



USING GIS IN THE ANALYSIS OF THE HEALTHCARE NETWORK ACCESSIBILITY AND THE POPULATION'S ADDRESSABILITY WITHIN THE COUNTIES OF TIMIȘ, CARAȘ-SEVERIN AND MEHEDIŢI

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Abstract: *Reforms in the Romanian healthcare system have produced a series of changes, meant to improve medical services and to provide the population with quality ambulatory care. Some of the decisions regarding the restructuring of the hospital system did not prove to be successful, making it more difficult for the population to obtain medical care. Through an analysis at the level of three counties, Timiș, Caraș-Severin and Mehedinți, I have attempted to illustrate the consequences of closing or repurposing certain hospitals within these analysis areas. Following the reform, people living close to the borders between these counties face great difficulty when it comes to accessing the county hospitals in Timișoara, Reșița, and Drobeta Turnu-Severin.*

Key words: *health system reform, hospital accessibility, healthcare reform in Timiș, healthcare reform in Caraș-Severin, healthcare reform in Mehedinți*

1. INTRODUCTION

The healthcare system is defined by the World Health Organisation as “all the activities whose primary purpose is to promote, restore and/or maintain health” (Evans, et al., 2001, pp. 307-10). The health sector reform pursued a change in the national policies, by shifting priorities within the healthcare system, along with revising regulations, organisational structures, management and financing systems. The restructuring attempted to improve the population’s access to medical services, as well as their quality and equity (Tufănar, 2006, p. 3). The World Health Organisation (WHO) has determined that governments are responsible towards the respective health systems that they coordinate, invoking the “concept of administration” (Saltman and Ferroussier-Davis, 2000, p. 732) and implying “the assumption of a more active role in promoting health” (McKee, 1999, pp. 123-128). The main irregularities in Romania’s

healthcare system are largely caused by the issue of collecting funds (Dumitru, et al., 2011). Following a deepening of the economic crisis, the funds necessary for the optimal functioning of hospitals became increasingly difficult to allocate. Consequently, the government made the decision to close down a number of facilities throughout the entire country and to reassign the patients they were serving to the county hospitals. This decision to restructure the health sector impacted 13% of the hospitals in the country (66 hospitals) (Ciutan et. al., 2012, apud Merciu and Muşat, 2013).

The Romanian health system has one of the most over-stretched hospital systems in Europe, requiring much more patients to be admitted than in the case of other European countries (one of the highest admission rates – 215,13 hospital admissions/1000 residents) and having insufficient resources, that are inefficiently allocated (200 Euro per capita for the health sector; about 50% of the Unique National Fund of Health Insurance is allocated within the hospital system) (Government Resolution no. 345/31.03.2011; MO 226/2011). Despite the fact that, during the past years, the healthcare reform has featured a number of attempts to reorganise the hospital system, these have either consisted in minor adjustments in the organisation of hospital activity, or have been time-delayed actions (of a cosmetic nature, alternations in office) which proved to be mandatory, following the reform measures taken at the other levels of medical care. (Ciutan et al., 2012). This analysis attempts to reveal the effects of the healthcare reform, beginning with the restructuring of the hospital system, at the level of three laboratory counties. On the ground, the government decision has had a direct impact on the patients' accessibility to the medical services they require.

2. METHODOLOGY

Research methods are said to be “abstract guides of reason that lead to meeting the requirements imposed by principles”. (Petrea, 2005, p. 73) During the course of this research, we have emphasised certain characteristics of the health system by using the Geographic Information System, which allows a view of the healthcare services provided at the level of the studied territory. The analysis method will be used in the process of examining and interpreting information regarding the effects of the healthcare reform, when problematizing and elaborating the proposed research, as well as in the course of processing the information obtained on the ground (data, physical evidence, etc.).

Using GIS to emphasise the characteristics of the current health system within the laboratory territory allows for a visualisation of the population health status and of the healthcare services they can access, in correlation with the current socio-economic and demographic context (Mihăilă et al., 2007). Patients within the three laboratory counties have been redistributed according to the degree of their accessibility to the county hospitals. Throughout this analysis of access to health services, the Geographic Information System (GIS) has been used, taking into account both the road network, as expressed in length (km), time (minutes), and the average speed on each road type (motorway, national road, county road, rural road), as well as the natural environment conditions. The administrative importance of the three county capital cities (Timișoara, Reșița, Drobeta Turnu-Severin) reflects the area of their medical influence, as they meet a large flow of patients traveling from other parts of the analysed counties, in order to obtain medical care at the county hospitals.

