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Conference Proceedings

**Nemzetközi tudományos konferencia
a Magyar Tudomány Ünnepe alkalmából**
International Scientific Conference
on the Occasion of the Hungarian Science Festival

Sopron, 2022. november 3.
3 November 2022, Sopron

**TÁRSADALOM – GAZDASÁG – TERMÉSZET:
SZINERGIÁK A FENNTARTHATÓ FEJLŐDÉSBEN**

SOCIETY – ECONOMY – NATURE: SYNERGIES IN SUSTAINABLE DEVELOPMENT

Szerkesztők / Editors:

OBÁDOVICS Csilla, RESPERGER Richárd, SZÉLES Zsuzsanna, TÓTH Balázs István

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Comparison of the Density of Physicians and General Practitioners in the Hungarian Csongrád-Csanád Country and in the Territorial Units of Vojvodina for the Period 2002-2020

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Abstract

I will present the density of physicians and general practitioners (number of physicians/100 000 inhabitants, number of general practitioners/100 000 inhabitants) in the Hungarian Csongrád-Csanád country (NUTS 3 statistical region) and the territorial units of Vojvodina, (NUTS 3 statistical regions), as one of the key indicators in the healthcare system. Vojvodina (NUTS 2 statistical region) is the Autonomous Province of Serbia, which includes 7 territorial units (NUTS 3 statistical regions). I did this research for the period between 2002-2020 based on the official Hungarian and Serbian statistical data. As Hungarian Csongrád-Csanád country and Vojvodina are two neighbouring territories, such a comparison can provide us with important information on regional similarities and differences, as well as development perspectives in the future. Another important aspect is that there are discrepancies between Hungary and Serbia in terms of economic development and EU membership. However, both countries have undergone considerable economic and political changes in the last 15-20 years and, in this context, it might be important to examine and compare the development of their healthcare systems, including the density of physicians and general practitioners over this period. This research showed that, the density of physicians is higher in the Hungarian Csongrád-Csanád country compared to the territorial units of Vojvodina and this ratio has not changed in the examined period. However, by 2020 the GPs density in three territorial units of Vojvodina surpassed the GPs density in the Hungarian Csongrád-Csanád country, which can provide us with the conclusion, that the Serbian primary healthcare strengthening strategy might serve as explanation for this phenomenon.

Keywords: density of physicians, density of general practitioners. healthcare indicators, healthcare workforce, regional differences

JEL Codes: I15, J45, O15

1. Introduction

The human resources are the key element of efficient service provision and have become one of the most important focal points of modern management. The health workforce management adopted during the healthcare reforms is of outstanding importance in the organizations, since healthcare management is now a natural concept in developed countries. As a result of globalization, reforms have taken place in the healthcare sector worldwide, from the 1970s until today. The main task, goal and priority of healthcare management is to provide high-quality and empathic healthcare services (Dixon-Woods et al, 2014).

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In the case of countries such as Serbia, where social and economic changes actually started 15-20 years ago, healthcare management should be considered as a fairly new phenomenon and it is currently being integrated into the healthcare system through great efforts. Following the example of developed European countries, especially neighboring countries, the development of the healthcare system has begun. This makes important the continuous comparison of the Serbian healthcare system with the healthcare system of other, more developed countries. It is especially valuable to compare the situation in Serbia with the situation in Hungarian healthcare system, since these are neighboring countries, with significant geographical proximity, common historical past, and the centuries-old economic relations. More particularly, we should compare territorial units of Vojvodina, an autonomous province that occupies the northernmost part of Serbia, and the neighbouring country of Hungary, e.g. considering the density of physicians and general practitioners (GPs), as important element of the healthcare service. The purpose of this study is a simple comparison of indicators, such as physicians and GPs density in order to provide us with the adequate information on similarities or differences between the territorial units of Vojvodina and its neighbouring Hungarian Csongrád-Csanád country in terms of health workforce supply, more particularly the physicians supply.

Delving deeper, this comparison could provide useful information on the current stage of development as well as provide input and estimation on the level of geographical, cultural and regional influences, which could be topics for further research. In case of Hungarian Csongrád-Csanád country, it is also useful to compare the level of healthcare with an economically less developed, same NUTS level territorial units. This can serve as evidence of the real impact of the previously implemented healthcare reforms and how much the healthcare system has developed compared to its previous state. On the other hand, this can serve as a motivating effect for further development. Also, the comparison can increase the competitiveness of healthcare systems and services and strengthen the role of healthcare management.

