COUNTRY REPORT

Serbia

May 2022

Contents

Executive summary

The project Action for Health and Equity: Addressing medical Deserts – or AHEAD – is the co-funded project of the HaDEA health programme of the European Union which aims to reduce health inequalities by addressing the challenge of medical deserts and medical desertification in Europe. With a vision to contribute to the achievement of better access to health services, especially in underserved areas, and more equitable access to sufficient, skilled and motivated health workers, the project leader, WEMOS (Netherlands) with partners from Italy, Moldova, the Netherlands, Romania and Serbia aimed at building knowledge encouraging (digital) innovation in health service delivery and applying a participatory approach to public health policymaking. One of the deliverables of the AHEAD project is an interactive mapping tool that visualises, per country, important indicators related to different aspects of desertification - Medical Deserts Diagnostic Tool (MDDT). In order to guide the MDDT prototype development, the Consortium has agreed on the provisional working definition of 'medical desert', based on the findings from our literature review. "Medical deserts working definition is the following: *"Medical deserts imply the inability of a given population (and / or a population group) to access health services, or the state of isolation when it comes to receiving health services, based on three categories of quantitative and qualitative barriers ('dimensions'), which are interrelated and dependent on each other, in varying degrees and modalities."* [1]

This country report is written to illustrate key findings from research activities undertaken to explore the validity of the developed working definition of the medical deserts and to explore the potential for application of the MDDT in Serbia. MDDT will be fully developed towards the end of the Project, on the basis of AHEAD research findings. This report combines desk and field analysis findings. From undertaken literature review, the above mentioned working definition of the medical deserts is proposed, and after analysis of the MDDT indicators created are maps which were then validated in field work using surveys and in-depth interviews

[1] More details of AHEAD project can be retrieved from project's website http://ahead.health

with stakeholders. Furthermore, the desk research findings on the current country context are presented by looking at the available indicators of the demographic, social, economic, and technological and health system characteristics of Serbia for the last five years. In a conclusion, potential solutions and recommendations were shaped to be discussed in the next phase of the AHEAD project activity, by using participatory health policymaking mechanism.

The main country report findings include stakeholders have low awareness of the meaning of "the medical desertification". Both inadequate availability and physical and time accessibility of health care is considered most relevant dimensions of the medical deserts, whilst the population density is perceived as not exclusive responsibility of the health care sector, therefore, less modifiable factor by the leverages and tools available to the stakeholders in the health care sector. Recommendations to the MDDT methodology include further calculation of MDDT index and its application to validate indentified medical deserts, and to include indicators of the inpatient care accessibility. Main respondents solutions are related to continuance in the investment in health care sector (resources and capital), in health workforce recruitment and incentives to work in remote areas (medical deserts), establishment of mobile teams of health and care professionals (health and nursing care) as well as mobile clinics and mobile pharmacies, to train allied care or voluntary workforce to support continuity of health care and nursing care, and invest in larger use of digital solutions for peer consultations with health care professionals.

I. Country health system overview

A. Demographic Context

The Republic of Serbia belongs to the region of Western Balkans[2] and is the largest country among the comparators with about 75% territory in south-east Europe and in the Pannonian Plain, and about 25% in central Europe[3]. The population of Serbia

[2] European Commission - Western Balkans. https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/europe-world/international-cooperation/western-balkans_en

[3] Bjegovic-Mikanovic V, Vasic M, Vukovic D, Jankovic J, Jovic-Vranes A, Santric-Milicevic M, Terzic-Supic Z, Hernández-Quevedo C. Serbia: Health system review. Health Systems in Transition, 2019; 21(3):i-211.

according to the Census of 2011 was 7.519 million[4]. The Statistical Office of the Republic of Serbia (SORS) has estimated 6,945,235 inhabitants in 2021 (Table 1)[5], out of which 48.7 % males and 64.4% the population is in a productive age of 15-64 years.

Table 1. Population size and natural growth in the Republic of Serbia for the last available year and changes over the last 5 years

	2021	**2020**	**2019**	**2018**	**2017**
Total population mid-year estimates, *n* (in thousands)	6 927	6 899	6982	7020	7058
Population natural growth n, (%)		-55158 (-8.0)	-37059 (-5.3)	-37680 (-5,4)	-38828 (-5.5)

Source: The Statistical Office of the Republic of Serbia. Statistical Calendar of the Republic of Serbia 2022. Belgrade: SORS, 2022. https://publikacije.stat.gov.rs/G2022/Pdf/G202217015.pdf, accessed 3/3/2022.

The number of inhabitants has been decreasing continuously since 1989, and the annual population growth is negative in the last five years (Table 1). The Serbian population belongs to old populations since an average age of the inhabitants is estimated 43.4 years (Serbia-north, including NUTS2 Belgrade region and NUTS2 region Vojvodina: 42.8 and Serbia-south, including NUTS2 Region Šumadija i Western Serbia, NUTS2 region South & East Serbia, and NUTS2 region Kosovo and Metohija: 44.1) and age dependency ratio (i.e., the ratio of old (60 and older) and young (0-19 years) population) is 144.7 (Serbia-north: 136,3 and Serbia-south: 153.8).[6]

According to the last Census (2011), an average density was 92,6 inhabitants per 1 square kilometre, and an average 2.9 members per household (in total 2.49 million households). Population density shows the concentration of the population, the distribution of the population and the degree of use of space. The general / average

[4] The Republic Statistical Office has not had certain data for AP Kosovo and Metohija since 1999, so they are not included in the coverage of data for the Republic of Serbia (total).
[5] The Statistical Office of the Republic of Serbia. Statistical Calendar of the Republic of Serbia 2022. Belgrade: SORS, 2022. https://publikacije.stat.gov.rs/G2022/Pdf/G202217015.pdf, accessed 3/3/2022.
[6] The Statistical Office of the Republic of Serbia. Statistical Calendar of the Republic of Serbia 2022. Belgrade: SORS, 2022. https://publikacije.stat.gov.rs/G2022/Pdf/G202217015.pdf, accessed 3/3/2022.

population density shows how many inhabitants live on 1km2 of a territory. Depending on the type of settlement, there are differences in population density. In Serbia, the most densely populated areas are large cities, especially Belgrade. Almost a fifth of the population of Serbia lives in Belgrade. The population density in all regions is decreasing, with the decrease being most pronounced in the south of Serbia (NUTS2 region of Southern and Eastern Serbia).

B. Social context

SORS data indicate that ethnically, the Republic of Serbia is a multinational community, where the most numerous are Serbs (83.3%), Hungarians (mostly in NUTS 2 Region Vojvodine), Roma people (NUTS2 Region South and Eastern Serbia) and the Bosnians (mainly in NUTS 2 Region Šumadija, and Western Serbia). Therefore, Roma are a diverse and dispersed population group and the second largest minority in Serbia. According to domestic and international sources, about 300,000-460,000 Roma population in Serbia are highly concentrated in urban areas of Belgrade, Nis, Vojvodina and southern Serbia[7].

According to the World Bank, in 2015, it was observed that Roma had problems with access to basic services, such as health care and social assistance driven by discrimination and lack of language skills and exacerbated by many Roma lacking personal documents. Although there is deficient assessments of the health status of the Roma population in Serbia, researches have demonstrated that while a routine immunization coverage in Serbia is 97 per cent, the coverage amongst the Roma is estimated by the Institute of Public Health of Belgrade to be as low as 20-30 per cent. UNICEF[8] reported nearly two times higher mortality rate among Roma infants and children under five years of age then the average mortality rate in Serbia. In 2016, the Strategy of social inclusion of Roma for the period from 2016 to 2025

[7] World Directory of Minorities and Indigenous Peoples

[8] Multiple Indicator Cluster Survey on the situation of women and children in Serbia/ Multiple Indicator Cluster Survey on the situation of women and children in Roma settlements in Serbia, MICS (1996, 2000, 2005, 2010 and 2014), Final Results, Belgrade and Serbia: Statistical Office of the Republic of Serbia and UNICEF, 2014, http://webrzs.stat.gov.rs/WebSite/userFiles/file/MICS/ MICS%20GLAVNI% 20NALAZI srp.pdf

was adopted[9], and further support to the Roma in Serbia was materialised notably through the partnership with the European Union/Council of Europe Joint Programme ROMACTED "Promoting good governance and Roma empowerment at local level", 2021 - 2024[10] signed of the Memorandum of Understanding by the Council of Europe, the Ministry of Human and Minority Rights and Social Dialogue and the municipal representatives from the 14 partner cities/municipalities in Serbia. It will serve to consolidate and expand efforts to improve the integration of Roma populations in local communities through enhanced participation in local policymaking and implementation of local actions.

According to the Census 2011, in Serbia less than 2% of the population aged 10 and over were illiterate (82.1% were women, and 70.5% were in the age group 65 and over). Only half of population aged over 15 (48.9%) have completed secondary school, and one over six inhabitants has attained tertiary education of which the majority live in NUTS2 Belgrade region(28,5%) and the fewest in the NUTS2 Region South and Eastern Serbia (19,3%). Mostly men have completed secondary school, but women are the majority in the population group who have attained tertiary education.

In Serbia, persons with disabilities make up 8% of the total number population (58.2% women and 41.8% men). Their average age is about 67 years, as 71% of them belong to the age group of 65 and over. The majority reside in NUTS2 Region of Southern and Eastern Serbia (9.4%), while the smallest percentage of people with disabilities is in the Belgrade region (5.9%).

According to data provided by Transparency International[11] the Serbia's Corruption Perception Index (CPI), has oscillated since 2012 between 39 (with 0 being highly corrupt and 100 very clean) in 2012 and 42 at its peak in 2013 and 2016. In the 2019 CPI, Serbia kept a score of 39 for two years running. These data have not shown a significant change in the last 10 years and might indicate stagnation

[9]Strategy of social inclusion of Roma for the period from 2016 to 2025 https://www.rcc.int/romaintegration2020/files/admin/docs/25271eee1fb46a73d48630d6d4d63bec.pdf
[10] ROMACTED https://pjp-eu.coe.int/en/web/roma-local-governance/
[11] U4 Anti-Corruption Helpdesk Serbia: Overview of corruption and anti-corruption changes in the last 10 years https://www.u4.no/publications/serbia-overview-of-corruption-and-anti-corruption-changes-in-the-last-10-years.pdf accessed 3-3-2022

regarding progress to reduce corruption. In health care sector, Ministry of Health has declared "zero tolerance to corruption". With that regard, the current Health care law has an article that

C. Political context

According to data provided by Transparency International[12], the political transformation indicator for Serbia, that is "the Bertelsmann Transformation Index (BTI), which measures the consolidation of democracy on a 10-point scale (10 corresponds to the highest and 1 to the lowest result). BIT's index defines Serbia as a "defective democracy", as it has been decreasing from 8.05 in 2012 to 6.95 in 2020. This is likely one of the priority issues for the new government to be elected in mid-year of 2022.

The European Council has confirmed Serbia as a candidate country a decade ago. Since the start of accession negotiations in January 2014[13], 12 out of 35 chapters have been opened and two of them were provisionally closed (Chapters 25 – science and research and 26 – education and culture). However, the Negotiation Chapters 2, 19 and 28 are still not opened. These are chapters on the 1. Freedom of Movement for Workers and Employment and Social Policy, 2. the chapter Social Policy and Employment and 3. the Consumer and health protection chapter.

According to the European Commission Report 2018 for Serbia[14], the negotiating position for Chapter 2 was adopted and forwarded to the EU Council in July 2018 and the course of negotiations affects further normative and institutional harmonization with acquis of the European Union.

[12] U4 Anti-Corruption Helpdesk Serbia: Overview of corruption and anti-corruption changes in the last 10 years https://www.u4.no/publications/serbia-overview-of-corruption-and-anti-corruption-changes-in-the-last-10-years.pdf accessed 3-3-2022

[13] EEPOW Country Report – Serbia 12 This material has received financial support from the European Union Programme for Employment and Social Innovation "EaSI" (2014- 2020). For further information please consult: http://ec.europa.eu/social/easi
https://www.etf.europa.eu/sites/default/files/document/Country%20Fiche%202020%20Serbia%20Education%20Training%20and%20Employment%20Developments.pdfhttps://www.minrzs.gov.rs/sites/default/files/2019-05/EEPOW_Country%20report%20Serbia.pdf

[14] https://europa.rs/wp-content/uploads/2021/10/Serbia-Report-2021.pdf

Regarding Negotiation Chapter 19 – Social Policy and Employment, Serbia is partly prepared for EU membership, mainly in the area of health and safety at work, and in the functioning of social dialogue, although has not yet transposed the Posting of Workers Directive (PWD).

The national regulatory framework is complex (Box 1) as it consists of numerous documents, which require a comprehensive national health care development master plan and health workforce development strategy for a systematized implementation of numerous foreseen actions, measures and efforts related to equity in healthcare and access to health services. However, both the contemporary master plan for health care development in Serbia and health workforce development strategy is lacking.

The policy and regulatory framework primarily includes systems' health related laws and bylaws that regulate health care organization, financing and coverage provision in the Republic of Serbia, as presented in Box 1:

BOX 1. Selected laws, bylaws and regulation currently operating in the health care of Serbia

- Constitution of the Republic of Serbia Official Gazette RS, 98/2006.
- Health Care Law. Official Gazette RS, 25/2019
- Health Insurance Law Official Gazette RS, 25/2019.
- Law on Chambers of Health Workers]. Official Gazette RS, 107/2005, 99/2010 and 70/2017.
- Law on Disaster Risk Reduction and Emergency Management. Official Gazette RS 87/2018.
- Law on Health Records and Reporting in the Field of Health Official Gazette RS, 123/2014, 106/2015, 105/2017 and 25/2019.
- Law on Higher Education. Official Gazette RS, 88/2017, 73/2018, 27/2018, 67/2019 and 6/2020
- Law on Medicines and Medical Devices. Official Gazette RS,30/2010,107/2012,113/2017 and 107/2017.
- Law on Protection from Exposure to Second-Hand Smoke. Official Gazette RS, 30/2010.
- Law on Protection of Persons with Mental Disabilities. Official Gazette RS,45/2013.
- Law on the Protection of Population from Communicable Diseases. Official Gazette RS,15/2016.
- Law on Patients' Rights. Official Gazette RS, 45/2013 and 25/2019.
- Law on the Planning System of the Republic of Serbia. Official Gazette RS,30/2018.
- Law on the Protection of the Rights of National Minorities. Official Gazette RS, 72/2009, 97/2013 and 47/2018.
- Law on Safety and Health at Work. Official Gazette RS, 101/2005,91/2015 and 113/2017.
- Law on Territorial Organization of the Republic of Serbia. Official Gazette RS, 129/2007, 18/2016 and 47/2018.

- Public Health Law. Official Gazette RS, 15/2016.
- Decision of the Highest Prices of Drugs for Use in Human Medicine, Whose Regime Issuing Prescription Official Gazette RS,69/2019
- Decision on the Plan for Development of Health Care in the Republic of Serbia. Official Gazette RS, 88/2010.
- Decree of Rules on the Corrective Coefficient, the Highest Percentage of Increase in Basic Salaries, Criteria and Norms for the Part of the Salary that is Realized on the Basis of Work Performance, as well as the Method of Calculation of Salaries of Employees in Health Institutions. Official Gazette RS,100/2011, 63/2012,101/2012,46/2013.
- Decree on the Planning and Type of Goods and Services for Which Centralized Public Procurement is Conducted. Official Gazette RS, 34/2019 and 64/2019.
- Decree on the Plan of the Health Institutions' Network. Official Gazette RS, 5/2020.
- Decree on Voluntary Health Insurance. Official Gazette RS, 108/2008 and 49/2009.
- Regulation on the Codebook of Job Designations. Official Gazette RS,12/2016.
- Regulation on National Programme of Preventive Dental Care. Official Gazette RS, 22/2009.
- Regulation on National Programme of Health Care of Women, Children and Adolescents. Official Gazette RS 28/2009.
- Rulebook on Detailed Conditions for Performing Health Care Activities in Health Institutions and Other Forms of Health Care Services. Official Gazette RS,43/2006,112/2009,50/2010,79/2011,10/2012,22/2013 and 16/2018.
- Rulebook on Health Care Quality Indicators. Official Gazette RS, 49/2010.
- Rulebook on Immunization and Method of Protection by Drugs. Official Gazette RS, 88/2017, 11/2018 and 14/2018.
- Rulebook on Normative and Standards of Work and Prices of Prevention, Assessment and Treatment of Oral Disease, which are paid by mandatory health insurance. Official Gazette RS, 12/2012, 1/2019 and 15/2019.
- Rulebook on the Content and Scope of the Right to Health Care from Compulsory Health Insurance and Co-Payment for 2017. Official Gazette RS,8/2017.
- Rulebook on the Type and Closer Conditions for the Foundation of Organizational Units and the Conduct of Mental Health Activities in the Community. Official Gazette RS, 106/2013.
- Strategy for Continuous Quality Improvement in Health Care and Patient Safety. Official Gazette RS, 15/2009.
- Strategy for Mental Health Care Development]. Official Gazette RS 55/2005, correction 71/2005.
- Strategy for Palliative Care. Official Gazette RS,55/2005, 71/2005, 101/2007, 65/2008.
- Strategy for Safety and Health at Work of the Republic of Serbia Official Gazette RS, 100/2013.

