of weather may have only slowed the spread of COVID-19.

Keywords: Weather • Climate • Temperature • COVID-19 • Humidity

Introduction

We discovered that COVID-19 cases have steadily increased in warm and humid nations, accounting for roughly 500,000 cases in regions with absolute humidity >9 g/m3. As a result, effective public health actions are needed to curb the spread of COVID-19 [1]. This also suggests that 'summer' would not be enough to stop COVID-19 from spreading over the earth. Several cases of a new coronavirus known as 2019-nCoV or COVID-19 emerged in China at the start of 2020. Due to its highly transmissible nature and greater worldwide mobility, the disease rapidly spread to other countries and was labeled a pandemic by the World Health Organization on March 11, 2020 [2].

In several researches, human coronaviruses have been linked to a wide range of respiratory disorders. Influenza viruses have been found to have a seasonal pattern, while SARS-Cov-1 (a type of coronavirus) has been identified to lose its capability to survive longer at higher temperatures, possibly due to the breakdown of their lipid layer at higher temperatures. Other coronaviruses have shown some seasonality as well [3]. However, as COVID-19 is the first time it has appeared in the human population, it is unclear how it will respond to changes in climatic conditions. Initial reports from China had mixed results when it came to the association between weather patterns and COVID-19 infections. Temperatures and humidity have varied dramatically between countries that have been hit hardest by the COVID-19 pandemic and those that have escaped a similar scale of epidemic [4]. Temperature and humidity ranges that appear to correlate with lower reported incidence rates are located geographically between 30 N and 30 S, which are circles of latitude 30 degrees north and south of the Earth's equatorial line, respectively. Even though they account for more than 40% of the global population, the lack of substantial numbers of cases in the nations between 30 S and 30 N (5,000,000, or around 15% of total COVID-19 cases as of 1 May 2020) is baffling. Many of these countries, it has been alleged, are slipping behind [5].

Discussion

The number of COVID-19 cases has increased exponentially, lagging behind North America and Europe by 2 to 3 weeks. The low number of verified COVID-19 cases is attributable to a lack of reporting and testing in several of these countries, including Pakistan, Indonesia, and several African nations, which have weak health infrastructure. Many countries and areas, like Singapore, the United Arab Emirates, Saudi Arabia, Australia, and Qatar, have undertaken more COVID-19 tests per million inhabitants than the United States, Italy, and numerous European countries indicating that, at least for some countries between 30 S and 30 N, non-testing is not a concern [6]. Despite the fact that India conducted hundreds of thousands of tests recently, the stated number of cases per million people did not considerably increase. Even though most of them have not undertaken harsh quarantine measures like those in China and Europe, the incidence rate of COVID-19 cases in all of these nations is lower than in America and Europe. Many of these countries, such as the United Arab Emirates (which receives more than 15 million visitors annually), Singapore (which receives more than 18 million visitors annually), and Qatar (which receives about 2 million visitors annually), are also global travel hubs, with thousands of people entering and exiting the country each day. Hundreds of people came to Saudi Arabia Thousands of pilgrims from all around the world are expected to visit on a regular basis till February 27, 2020 [7]. Given these facts, it's important looking into the additional factors that influence COVID-19's occurrence and dissemination. The epicenter of COVID-19 is major, well-connected cities in each country and state, and the function of connectivity and population in the spread of a pandemic is well recognized. Other factors, such as the health-care system, demographics, social structure, public policy, and climate, can influence the breadth and rate of SARS-CoV-2 transmission [8].

Testing, population (density), community structure, social dynamics, governmental policies, global connection, air and surface life, reproduction number, and serial interval of the SARS-CoV-2 all influence the frequency of COVID-19 cases discovered in a country/state. Many details about COVID-19 are still being uncovered, such as the fact that it can stay airborne for more than 3 hours and that it has various survival durations on metals, cardboard, and plastics (published on March 17, 2020) [9]. The virus is susceptible to heat, according to recent research on the stability of SARS-CoV-2 with temperature variations, but these data are still preliminary. Previous research has demonstrated that virus distribution is influenced by environmental conditions, with many respiratory infections exhibiting seasonality and lower transmission rates in hotter, humid regions. However, the behavior of COVID-19 is still being studied and is the focus of this publication. The causes for the limited number of COVID-19 cases documented to date in regions with T > 17 °C and AH > 9 g/m3, which includes most of the countries between 30 S and 30 N, are discussed below [10].

First, approximately 81 percent of testing took place in non-tropical countries (30 N and above), and 85 percent of COVID-19 instances were documented in the same countries between the temperatures of 0 and 17 °C and absolute humidity (AH) of 1 and 9 g/m3 [11]. As a result, the northern-cooler countries' higher number of tests and global connectedness may help to explain the difference in the number of confirmed COVID-19 cases between cooler and warmer-humid locations [12]. However, several countries and regions between 30 S and 30 N that conducted extensive testing, such as Singapore, the United Arab Emirates, Saudi Arabia, Australia, and Qatar, reported a lower number of positive COVID-19 cases per capita and a lower incidence rate than European and American countries, implying that the disparity is not solely due to geographical differences [13].