2. Literature review

WHO and its partners developed the Global Strategy on human resources for health: Workforce 2030 (GSHRH). Over 200 experts from all WHO regions contributed to merging the evidence around a comprehensive health labour market framework for universal health coverage (UHC). Its most important target is to substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States (Global strategy on human resources for health: Workforce 2030, 2016). However, the evidence based planning of healthcare workforce, using different indicators as base should be used as essential and crucial globally.

According to the World Health Organization (WHO) one of the crucial indicators related to the healthcare workforce is the density of physicians per 100 000 population (inhabitants), which covers number of medical doctors (physicians), including generalist and specialist medical practitioners, per 100 000 population. WHO highlighted, that preparing the health workforce to work in order to achieve country's health objectives is one of the most important challenges for its health system. Although, there are no gold standards for evaluation of the sufficiency of the health workforce, it has been estimated, that countries with fewer than 23 physicians, nurses and midwives per 10 000 population (230 per 100 000 population) do not achieve adequate coverage for selected primary healthcare interventions, which are prioritized by the Millennium Development Goals framework (World Health Report, 2006). There are also many other indicators (e.g. pharmacists per 10 000 population, absolute number of medical doctors, medical doctors per 10 000 population, nursing and midwifery personnel per 10 000 population, absolute number of specialist medical practitioners, absolute number of general

medical practitioners, dentists per 10 000 population, medical doctors by sex (%)), which could be used to evaluate the healthcare workforce supply.

The density of physicians refers to the total number of general practitioners, specialists and other doctors per 100 000 population in the given national and/or sub-national area. It may include only practicing (active) doctors or all registered doctors. If data for practicing physicians is available, that data should be reported. If this data is not available, then the data for professionally active physicians or data for licensed physicians should be outlined. Practising physicians are defined as physicians who provide services directly to patients. Physicians working in administration, research and in other posts that exclude direct contact with patients, as well as retired physicians or physicians working abroad should not be covered by this category. Professionally active physicians include all physicians for whom their medical education is a prerequisite for the execution of the job, while physicians licensed to practice include practising and non-practising physicians who are registered to practice as healthcare professionals.

Moving on from the methodological basis and talking about the particular problem of healthcare workforce development, we should agree this is a topic, that directly effects a lot of developing countries, which are struggling with healthcare systems financing, the recruitment, training and retention of the medical professionals. One of these developing countries is Serbia, a country in which significant efforts have been done since the healthcare reforms started 20 years ago, however, the economic development of Serbia is a factor, that must be kept in mind and the results achieved during the reforms must be evaluated considering this aspect as well.

As the historical core of Yugoslavia, Serbia followed the democratic changes taking place in the surrounding countries at a slower pace, and the development of the healthcare system was also largely influenced by historical circumstances. The process of wider socio-political transition in Serbia began only after 2000, and then, as a result of the subsequent dynamic economic development, the national health expenditures also increased. It should be added that serious difficulties arose in the Serbian healthcare system during the implementation of the sustainable financing model (Jakovljevic et al., 2011). In 2002, the Serbian government began to reform the healthcare system. In this process, the Serbian government was assisted by the European Union and the World Bank. The main objective of the reform was to improve healthcare, increase the accessibility of health services, use existing financial resources more efficiently, and improve quality (World Bank, 2009). In 2003, it also became clear that there is a need for transparency in decision-making processes regarding innovative medicines and technologies and their distribution. This was started in 2003 and 2014, supported by the World Bank, implemented in the framework of Serbia Health Projects (Bjegović-Mikanović et al., 2019). From the political point of view, it is important to mention, that Serbia has been on the current agenda for the future enlargement of the EU since 2012, which also makes important to build and reform Serbian healthcare system, as been imbedded in wider public sector reforms. Also Hungarian economy has undergone major changes over the past 30 years. The centrally planned economy has been transformed into a market economy. In Hungary, as in Serbia, the state is responsible for the health of the population, in particular for enabling communities and individuals to protect and improve their health and, where necessary, to restore it to the extent possible, by creating the necessary conditions for health (Act CLIV of 1997 on Health Care)².