Although in 2019, the Waiting Lists for specific medical procedures and expensive interventions was established by the Health Care Law, these were not evaluated in terms of whether they contribute to equal distribution of health care delivery, and how much there is a rational use of valuable resources for all citizens on equal terms. Waiting lists are publicly available on the website of the National Health Insurance Fund (NHIF).

The National legislation has allowed private health care services to operate since 2005, but the volume of services provided by the private sector remains small, and rarely surpasses 5% of services provided by the public sector because facilities are much smaller, mostly situated in urban settings a well as for financial reasons. There are several thousand private health workers who mostly work on a fee-for-service basis. As the services of private health workers are mainly covered by private out-of-pocket payments, low-income groups, remote residents and other socio-economically vulnerable people are at a disadvantage in accessing their services, or at financial risk of poverty if they need to use their health services. A good example of this is the emergency medical transport of the elderly (e.g., in the event of a stroke or fall at home, on the street, etc.), which was in high demand in the waves of the COVID-19 pandemic, and when public emergency medical transportation was unavailable for a long time (e.g., waiting time was several hours), it was often supplement by private practice ambulances and are paid directly.

D. Economic context

Less than a half of the population of Serbia aged 15 and over is economically active (41.3%), mostly male (57.2%) than female (42.8%), and predominantly in NUTS 2 Belgrade region (41.6%), and for the least part in NUTS 2 Region South and Eastern Serbia (34.0%). The employment rate is 37.4%, being higher in men (44.9%) than in women 30.5%. The unemployment rate, i.e. the share of unemployed persons in total economically active population is 22.4%, somewhat higher in women (23.6%) than in men (21.6%). The lowest unemployment rate has been recorded in NUTS 2 Belgrade region (17.9%), and the highest in NUTS 2 Region South and Eastern Serbia (27.3%).

However, SORS data indicate 51.8% (42.8% men and 60.1% women) of not economically active in total population aged 15 and over, with the lowest unemployment rate recorded in NUTS2 Belgrade region (49.4%), and the highest in NUTS 2 Region South and Eastern Serbia (53.3%).

Gross domestic product (GDP) is an indicator of economic activities on the level of a whole country and presents the result of production activities of resident

institutional units, and it equals the sum of values added that are calculated for all institutional sectors. Over the last five years, the Serbian is slightly increasing, which is reflected in the total GDP at current prices, real GDP growth rate and GDP per capita (table 2). According to preliminary data, in 2021 Gross domestic product at current prices amounted to RSD 6 268 714 million. The real GDP growth in 2021, related to the previous year, equalled 7.4%.

The Economic Trading[15] has estimated an annual expansion of the Serbia's gross domestic product by 4.4 % in the first quarter of 2022, following a 7% advance in the previous three-month period, based on the SORS data. Accordingly, this decelerated growth might be an effect from 7.1% higher household consumption 2.5% of the rise of government expenditure and 1% advancement of gross fixed capital formation during the fade of the COVID-19 pandemic.

Table 2. Basic economic data, Republic of Serbia, 2017-2021

	2021	2020	2019	2018	2017
GDP total (million, national currency RSD)	6268714	5502216	5417724	5072932	4760686
Real GDP growth rate: change on previous year of GDP volume (%)	7.4	-0.9	4.2	4.5	2.1
GDP per capita, EUR[16]	7 697	6 783	6 619	6 143	5 590

In the World Bank income grouping, the Republic of Serbia is an upper middle-income economy, and in 2021 the GDP per capita was EUR 7 697 (Table 2). The Serbian economy is based mainly on services which account for 51% of GDP, with industry contributing to 25.9% and agriculture to 6.2%.

The at-risk-of-poverty rate in 2018 was 24.3%. For Serbia, the Gini coefficient score[17] was declining since 2015. In April 2022, the World Bank has last updated

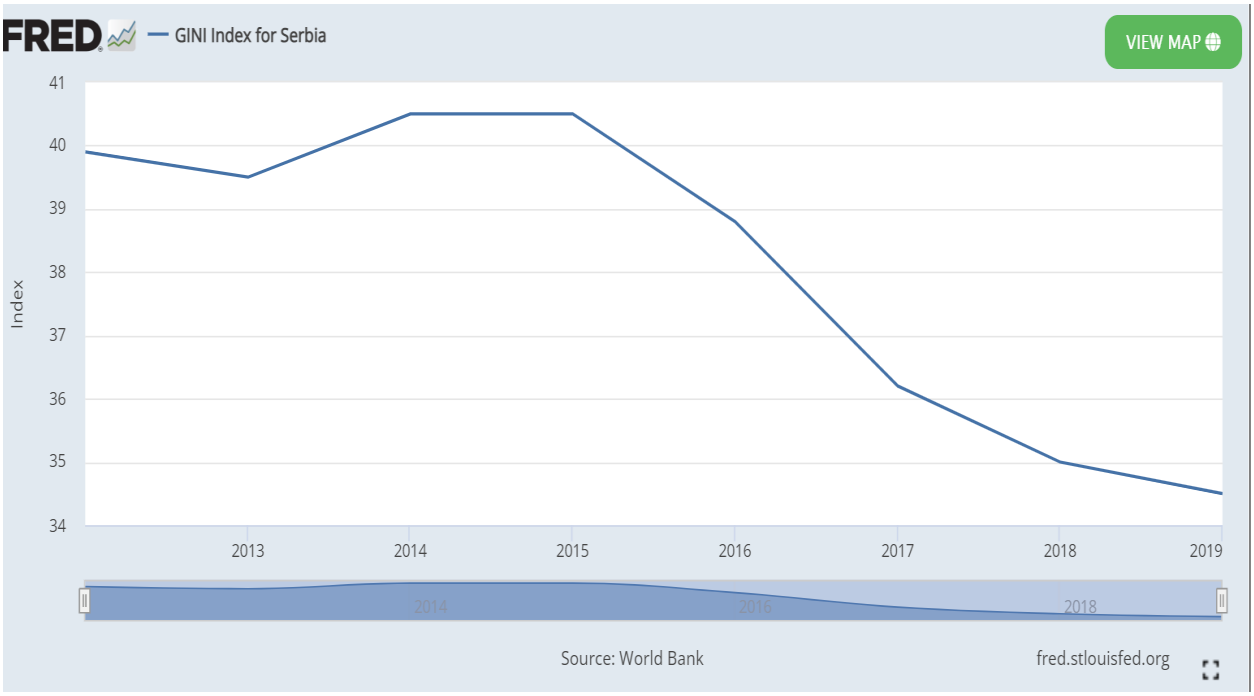
[15] https://tradingeconomics.com/serbia/gdp-growth-annual

[16] The recalculation of GDP into USD and EUR values is based on the average annual exchange rate of the National Bank of Serbia, and the calculation of GDP per capita is based on the estimated total population in mid-year.

[17] According to the World Bank, "Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line.

the estimates, according to which the Ginni score has varied from 40.5 in 2015 to 34.5 in 2019 (Figure 1). The highest decrese was calculated in the period from 2016 (38.8) to 2017 (36.2), while the decline was slow in the two subsequent years. Nontheless, the Gini coefficient score in Serbia is higher than in Netherlands (29.2) and Moldova (26), but was similar to Romania (34.8).

Figure 1. Gini coefficient score, Serbia (changes in the last 5 years)



Source: World Bank, GINI Index for Serbia [SIPOVGINISRB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/SIPOVGINISRB, June 4, 2022.

E. Technological context

According to the SORS Statistical Yearbook 2020, in Serbia, computer literacy is rising, with the almost equal share by sex (50.4% of men and 49.6% of women). In 2019, 34.2% of persons aged 15 and over are computer literate, while 14.8% are partially literate, meaning that they know how to perform one of the basic computer activity (text processing, tabulation, sending/receiving e-mails and web

Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality. Data are based on primary household survey data obtained from government statistical agencies and World Bank country departments. For more information and methodology, please see PovcalNet (http://iresearch.worldbank.org/PovcalNet/index.htm).".

browsing), but not very fourth person. Observed by sex, among illiterate persons the share of women is higher than that of men (54% and 46% respectively).

Within the macroeconomic contextual framework, the Republic of Serbia is putting its efforts to promote the technological innovations but has a relatively slow pace in integrating digital technology equally countrywide. For example, total of 81% of all households in the country had an internet connection, and 74.3% had a computer in 2020, according to the Statistical Office of the Republic of Serbia. The use of internet services in Serbia is well above the EU average. Forty percent of Serbian businesses place orders online, but the use of cloud technologies is still low (estimated at 40 percent) for companies with more than 250 employees. The use of e-invoices is growing slowly.

According to ITU, in March 2019, Serbia ranked 29th in the world for mobile speeds and 55th for fixed broadband speeds. There are 212 internet service providers (ISPs). Of those, 91 provide wireless access, 37 provide cable access, 24 provide fiber-optic access to homes and businesses, 15 provide digital subscriber line (xDSL) access, 13 provide Ethernet/LAN access, and three provide mobile access. At the end of 2020, the number of fixed broadband subscribers in Serbia stood at 1.7 million, while the number of mobile broadband users reached 6.48 million. More than half of users of fixed broadband use a speed of 10 Mbps to 30 Mbps. (Source: National Telecommunications Agency RATEL) [18].

F. Environmental context

For defining the rural area of Serbia, the Republic Bureau of Statistics of the Republic of Serbia applies in censuses the administrative, administrative criteria for determining the type of settlement, according to which the settlements are divided into "urban" and "other". This division was made on the basis of administrative decisions of the local self-government unit itself to declare a certain settlement urban. All other settlements, which were not declared urban, were classified in the "other" category. According to the Law on Territorial Organization of the Republic of

[18] https://www.trade.gov/country-commercial-guides/serbia-information-and-communications-technology-market
World Bank, GINI Index for Serbia [SIPOVGINISRB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/SIPOVGINISRB, May 26, 2022. https://fred.stlouisfed.org/series/SIPOVGINISRB

Serbia[19], the term city refers to the type of unit local self-government and is defined as: "*a territorial unit that represents an economic, administrative, geographical and cultural center of the wider area and has more than 100,000 inhabitants, a exceptional and less. The territory of the city can be divided into city municipalities. Division of the city into of the city municipality is established by the statute of the city, in accordance with the law* ". According to this law, "village" is defined as: "*settlement in which the population is predominantly engaged agriculture, and is not the seat of the municipality*." This definition is considered insufficiently precise, which makes it difficult to make a clear distinction between urban and rural settlements and allows for arbitrary interpretation statistical data.

Out of a total of 6,158 settlements in Serbia, 193 (3%) are urban settlements, while the remaining 5,965 settlements are in the category of "other settlements" which are considered rural[20]. The number of rural settlements is the largest in the area of the south Serbia (i.e., more than 34% of the total number of rural settlements are in Šumadija and Western Serbia). In such landscape, medical transportation challenges are related to access to healthcare services such as emergency and inpatient care, and will be probably highly relevant for identification of the medical deserts.

[19] "Law on Amendments to the Law on Territorial Organization of the Republic of Serbia" (Official Gazette of RS, No. 47/2018, 20 June 2018).

[20] The Statistical Office of the Republic of Serbia. Statistical Yearbook of the Republic of Serbia 2020. Belgrade: SORS, 2020. https://publikacije.stat.gov.rs/G2020/PdfE/G20202053.pdf , accessed 3/3/2022.

The spatial structural and functional organization of settlements is dominated by small urban settlements (Figure 2). Among urban settlements, 16 settlements have less than two thousand inhabitants, while there are also urban settlements with less than a thousand inhabitants. On the other hand, in the category of "other settlements", i.e., rural, there are many settlements with more than 10 thousand inhabitants, such as settlements in suburban area of Belgrade and Vojvodina settlements.

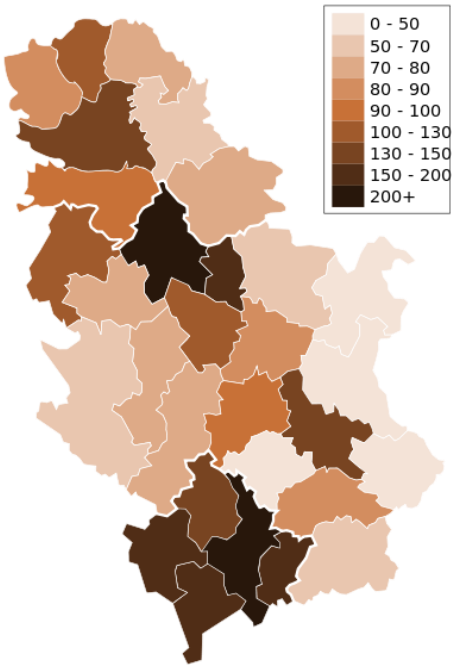


Figure 2. The number of inhabitants (in thousands) per NUTS3 regions

There are no city councils in the area of AP Vojvodina settlements with less than two thousand inhabitants, and the largest number of urban settlements in this area has between five and 20 thousand inhabitants. While almost 60% of population lives in urban areas, the most populated of four statistical regions (Vojvodina, Belgrade, Šumadija and western Serbia, and southern eastern Serbia)

- Migratory characteristics

The SORS data a decrease in total number of population of the Republic of Serbia of 4.1% (-311 139 persons) between two last censuses (2002-2011), which was a which is primarily the result of a negative natural increase and emigration of our citizens abroad. Their number of the autochthonous and migrant population[21] show a largest share of immigrant population belongs to the population that has moved to the settlement of residence from another area (17.1%), then from another

[21] According to the SORS "Identification of both contingents was enabled by a question on whether the person has been living continuously from birth in the place of permanent residence. The contingent of autochthonous includes persons who live from birth in the place of permanent residence, i.e. they have never moved."

settlement of the same municipality (9.7%), while the share of immigrated population from the former republics of the Socialist Federal Republic of Yugoslavia is 9.6%. In addition, the number of daily migrants[22] (persons who leave every day their place of permanent residence for reasons of work or studies and return on a daily basis or several times a week), includes more than 900 000 employees, as well as pupils and students. In total, 14.6% of the total number of population aged 15 and over is daily migrants (the largest share of daily migrants has been recorded in the south of Serbia – NUTS 2 Region Šumadija and Western Serbia: 31.38%, and the smallest in the north of Serbia – NUTS 2 Belgrade region: 19.40%). Among them, the share of persons who leave every day their place of permanent residence for reasons of work is twice larger than the share of pupils/students (Table 3).

Table 3. Daily migrations of the active population performing an occupation, pupils and students, by 2011 Census

NUTS2	**Total**	**Serbia- north**		**Serbia -south**	
NUTS3		**Belgrade region**	**Region Vojvodina**	**Region Šumadia and West Serbia**	**Region South and East Serbia**
Total	901299	174807	252583	282855	191054
Active population performing an occupation in					
Total	615990	132970	173917	183034	126069
municipality of permanent residence	341959	43355	90941	37779	1 69884
another municipality	178172	78007	42071	21914	36180
another area	93705	11125	40286	22608	19686
foreign country	2154	483	619	733	319
Pupils/students going to school/university in:					
Total	285309	41837	78666	99821	64985
municipality of permanent residence	153971	13973	29156	74061	36781
another municipality	74439	24866	22437	12121	15015

[22] According to the SORS "It is also considered that a person goes back to the place of her/his usual residence in the case when she/he is absent from work due to the nature of the job, that is, when has a 24-hour shift or even two-day shift of 48 hours (e.g., in traffic/transportation, health and some other services). The identification of the daily migrants' category was enabled by answering the questions on the place of work/attending school/university, as well as on the frequency of returning to the place of usual residence (daily, weekly or less frequent)."

another area	54546	2825	26189	12546	12986
foreign country	2353	173	884	1093	203

Health system

Health Status

- Life expectancy at birth (last available year and the last 5 years)

The negative trend was also observed for the average life expectancy at birth, which was the smallest in 2020 (71.4 years for males. and 77.2 for females) in comparison to the figures over the last five years[23]. Again, the life expectancy was smaller for the population living in the south of Serbia (77.0 years for females and 71.2 years for males), than for population living in the north of Serbia (77.5 years for females and 71.5 years for males). Since life expectancy is almost six years longer for women than for men, the female population is on average older than the male population (44.8 years versus 42.0 years). Average life expectancy at birth is unequal across regions. In 2020, it was the highest in NUTS2 Belgrade Region (72.4 years for males, and 78.5 years for females), and the lowest in the NUTS 2 South and Eastern Serbia (70.6 years for males, and 76.8 years for females). Comparing districts (NUTS3 level data), the highest average life expectancy at birth is found in Belgrade, and the lowest in the Severnobanatski district in Vojvodina.

Similar are Eurostat estimates of the life expectancy (Table 4). According to the Eurostat, both indicators of infant mortality rate and under-5 mortality rate (per 1000 live births) are showing a decline over the last five years, with the lowest figures in the last available year of 4.8 infant deaths per 1000 live births (2019), and 356 under-5 mortality rate per 1000 live births (in 2020). In addition, the mortality rates of preventable and treatable causes were also decreasing from 2016 to 2018, but has increased again in 2019 to 229.96 deaths per 100 000 inhabitants due to preventable and 173.51 deaths per 100 000 inhabitants due to treatable causes (Table 4). According to the Eurostat specification, preventable mortality refers to mortality due to causes of death that can be mainly avoided through effective public health and primary prevention interventions (i.e. before the onset of

[23] SORS data

diseases/injuries, to reduce incidence). In contrast, treatable (or amenable) mortality is mortality due to causes of death that can be mainly avoided through timely and effective health care interventions, including secondary prevention and treatment (i.e. after the onset of diseases, to reduce case-fatality).[24] In that regard, people in Serbia were more often dying from causes that are likely preventable, than from causes that are treatable (or amenable).