3. USING GIS IN THE ANALYSIS OF THE HEALTHCARE NETWORK ACCESSIBILITY AND THE POPULATION'S ADDRESSABILITY WITHIN THE COUNTIES OF TIMIȘ, CARAȘ-SEVERIN AND MEHEDINȚI (RESULTS)

The results obtained after the research phase show the degree of accessibility between the medical centres and the area they serve within their respective county. The city of Timișoara is the most important urban centre in Timiș County due to its administrative role, as well as through its ability to polarise the surrounding region. Healthcare-wise, it has a wide polarised area, encompassing a large number of specialised medical units, prominent medical centres and institutes and a medical school that provides specialised training to professionals working in the system.

After analysing the cartographic structure in figure 1, it is apparent that people living in the proximity of Timișoara city have a better accessibility to medical care, having access to a well-represented road network, and being able to reach a facility for outpatient care in less than 20 minutes. This category includes regions that are administered by the communes of Giroc, Dumbrăvița, Ghiroda, Giarmata, Săcălaz, Moșnița, etc. However, patient influx declines as the travel distance increases between their respective home regions and the Timișoara County Emergency University Hospital. When it comes to districts at the extreme periphery of Timiș County, from where patients would have to travel for more than 90 minutes to reach the county hospital, they may be redirected to nearer hospitals within the county.

Before the hospital restructuring, there were two healthcare centres providing medical services to people in the towns of Buziaș and Ciacova. It was suggested that, starting from April 2011, they would be redirected to Timișoara city, and the two healthcare centres would be repurposed as nursing homes for the elderly. However, the proposal has still not been carried into effect, and the two facilities currently function as permanent medical centres that mainly provide family practice services.

In the county of Caraș-Severin, the Reșița County Emergency Hospital has registered an increased patient influx after the restructuring of the hospital system. According to the National School of Public Health, Management and Professional Development in Bucharest (SNSPMPDSB), there have been changes in the territorial span and the intensity of the population requiring medical services from the Reșița County Emergency Hospital. Currently, the city draws patients from the entire county of Caraș-Severin, but there are differences in intensity, which directly correlate with the distance between the city and the patients' home regions, as well as with the density of the road network (figure 2). Just as well, if the values of the patient influx decrease, it follows that the distance between their home districts and the county hospital must be longer. The smallest intensity (0,01%-0,37%) has been recorded in communes located in the extreme periphery of the county, such as Rusca Montană, Constantin Daicoviciu, Sichevița, Berzasca (Statistical reports – SNSPMPDSB).

Since 2011, closing down the hospitals in Anina, Bocșa and Bozovici has prompted an increase in the number of patients from these areas bound to travel to the County Emergency Hospital in Reșița. People from the Almăj Hollow area, who had previously been served by the Bozovici Commune Hospital, were redirected to the town of Reșița for health services. It follows that the Reșița County Emergency Hospital is of great importance to the county of Caraș Severin, due to its being surrounded by rural territories, which face a large deficit when it comes to local medical facilities. The

accessibility to medical care represents an important criterion throughout this analysis of population services, in the context of the numerous hospital closures.