According to data from the National Health Insurance Fund Management Agency (NEAK)³, in January 2022 there were 643 vacant GP districts in Hungary, of which 559 (87%) were permanently vacant. 359 (55.8% of the total) have been vacant since the outbreak of the

² Hungarian: Az egészségügyről szóló 1997. évi CLIV. törvény

³ Hungarian: Nemzeti Egészségbiztosítási Alapkezelő (NEAK)

COVID-19 pandemic in the country in March 2020. The average age of GPs in Hungary is 60 years.

When we talk about the density of physicians/GPs in Serbia and Hungary, considering the situation on European level (densities of physicians and GPs in different European countries in 2020 based on EUROSTAT data), we can say, that in terms of practising physician both Hungary and Serbia are on the bottom of the ranking. While the „leading” Austria had density of physicians 535/ 100 000 inhabitants, these numbers were 314/ 100 000 for Hungary and 288/ 100 000 for Serbia. Considering density of GPs on European level, there was quite the same situation, Serbia had 65/ 100 000 inhabitants GPs density, while Hungary is literally on the bottom of the ranking with 39 GPs/ 100 000 inhabitants. This is definitely a topic, which requires further, deeper exploration.

3. Methodology

In my current research, I analyzed secondary data from Hungarian and Serbian literature, and official data in statistical databases of both countries. In particular, I would like to highlight the reports of the Hungarian Central Statistical Office on the situation of human resources in the health sector, as well as and the annual reports of the Serbian Public Health Institute „Milan Jovanovic Batut”. Based on the collected data, I did the comparison with physicians and GPs density indicators for territorial units of Vojvodina and Hungarian Csongrád-Csanád country.

Besides the secondary data, due to lack of particular indicator values, especially for Vojvodina, I have done my own calculations using the above mentioned secondary data and accepted calculation methods. The density of physicians/GPs has been calculated as number of physicians/GPs relative to the size of a population (per 100 000 population). As already mentioned, the data on physician/GP density, number of physicians/GPs or population size have been collected from the annual reports (for 2002 and 2020) issued by the Serbian Public Health Institute „Milan Jovanovic Batut” and the data available at the current database of Hungarian Central Statistical Office.

It is important to mention that this research topic offers further research opportunities. Also, the additional push caused by COVID-19 pandemic could be used to analyse the experiences and information gained during this period, which can serve as useful element in the creation of the health human resource management and planning policy concept.

4. Results

According to estimates, the population of Serbia in 2020 was 6 899 126 (3 360 306 males and 3 538 820 females) (Serbian Public Health Institute, 2020). Based on data from the Hungarian Central Statistical Office database, the population of Hungary on 1st January 2021 was 9 730 772 (4 663 794 men and 5 066 978 women). Broadly speaking, the population of Hungary is approximately 30% larger than the population of Serbia.

In 2020, based on estimates the population of Vojvodina was 1 840 852 (897 815 males and 943 037 females) (Serbian Public Health Institute, 2020). According to the census in 2002 it was 2 031 992 (984 942 males, 1 047 050 females) (Serbian Public Health Institute, 2002). The autonomous province of Vojvodina, part of the Republic of Serbia, covers the northern part of Serbia, i.e. the southern areas of the Pannonian Plain, where the rivers of the Danube, Sava and Tisa converge. It includes the regions of Srem, Banat and Bačka. Talking about territorial units of Vojvodina, there are 7 territorial units, which correspond to NUTS 3 level of Nomenclature of Territorial Units for Statistics (NUTS) (Figure 1.). Vojvodina occupies an area of 21 506 km² (which is approximately one quarter of the territory of the Republic of Serbia). The

capital is Novi Sad (with around 300 000 inhabitants), and the larger cities are Subotica, Zrenjanin, Pančevo, Sombor, Sremska Mitrovica, Kikinda, Vršac. Vojvodina is the most ethnically diverse region of the country, where more than 30 nations live. The most numerous are Serbs (71%), Hungarians (7%), Croats, Slovaks, Montenegrins, Romanians, Ruthenians and others. The Statute of AP Vojvodina, as the highest legal act in the Province, established that the Hungarian, Croatian, Slovak, Romanian and Ruthenian languages are in official use at the same time as the Serbian language.