According to the European Commission working document on Serbia EU integration progress[25], health promotion regarding non-communicable diseases (especially cancer screening for colorectal, breast and cervical cancers, and mental health services) is still not at an advanced level in Serbia. A progress is slow, and in many regions of the country cancer screening lacks a systematic performance. Community-based mental health services are underdeveloped; there were no developments on preventing drug abuse, while a national programme to reduce the harmful effects of alcohol and alcohol-induced disorders has been adopted.

Table 4. Selected Eurostat indicators of the population health status, Serbia,

	2020	2019	2018	2017	2016
Life expectancy at birth	74.5 M:71.6 F: 77.5	76.0 M:73.4 F: 78.6	75.9 M:73.5 F: 78.4	75.5 M:73.1 F: 78.1	75.7 M:73.2 F: 78.3
Infant mortality rate *	:	4.8	4.9	4.7	5.4
Under-5 mortality rate *	356 M: 208 F: 148	366 M: 207 F: 159	379 M: 202 F: 177	375 M: 212 F: 163	394 M: 233 F: 166
Preventable mortality**	:	229.96 M: 337.09 F: 136.02	228.82 M: 333.63 F: 136.73	233.53 M: 341.38 F: 138.8	235.37 M: 345.67 F: 138.87
Treatable mortality**	:	173.51 M: 199.03 F: 151.82	169.81 M: 195.6 F: 147.78	173.51 M: 199.03 F: 151.82	172.76 M: 199.7 F: 149.78

Notes: ":" is data unavailable; *per 1000 live births; ** per 100 000 inhabitants

[24]Eurosat. Specifications of the public health theme tables (hlth_cd_pbt). Treatable and preventable deathhttps://ec.europa.eu/eurostat/cache/metadata/Annexes/hlth_cdeath_sims_an5.pdf.

[25] EC. Serbia 2021 Report Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 2021 Communication on EU Enlargement Policy. Strasbourg, 19.10.2021 SWD(2021) 288 final.

- Top 5 causes of death in Serbia in 2020

The main causes of death were cardiovascular diseases and cancers, accounting for almost three quarters of all deaths. Diseases of the circulatory system are the most common cause of death, with an unstandardized death rate of 801.6 per 100 000 population and representing 47.3% of all causes of death (males: 42.4%, females: 52.6%). These are followed by neoplasms (18.3%; males: 19.8%, females: 16.7%), COVID-19 8.9% (men 11% women 6.6%), respiratory disease (5.7%; males: 6.5%, females: 4.9%), and endocrine, nutritional and metabolic diseases 3% (men 2.6 % women 3.4%). Furthermore, 4.7% of total mortality is caused by the group Symptoms, signs and abnormal clinical and laboratory findings[26].

[26] IPH of Serbia "Dr Milan Jovanović Batut" (2021). Health Statistical Yearbook of Republic of Serbia 2020. Belgrade: IPHS. https://www.batut.org.rs/download/publikacije/pub2020.pdf

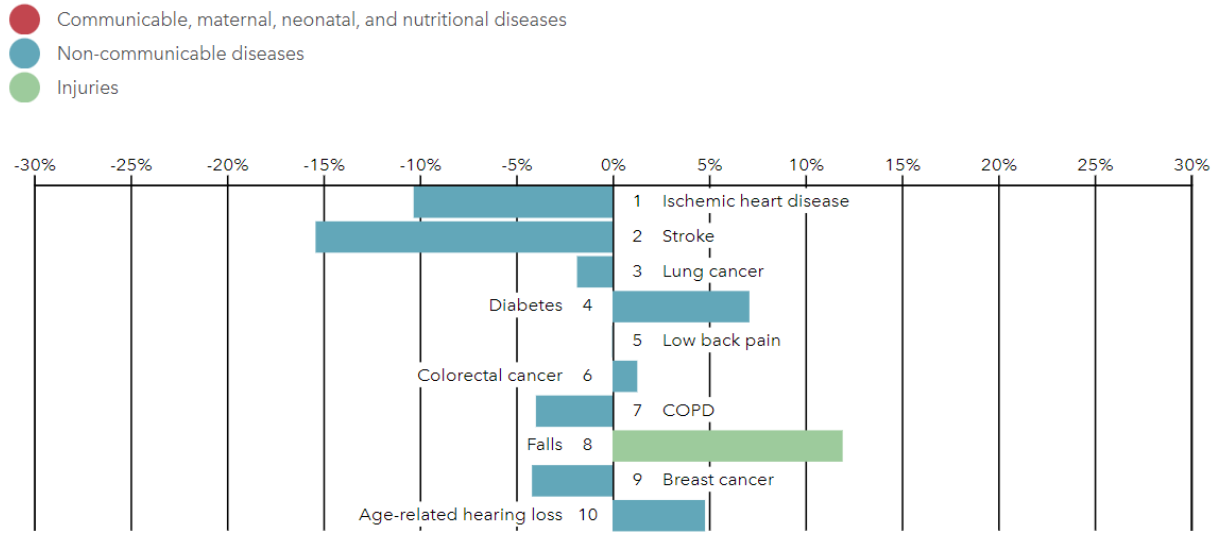
-Burden of disease (DALYs)

In terms of the all causes of death and disability combined, the estimates of the Global Burden of Disease Study 2019[27] indicate that Serbian has 3276178 DALYs (3835035-2763637) or 37455.8 DALY rate (43845.08-31596.04) in 2019. The non communicable diseases and injuries prevail over the communicable, maternal and nutritional diseases. Ischemic heart disease (causing 452758.1 DALYs [544997.9-372552.9], 5176.3 DALY rate [6230.8- 4259.3]), stroke (causing 427280.4 DALYs [510890.6-360197.1], 5176.3 DALY rate [6230.8-4259.3]), and lung cancers (causing 176690.6 DALYs [222904.3- 137757.7], 2020.1 DALY rate [2548.4-1574.9]) were the highest ranking causes in 2019. However, compared to 2009, a significant decrease in DALYs caused by these diseases has been estimated in 2019 (Figure 3).

Among the top ten risk factors drive the most death and disability combined in Serbia, metabolic and behavioural risks are more presented then environmental risk factors (Figure 4). The leading risk factor in Serbia is high blood glucose, tobacco [], high fasting plasma glucose, dietary risks and high body mass index. These risk factors were the top risk factors in Serbian population in 2009 also, implying a poor effects of health promotion and disease prevention over the last decade as well as a sedentary lifestyle of the Serbian population.

[27] Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2019 (GBD 2019) Results. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2020. Available from https://vizhub.healthdata.org/gbd-results/.

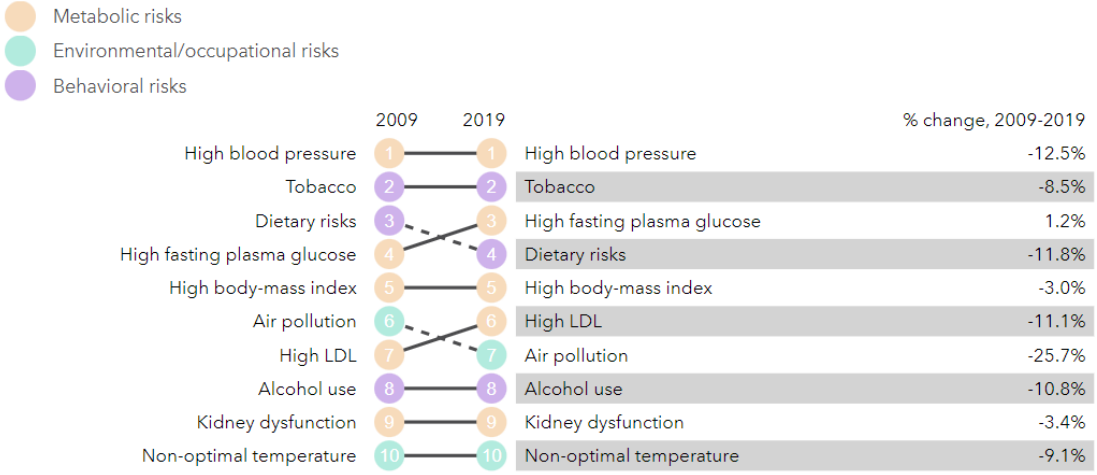
Figure 3. The main causes of death and disability combined



Top 10 causes of death and disability (DALYs) in 2019 and percent change 2009-2019, all ages combined

Source: GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. GLOBAL HEALTH METRICS, 2020;396,(10258):P1204-1222. https://doi.org/10.1016/S0140-6736(20)30925-9

Figure 4. The top ten risk factors drive the most death and disability combined in Serbia



Top 10 risks contributing to total number of DALYs in 2019 and percent change 2009-2019, all ages combined

Source: GBD 2019 Risk Factors Collaborators. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. GLOBAL HEALTH METRICS, 2020;396,(10258):P1223-1249.

- Unmet health care needs for medical examination or treatment (%) (last available year and the last 5 years)

According to the European Commission working document on Serbia EU integration progress[28] on health inequalities, people with disabilities, people living with HIV, children and adults who use drugs, prisoners, women involved in prostitution, LGBTIQ people, internally displaced persons and the Roma, require more focused activities for improved access to healthcare services in Serbia and the Serbian legislation on pricing of medicinal products has yet to be aligned to the EU acquis.

Eurostat statistics[29] show that in 2019, More than 3 % of the EU population aged 16 and over had an unmet need for a medical examination or treatment, and 4 % of the EU population had an unmet need for dental examination or treatment. The main reasons for unmet needs were related to the organisation and functioning of health care services , such as financial reasons (too expensive), transportation (too far to travel), or timeliness (long waiting lists) — 1.7 % of the EU adult population reported they had unmet needs, a share that ranged from 0.0 % in Malta to 15.5 % in Estonia. These data show a significant decline in unmet needs in comparison to 2014, when a total of 26.5 % of the EU-28 population aged 15 and over in need of health care reported having unmet needs for health care for reasons of financial barriers, distance or transportation problems, and/or long waiting lists.

In Serbia, in 2019, total of 10.2% of adult population aged 16 year and over had an unmet need for medical examination or treatment (4.8% of reasons related to the health system, and 5.4% were reasons other than related to the health system). The overall percentage of unmet need in Serbia is almost three times worse than the average for countries of EU-27. With regard to the bad percentages of unmet needs for medical examination or treatment, Serbia ranked the second country in EU region, after Estonia, and the first among the EU-candidate countries (Turkey, 7.2%; North Macedonia, 4.9%; and Montenegro, 3.8%).

[28] EC. Serbia 2021 Report Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 2021 Communication on EU Enlargement Policy. Strasbourg, 19.10.2021 SWD(2021) 288 final.

[29] *Source:* Eurostat (hlth_silc_08)

High percentages of overall reasons for unmet needs for medical examination or treatment have also Greece (9.1%), Poland (8.5%), Denmark (8.0%), Latvia (7.9%) and Romania (7.0%).

With regard the reasons for unmet needs for medical examination or treatment that are directly related to health system, Serbia (4.8%) ranks fourth after Estonia (15.5%), Greece (8.1%), and Romania (4.9%). This finding indicates that in Serbia, as in Denmark, Poland and Turkey, the majority of reasons are falling beyond organization of health care system, while in Estonia, Greece, Romania, Latvia, and Finland the majority of reasons are related to health system (Eurostat, 2022)[30].

In Serbia, in 2019, among the reasons for unmet needs for medical treatment related to the health system, most often reported were the following:

- Too expensive health care (2.6%),
- Waiting list (1.4%) and
- Too far to travel (0.8%).

In Serbia, in 2019, among the reasons for unmet needs for medical treatment other than related to the health system, most often reported were the following:

- Fear of doctor, hospital, examination or treatment (2.3%),
- Having no time (1.7%),
- Wanted to wait and see if problem got better on its own (0.5%),
- Other (0.9%), and
- Did not know any good doctor or specialist (0.0%).

Further disaggregation of the declared Self-reported unmet needs for medical examination by main reason has showed that all reasons were falling down but the waiting list (Table 5). Financial reason was high in the south of Serbia, e.g, 8.4% for population in Kosovo and Metohija, while reasons "too expensive or too far to

[30] Eurostat. Self-reported unmet needs for medical examination by sex, age, main reason declared and income quintile, online data code: HLTH_SILC_08 last update: 16/05/2022. https://ec.europa.eu/eurostat/databrowser/view/hlth_silc_08/default/table?lang=en, accessed 3-3-2022.

travel or waiting list" were highest for population in the first income quintile group (poorest population)[31], for female population, and those in elderly (in particular for those aged from 75 to 84 years and 85 years or over).[32]

Table 5. Self-reported unmet needs for medical examination by main reason, Serbia, 2015-2020

SERBIA TIME	2015	2016	2017	2018	2019 e	2020
Too expensive	2.1	1.7	1.0	1.0	0.9	:
Too far to travel	0.1	0.1	0.1	0.1	0.1	:
Too expensive or too far to travel or waiting list	3.3	2.6	1.7	2.0	1.9	:
No time	0.5	0.5	0.3	0.3	0.3	:
No unmet needs to declare	94.8	95.7	96.9	96.4	96.6	:
Didn't know any good doctor or specialist	0.1	0.1	0.1	0.1	0.1	:
Waiting list	1.0	0.8	0.7	0.9	0.9	:
Fear of doctor, hospital, examination or treatment	0.2	0.2	0.1	0.1	0.1	:
Wanted to wait and see if problem got better on its own	0.7	0.7	0.6	0.6	0.6	:
Other reason	0.5	0.4	0.3	0.4	0.5	:

Notes: ":" - not available; "e"- estimated
Source: Eurostat_ [HLTH_SILC_08__custom_2859770]

According to the WHO, the UHC service coverage index for Serbia is 51.43%. This number is the same as for Croatia (an EU country), somewhat higher than Hungary, Romania and Bulgaria (also EU countries), and much higher than other neighboring countries such as Bosnia and Herzegovina, Montenegro, Albania, and North Macedonia.

- Covid-19 (total number of cases, total deaths, vaccination rate)

On the invitation of the EU Serbia and other Western Balkan partners have signed the EU joint procurement agreement to procure medical countermeasures to COVID-19 on 21 April 2020 and ratified it in December 2020. Serbia is an observing

[31] Eurostat's definition of the first quintile group: It "represents 20% of population with lowest income and the fifth quintile group 20% of population with highest income. Income quintile group is computed on the basis of the total equivalised disposable income attributed to each member of the household (for more details on the definition, please consult EU-SILC reference metadata file)".
[32] Eurostat. Self-reported unmet needs for medical examination by sex, age, main reason declared and income quintile, online data code: HLTH_SILC_08 last update: 16/05/2022. https://ec.europa.eu/eurostat/databrowser/view/hlth_silc_08/default/table?lang=en, accessed 3-3-2022.

93 member of the EU Health Security Committee since 2017 and has access to the EU Early Warning and Response System for all information related to the COVID-19 pandemic. Serbia has an active focal point of the European Centre for Disease Prevention and Control (ECDC), and is participating in the European COVID-19 Surveillance Network, for reporting COVID-19 data to the European Surveillance System (TESSy).

As of 28 February 2022, a total of 1,910,975 COVID 19 cases have been reported, as well as 15,241 deaths. Serbia was one of the first countries in the European Region to have a strong start of the national COVID-19 vaccination campaign. Considering the vaccination data, on 28 February, a total of 8,466,632 vaccine doses have been administered, out of which 3,261,760 people received two doses and 1,861,647 received the third (booster) dose of the vaccine. Public outreach campaigns regarding promotion of vaccination have been led by Government of Serbia and supported by health professionals. A national campaign was introduced in 2020 and more information is available at https://vakcinacija.gov.rs/.

Despite the efforts at the national level to promote vaccination, the coverage of the adult population is below 50%, and large proportions of unvaccinated people are below age of 30. Concerns over the safety of COVID-19 vaccine remain the most important barrier, with 42% fearing they will have serious reactions to the vaccine. Perception of vaccine effectiveness is another matter: 35% are not convinced that vaccination would help to control the virus' spread.

According to the European Commission working document on Serbia progress[33], the main capacity of the health system in dealing with the COVID-19 pandemic was the Ministry of health which in cooperation with the national institute of public health and the relevant health institutions, have monitored the epidemiological status of the disease, and were responsible to keep the public informed, and issue guidelines and standard operating procedures to health institutions and to all entrance points

[33] EC. Serbia 2021 Report Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 2021 Communication on EU Enlargement Policy. Strasbourg, 19.10.2021 SWD(2021) 288 final.