It may be claimed that countries between 30 S and 30 N are in the early stages of the pandemic, with the incidence rate appearing linear and picking up only after hundreds of cases have been documented, as seen in the United States, Italy, and Spain [14]. If the epidemic is still in its early stages, numerous countries may experience exponential expansion in the near future. However, for other nations with more than 1500 cases, such as Australia, Malaysia, Thailand, and Saudi Arabia, the time it took to reach these

levels was far longer than for European countries and American states. There may be a few drawbacks to our findings. Several nations are undercounting instances and have implemented differing public health measures, despite the fact that the number of reported cases was derived straight from WHO reports [15]. For example, while Korea conducted widespread testing to identify potential COVID-19-positive subjects, including those who were asymptomatic, in order to reduce transmission, the United States and a number of other countries, including the United Kingdom and Japan, decided to test only those who had symptoms or had come into contact with COVID-19-positives. This may result in undetected cases; therefore even if the community has a higher number of COVID-19-positives, they may go unnoticed until it reaches the most vulnerable members of the population. Other environmental parameters, such as sun radiation and cloud cover, were not taken into account. However, since solar radiation and cloud cover are connected with temperature in natural environments, similar trends can be expected from those climate variables, according to our findings [16].

Conclusion

We focus on the importance of are included quarantine measures to effectively minimise COVID-19 transmission and safeguard the vulnerable, even in warmer, humid places where the incidence rate appears to be lower. Warm weather alone may not be enough to stop the spread of COVID-19, even in hot and humid countries, if necessary precautions are not followed, as evidenced by the fact that COVID-19-positive cases continue to rise in hot and humid locations. Aside from weather, a variety of other factors, such as population density, public health regulations, political and social structures, healthcare quality, healthcare intervention, and global connectedness, may all play a role in the number of impacted cases in any given place. These issues should be considered in future research, and analytic methods should be used. To learn more about the association between weather and COVID-19 transmission, researchers used an epidemiological statistical model.

References

1. Lu, H., et al. "Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle." *Jour Med Virol* 92.4 (2020): 401.
2. Chen, N., et al. "Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study." *Lancet* 395.10223 (2020): 507-513.
3. Bogoch, I.I., et al. "Pneumonia of unknown aetiology in Wuhan, China: potential for international spread via commercial air travel." *J Travel Med* 27.2 (2020)
4. Huang, C., et al. "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China." *lancet* 395.10223 (2020): 497-506.
5. Xu, P., et al. "Clinical characteristics of two human to human transmitted coronaviruses: corona virus disease 2019 versus middle east respiratory syndrome coronavirus." *MedRxiv* (2020).
6. Van Der Hoek, L., et al. "Identification of a new human coronavirus". *Nature Med* 10.4 (2004): 368-373.
7. Lowen, A.C., et al. "Influenza virus transmission is dependent on relative humidity and temperature." *Plos Pathogens* 3.10 (2007): e151.
8. Chan, K.H., et al. "The effects of temperature and relative humidity on the viability of the SARS coronavirus." *Advan Virol* 2011 (2011): 1-7.
9. Neher, Richard A., et al. "Potential impact of seasonal forcing on a SARS-CoV-2 pandemic." *Swiss Medical Weekly* 11 (2020).
10. Xie, J., & Yongjian Z. "Association between ambient temperature and COVID-19 infection in 122 cities from China." *Sci Total Environ*724 (2020): 138201.
11. Iribarne, J.V., & Cho, H.R. "Atmospheric Thermodynamics and Vertical Stability." *Atmosph Phy. Springer* (1980): 79-96.
12. Zu, Z.Y., et al. "Coronavirus disease 2019 (COVID-19): a perspective from China." *Radiol* 296.2 (2020): E15-E25.
13. Shannon, M. "Climate Change and Engineering Geological Challenges". *J Climatol Weather Forecast* 10.1 (2022): 1-2.
14. Tim, O. The Interplay of Climate Change and Air Pollution on Health. *J Climatol Weather Forecast* 10.1 (2022):1-2.
15. Wang, Z. T., et al. "A Climatic Index for Aeolian Desertification in Northern China and its Application to Dust Storm Frequency." C*hina. J Climatol Weath Forecast* 9.10 (2021): 1-5.
16. Mostafa, A. "Studying the Effects of Climate Change on Macro Economy Sectors using Recursive Dynamic Computable General Equilibrium Approach: Evidence from Iran". *J Climatol Weather Forecast* 9.8(2021):1-6.

Cite this article: Wilson C. Weather Effects on Coronavirus Pandemic. J Climatol Weath Forecast. 2022, 10 (2), 001-002