The closest neighbouring county to Vojvodina in Hungary is the county of Csongrád-Csanád. Csongrád- Csanád county is part of the Northern Great Plain region, bordered by Jász-Nagykun-Szolnok county to the north, Békés county to the east, Romania and Serbia to the south, and Bács-Kiskun county to the west. Its two busiest border crossing points are Röszke (towards Serbia) and Nagylak (towards Romania). The county seat is the town of Szeged, which is also an university and clinical centre. Based on data of Hungarian Central Statistical Office the population of Csongrád-Csanád country in 2022 was 393 116.

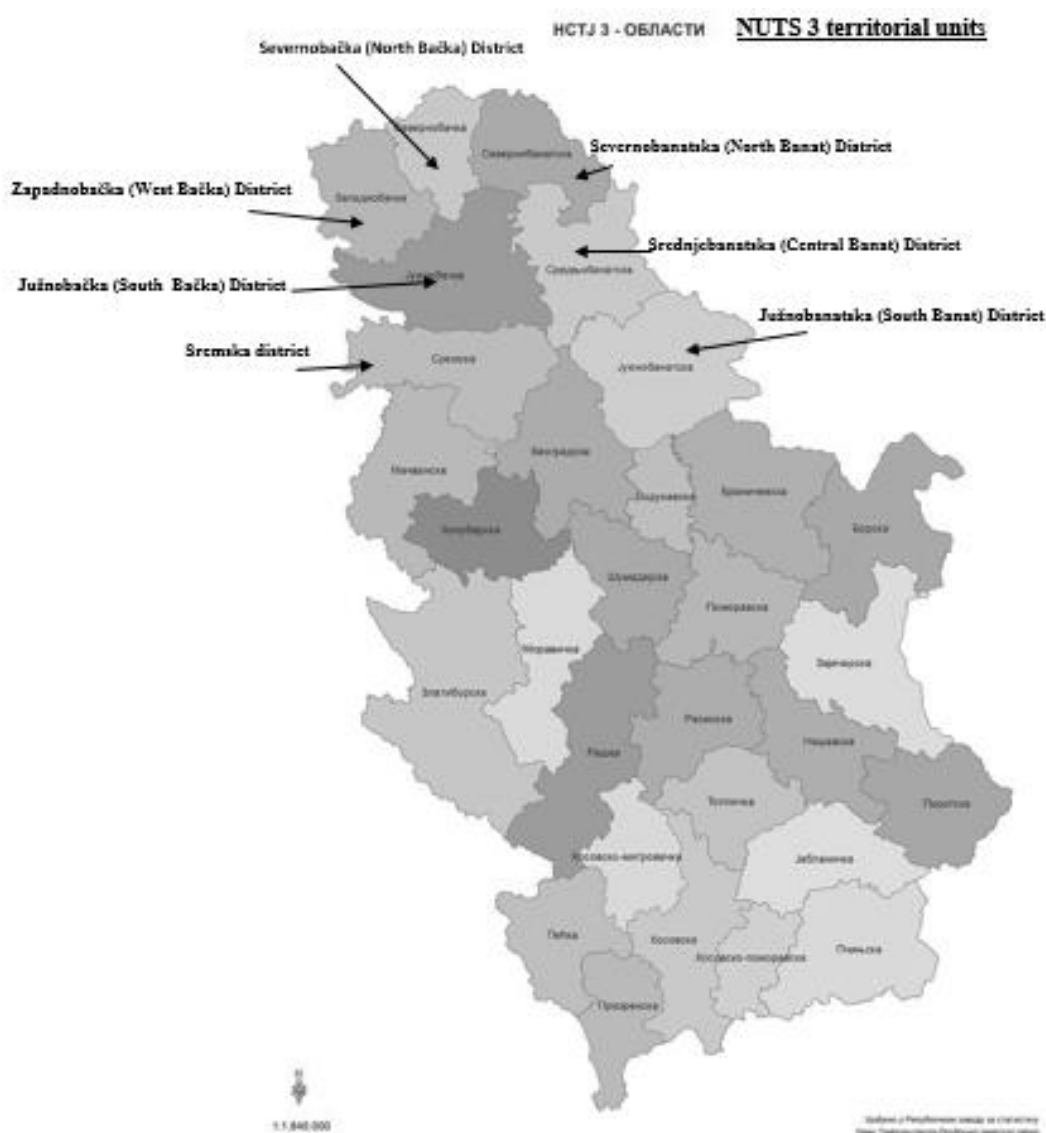


Figure 1: NUTS territorial units of Serbia
Source: Serbian Republic Institute for Statistics, self-edited