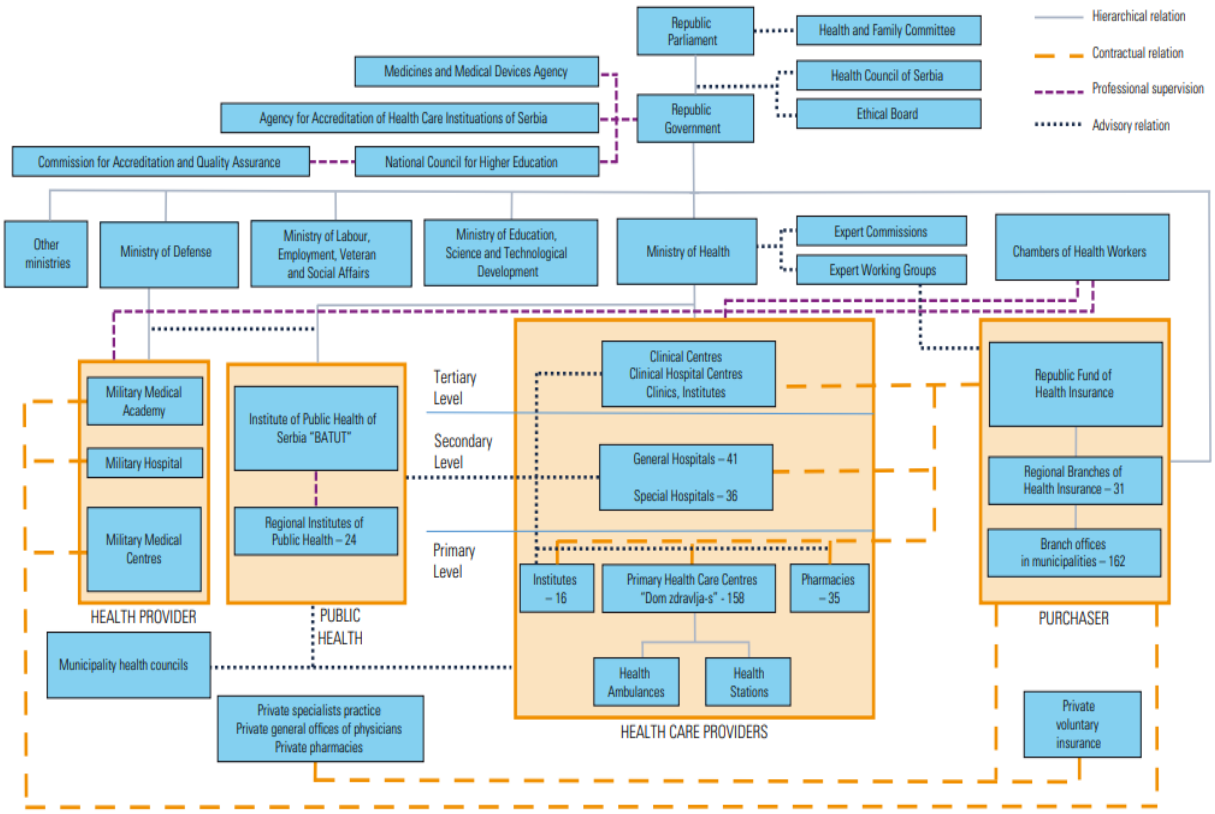
into the country. During the epidemic, many hospitals were pronounced exclusive COVID-19 facilities, treating only those infected with SARS-Cov-2, two special intensive care COVID-19 hospitals were opened, a third 500-bed COVID hospital is being built in Novi Sad to become operational in September 2021, while 158 municipal health care centres were tasked with primary prevention, and temporary COVID-19 clinics were set up by army forces, in each of them with examination and testing facilities for all citizens.

However, persistent weaknesses of the system (a lack of resources on all levels, due to the previous constant outflow of professional workforce) became further exacerbated, with a large number of medical personnel testing COVID-19 positive for, most likely due to lack of personal protection equipment and medical equipment, medical expertise, and laboratory testing capacities as well as data processing and contact tracing. Therefore, in the seventh week of the outbreak in the country government has directed numerous procurements of equipment and employment of 2,500 new healthcare personnel during March/April 2020, which has been leading to more favourable results during the progress of the pandemic.

- Healthcare system (governance; resources; service delivery)
- Type of health system (health insurance, national)

The tree key high-level stakeholders, Ministry of Health (MoH), the National Health Insurance Fund (NIHF), and the Institute of Public Health "Dr Milan Jovanović Batut" (IPHS), who organize and manage the policy and planning in the Serbian health system. Administrative and regulatory functions of the health system are the responsibility of ministries and state agencies. Publicly owned health institutions comprise a wide network at the primary, secondary and tertiary level, and this network is overseen by the Ministry of Health. The organizational structure of the health system, based on current legislation is illustrated in Figure 5.

Figure 5. The organizational structure of the health system in Serbia



Note: Besides the network of Institutes of Public Health, health institutions providing health services at multiple levels of health care are: Institute of Blood Transfusion, Institute of Occupational Medicine, Institute of Forensic Medicine, Institute of Virology, Vaccines and Serums, Institute for Antirabies Protection, Institute of Psychophysiological Disorders and Speech Pathology, and Institute of Biocide and Medical Ecology.

Source: Bjegovic-Mikanovic V, Vasic M, Vukovic D, Jankovic J, Jovic-Vranes A, Santric-Milicevic M, Terzic-Supic Z, Hernández-Quevedo C. Serbia: Health system review. Health Systems in Transition, 2019; 21(3):i-211

According to the 2019 Health Insurance Law, the compulsory health insurance guarantee equity and solidarity in health financing and the provision of health care for the whole population, with priority given to vulnerable groups. The organizational relationship between the main purchaser (NHIF) and providers is contract-based and centralized, and the government plays a regulatory role through steering the Health Care Plan from Compulsory Health Insurance in Serbia, which is adopted each year. It provides types and volume of health services, which will be provided to insurers with the compulsory health insurance.

Upon the opinion of the Ministry of Health, the Ministry of Finance scrutinizes the financial implications of the Plan, which is then used to determine final content of contracts between the NHIF (its regional branches) and each provider at primary, secondary and tertiary level. By this contract, specified are the type, volume or quantity of health services, and measures for ensuring the quality of health care to be provided to insured persons. Contracts are determined on the basis of norms of staff and standards of work necessary for the realization of health care, the compensation or price paid by the regional branch or the NHIF for the provided health services, the method of calculation and payment, control and responsibility for performing obligations under the contract, the deadline for the implementation of the undertaken obligations, manner of resolving the disputed issues, termination of the contract, as well as other mutual rights and obligations of the contracting parties.

The number of jobs is determined by the Health Care Act 2019 and a bylaw that defines standards for the opening and operation of health facilities, including staffing standards as a minimum, but for state-owned health facilities employment standards are also the annual minimum, optimal and maximum number of employees, who have a contract with the NHIF. The main employer in Serbia in health and care sector is the state. Total number of health care institutions according to the Decree on the plan of the network of health care institutions in 2019 in Serbia amounted to 350[34] (of which at the 35 pharmacies, 158 primary health care centres, 41 general hospitals, 34 special hospitals, 4 clinical-hospital centres, 4 clinical centres, 7 clinics, 16 institutes, 25 institutes of public health, 22 *zavod*, and 4 military institutions).

In 2019, the health care service of the Republic of Serbia (health institutions in the Network Plan) employed a total of 100,880 persons[35]. There were 24,550 health workers and health associates with university education. Of those, 19,984 (81%) were doctors, 1596 (7%) dentists, 1528 (6%) pharmacists and 1542 (6%) were

[34] Decree on the plan of the network of health care institutions ("Official Gazette of RS", no. 42/06, 119/07, 84/08, 71 and 85/09, 24/10, 6 and 37/12, 8 / 2014, 92/2015, 111, 114/2017, 13/2018, 15/2018 and 68/2019).
[35] Institute of public health of Serbia "Dr Milan Jovanovic Batut" (2020) Health Statistical Yearbook of Republic of Serbia 2019. Belgrade: Institute of public health of Serbia "Dr Milan Jovanovic Batut".

other professionals. Of all physicians in the Republic of Serbia 5309 were non-specialists (27%), of whom 2754 were general medicine doctors (14%) and 2555 were in specialist training (13%). The total number of specialists was 14,575 (73%). The structure of employed doctors by sex was the following: 35% were male and 65% were female doctors. Of the total number of 1596 dentists, 839 (53%) were specialists. Health care institutions employ a total of 1653 pharmacists, of whom 303 (20%) were specialists. In 2019, there was a total of 10,269 health workers and associates with college education in health care institutions, of whom 5818 (57%) nurses-medical technicians. 44,666 health workers and associates had secondary education, of whom 31,165 (70%) were nurses-medical technicians. Health care institutions employed a total of 21,020 non-medical staff, of whom 7231 (34%) administrative and 13,789 (66%) of technical staff. In 2019, physicians made up 19.8% of the total personnel in the Network (out of these, 14.3% were medical specialists). The ten leading specializations are internal medicine (13.2%), pediatricians (11.0%), general medicine (10.0%), gynecology and obstetrics (7.4%), anesthesiologists (5.8%), radiologists (5.5%), general surgery (5.0%), physical medicine (3.8%), psychiatry (3.7%), and urgent medicine (3.5%).

According to the Statistics of employment and earnings[36], the total number of employed in the Republic of Serbia in 2020 amounted to 2,215,475 (annual average[37]), of which 155,240 (7.01%) were registered employees in human health and social work activities. Most of the registered employees in human health and social work activities work in public sector (152,073, or 97.96%), and this number includes employees in "long-term employment" and in "temporary and occasional employment". The highest number of employees in section human health and social work activities was in Belgrade region (48,805), and the lowest in the region of South and Eastern Serbia (31,171).

[36] Statistics of employment and earnings (Statistical release 13, SERB013 ZP20 280121

[37] Annual average is calculated as the arithmetic mean of the number of employees for 12 months

The 2021 SORS data [38] show slight changes of the density of health workers over the period from 2016-2020, (table 6), probably due to negative population growth, the density rates have increased.

Table 6. Health worker density 2016-2020 per 10 000 population, Republic of Serbia

Period	Physicians	Dentists	Pharmacists	Nurses and midwives
2016	30.5	2.8	3.1	64
2017	30.5	2.8	2.9	64.9
2018	30.8	2.8	2.7	65.8
2019	28.6			
2020	28.6			

According to the IPHS, within the stock of health workers in the public sector –the Network Plan of the health care institution in the public sector, Serbia provides health workforce coverage with 2.8 physicians and 5.6 nurses per 1000 population in 2019, which is sufficient to ensure Universal Health Coverage (benchmark indicators of 4.45 physicians and nurses[39]).

The medical workforce tends to be allocated in urban areas with better infrastructure and concentrated within medical universities and highly specialized medical centers. In 2015 it varied by −59% for general medical professionals on specializations; and +62% for midwifery professionals)[40]. In 2019, the districts' density of the medical workforce still varied significantly from the national average rates (Figure 6).

In addition to unequal distribution, other two prominent characteristics of the Serbian medical workforce, of which the first is feminization (female workers were 76.7% of all workers), and the second is aging (staff younger than 35 years comprise 26.9% of all workers).[41]

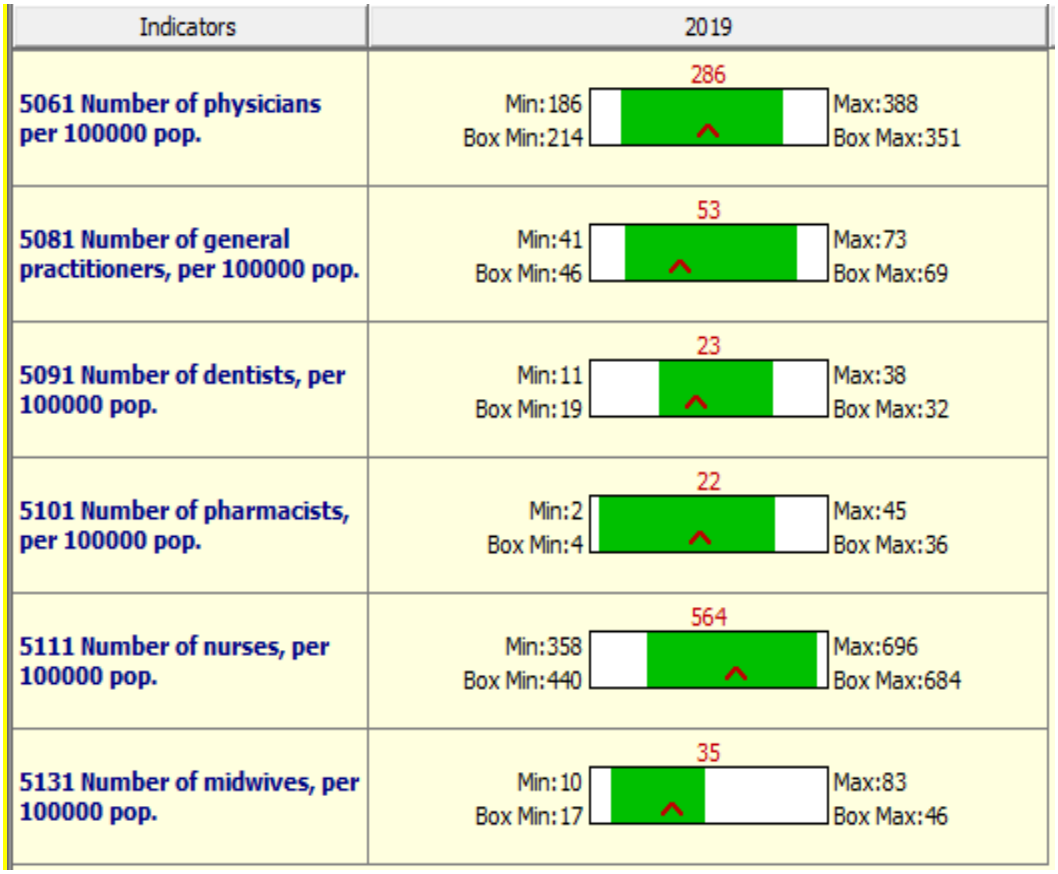
[38]https://data.stat.gov.rs/Home/Result/SDGUN031201?languageCode=en-US&displayMode=table&guid=d4e5ebf5-96a1-42c5-bbf6-448485b16c4d

[39] https://apps.who.int/iris/bitstream/handle/10665/250330/9789241511407-?sequence=1

[40] *Santric-Milicevic M, Vasic M, Edwards M (2015). Mapping the governance of human resources for health in Serbia. Health Pol.119:1613–1620. Ili Ibid*

[41]Santric-Milicevic M, Vasic M, Edwards M (2015). Mapping the governance of human resources for health in Serbia. Health Pol.119:1613–1620.

Figure 6. District and national health workers densities in Serbia in 2019



Note: Green represents 90% of district values and national densities are marked with ^

The data on the structure and work of health workers in the private sector refer to data collected from private institutions that have fulfilled their legal obligation and submitted data to the relevant institutes of public health in 2017 and 2018. In total, there were 2,868 institutions with 8,245 employees of which 2,296 were physicians, 3,573 nurses and medical technicians, 2,092 stomatologists, 526 pharmacists and 31 health associates. Their distribution varies across districts, from zero workers in most districts to 679 physicians, 882 nurses /health technicians and 779 stomatologists providing outpatient (ambulatory) care services in the Belgrade district, and 190 pharmacists in the South Bačka district. However, these data should be checked with record of the health workers chambers, as it is hard to believe that no pharmacists in the private sector were employed in the Belgrade district at that time.

- Basic benefit package

The statutory benefits package is broadly defined in the 2005 Health Insurance Law and includes, in addition to the right to all types of health care services, the right to compensation of earnings during temporary absence from work due to illness and reimbursement of transport costs related to use of health care by the insured person. The right to health care covered by compulsory health insurance specifically includes:

- measures for the prevention and early detection of diseases;
- examinations and treatment of women in relation to family planning, as well as during pregnancy, childbirth and maternity, up to 12 months after delivery;
- examinations and treatment in case of illness and injury;
- examinations and treatment of dental diseases;
- medical rehabilitation in case of illness and injury;
- medicines and medical devices; and devices for movement, standing and sitting, aids for vision, hearing, speech, dental allowances, and other aids.

- Health financing

In 2018, total health spending reached 8.55% of GDP, at 1 437 US$ per capita spending. Public expenditure on health has steadily increased in the last five years, and in 2018, the public share of total expenditure on health was 60.0%, and private expenditure was 40.0%. In 2018, Serbia spent 8.55% of GDP in health, and per capita spending was 1 437 US$ (PPP). Health expenditure per capita is still one of the lowest in the WHO European Region. However, there has been an important increase in spending on health in absolute terms: total health expenditure per capita increased from 1275 US$ (PPP) in 2015, to 1437 US$ (PPP) in 2018. Health financing from public sources is based on a nationally pooled health insurance system, with compulsory health insurance accounting for 94% of public expenditure on health.

Table 7. Selected indicators on health expenditures in Serbia, last available data

Indicators	2015	2016	2017	2018
Total expenditure on health (THE) as % of GDP	9.40	8.98	8.76	8.55
General government expenditure on health (GGHE) as % of THE	58.1	58.0	57.6	60.0
Private sector expenditure on health (PvtHE) as % of THE	41.9	42.0	42.4	40.0
GGHE as % of General government expenditure	12.0	11.7	11.7	12.5
Social security funds as % of GGHE	93.9	93.9	94.0	93.6
Prepaid and risk-pooling plans as % of PvtHE	1.0	1.4	1.7	2.0
Private households' out-of-pocket payment as % of PvtHE	96.8	96.3	96.0	95.9
Total expenditure on human resources on health as % of THE	51.9	51.6	52.2	50.3
Total expenditure on health / capita at international dollar rate	1275	1261	1319	1437
General government expenditure on health / cap int. $ rate	741	732	760	863

Private health expenditure is related to expenditure in voluntary health insurance (VHI), out-of-pocket OOP expenditure, and other private health expenditure. Private expenditure on health in 2018 reached 40.0% of total health expenditure, which is slightly lower than in 2015. In 2018, private expenditure on health was 40.0%. The main share of private expenditure is OOP expenditure, reaching 95.9% in 2018, while VHI accounted for 2% of private expenditure on health in 2018. The 2018 Household Budget Survey determined that 4.4% of household revenue was spent as OOP expenditure on health in 2017[42]. It does not provide information on which percentage of this amount comprises OOP user fees and which percentage comprises informal payments.