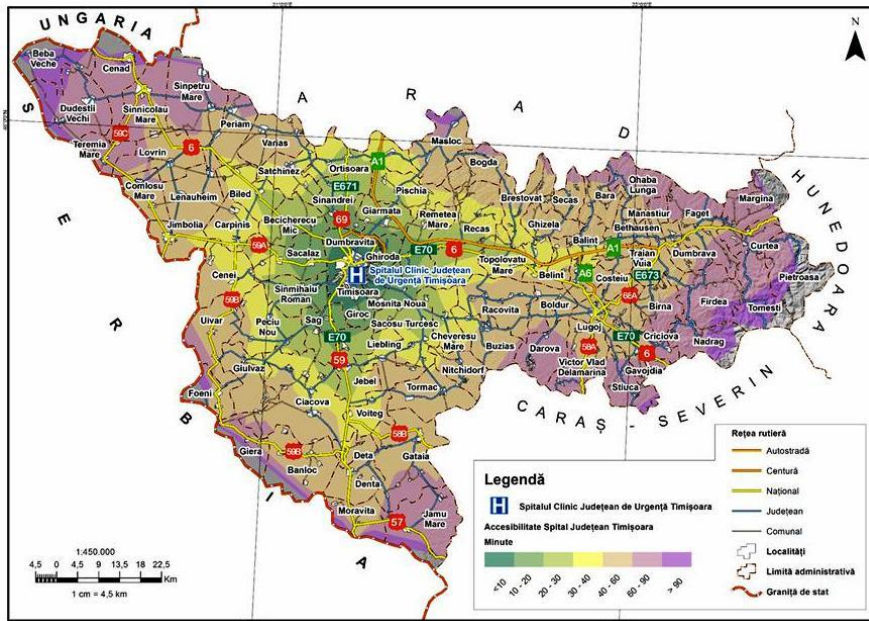


Figure 1. The accessibility of patients from Timiș County to the Timișoara County Hospital

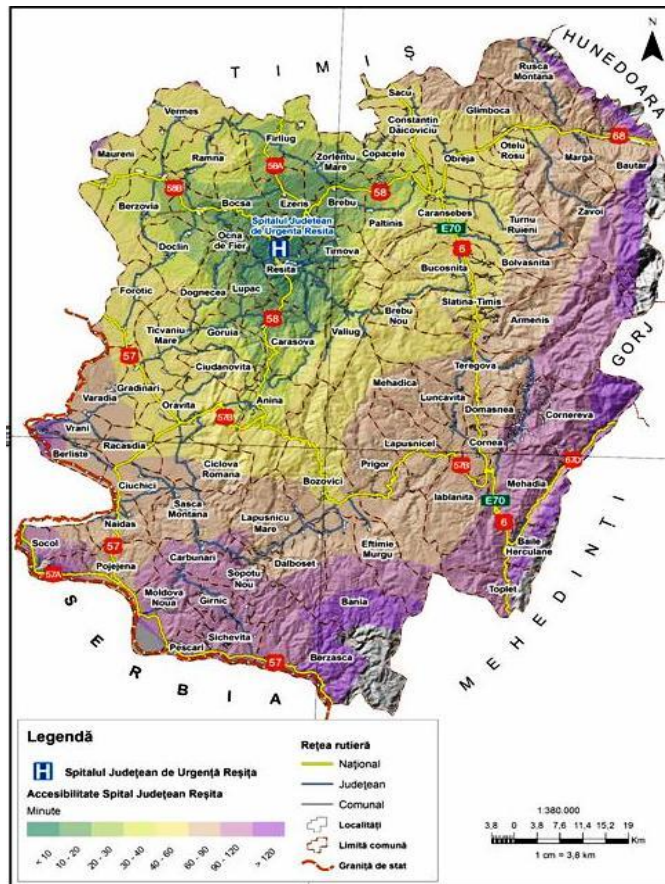


Figure 2. The accessibility of patients from Caraș-Severin County to the Reșița County Hospital

When it comes to emergency medical services, easy access is crucial, and the consequences of hospital closures soon became apparent. The towns of Bocşa and Anina, located at a relatively close distance from Reşiţa County Hospital, can gain access to its medical services in less than 20 minutes, as opposed to the commune of Bozovici, situated 80 kilometres away from Reşiţa, where certain situations have occurred in which “emergency cases could not be resolved within an optimal time frame” (Merciu and Muşat, 2013, p. 22). After recognizing the fact that the closed medical facility had been serving 24 communes and villages in the Almăj Hollow region, the initial decision was reconsidered, and 2012 saw the opening of a multifunctional medical centre administered by the Reşiţa County Hospital, as well as of a SMURD (Mobile Emergency Service for Resuscitation and Extrication) centre, handling emergency cases. Another issue related to the population’s access to medical care is that certain facilities, such as county hospitals, are overstretched, becoming unable to provide sufficient patient beds. However, as part the first reform measures, a number of 9200 hospital beds were cut back nation-wide, in those departments able to provide outpatient medical services (Ciutan et al., 2012). Mehedinţi County faces a similar situation, since the Drobeta Turnu-Severin County Hospital represents a polarised area, providing medical services to patients throughout the entire county. As part of the restructuring, it was decided that two hospitals, the Strehaia Town Hospital and the Vânu-Mare Town Hospital were to be repurposed. At the time, there were loud protests concerning the proposal to repurpose the medical units into nursing homes for the elderly, and the two facilities have subsequently become external wards (multifunction centres) of the Drobeta Turnu-Severin County Emergency Hospital (figure 3).