Considering territorial units of Vojvodina, we can say that in 2002 and 2020 the density of physicians (Figure 2.) was the highest in Južnobačka district, (406/ 100 000 inhabitants and 305/ 100 000 inhabitants), while the lowest was in Sremska district (192/ 100 000 inhabitants and 185/ 100 000 inhabitants). Considering the density of GPs (number of GPs relative to the size of a population, per 100 000 population) (Figure 3.), we can see that there were significant variations between territorial units of Vojvodina. In 2002 the highest density of GPs had Sremska district (53/ 100 000 inhabitants) and the lowest was in Severnobańska district (40/ 100 000 inhabitants). In 2020 the density was highest in Srednjobanatska district (68/ 100 000 inhabitants), which was on 3rd place (44/ 100 000 inhabitants) in 2002. The lowest density in 2020 was in Južnobačka district (43/ 100 000 inhabitants). This district was with the same density on the 4th place (43/ 100 000 inhabitants) in 2002 and both in 2002 and 2020 had the highest density of physicians (which is not suprising fact, since the capital of the district is Novi Sad the university and clinical center of Vojvodina). In 2020 the density of GPs in Sremska district was 50/ 100 000 inhabitants, which was 5th in the rank and also lower than it was 18 years ago in 2002 (53/ 100 000 inhabitants).

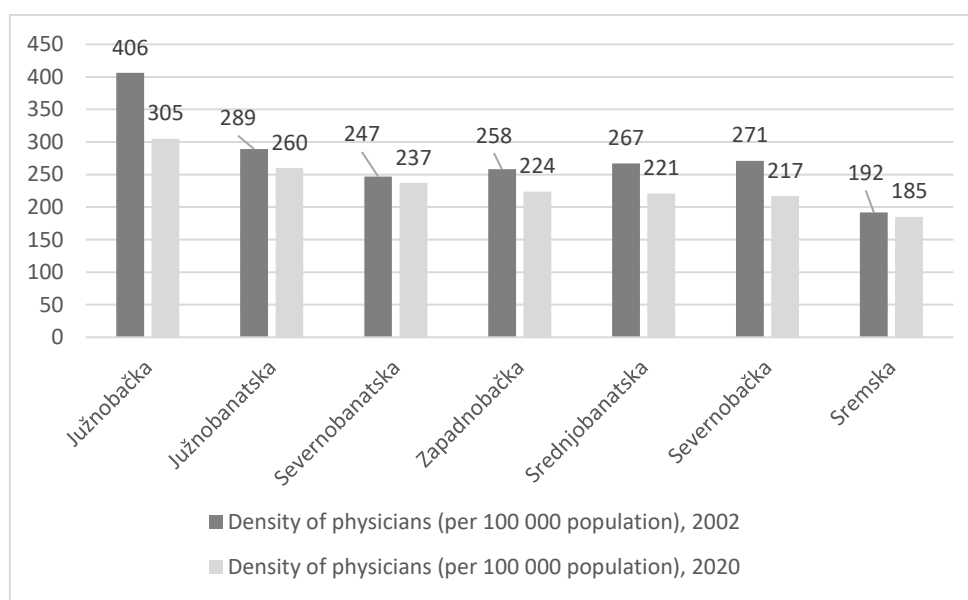


Figure 2: Density of physicians (per 100 000 population) by territorial units of Vojvodina in 2002 and 2020

Source: Health Statistical Yearbook⁴ 2002, 2020

⁴ Serbian: Zdravstveno Statistički godišnjak; Published annually by Serbian Public Health Institute „Milan Jovanovic Batut”