[42] SIPRU, 2018.

II. Mapping medical deserts

A. Methodology (description of the complete research methodology applied at country level

- Desk review

Desk review has included literature review based on the literature review guideline developed by CHPS and selected key terms and publications. The literature review has resulted in an initial definition of a medical desert which is to be further investigated and improved.

We searched the available literature in Serbian language or articles coming from the Serbian geographic area on Google Scholar for the key terms that we identify in part A, and we repeat the process for the list below (all translated in Serbian language).

1. "medical deserts"
2. "medical density"
3. "distance to GP"
4. "patients per GP"
5. "time to a healthcare provider."
6. "distance to a healthcare provider"
7. "distance to emergency health services"
8. "disparities in access to health care"
9. "physician shortage"
10. "health care deserts"
11. "telehealth"
12. "telemedicine"
13. "ambulance intervention time"
14. "ambulance arrival time"
15. "equitable access to healthcare"
16. "patient-doctor/ nurse ratio"
17. "mobility of health workers"

The review of the literature which was searched and selected by the responsible AHEAD WP4 partners, however, has not suggested specific definition of the medical deserts, and unfortunately none of the proposed articles were dealing with medical deserts or specific terms related to medical deserts or medical desertification. Therefore, Serbian partners have done additional search within the literature published up to 2020, with key terms such as:

1. access to health care,
2. health services accessibility
3. health workforce availability
4. health care (related) inequalities,
5. unmet health care needs
6. health disparities
7. remote health care

The selected articles were revised and main findings presented to AHEAD partners.

In the next step, the desk review included an analysis of main policies affecting and addressing medical deserts as well as of main results of the national articles, and the "grey literature". Furthermore, a stakeholder analysis has been undertaken to identify the stakeholders to be interviewed at different policy levels and in different policy areas (Box 4.).

BOX 4. Final list of stakeholders considered for consultations, in-depth interview and survey on medical deserts in Serbia.

1. Union of patient organizations
2. HIV organization
3. Patient organization of Serbia
4. Patient organization HELP
5. Partner organizations of the National Health Insurance Fund
6. Continuous conference of cities and of local municipalities
7. Government of the Republic of Serbia
8. National Alliance for Local Economic Development (NALED)
9. Ministry of administration and local administration

10. Ministry of Finance
11. Ministry of Health
12. Health Insurance Fund of the Republic of Serbia
13. Health Council of the Republic of Serbia
14. Institute of Public Health of Serbia
15. Regional (Vojvodina) secretariat for Health
16. Minister for the improvement of development of underdeveloped municipalities
17. Ministry of education and higher education
18. Ministry of human rights, rights of minorities and societal dialogue
19. Ministry of labour, employment, veteran and social issues
20. Ministry for the care of family and demography
21. Ministry for rural areas
22. Minister for innovation and technological development
23. Union of local municipalities
24. Parliament of Serbia – Section of health and family
25. Ombudsman
26. World Bank
27. World Health Organization
28. United Nations Development Programme
29. US AID
30. Serbian Academy of Sciences and Arts (Department of Medical Sciences, Section for rural areas and villages)
31. ICT Health
32. Statistical office of Serbia
33. Insitute of Public Health of Serbia
34. National employment agency
35. Serbian Medical Chamber
36. Farmeceutical Chamber of Serbia
37. Chamber of Nurses of Serbia
38. Society of health workers of Serbia
39. Union of societies of nurses of Serbia
40. Union of societies of health workers of Serbia
41. Chamber of nurses of Serbia
42. Conference of academies and higher education institutions of Serbia
43. Chamber of health institutions of Serbia
44. Association of private health institutions

45. Chamber of stomatological doctors
46. National youth organization of Serbia
47. Health care providers- medical doctors and nurses
48. Medical and nursing students

- Data sources and study instruments

National statistical data were retrieved for the last available years from the various statistical reports, and publications of the data holders including the SORS databases (obtaining data on population size, by age, sex and NUTS3 regions), and the IPHS data sources (on the number of health workers and unmet needs by NUTS3 regions). Annex 1 contains the raw indicators used to identify localities (counties, NUTS3 level) with low access to health services.

-Tools used for the in-depth quantitative and qualitative research in a medical desert area

Protocol for selecting indicators

Based on the definition, one should consider at least three types of basic information that allows combining it into relevant indicators. All should be collected at least at locality level, localities being defined by current administrative units in each country (e.g. *Gemeente* in NL, *municipiu/oraș/comună* in RO and MD, *општине и градови* in SR, *comuni* in IT).

1. population data (adapted to Serbian data collection methodology, see Annexes):
    a. total number of inhabitants
    b. number of inhabitants by age groups:

    0-5 years

    5-9

    10-14

    15-19

20-24

25-29

30-34

35-39

40-44

45-49

50-54

55-59

60-64

65-69

70-74

75-79

80-84

85-89

90+ years

2. data on geography (where available):
    a. geolocation (XY codes) and/or latitude and longitude for each locality
    b. a matrix of distances on road between localities (not available in Serbia)
    c. a matrix of distance on rail between localities (not available in Serbia)
    d. a matrix of average time for travelling on roads between localities (not available in Serbia)
    e. a matrix of minimum travel time by public transportation between localities

(not available in Serbia)

3. data on provision of basic health care (where available):
    a. data on GPs: number of GPs and/or GPs practices by locality, average work time by GPs by locality (impossible to find), average distance to GPs by locality (available for NL)
    b. presence of emergency services
    c. intensive care beds (not available in Serbia)
    d. number of pharmacies (not available in Serbia)
    e. number of staff in the pharmacies (not available in Serbia)

4. data on provision of "Advanced health care" (where available):
    i. each country decides what is important in its context
    ii. Data is collected for each indicator similar to "basic health care"

Data sources

In Serbia, the search for data should include at minimum the following providers:

- the national statistics office
- the health insurance providers
- ministry of health
- NGOs active in the area
- Academic reports/papers/books/chapters that make use of relevant data
- Eurostat data

Resulting database

The resulting database was structured as a double entry table, with localities on the rows, and traits for each locality on the columns. The columns will include, at minimum, the following variables:

- Statistical code of the geographical unit (e.g. GM code in NL, SIRUTA in RO)
- Name of the locality
- District/county

- Geographical coordinates (lat/long and/or XY coordinates)
- Population divided by the above-mentioned categories
- data on provision of basic health care:
    a. data on GPs:
        i. number of GPs and/or GPs practices by locality,
        ii. average distance to GPs by locality (available for NL)
    b. presence of emergency services
    c. intensive care beds
    d. number of pharmacies
    e. number of staff in the pharmacies
    (b-e should be treated identical to a)

- data on provision of "Advanced health care":
    i. each country decides what is important in its context.
    ii. Data is collected for each indicator similar to "basic health care"

The MDDT tools used for in-depth qualitative research in a medical desert area were translated into Serbia language, culturally adopted and prepared for distribution. An example of the structured interview for in-depth quantitative and qualitative research is presented in Annex 2, while the survey questionnaire translated in Serbian language is attached in Annex 3.

-Sampling criteria and methodology to select the medical deserts or areas at risk for case studies

Formulas depicted in the report on literature review should be used to combine the row data into indicators of access to health care. Each indicator is depicted graphically into a map, and categorized into "medical desert", "close to desertification", "no sign of desertification". The thresholds for considering an area as a desert include usage of empirical and theoretical knowledge as explained in the literature review and according to national standards / normative.

In the end, the outcome for this step is a database that includes both the initial (raw) indicators (described above) and the resulting indicators for desertification.

The resulting indicators for desertification are considered for selecting case studies for the interviews in Steps 3 and 4, and for the survey in Step 5.

After the interviews and the survey, the thresholds for computing indicators will be revised and a revised database will be used for the validation in step 6.

Although we have collected the raw indicators available in the Serbian context, we are yet to apply, with the WP4 leaders, the methodology of creating indexes of desertification and calculate the MDDT index in Serbia.

Sampling criteria for case studies

To select the case studies and the locations of interviewees in Steps 3-5, one needs the initial classifications. For each country, the bottom 10% of cases in terms of access to health care (that is the localities that are at the top of desertification index for the respective country) are selected for interviews and survey.

Firstly, the top 3 localities are selected for interviews in Steps 3 & 4. Then, during the recruiting phase (step 3), representatives from the most deserted locality is considered. If all three interviews planned for local level (see Step 3) can be carried out, they should be carried out and the selection procedure stops here. If it is not possible to find three local representatives that are available and are willing to be interviewed, the second locality in the list is considered. If one cannot carry out the interviews in this locality, the third one is considered. Normally, the probability that there is impossible to carry out the interviews in each of the Top 3 localities is quite low. However, if the risk of not finding interviewees in the same locality occurs, one should continue the selection procedure until the criteria that all three local representatives are from the same area is fulfilled.

Let note that the criteria to have all local representatives focused on the same locality is important in order to have a comprehensive view over the respective case study.

For the survey, top 10% of deserted localities in each country should be selected.

Content for case studies

A case study will minimally consist in:

- Depicting the locality based on the indicators computed using the collected data.
- Collecting recent (last 3 year) media reports about medical situations in the respective locality. Local media is particularly relevant.
- Interviews with stakeholders in the respective localities.

After computing indicators of health care provision, one should decide from which threshold one can consider a locality as subject to desertification. More precisely, based on definition, the team collects the data, and calculates indicators of desertification, as described in the previous section. Then, one should decide the value below (or above) which a place is considered as desert.

Two strategies could be employed:

1. Statistical:
    a. One can consider statistical thresholds, relative to the mean in each country. For instance:
        - Three standard deviations bellow the mean ➔ severe desertification
        - Two standard deviations bellow the mean ➔ severe desertification
        - Everything else below the mean ➔ potential desertification
    b. Instead of mean, in case of skewed or non-normal distributions one can use the median. For instance:
        - 90% below the median ➔ severe desertification
        - 80% below the median ➔ severe desertification
        - Everything else 60% below the median ➔ potential desertification
2. Based on existing standards/judgements:

a. This implies asking key stakeholders on thresholds and deriving thresholds based on such interviews
b. Also, one can consider the national legislative provision for a basis to derive thresholds

In any case, the decision about how to deal with the issue needs legitimacy, The best provision of legitimacy is consultation with key stakeholders, that can be done not only while considering the second strategy, but also in the first one. Even more, the two strategies (and their sub-strategies) could be considered not as exclusive, but complementary.

Furthermore, while the above strategies apply to each indicator (e.g. GPs, pharmacists, gynaecologists, etc.), they actually lead to defining an area as medical desert for the respective indicator.

However, one can be interesting in an overall desertification. This means that one should consider how to combine several indicators in a single one. For instance, if a locality is in a medical desert based on 3 criteria out of 8, is it a medical desert or not?

The recommended tool is to carry out discussions (interviews) with key stakeholders. The following two sections specify how to select the interviewees, and which questions should be included in the interview protocol.

Resuming the above considerations, it is important to observe that the aim of the entire exercise is to document quality of classification and to refine it (changing thresholds and ways to combine indicators), and to increase legitimacy by making the tool for desertification known to stakeholders.

Protocol for selecting stakeholders

(1) type of interviewees

Considering the need for information and the need for relevance, one needs to consider discussing with local and central-level stakeholders, with service providers

(hospitals, GPS, etc.), receivers of health care (patients), regulators (public authorities), independent stakeholders (NGOs).

This simply means that two basic criteria need to be combined: the type of stakeholder (regulator, service providers, patients, NGOs) and the localization (central vs. local/regional).

(2) Number of cases to be selected

There are two perspectives to be considered:

- On one hand, the aim of the exercise is to document with potential inputs the classification, and to increase legitimacy of the endeavor. Both indicate that one needs relevant cases, not representativeness, and in-depth interviews are the most suitable tool in this respect.
- On the other hand, one needs to consider the available resources, in terms of time and human resources.

Considering both perspectives, one case study per country, and six interviews per case study should suffice to provide the necessary information.

(3) selection of interviewees

The interviews are to be carried out with:

- 1 representative of patient associations, central level
- 1 representative of public authorities at central level
- 1 representative of public authorities in the locality/district potentially affected by desertification (that have at least one dimension on which could be considered as medical desert) [local level]
- 1 representative of health insurance agencies (regional/local – in the area of potential desertification)
- 1 representative of physicians (regional/local – in the area of potential desertification)
- 1 representative of NGOs active in the area of health policy [central level]

Given that the number of such persons at local level is not high, one should use the following guidelines for selection:

- Public authority: the selected person could be the public clerk in charge with health issues, or the mayor/vice-mayor, or a local counselor.
- Physicians: the selected person could be from the local branch of Physicians Associations/Colleges, or simply a GP in the area or a doctor in the nearby hospital (if such hospital exists).
- health insurance agencies: if there is a local branch, should be one from this branch, otherwise should be from the district/county/regional level. The selected person should have some decision-makers roles in the organization.

The central-level interviewees should be selected based on existing contacts in central-level organizations. Let remember that this component of the project does not consider representativeness but being productive in terms of ideas and feedback from the existing tool, as well as to increase legitimacy. This means that a very strict criterion for selecting the interviewees is not necessary.

Outputs for step 3

Tables 8.1 to 8.7 present the lists of localities (at NUTS3 level) proposed for case studies, based on the raw indicators, and ranked from the worse (e.g. lowest number of health personnel) to the best values, in terms of physical availability.

Table 8.1. Total number of Health Centres per 100.000 populations arranged from the lowest to the highest value.

County (NUTS3)	Tot Health Centres per 100.000 pop
Beograd	0,94
Podunavski	1,64
Raski	1,65
Severnobacki	1,69

Juznobacki	1,78
Nisavski	1,96
Moravicki	2,04
Zapadnobacki	2,37
Sremski	2,37
Sumadijski	2,51
Jablanicki	2,55
Rasinski	2,74
Juznobanatski	2,91
Srednjebanatski	2,91
Macvanski	2,91
Pomoravski	3,08
Pcinjski	3,59
Borski	3,66
Kolubarski	3,74
Zlatiborski	3,81
Zajecarski	3,83
Severnobanatski	4,48
Pirotski	4,85
Toplicki	4,87
Branicevski	4,91

Excluding large urban areas (e.g. the city of Belgrade) the counties with the lowest number of Health Centres per 100.000 population are Podunavski, Raški, Severnobački and Južnobački.

Table 8.2. Total number of GPs per 100.000 populations arranged from the lowest to the highest value.

County (NUTS3)	Number of GPs per 100.000 pop 2020
Macvanski	34
Kolubarski	34
Toplicki	34
Borski	35
Moravicki	38
Podunavski	39
Pomoravski	43
Zapadnobacki	43
Zlatiborski	45
Severnobanatski	47
Rasinski	48

Beograd	49
Pirotski	50
Juznobacki	51
Sremski	52
Raski	52
Republika Srbija	52
Branicevski	53
Severnobacki	54
Jablanicki	54
Srednjebanatski	55
Zajecarski	56
Juznobanatski	60
Nisavski	81
Sumadijski	82
Pcinjski	94

Counties with the lowest number of GPs per 100.000 population are Mačvanski, Kolubarski, Toplički, and Borski.

Table 8.3. Total number of GPs per 100.000 population over the age of 20 (served by GPs) arranged from the lowest to the highest value.

County (NUTS3)	Number of GPs per 100.000 pop 2020
Kolubarski	41
Macvanski	42
Borski	42
Toplicki	42
Moravicki	47
Podunavski	49
Pomoravski	52
Zapadnobacki	52
Zlatiborski	56
Severnobanatski	58
Rasinski	58
Pirotski	59
Beograd	61
Sremski	64
Juznobacki	64
Branicevski	65

Republika Srbija	65
Zajecarski	66
Severnobacki	66
Jablanicki	67
Srednjebanatski	68
Raski	69
Juznobanatski	74
Nisavski	100
Sumadijski	101
Pcinjski	121

Counties with the lowest number of GPs per 100.000 population over the age of 20 are Kolubarski, Mačvanski, Borski, and Toplički.

Table 8.4. Total number of obs-gin physicians per 100,000 female population 2019 arranged from the lowest to the highest value.

NUTS3	Number of obs-gin physicians per 100,000 female population over 14 in 2019, Serbia NUTS3 level
Zapadnobacki	16
Sremski	19
Severnobacki	20
Zajecarski	20
Juznobanatski	22
Moravicki	24
Pirotski	24
Macvanski	24
Rasinski	25
Juznobacki	26
Kolubarski	27
Srednjebanatski	27
Raski	27
Severnobanatski	27
Podunavski	28
Jablanicki	28
Borski	30
Zlatiborski	31
Toplicki	32
Nisavski	33

Branicevski	33
Pomoravski	36
Sumadijski	37
Pcinjski	38
Beograd	39

Counties with the lowest number of obs-gyn physicians per 100.000 female population over the age of 14 are Zapadnobački, Sremski, Severno bački, and Zaječarski.

