DEVELOPMENT OF LOCAL HEALTH CARE PLANNING AND DEMANDING IN SAUDI ARABIA BY USING GIS APPLICATIONS

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ABSTRACT

The purpose and the goal of the paper is to show how Geographical Information Systems (GIS) can be used to support health planning and demanding on a micro-scale and explore the possibilities of using GIS for health care services in hospitals at Saudi Arabia sub_areas. GIS as a computer system that stores and links non-graphic attributes or geographically referenced data with graphic map features to allow a wide rang of information processing and display operations, as well as map production, analysis, and modeling. GIS has several useful functions and tools that can be used in health planning field.

GIS spatial planning support tools have an important advantage; changing the valuation criteria to visually illustrate and depict the implications of different spatial decisions and alternatives is convenient. The capabilities needed for decision making readily available in a single system make GIS a great tool for integrating in planning processes. The first part of this paper explain the issues that affect a local health care planning and monitoring of catchment area and facilities management. Each one of these issues is covered using several GIS functions including network analysis and spatial data analysis.

The second part defines GIS and its possible application in the health care field. In this section, the relevant GIS functions have also been explained. In response, alternative sources were used, such as Google Earth, printed maps and information gathered on the ground by GPS. With these, it was possible to implement a methodology grounded in knowledge of the factors that influenced the health of the population. The third part of this paper discusses the created and implemented GIS application models, which is made for a local health care centre in Makkahh Al-Mokaramah region and Taif city in Saudi Arabia. All the produced models can be applied in any private or public hospital in Makkahh region and Taif city.

They can be used to build a spatial decision making support system for hospitals in Taif region and serves five local health services neighborhoods named as Tarabah, Al-Khurma, Rania, Zulam and Al-Moya. The ability of GIS to combine different entities based on their common geographic occurrence makes it a very valuable tool in epidemiological research, disease surveillance and monitoring. Some recent applications of GIS include vector borne diseases, water borne diseases, environmental health and modeling exposure to electromagnetic fields. Also GIS is highly relevant to meet the demands of outbreak investigation and response, where prompt location of cases, rapid communication of information, and quick mapping of the epidemic's dynamics are vital.

In this paper; the former is used to produce drive-time hospital service area and the route is applied at the selected hospital to calculate the size of its served demand. Finally; in this work, three sets of GIS models have been produced. These are catchment area; patient profile and patient distribution; and patient flows models. So, the output of creating and implementing a GIS models are produced to help a local health planners in their health care decision making output.

KEYWORDS: GIS, Health Planners, Network Analysis, Hospital Served Demand, Spatial Data