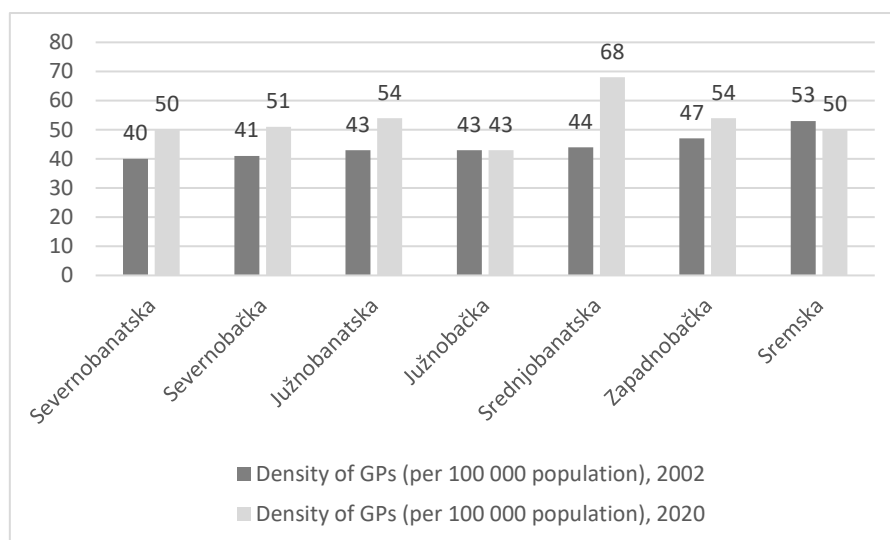


Figure 3: Density of GPs (per 100 000 population) by territorial units of Vojvodina in 2002 and 2020

Source: Health Statistical Yearbook 2002, 2020

If we compare the above presented data of territorial units of Vojvodina with the density of physicians in Hungarian Csongrád-Csanád country (based on the data from the Hungarian Central Statistical Office database) we can notice that both in 2002 and 2020 (Figure 4.) the density of physicians was significantly higher in the Hungarian country. It was 470 physicians/ 100 000 inhabitants in 2002 and 588 physicians/ 100 000 inhabitants in 2020.

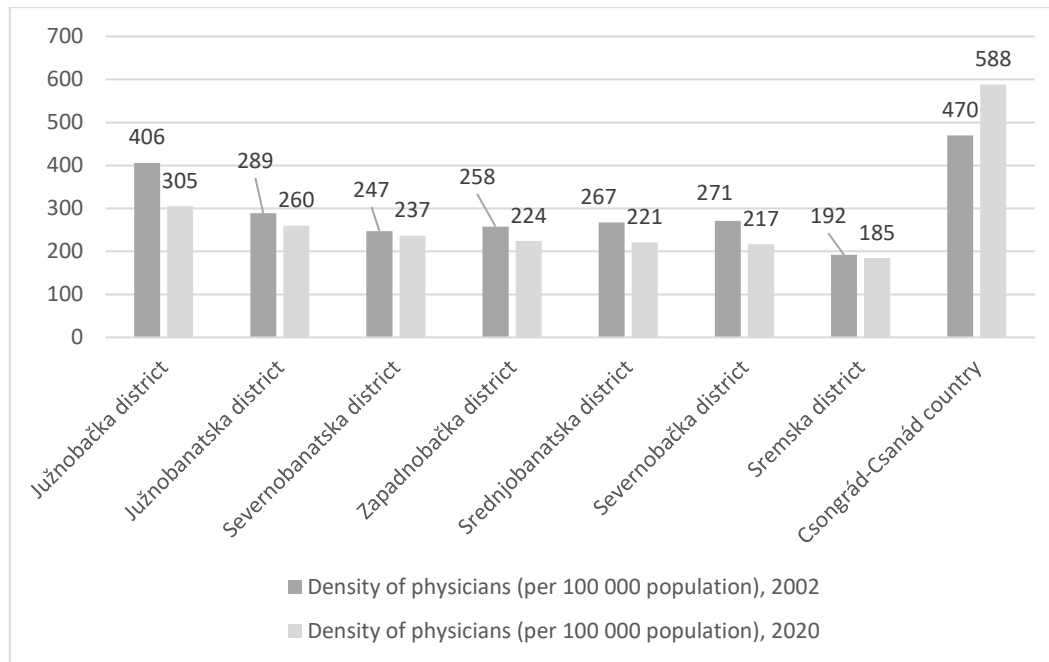


Figure 4: Density of physicians (per 100 000 population) in territorial units of Vojvodina and Hungarian Csongrád-Csanád country, in 2002 and 2020

Source: Health Statistical Yearbook 2002, 2020; and Hungarian Central Statistical Office⁵ database

⁵ Hungarian: Központi Statisztikai Hivatal (KSH)

Regarding the comparison of density of GPs in the territorial units of Vojvodina and Hungarian Csongrád-Csanád country in 2002 and 2020, we might say that there was not such a notable difference as in case of physicians density. In 2002 density of GPs in Csongrád-Csanád was 53/ 100 000 inhabitants, while in Vojvodina, as mentioned previously, the highest density of GPs had Sremska district (53/ 100 000 inhabitants) and the lowest was in Severnobańska district (40/ 100 000 inhabitants) (Figure 5.).