Table 8.5. Total number of pediatric physicians per 100.000 patients younger than 20 arranged from the lowest to the highest value.

County (NUTS3)	Number of ped physicians per 100.000 patients younger than 20 y.o.
Srednjebanatski	60
Juznobanatski	73
Zapadnobacki	73
Severnobacki	80
Sremski	80
Raski	93
Rasinski	95
Jablanicki	96
Kolubarski	103
Severnobanatski	105
Branicevski	113
Macvanski	116
Pcinjski	117
Moravicki	120
Republika Srbija	121
Juznobacki	124
Podunavski	128
Borski	130
Zlatiborski	131
Beograd	140
Zajecarski	147
Pomoravski	156
Nisavski	159

Toplicki	163
Sumadijski	169
Pirotski	178

The counties with the lowest number of pediatric specialists per 100.000 population under the age of 20 are Srednjebanatski, Južnobanatski, Zapadnobački, and Severnobački.

Table 8.6. Total number of nurses (excluding midwives) per 100.000 population arranged from the lowest to the highest value.

County (NUTS3)	Number of nurses, per 100000 pop.
Sremski	358
Zapadnobacki	440
Moravicki	449
Severnobacki	455
Podunavski	456
Rasinski	457
Pcinjski	467
Macvanski	472
Jablanicki	488
Raski	495
Zlatiborski	518
Srednjebanatski	520
Kolubarski	527
Juznobanatski	545
Severnobanatski	559
Republika Srbija	564
Juznobacki	570
Branicevski	573
Pirotski	573
Sumadijski	584
Pomoravski	594
Toplicki	619
Nisavski	647
Borski	678
Beograd	684
Zajecarski	696

Counties with the lowest number of nurses (excluding midwives) per 100.000 population are Sremski, Zapadnobački, Moravički, and Severnobački.

Table 8.7. Total number of physicians of surgical specialty per 100.000 population arranged from the lowest to the highest value.

County (NUTS3)	Num physicians (surgical) per 100.000 population
Sremski	22
Zapadnobacki	25
Srednjebanatski	26
Macvanski	28
Juznobanatski	30
Severnobacki	30
Rasinski	30
Raski	31
Jablanicki	32
Severnobanatski	32
Pcinjski	33
Branicevski	34
Zlatiborski	34
Pirotski	35
Podunavski	35
Kolubarski	35
Moravicki	35
Toplicki	37
Zajecarski	40
Republika Srbija	45
Pomoravski	46
Borski	49
Juznobacki	51
Sumadijski	56
Beograd	64
Nisavski	72

Counties with the lowest number of physicians of the surgical specialty per 100.000 population are Sremski, Zapadnobački, Srednjebanatski, and Mačvanski.

B. Media analysis based on the most recent media reports about medical situations in the case study area(s) - main findings *per country* and per the selected county(counties)

- How are medical deserts in Serbia covered in media:

- Serbia in general most commonly addressed
- Srednjebanatski (Zrenjanin) county and municipality often covered
- Podunavski county sometimes mentioned (Smederevo municipality)
- Mačvanski county sometimes mentioned (Šabac municipality and surrounding villages)
- Other regions get no or low media attention

- Common themes

A. Common problems (or how medical deserts are described in the media)
   - Lack of medical doctors (and nurses, but less common), mostly in primary care
   - Low density of doctors or more often average number of patients per doctor/nurse (but in general terms, not specific for any specialty, level, population)
   - Lack of medical facilities, mostly primary care, but also emergency care (together with long travel)
   - Long travel time to medical facility, either because of the lack of facility nearby or lack of specific doctor in that facility
   - Doctors available only on specific days, or during short periods of time (e.g. only in the morning)
   - Long waiting time to see a doctor or make an appointment
   - Operations postponed, delayed, moved to another facility
   - Lack of specialist doctors in general hospitals (secondary healthcare)
   - Periodic/Seasonal inability to access due to weather conditions, bad roads, etc.

B. Common source of problem (root cause)
    - State ban/policy of no new employments in the public sector most commonly mentioned
    - No long-term strategy for the medical workforce planning/development
    - Disproportionate number of non-medical personnel (usually connected to political hiring, some mention construction workers, PE teachers, painters hired as permanent staff) in medical facilities
    - Short term contracts for medical personnel (e.g. 6 month contracts which are renewed each 6 months for years)
    - Doctors moving and/or asking for jobs at bigger centres
    - Doctors migrating to other countries
    - Specialists not continuing to work in their hospital/centre after specialization (usually paid by their centre, but later they move to another medical facility and the centre remains without the specialist)
    - Bad infrastructure, lack of facilities, roads, maintenance of roads

C. How they cope with the problem now
    - Hiring retired doctors
    - Specialists from a nearby hospital come to another health facility to help/work part time
    - Integrating primary and secondary healthcare? (some articles mention this would shorten the time needed to arrive to a specialist)

D. Common solutions proposed or implemented
    - Lifting the ban on public health system hiring
    - Hiring more medical personnel as opposed to non-medical personnel
    - Better planning of specialists to be educated (mentioned: "you need 10 years to have a good independent specialist")

The media coverage of counties or localities with low access to medical services is usually general, with some specific counties more often mentioned, such as

Srednjebanatski, with the city of Zrenjanin, Podunavski, with the city of Smederevo, and Mačvanski, with the city of Šabac. Although other regions might be at risk of becoming medical deserts in Serbia, they are rarely covered in Serbian Media.

Medical deserts are commonly identified as places where there is a lack of doctors (in general or of specific specialties), often there is a discussion about the density of doctors, lack of medical facilities, and long travel to medical facilities. As some effects, there is mention of operations being postponed and difficulties regarding making appointments with the doctors.

Most commonly, as the source of the problem, the media and their interviewees identify the state ban on public hiring as part of saving policy, the lack of long term strategy for health workforce planning/development, disproportionate number of non-medical personnel hired in healthcare facilities, and health personnel unsatisfied with their working conditions (contract, hours) and migrating to other places.

C. Results: The case study of a medical desert (an in-depth research of a medical desert at local level)

Objectives of the case study research were the following:

- To see how access to medical services (primary and specialized) are covered (or not) in each area. Most specifically if the elements for medical desertification can be identified in that text (limited number of HCW, high distance to the nearest point of service, long waiting time, lack of certain critical medical specializations in the area, which ones etc)
- To identify the most prevalent elements for medical desertification, based on what was already known 10 000 population on medical desert from the literature review.

In addition, we look for getting respondents opinion regarding possible solutions to medical desertification and responsible entities.

III. County context

Within this study, total of nine maps were developed with the latest available data. These nine maps (www.ahead.health) include:

1. Map presenting the number of GPs per 10 000 population in settlements of Serbia (GP in Serbia is covering the needs of population aged 20 years and over),
2. Map presenting the number of GPs per 100 000 population NUTS 3 level (GP in Serbia is covering the needs of population aged 20 years and over),
3. Map presenting the number of specialists physician per 10 000 population, in settlements of Serbia
4. Map presenting the number of nurses and midwives per 10 000 population, in settlements of Serbia
5. Map presenting the number of nurses per 100000 population, NUTS3 level of Serbia
6. Map presenting the number of primary health care centres per 100 000 population, NUTS 3 level in Serbia
7. Map presenting the number of gynaecologists per 100000 female population aged 15 years and over, NUTS 3 level in Serbia
8. Map presenting the number of paediatricians per 100 000 population of age 0-19 years, NUTS 3 level in Serbia
9. Map presenting the number of surgeons per 100 000 population, NUTS 3 level in Serbia.

Figure 7.1-7.9. Mapping the localities (NUTS3 and LAU 1 of Serbia) according to the density of health workers (the AHEAD-MDDT indicator of medical deserts)

Note: Grey areas illustrate areas with no adequate data.

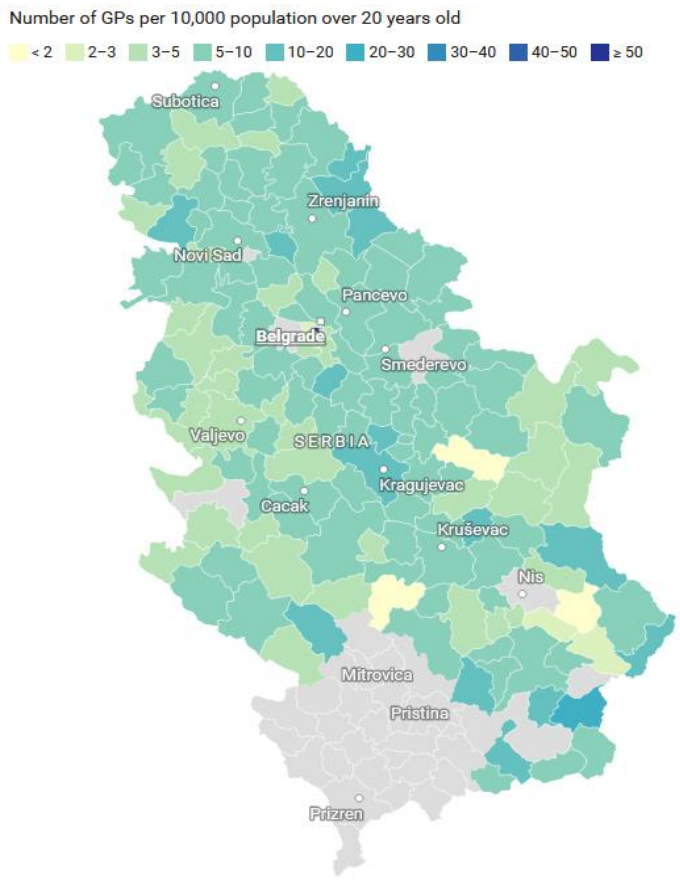


Figure 7.1.

Potential medical deserts are located throughout Serbia, mainly in the NUTS2 region- South and Eastern Serbia, where the LAU1 municipalities Despotovac (Pomoravski district NUTS3), Brus (Rasinski district NUTS3) and Bela Palanka (Pirotski district NUTS3) stand out by the worst density of general practitioners per 10.000 population, i.e. with less than 2 GPs/10000 (Figure 7.1)

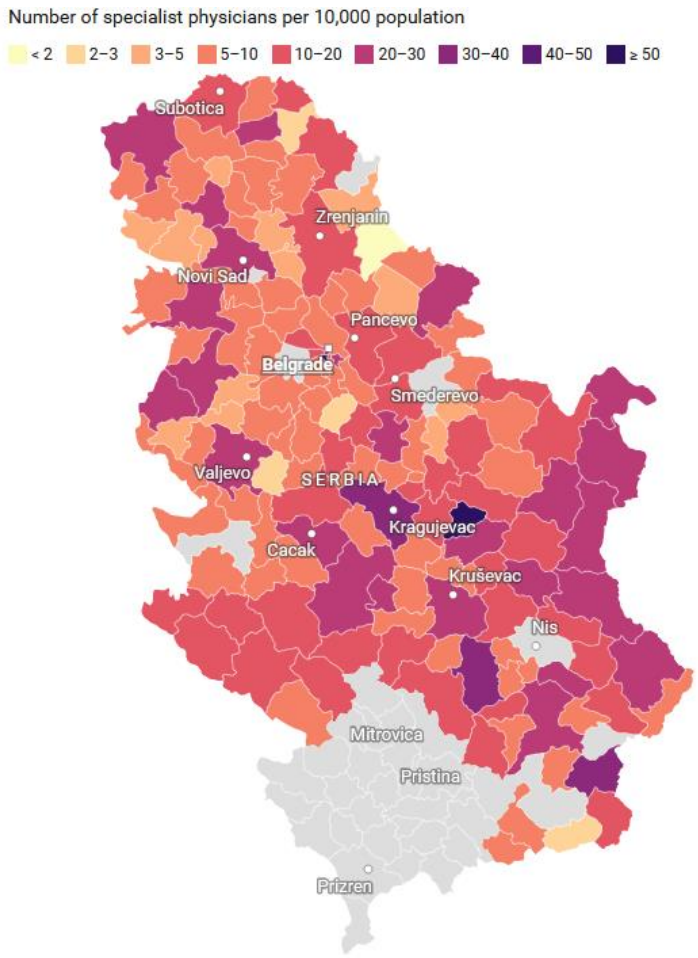


Figure 7.2

Potential medical deserts are located throughout Serbia, mainly in the NUTS2 region- Vojvodina, where the LAU 1 Sečanj (NUTS3 Central Banat district) stands out with less than 2 physicians specialists per 10000 population, and Čoka (NUTS3 North Banat district), with 2-3 physicians specialists per 10000 population.

In the NUTS2 Belgrade, there are LAU1 Sopot with 2-3 physicians specialists per 10000 population.
With 2-3 physicians specialists per 10000 population are also localities in the NUTS2 Šumadija and Central Serbia, LAU1 Mionica (NUTS3 Kolubara district),
and in the NUTS2 South and Eastern Serbia, there are LAU1 Trgovište (NUTS3 Pčinjski district) (Figure 7.2).

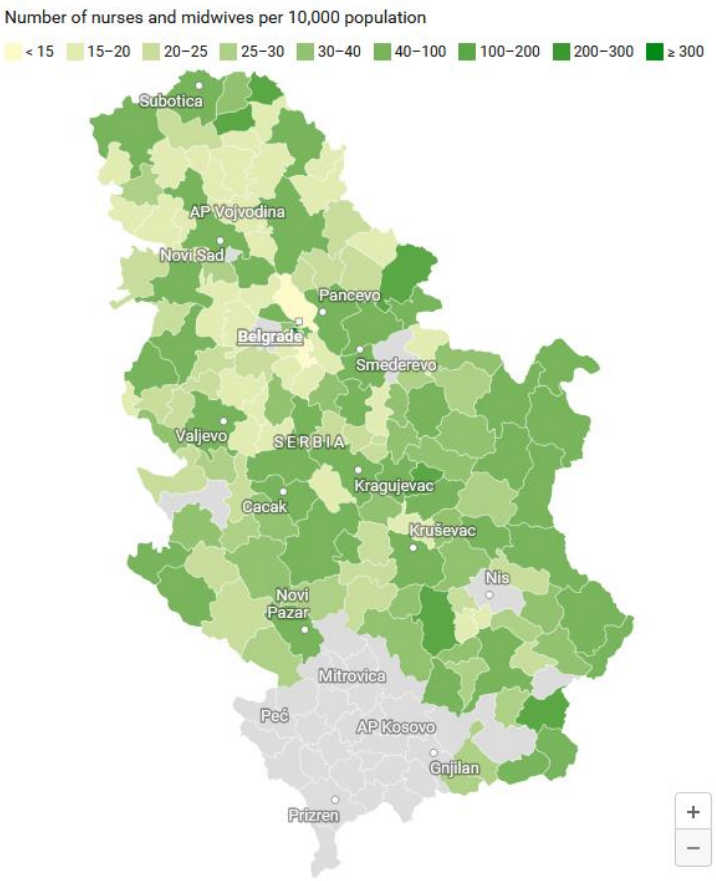


Figure 7.3

Potential medical deserts are located throughout Serbia, mainly in the NUTS2 region- Vojvodina, where many LAU 1 have less than 2 nurses per 100 000 population. (Figure 7.3).

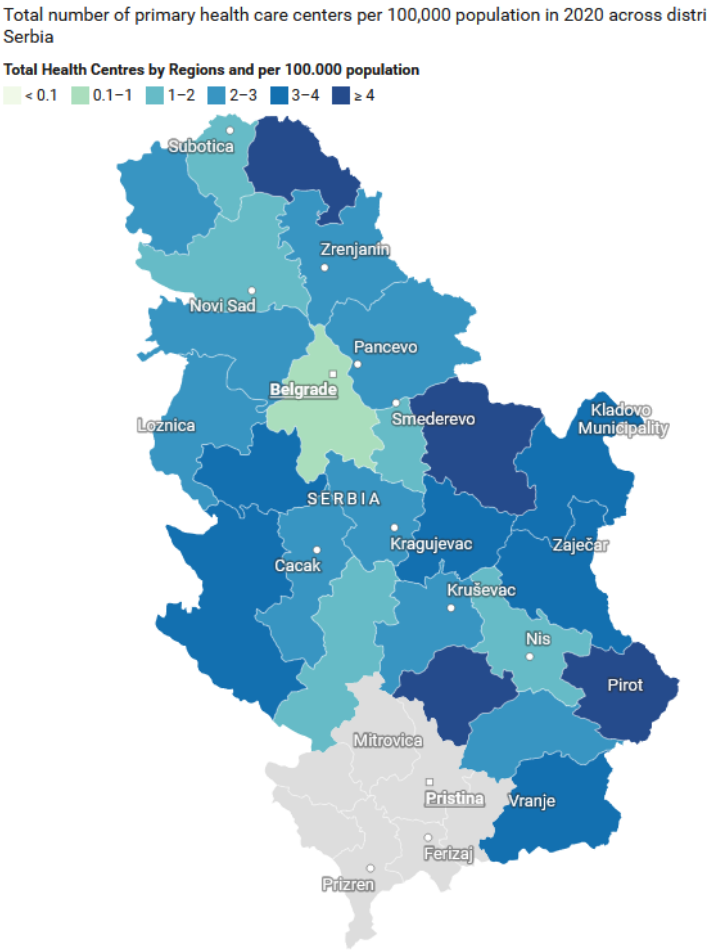


Figure 7.4

Although it looks like NUTS3 Belgrade has the smallest number of primary health care centres per 100 000 inhabitants, this is not true in reality as each primary health centre has its own stations and ambulance posts in all municipalities (Figure 7.4). That is why in the previous figure (Figure 7.3) a low number of nurses (less than 1.5 nurses/100 000) was identified in two large municipalities of Belgrade city (LAU1 Palilula, and LAU1 Voždovac) covering urban, suburban and rural areas of the municipality.

