

MULTIVARIATE TECHNIQUES AND GEOSTATISTICAL MODELS APPLIED TO THE HOMICIDES STUDY IN CALI, COLOMBIA

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Background In a city with high rates of violence such as Cali is important to use tools to monitor this phenomenon to identify the sites of major crime and thereby prevent and mitigate the problem.

Objectives To estimate the homicide risk in Cali through geostatistical models involving spatial correlation structure as also identifying relationships between variables that explain the homicides in the city.

Methods The methodology has two components: the first one corresponds to the spatial analysis which observes if there is a possible correlation of homicides (also addressing statistical methods of concentration) and distribution as it works in geostatistics. The second is to characterise the homicides through a multiple factor analysis, working with tables of three indexes: individuals, variables, and the moments when these variables are measured.

Results Using this methodology, the results indicate that the highest homicide risk is concentrated in the neighbourhoods of central and eastern sectors of the city, as well as evidencing the communes of the centre have the highest number of murder cases which are highly related with firearm deaths, knives, unemployees and male gender. Also was observed anisotropic behaviour of semivariogram, directed by an angle of 90 degrees, which corresponds to the eastern neighbourhoods of the city.

Contribution to the Field Through this methodology, we can obtain useful tools and strategies to help the stake holders in differentiated by zones, and build public policy actions to mitigate the problem and prevent homicide deaths.