In 2020 there was a slightly different situation. Three of territorial units of Vojvodina were showing higher density of GPs (Srednjebanatska 68/ 100 000 inhabitants, Južnobańska 54/ 100 000 inhabitants, Zapadnobańska 54/ 100 000 inhabitants) compared to the Hungarian Csongrád-Csanád country (52/ 100 000 inhabitants). The explanation for this change in GP density following 18 years period might be found in the primary healthcare strengthening strategy, which is import aim of healthcare system in Serbia on national level.

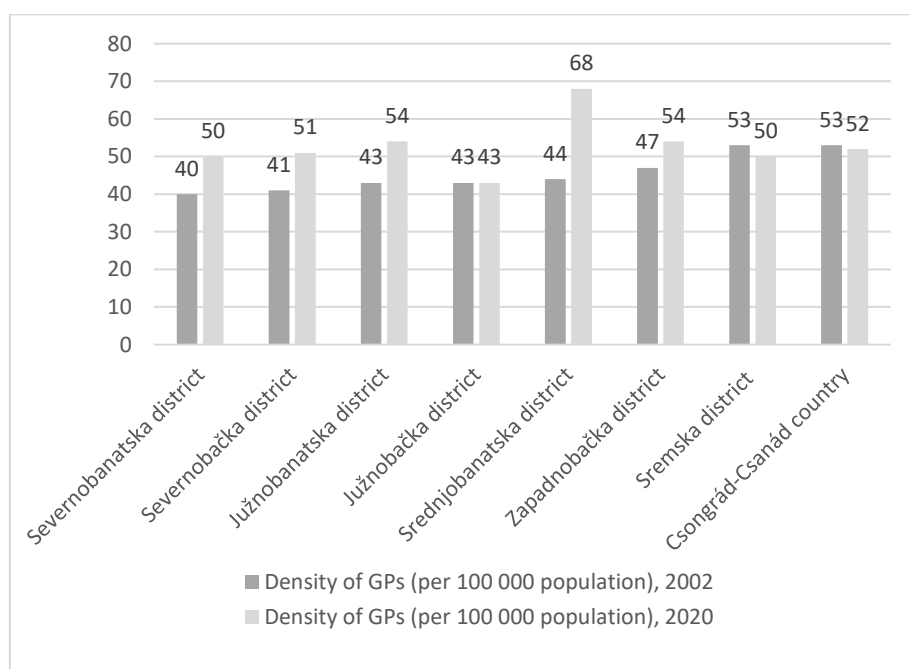


Figure 5: Density of GPs (per 100 000 population) in territorial units of Vojvodina and Hungarian Csongrád-Csanád country, in 2002 and 2020

Source: Health Statistical Yearbook, 2002, 2020; and Hungarian Central Statistical Office database

In order to explore the situation more deeply, we can compare the densities by territorial units in three years 2002, 2011 and 2020. Regarding the territorial units (districts) of Vojvodina, we can say that only in 3 districts the density of GPs was increasing continuously. These were Severnobańska, Srednjebanatska and Zapadnobańska. In two district the density of GPs increased in 2011 compared to 2002, however, in 2020 decreased again but not under 2002 level (Severnobańska and Južnobańska). In Južnobańska district in 2011 the density of GPs increased compared to 2002 and in 2020 decreased to the 2002 level again, while in Sremska and Beogradská dsitricit it fell even under 2002 level (Figure 6.).