The map shows the Total number of general practitioners per 100,000 population (of age 20 years and more) in 2020 across districts in Serbia. Health Statistical Yearbook 2020. Belgrade: IPHS, 2021.

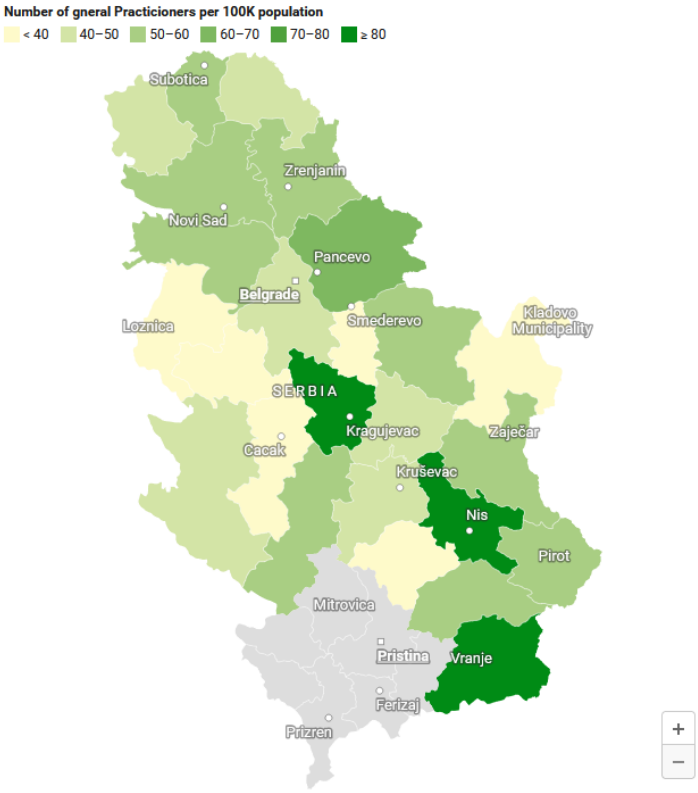


Figure 7.5

The smallest number of GPs per 100 000 inhabitants (i.e. less than 40 GPs/100000) is identified in the South and Eastern Serbia - NUTS3 Toplički and Borski district, and in the Šumadija and Western Serbia - Kolubarski, Mačvanski, and Podunavski district (Figure 7.5).

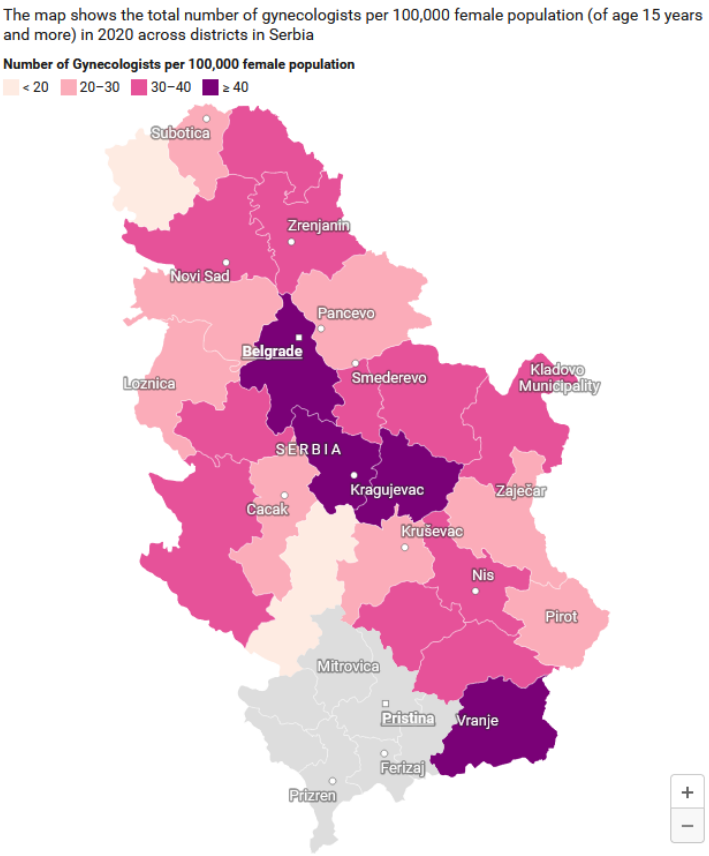


Figure 7.6

The two districts were identified with less than 20 gynaecologists per 100,000 female population (of age 15 years and more) in 2020: In Vojvodina – it is NUTS3 Zapadnobački district, and in the Šumadija and Western Serbia - NUTS3 - Raški district (Figure 7.6).

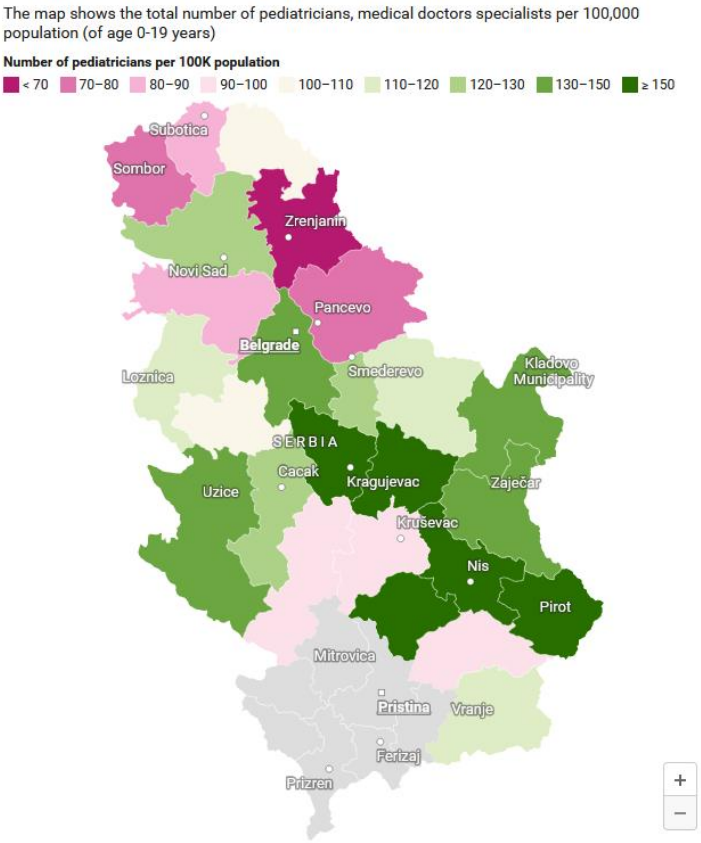


Figure 7.7

The smallest number of paediatricians, medical doctors specialists per 100 000 inhabitants (i.e. less than 70/100000) is identified in Vojvodina – NUTS3 Srednjebanatski district (Figure 7.7).

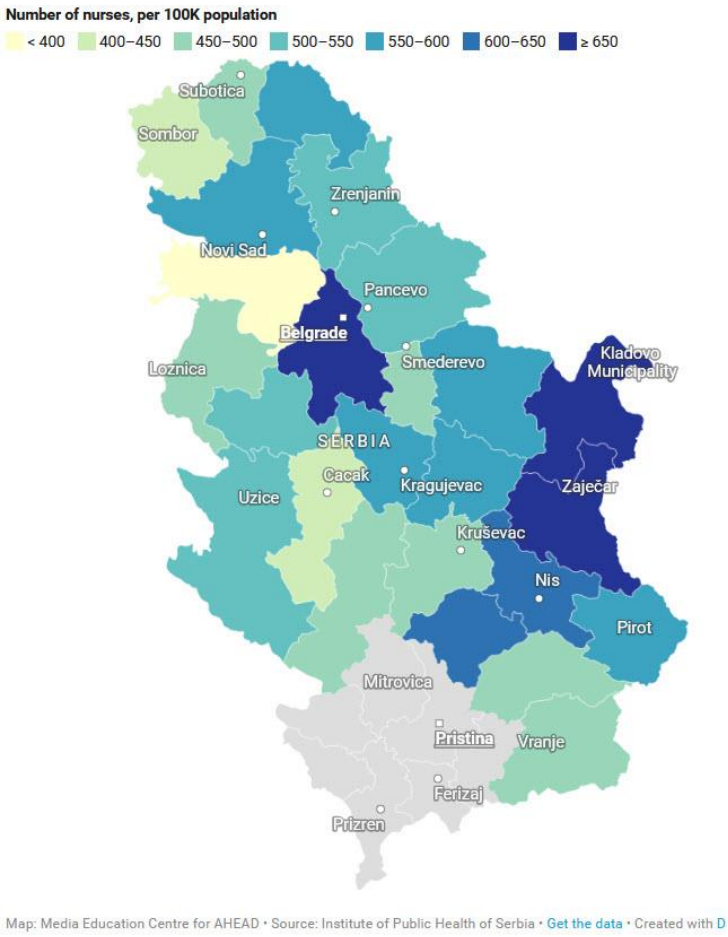


Figure 7.8

The smallest number of nurses per 100 000 inhabitants (i.e. less than 400 nurses/100000) is identified in Vojvodina – NUTS3 Sremski district (Figure 7.8).

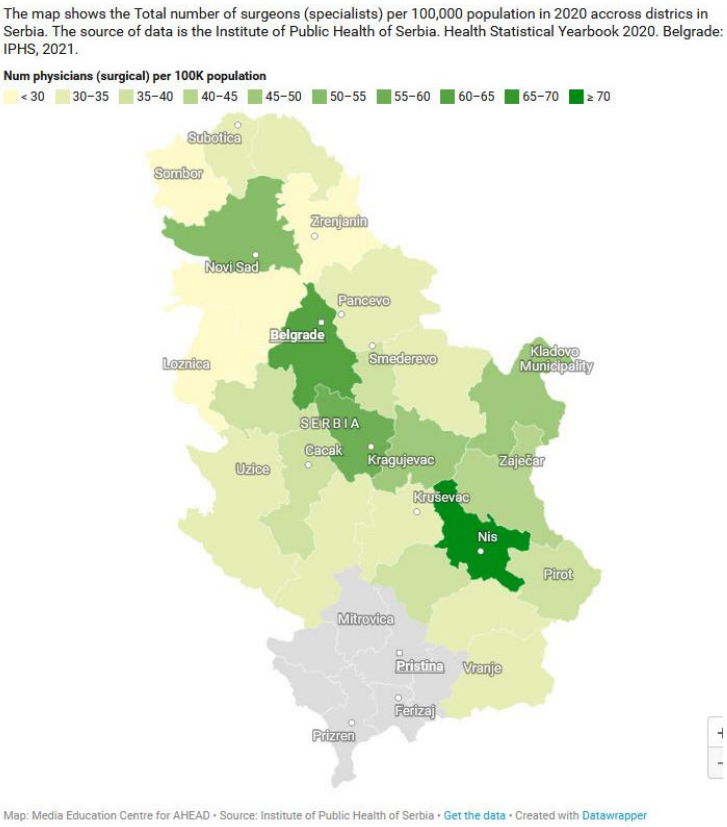


Figure 7.9

The smallest number of physicians (surgical) per 100 000 inhabitants (i.e. less than 30 physicians (surgical)/100000) is identified in Vojvodina - NUTS3 Severnobački, Srednjebanatski, Sremski and Mačvanski district (Figure 7.9).

In the absence of calculated MDDT index for Serbian data, but according to the available raw data, media analysis, as well as a previously developed multi-criteria approach [43], Mačvanski, Podunavski, and Srednjebanatski counties were selected as case study districts potentially identified as medical deserts. Raw MDDT indicators and calculated values are extracted from the Health Statistical Yearbook of the Republic of Serbia and computed using the National Patient Satisfaction Survey of the Institute of Public Health. The identified districts might change once the MDDT index is calculated for the Republic of Serbia.

The following radar diagrams show the different "faces" or "forms" of medical deserts in the selected districts.

[43] Mandić-Rajčević et al. 2022. Submitted for publication.

Figure 8.1 Radar diagram of Mačvanski district showing areas where this district might be categorized as a medical desert (higher number indicates more criteria identified as potentially problematic provision of health care)

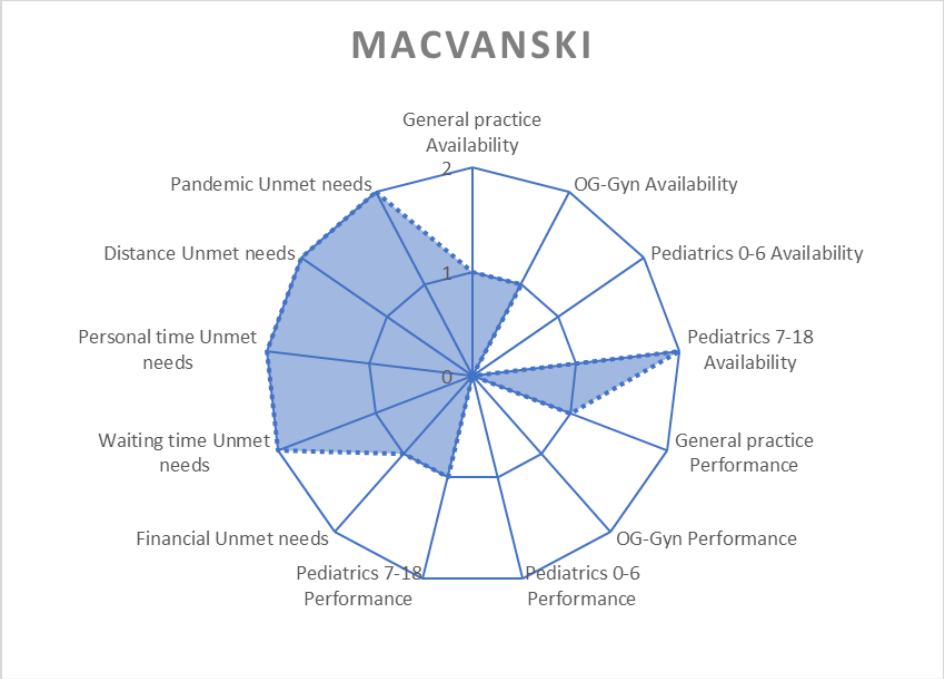


Figure 8.2 Radar diagram of Podunavski district showing areas where this district might be categorized as a medical desert (higher number indicates more criteria identified as potentially problematic provision of health care)

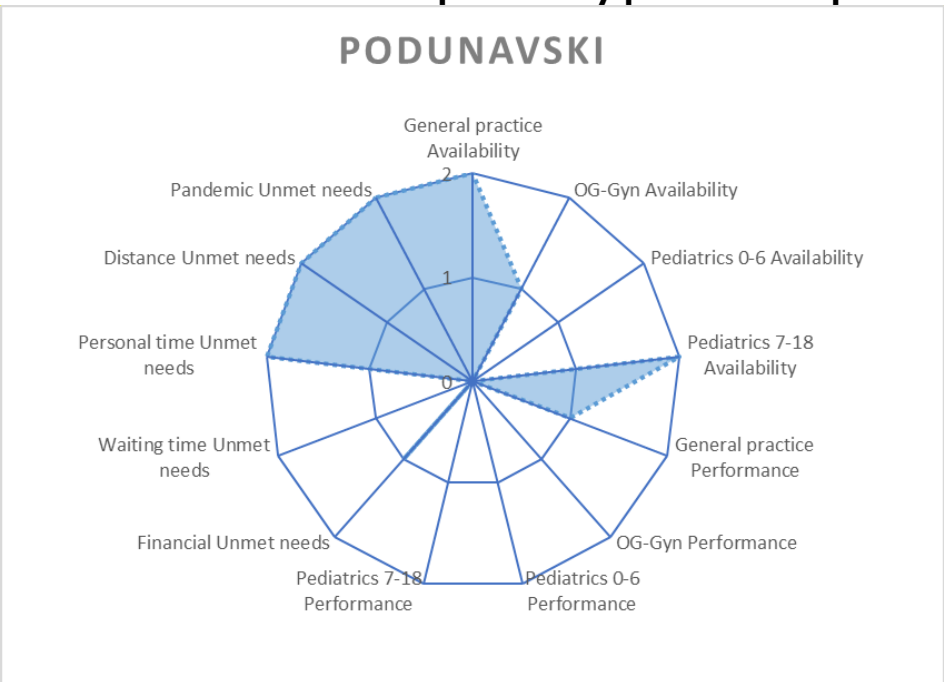
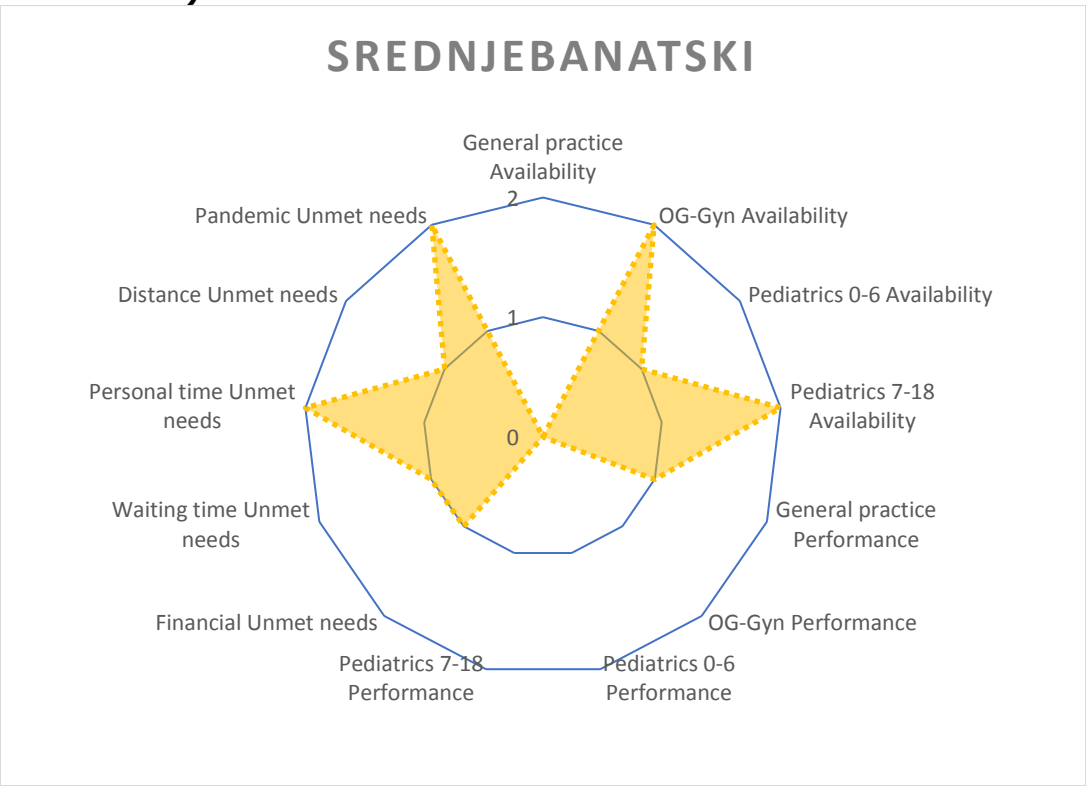


