



## Geographical information systems and health

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### 1. Letter to Editor

All over the world, to provide better services in the health sector with the aim of collecting the necessary data, and the use of information strategies for sharing studies are conducted. The purposes of the more widespread use of information technologies in many countries are to serve the system throughout the country, quick and easy access to information, to comply with high standards, to make use of new technologies and knowledge, and to help reveal the causes as well as the treatment of diseases.

Due to the increasing production of information and globalization throughout the world, the importance of correct information processing is increasing. Interdisciplinary cooperation is made to make information processing usable (1). Referencing health-related information based on geographical location is possible with Geographical Information Systems (GIS).

GIS is an information system that performs the functions of collecting, storing, analyzing, and presenting graphical and non-graphical data obtained through location-based processes in an integrity. It is a set of hardware, software, personnel, geographic data, and methods developed to assist users in location-based decision-making processes for solving complex social, economic, and environmental problems around the World. GIS is a system of computer-aided tools required to map and analyze landforms and events on the earth (2).

In recent years, a significant increase has been observed in GIS applications in the field of health. Because in health-related planning and administrative organizations, keeping all relevant information together, making the necessary analyzes easily and providing the results visually effectively can be performed with GIS technologies. The concept of Health GIS has emerged as a common working area of the professional disciplines that carry out health and cartography activities. As a result of developments in GIS technologies and statistical methods, it is possible to evaluate health and population data

in a geographically defined region together and to investigate logical spatial variations in disease risks (2).

The uses of GIS in health are epidemiological studies, assessment of the spread of diseases and famine, evaluation of the spread of toxic spills and other extreme health events and monitoring these events on maps (3). Public health organizations such as disease control centers have been using GIS technologies in studies such as where and how diseases spread over the last decade or how various factors affect human health. For example, GIS was used to show the spread and intensity of the disease around the world during the COVID 19 pandemic (4).

As a result, with the use of GIS in the field of health, the need for health services can be determined, inequalities in the accessibility and execution of health services can be eliminated, the planning and evaluation of health services can be carried out effectively, and patients can be followed up quickly and reliably due to monitorization of the places and frequency of diseases (5). On the other hand, GIS can effectively present and share the information obtained by visualizing all these services and results using maps and graphics (5).

### References

1. Ateş S. Determining Optimum Ambulance Locations for Heart Attack Cases with Geographical Information Systems. Thesis. İstanbul Technical University. 2010.
2. Dermatis Z, Tsaloukidis N, Zacharopoulou G, Lazakidou A. GIS Mapping and Monitoring of Health Problems Among the Elderly. *Stud Health Technol Inform*. 2017; 238:48-51. PMID: 28679884.
3. Özdemir S, Şahbaz K. Spatial Analysis and Evaluation of Carbon Monoxide Poisoning Admitted to A Tertiary Hospital-A Pilot Study. *Eurasian J Tox*. 2020; 2(2): 35-9.
4. Kamel Boulos MN, Geraghty EM. Geographical tracking and mapping of coronavirus disease COVID-19/severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic and associated events around the world: how 21st century GIS technologies are supporting the global fight against outbreaks and epidemics. *Int J Health Geogr*. 2020 Mar 11;19(1):8. doi:

10.1186/s12942-020-00202-8.

5. McLafferty SL. GIS and health care. *Annu Rev Public Health.* 2003; 24:25-42. doi: 10.1146/annurev.publhealth.24.012902.141012.