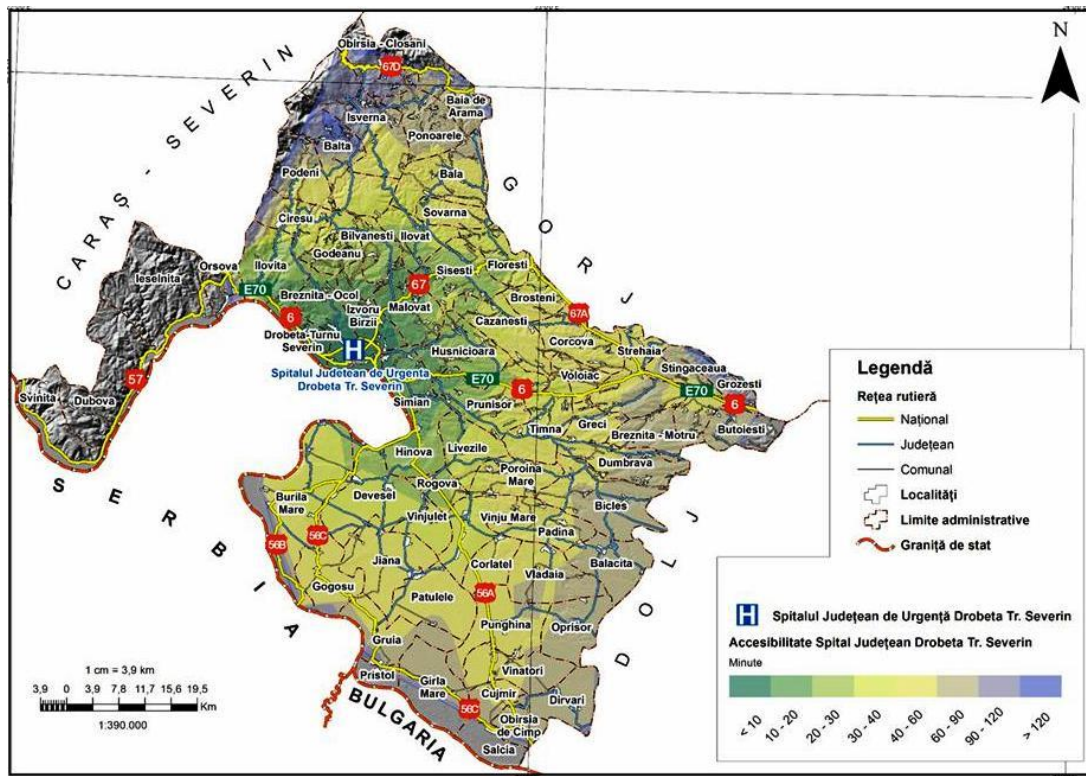


Figure 3. The accessibility of patients from Mehedinţi County to the Drobeta Turnu Severin County Hospital

3. CONCLUSIONS

The issue of decentralising the health sector has been under scrutiny since the beginning of the 1990's, and over the past years it has come to signify the restructuring of the hospital system. When we consider the chosen case study, at the level of the laboratory counties there have been issues regarding the need to provide the population with medical services in a timely manner. As an example, the decision to close down the Bozovici Commune Hospital was reconsidered in 2012 by opening a medical centre, after evaluating its consequences. Just as well, the two medical facilities in Mehedinți County could not be repurposed as nursing homes, after concluding that they were serving a large part of the local population, their necessary purpose being to provide medical care. The present study reflects the fact that, throughout the three laboratory counties, the political decisions taken regarding the reorganisation of the hospital system were not the most appropriate, having a negative impact over time.

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