Analysis of the risk of infection by COVID-19 taking into account the Social Determinants of Health in Bogotá between february and august 2020

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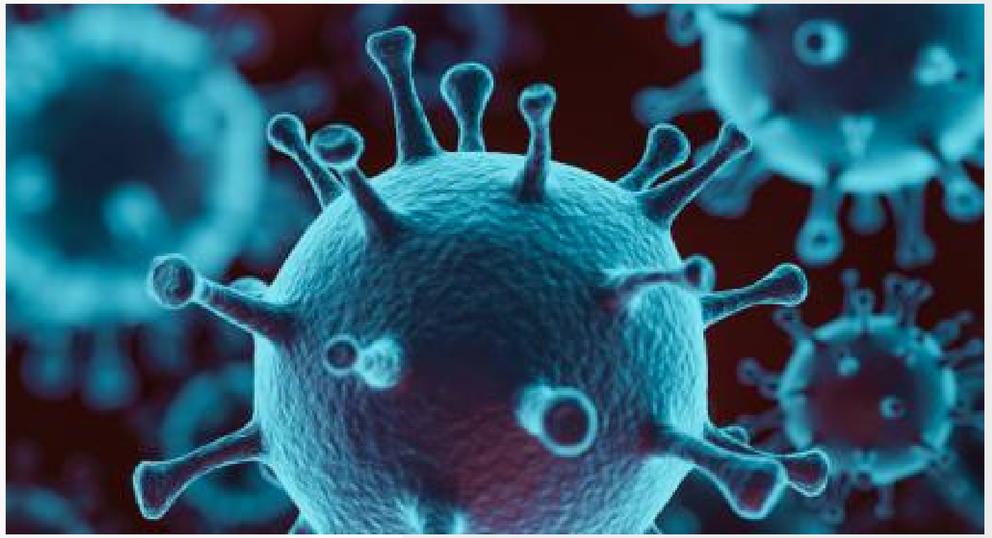
Abstract

This spatial epidemiology study was carried out to evaluate the risk of contracting COVID-19 taking into account the Social Determinants of Health (SDH).The study demonstrated a strong relationship between the data from the model created in the risk analysis and the infections by locality registered during the months of February to August 2020. Kennedy, Bosa and Engativá were the suburbs that presented a higher risk of contagion of COVID-19 compared to the rest of the city.



https://es.cochrane.org/es/recursos/evidencias-covid-19

Materials and methods

Vulnerability calculation

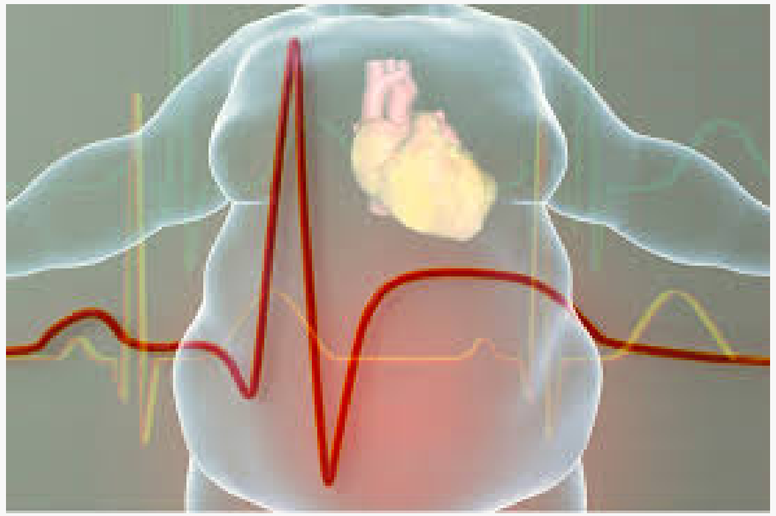
Environmental SDOH

PM 10 and 2.5, NO2, O3

https://blog.redbus.co/cultura/aniversario-de-bogota-actividades-celebrar/

Biologics SDOH

Pre-existing diseases of the population



Vulnerability calculation

Environmental SDOH

Socioeconomic stratum and quality in the health service

https://www.google.com/search?q=servicio+de+salud+&tbm=isch&ved=2ahUKEwiX9LPt0P7tAhVaVlkKHSGfD4YQ2-cCegQIABAA&oq=servicio+de+salud+&gs_lcp=CgNpbWcQAzICCAAyAggAMgIIADICCAAyAg

Behavioral SDOH

Type and amount of food

https://www.doktuz.com/wikidoks/prevencion/estilos-de-vida-saludable.html

Menace calculation

This variable is constant, beacuse in Bogotá the virus is in the whole city. We take into account what the WHO establishes about the classification of infectious microorganisms for their risk

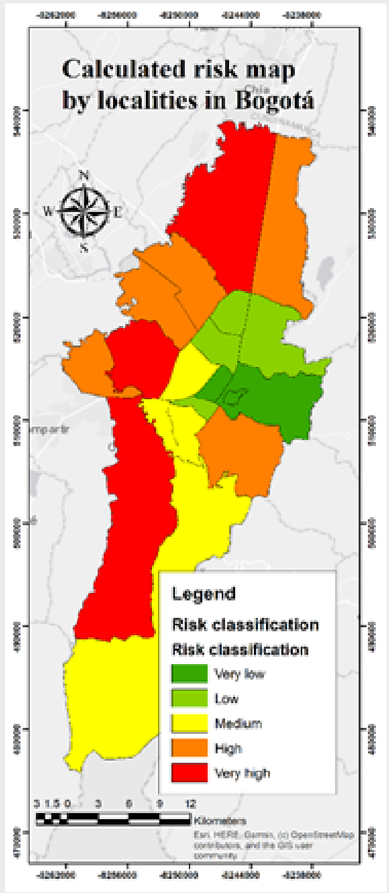
Risk calculation

For this formula is take into account the of risk and disaster assessment formula, also an adaptation is made to the model which is determined by the authors, the equation is the following:

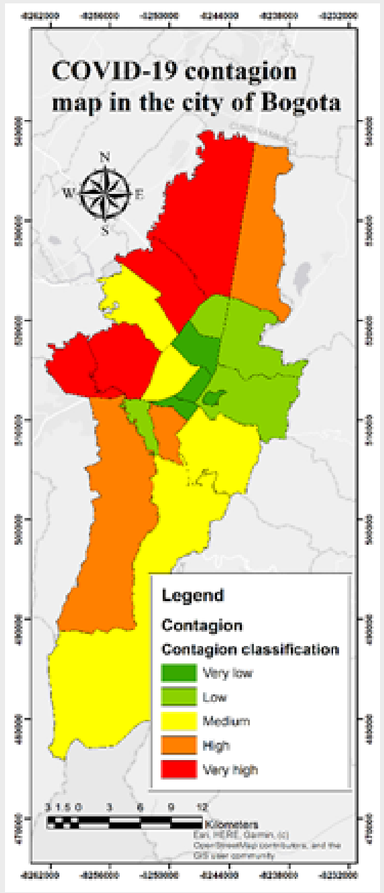
$$R = (5(V) * 0{,}2(M)) * PD * Rt$$

Where:
R: risk
5: vulnerability weighting value
V: vulnerability
0.2: menace weighting value
M: menace
PD: population density
Rt: effective number of reproduction.

Analysis and Results

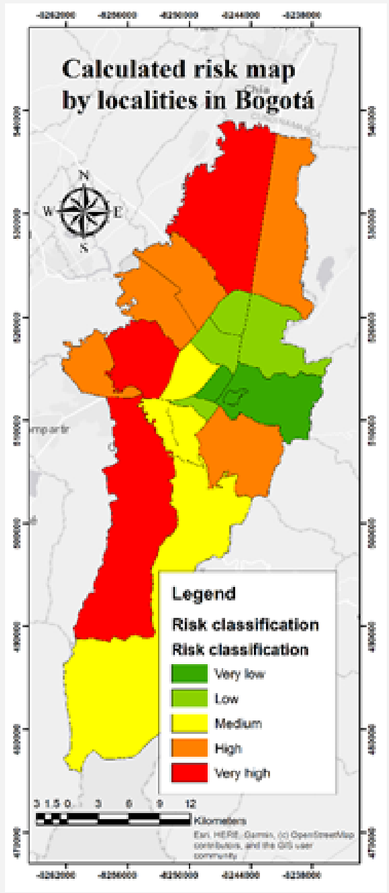


(a)

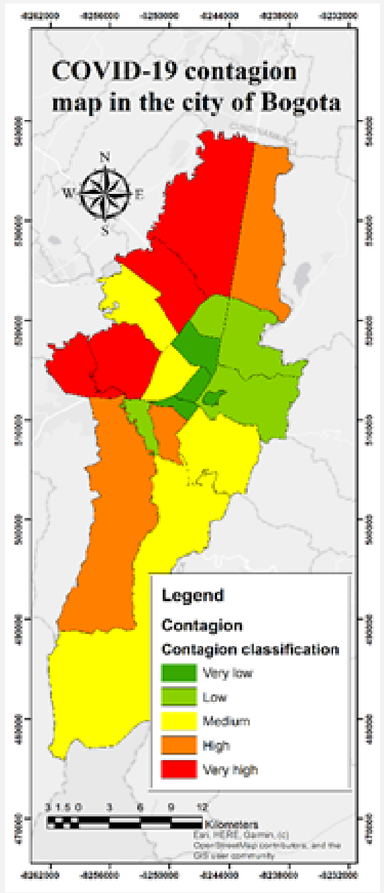


(b)

Is evident that the results obtained in the map (a) from the model executed has a close relationship with the map showing the contagions of the city (b) recorded during the study period, since the western part presents a high and very high risk, with localities such as Suba, Ciudad Bolívar and Kennedy, which present a very high risk



(a)



(b)

Localities such as Kennedy, Bosa and Ciudad Bolívar, are among the most vulnerable, since the predominant stratum is 2, which is related to the amount of income, for what the country is stratified is characterized by low to medium-low economic income, therefore, they sometimes do not have access to quality education, adequate food, among others

Discussion

The SDH have a great influence since they largely determine the level of risk that the population may present to infectious diseases, in this case, the COVID-19, which has a direct relationship with the results given by the model carried out in this study, which shows that the localities located in the western area of the city, are those that present a higher high and very high risk, in addition to the south-eastern part.

The western part of the city is known for the low quality of the air, since there are located areas of industry with large number of companies, being a risk factor for cardiorespiratory diseases which increases the possibilities of contagion to COVID-19

The result of the model created in this study can be used by governmental entities adding more variables in order to make it more robust and in this way attack in a more efficient and precise way situations like the one currently experienced with the COVID-19 and social and health disparities.

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