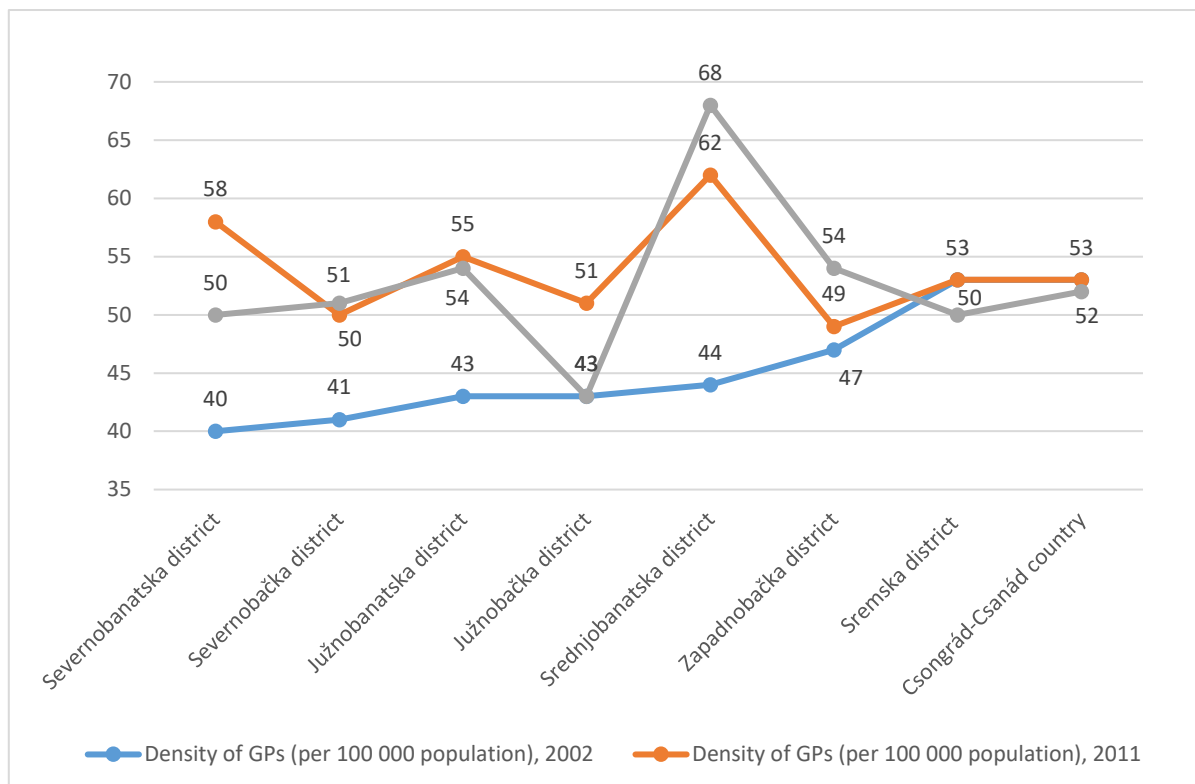


Figure 6: Density of GPs in territorial units of Vojvodina and Hungarian Csongrád-Csanád country, 2002-2011-2020

Source: Health Statistical Yearbook, 2002, 2011, 2020; and Hungarian Central Statistical Office database

Considering Hungarian Csongrád-Csanád country, the density of GPs was lower in 2020 comparing to previous years. In the period between 2002 and 2011 there was no change in GP density (53/100 000 inhabitants), while in 2020 it slightly decreased (52/ 100 000 inhabitants) (Figure 6.)

5. Conclusions

In Hungarian Csongrád-Csanád country, the density of physicians is higher than in the territorial units of Vojvodina. Since 2002, it has been continuously increasing, while in the territorial units of Vojvodina, after the „prominent” decrease following 2002, mainly stagnation has been observed. There is a different situation in term of GPs density. While in 2002 the territorial units of Vojvodina had mostly lower GPs density comparing to Hungarian Csongrád-Csanád country, in 2020 there was a slightly different situation. Three of territorial units of Vojvodina (Srednjobańska, Južnobańska and Zapadnobačka) were showing higher density of GPs compared to the Hungarian Csongrád-Csanád country (52/ 100 000 inhabitants). This could be explained by the Serbian efforts on national level to strighten the primary healthcare. We can conclude that despite the geographical proximity, there are significant differences in physicians density between the territorial units of Vojvodina and the neighbouring Hungarian Csongrád-Csanád country and this did not change over 18 years, in the period 2002-2020. On the other hand, the situation on GPs density in the territorial units of Vojvodina is continuously improving, while in the case of Csongrád-Csanád country we can speak about stagnation or even slight decrease.

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