

The use of geoprocessing to strengthen the epidemiological surveillance of covid-19

Shirley Verônica Melo Almeida Lima^{I,II,III,IV}

ORCID: 0000-0002-9062-0742

Caíque Jordan Nunes Ribeiro^{I,II,III}

ORCID: 0000-0001-9767-3938

Allan Dantas dos Santos^{I,II,III}

ORCID: 0000-0002-6529-1887

^IUniversidade Federal de Sergipe. São Cristóvão, Sergipe, Brazil.

^{II}Universidade Federal de Sergipe. Lagarto, Sergipe, Brazil.

^{III}Universidade Federal de Sergipe, Collective Health Research Center. Lagarto, Sergipe, Brazil.

^{IV}Universidade de São Paulo, Human Exposome and Infectious Diseases Network. São Paulo, São Paulo, Brazil.

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Corresponding author:

Shirley Verônica Melo Almeida Lima

E-mail: shirleylima@academico.ufs.br



The use of space to understand event distribution in epidemiology is not recent. Since the dawn of classical epidemiology, with the studies of Jhon Snow, space has been strongly identified as one of the main variables for sanitary analysis of the magnitude and transcendence of public health problems. The territory in which individuals live and work constitutes the locus where the social determinants of health (SDH) interact, in order to influence the dynamics of health events.

Territory mapping is a routine activity of nursing practice in Primary Health Care (PHC). The benefits of using geoprocessing in PHC have been reported in different regions of the world, namely: possibility of updating and analyzing epidemiological data in the form of maps; broader and more agile understanding of the population's health problems; optimization of health professionals' work process; assessment of the integrity of local surveillance programs; and identification of existing inequities in the territory for a better resource distribution⁽¹⁾.

The covid-19 pandemic, caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), has made explicit the need to prepare health systems around the world to follow the dynamics of spatial and temporal patterns of disease in a timely manner. In this context, strengthening health surveillance practices, incorporating the use of Geographic Information Systems (GIS) into epidemiological methods, is an excellent strategy for planning health actions and services with a focus on mitigating and controlling the disease in the territory.

Broadly speaking, GIS encompasses a fundamental and universally applicable set of tools to capture, transform, manage, analyze and present georeferenced information⁽²⁾. While conventional maps allow the observation of a finite set of data, GIS presents flexible digital cartography, as it allows the simultaneous visualization of health and contextual data⁽³⁾.

In view of this, investigations of an ecological nature have been important allies of scientific community and managers to assess the pandemic process. Although they do not allow the establishment of causality, these studies provide an accurate picture of the health situation, by pointing out high-risk spatial clusters, as well as raising hypotheses for the development of new research. In this way, the implementation of geoprocessing in studies of population aggregates can provide robust results on the covid-19 dynamics, magnitude and transcendence in Brazil and in the world.

Ecological studies conducted in northeastern Brazil showed important results on the spread⁽⁴⁾ and mortality of covid-19⁽⁵⁾ through spatial, temporal and spatial-temporal analysis techniques. The integration of these approaches makes it possible to analyze the pandemic process in a prospective and retrospective way, as well as measure the speed of spread and mortality of the disease, according to its growth trend.

Thus, we emphasize that, through the spatial regression technique, it is possible to propose explanatory models of the disease occurrence in space, considering contextual factors that make some populations more vulnerable to illness. Thus, we emphasize that these analysis tools allow

high-impact associations between diseases and SDH, an essential aspect in scenarios of social inequities.

Given the relevance and applicability of this method, we believe that the use of geoprocessing in scientific investigations can be part of health education from the most elementary level

(undergraduate degree), providing subsidies for these professionals to have expertise to strengthen epidemiological surveillance practices in health services. Thus, it is urgent to promote an agile and timely health system in the identification and resolution of health problems, considering the particularities of each population.

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