

Percentage of Influence and Affection of Covid-19 with Respect to the Climate in the USA

Research Article

Volume 3 Issue 5- 2022

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Article History

Received: December 5, 2022 Accepted: December 13, 2022 Published: December 13, 2022

Abstract

Objective this balance and verification of the research article “Effect of climate and weather on the spread of Covid-19 in the USA. Areas of lesser and greater spread” seeks to calculate the percentage of the real incidence in the US population according to time and climate. Methods: The data is taken from deaths per 100,000 inhabitants by state and compared to the generic reproductive index applied to the US climate, in its different states from the start of the pandemic and until November 2022. Results: We understand, based on The results obtained show that the climate has considerably influenced the spread, mainly in the areas with the highest population density. In the zones of more variable and changing weather during the study time, they have a different climatic incidence. Conclusion: It is confirmed that the data from the research article “Effect of climate and weather on the spread of Covid-19 in the USA. Areas of lesser and greater spread” are similar to the real data produced during the pandemic.

Introduction

Currently, the virus is or has been found in all countries of the world, although the arrival of vaccines [1], its spread has been sustained. Considering the great geographical extension of the object of study, a territorial extension of 9,147km² and the differentiation of the multiple climatic zones of the country, we maintain an arduous and extensive work where we have worked meticulously on a scale that allows us to have reliable results. In addition, we have compiled information from different sources and we have applied a new and proprietary mathematical expression to verify the real incidence of the virus on the US population according to climatic conditions from the start of the pandemic to November 2022.

Methods

To calculate the real percentage of influence and affect of Covid-19 regarding the climate in the USA, prior to the data digitization process with desktop GIS software, we have applied a new mathematical expression of our own elaboration to the generic reproductive index ap-

plied to the climate of USA and deaths per 100,000 inhabitants taken by states of the study period.

$$\% = |w \times d| / d$$

w: Rate of increase of R in the months with the most impact based on the weather [2].

d: Deaths per 100,000 inhabitants since the pandemic began [3].

Results

The data is extracted from the deaths per 100,000 inhabitants by Covid-19, since the accumulated incidence by months and by states offers irregular and inconsistent data. Cases due to deaths mark a more reliable incidence than dumping data into a database at uncertain moments and political weight. In the comparison, we apply the months with the highest incidence of coronavirus in American society from the end of 2019 to November 2022 [2].

The cartography shows how the weather has considerably influenced



the transmission of covid-19, mainly in the areas with the highest demographic index (Figure). In more southern areas and even the east coast, the percentage is more dispersed due to weather and social factors. The data extracted from the American meteorological service [4,5] are applied to a medium scale for the population level and contrast with specific situations of non-majority climate in the climatic series. In the work we have carried out, we take into account variables according to the climatic connotations of each study area (orography, wind regimes, temperature, relative humidity, altitude, solar radiation, insolation index, etc.), which we find in the climatic averages [6].

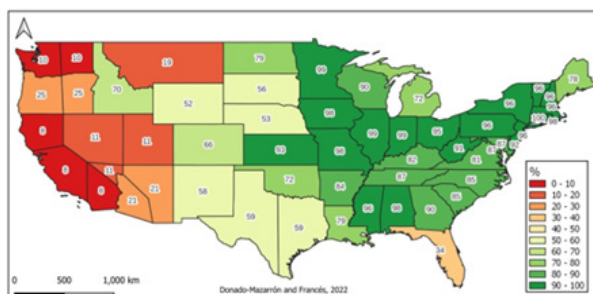


Figure: Percentage of affection of Covid-19 with respect to the climate in the USA by states.

Discussion

The most important point that we deal with in this research work are the main factors related to weather and climate: temperature and relative humidity of the air. With our work we provide conclusive data for outdoor spaces since, only through the incidence value applied to a climatic space with anthropic incidence. After more than a year of pandemic, it has been proven that summer and social containment actions slow down the transmission of the virus [7]. Virtually all observational studies are based on person-to-person infections, so population density and social behaviors are the most important values in the spread of SARS-CoV-2, however, we must insist and, with great emphasis, that the climate conditions social behaviors. Climatologically, the summer period is optimal for a supposed de-escalation, control of normality or adaptation to the virus in the US. It is true that we have applied to the mathematical expression a variable not applied in the previous work, such as the mortality rate per 100,000 inhabitants to know the cases of SARS-CoV-2, but this data is a value that does not lead to error in the US since it is a more exact and homogeneous number to apply to the monthly variables, due to the fact that the data on positive cases in the different states are arbitrary in dates and quantity, with records ineloquent with the reality lived and that are equivocally distant from each other.

Conclusion

Synoptic cartography applied to the effect of climate and weather on the spread of the SARS-CoV-2 virus is a very effective tool for any study that seeks to rationalize prevention methods and strategies to contain the spread of the virus in its territory and remains verified between the real data generated during the pandemic and the synoptic reproductive index to make assessments of the spread of the virus. In summary, weather and climate influence the spread of the SARS-CoV-2 virus due to its biological condition [8]. It is confirmed that the data from the research article "Effect of climate and weather on the spread of Covid-19 in the USA. Areas of lesser and greater spread" are similar to the real data produced during the pandemic.

Conflicts of Interest

The authors declare that there is not, under any circumstances, any conflict of interest in relation to the publication of this article.

Contributions

The authors participated in the preparation and design of the study; the acquisition, analysis and interpretation of data; the writing and/or revision of the manuscript and are responsible for its content.

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