Figure 8.3 Radar diagram of Srednjebanatski district showing areas where this district might be categorized as a medical desert (higher number indicates more criteria identified as potentially problematic provision of health care)



The in-depth interview methodology was applied as suggested by MDDT, including criteria used for selecting the stakeholders for the interviews in each locality (annex 5 with the Interview guide). In brief, an in-depth interview has taken approximately 60-120 minutes per interview. The first interviews were individual, as it was not possible to organize a focus group. Prior to the interview, participants were officially contacted in person, then by phone and reminded by email. In total 8 interviews are organized, 5 questionnaires are returned, and 8 more interviews are planned to be arranged in the next period. Frequent reminders and personal contacts were necessary given the unpredictable the political situation in the country caused by recent elections at all governance levels and renewal of mandates on their positions. In addition, Serbia's s geopolitical and historical situation is demanding different priorities at the national level during the ongoing war conflict in Ukraine.

The media analysis methodology was based on the suggested approach for MDDT (including the search criteria), and key terms were contextualised to the characteristics of localities, which were preliminary identified as potential medical deserts (see annex 5 with the full list of selected articles, accompanied with analysis and key terms). In brief, the search findings have confirmed that the districts with poor accessibility are commonly identified as potential medical deserts.

The survey methodology was a mixed methods approach using various instruments for data collection, such as face-to-face in-depth interview whenever possible, and as a back-up, by telephone interview and email. Criteria for the selection of the intended participants were the following: policy relevance of the institution, decision making power, vested interest, and availability. In total, 30 invitations were sent, on average 3 per type of institution.

A. Findings of the qualitative and quantitative research

-Awareness of desertification

The respondents to the AHEAD-MDDT survey and questionnaire have confirmed that are not familiar with the term medical deserts, but they also agree that medical deserts could be potentially relevant issue in Serbia, especially if looking at the availability of specific skill-mix expertise.

For stakeholders at central level, medical desertification might be already addressed in 2020 and 2021, when strong recruitment was directed for all categories of health workers, stronger than it was in years prior 2020.

The main difference is that stakeholders at central level hardly believe there are many medical deserts at the district and municipality level, while some stakeholders at the local level recognize a frequent lack of access to health care services due to inappropriate skill-mix in health care facilities at local level.

- Criteria considered relevant (by respondents) to define access to medical services

The respondents to the AHEAD-MDDT survey and questionnaire agree that main criteria for the desertification should be both availability and accessibility (physical accessibility and time accessibility) of health care services. They emphasized that not only outpatient services (primary health care, emergency care and pharmacies) should be analyzed for the desertification, but also accessibility and availability of inpatient service.

The majority of respondents to the AHEAD-MDDT survey and questionnaire has identified that all seven indicators propose for the desertification should be analyzed, while population density is beyond the sole responsibility of the health sector stakeholders. They identified the following indicators as relevant for Serbia:

- Availability of the primary health care facility/pharmacy/emergency care,
- Physical distance to reach,
- Time distance to reach,
- Density of **active** / **practicing** general practitioners, medical doctors-specialists, nurses, and care workers, emergency care, pharmacists, and dental health care,
- Waiting times to their services,
- The proximity to nearest primary care facility
- The proximity to nearest inpatient care facility such as general hospital or clinic, and
- Density of the community in neighborhood.
- Private practices distribution are relevant to be considered such as for dental and nursing care services.
- Existence of digital health care technology supporting the training and health care consultations.

Since the Health Care Law and the bylaws documents (Decree on the Plan of the Health Institutions' Network and Rulebook on Detailed Conditions for Performing Health Care Activities in Health Institutions and Other Forms of Health Care Services) define the minimum staffing and organizational criteria for establishment, functioning and operating of health care institutions, these are also reported as the

criteria that should be used in this country to define thresholds from which a locality is identified as a medical desert.

Although the MDDT foresees defining the index for the distance a person needs to travel to access a certain service at primary health care facilities, the responsible project partner has not been able to supply Serbian counterparts with the MD indexes for Serbian NUTS3 regions by the deadline of writing this country report. However, using these MD index would help differentiate between the far and closer distances a person needs to travel to access a certain service at primary health care level in various regions. According to the respondents' perception, the approach used for identification of MDDT might yield interesting results, thus it is recommended to be fully applied once the MDDT index is obtained, and presented to the same respondents for final discussion. The current maps used in MDDT methodology should be considered as initial map/classification. To many of the respondents, they are not new and seem relevant. Preliminary results of the implemented MDDT were as expected and should be further verified by local and national stakeholders when MDDT index for Serbia is obtained from the AHEAD partner. Nonetheless, the healthcare workforce density could only provide a partial insight into the reasons contributing to the process of medical desertification of districts and municipalities in Serbia.

Respondents were interested in seeing how other countries and localities are positioned regarding the selected criteria. In the absence of international health workforce standards, they suggested using best practices as a benchmark for creating and initiating local actions. In the case of the existence of standards developed by experts, for a meaningful comparison, there is a need to adapt the standards as much as possible to the local context prior to the comparison. Respondents would not opt to compare national averages, or averages with an international average (e.g., EU, OECD or Western Balkans, etc), for policy making. Still, they would like to be aware of these averages for orientation purposes. They suggested creating locally specific standards and monitoring its evolution over time and in case of developing a programme for addressing medical deserts in Serbia.

- Potential Solutions to desertification and actions to be taken (all levels)

According to the in-depth interview with stakeholders and respondents views, there is no unique or single solution that might be effective for each one medical desert (Box 2 and Box 3). Since the healthcare workforce density used in MDDT provides only a partial insight into the reasons contributing to the process of medical desertification of districts and municipalities in Serbia, the most common solutions addressing health workforce reasons might be the following:

Box 1. For stakeholders at national level, (i.e. government, ministers, health professionals' chambers and associations, top managers of health institutions, health care providers, institutes, patient societies, civic society, other agencies and experts).

Directed at the stock and skill mix of health workers	**Directed at the supporting working and living environment of health workers**
• Better monitoring of health workforce flows (for example, by introducing the health workforce accounts); • Develop the national health workforce strategy; • Revise the staffing standards for health and care workers; • Redefine the performance standards for physicians and nurses; • Revise dual practice policy; • Recruit more health and care workers; • Invest in establishment of more medical training schools closer to the local level for priority services; • Expand the list of job qualifications by introducing the occupation of assistant nurses and care workers; • Redesign field work of health professionals to organize work of mobile clinics, mobile teams of GPs, and mobile care workers; • Create various types of incentive packages;	• Develop national policies for the migration and mobility of health workforce, via better monitoring of health workforce flows (for example, by introducing the health workforce accounts) • Invest in digital solutions for professional consultations via video and tablet/mobile phones resources • Invest in digital solutions for patients consultations via video and tablet/mobile phones resources • Establishing a package of incentives for a long term and permanent work in medical deserts. • Invest in formation of mobile clinics, mobile teams of GPs, mobile pharmacies and mobile care workers. • Enhanced the public/private mix of service provision • Strengthen the voluntary health insurance package.

Box 3. For stakeholders at local level (i.e. local government, health care providers, top managers of health institutions, patient societies, civic society, other agencies and experts).

Directed at the stock and skill mix of health workers	**Directed at the supporting working and living environment of health workers**
• Identify health workforce needs • Provide up-to-date evidence on health needs of population • Develop the local information system for monitoring of health workforce flows. • Participate in health workforce planning and development • Propose the revised staffing standards for GPs and nurses; • Recruit more health and care workers; • Participate in organization of field work of mobile clinics, mobile pharmacies, mobile teams of GPs, and mobile care workers for a few neighborhood settlements ; • Create various types of incentive packages;	• Invest in digital solutions for professional consultations via video and tablet/mobile phones resources • Invest in digital solutions for patients consultations via video and tablet/mobile phones resources • Invest in establishment of more medical training schools closer to the local level for priority services (e.g., health promotion and nursing care); • Increase the moral and image of local health workers; • Develop local policies for the migration and mobility of health workforce;

For stakeholders at the national and local level, there were many proposed solutions, among which the most often was mentioned a necessity to recruit more health care workers in order to provide substitutions for health personnel on sick leave or leave for other reasons, and in that way ensure continuity and quality of care for patients. This will require revision of staffing and performance standards of health workers and development of the health workforce strategy. In addition, an increasing intention to emigrate and migrate to urban settings might be a facilitating factor for exacerbating the migrations of health workers from remote areas and medical deserts. With that in regard, it is necessary to strengthen the moral and image of domestic health workers, of those who are not emigrating. The terms "brain waste" and "brain drain" should not exclusively mean that only the best or most competent health workers leave the country, while, automatically, that

means the others who remain are not recognized as the best or most competent health workers. Another frequent solution was establishing a package of incentives for a long term and permanent work in medical deserts. The incentive package for young doctors who spend part of their internship before employment could be in terms of more ECTS credits during undergraduate / postgraduate studies, or an advantage in employment. For experienced health professionals, the incentive package would be a work experience in remote areas as a precondition for advancement in professional career.

In addition to the activities of the health care sector, there is a need for social and economic activities at national and local level aimed at raising the living and working standards, including an upgrade of the settlement infrastructure (electricity, roads, sanitary conditions, and tap water supply). This is in line with the fact that the majority of reasons for unmet needs are unrelated to the health system.

B. Conclusion and policy implications

In overall, preliminary results of the AHEAD-MDDT implementation in Serbia are in compliance with the demographic, economic, epidemiological and economic context of the country. This is well reflected in the fact that likely medical deserts are identified in the districts of the south of Serbia using only indicators of health workforce density, in the same districts where all contextual indicators are not as good as those in districts of the north part of Serbia. However, a further analysis using the complex approach with AHEAD - MDDT index (results were not available to the author at the time of the reporting country report) is yet to be validated.

The respondents to the AHEAD-MDDT survey and questionnaire have confirmed that are not familiar with the term medical deserts, but they also agree that medical deserts could be potentially relevant issue in Serbia, if looking data prior 2020. The main difference is that stakeholders at national level hardly believe there are many medical deserts at the district and municipality level, while some stakeholders at the local level recognize a lack of access to health care due to inappropriate skill mix in local health care institutions.

The respondents to the AHEAD-MDDT survey and questionnaire agree that main criteria for the desertification should be both availability and accessibility (physical accessibility and time accessibility) of health care services. They emphasized that not only outpatient services (primary health care, emergency care and pharmacies) should be analyzed for the desertification, but also accessibility and availability of inpatient service. The majority of respondents to the AHEAD-MDDT survey and questionnaire has identified that all seven indicators propose for the desertification should be analyzed, while population density is beyond the sole responsibility of the health sector stakeholders.

The current maps used in MDDT methodology should be considered as initial map/classification. To many of the respondents, results of the implemented MDDT were as expected and should be further verified by local and national stakeholders when MDDT index for Serbia is obtained from the AHEAD partner. Nonetheless, the healthcare workforce density could only provide a partial insight into the reasons contributing to the process of medical desertification of districts and municipalities in Serbia.

According to the in-depth interview with stakeholders and respondents views, required potential solutions for medical desertification are complex, as the issue itself is complex. Furthermore, there is no unique or single solution that might be effective for each one medical desert. The respondents have identified several solutions for addressing health workforce reasons, including recruiting more health care workers, establishing more training posts, especially for allied workers to help vulnerable population and patients that are positioned on the long waiting lists for inpatient services, investing in digital solutions for video and phone consultations, establishing a package of incentives and improve field work in medical deserts. In line with the fact that the majority of reasons for unmet needs in Serbia are unrelated to the health system, they emphasized a need for social and economic activities towards rising the living and working standards in potential medical deserts in Serbia.

The planning and regulation of the organization and financing of the health care and health care workforce in Serbia are centralized at the level of Ministry of Health,

and therefore it is responsible for many of solutions. However, a programme toward diminishing medical deserts would benefit from joint actions of the ministries (Ministry of Education, Science and Technological Development, Ministry of Labour, Employment, Veterans and Social Affairs and Ministry of Finance, etc.), local government and various health care stakeholders at the community level.

C. Policy recommendations

The reasons for the medical deserts and the needs of the population in these areas should be planned and systematically addressed, and in particular during the development of the new health care development plan of Serbia. This would require a bottom-up and participatory approach by key local actors during the formulation and the specification of an action plan. That mechanism would consist of wide-scale consensus-building events for main health policy topics, not just public discussions such as those in the "professional silos", a very common method for passing health regulations and laws in the previous period. Local communities play a crucial role in the integration of evidence of the health care needs and expectations of the Roma population, people with disabilities, including the preferences regarding the access to health care at local and central level.

The recommendations arising from the media analysis indicate that the hiring ban for public institutions should be lifted (at least in places at risk of becoming medical deserts), a long-term strategy for workforce planning/development is needed, and should be implemented as soon as possible, medical personnel should be prioritized when hiring for health institutions, and work is needed on health personnel satisfaction, to reduce the migration pressure. In addition, for many cases there is a need for improved infrastructure which would allow the citizens better access to health services.

Annex 1. Data collected for the calculation of MDDT indicators

Region ID	County	Total population 2020	Total population of age 19+ 2021	Primary Health Centre 2020	Health Centre 2020	Tot Health Centres per 100,000 pop	Number of physicians	Number of physicians per 100000 pop.
1	Severnobacki	177044	143138	3		1,69	382	214
2	Srednjebanatski	171988	138800	5		2,91	396	228
3	Severnobanatski	133934	109070	6		4,48	338	250
4	Juznobanatski	275289	221773	8		2,91	609	220
5	Zapadnobacki	168841	138685	4		2,37	371	217
6	Juznobacki	618624	490748	11		1,78	1897	307
7	Sremski	295132	238653	7		2,37	553	186
8	Beograd	1694480	1358492	16		0,94	5946	351
9	Macvanski	274549	221302	8		2,91	629	227
10	Kolubarski	160558	131402	6		3,74	398	245
11	Podunavski	182895	147858	3		1,64	423	229
12	Branicevski	163058	133962	8		4,91	422	255
13	Sumadijski	278917	226839	6	1	2,51	937	333
14	Pomoravski	194676	160055	6		3,08	578	293
15	Borski	109210	90759	2	2	3,66	380	342
16	Zajecarski	104352	87990	2	2	3,83	367	346
17	Zlatiborski	262664	212207		10	3,81	680	256
18	Moravicki	196516	159783	4		2,04	439	221
19	Raski	303552	229185	5		1,65	777	255
20	Rasinski	219017	179906	6		2,74	492	222
21	Nisavski	357920	291891	7		1,96	1399	388
22	Toplicki	82067	66090	4		4,87	214	257
23	Pirotski	82537	69025	4		4,85	241	288
24	Jablanicki	196265	158894	5		2,55	508	256
25	Pcinjski	195041	151525	5	2	3,59	508	259

Regions	County	Number of physicians per 100000 pop.	Num.physicians, medical group of specialties	Num.physicians, surgical group of specialties	Num physicians (surgical) per 100,000 population
1	Severnobacki	214	69	53	30
2	Srednjebanatski	228	80	46	27
3	Severnobanatski	250	54	43	32
4	Juznobanatski	220	100	82	30
5	Zapadnobacki	217	73	42	25
6	Juznobacki	307	408	316	51
7	Sremski	186	87	66	22
8	Beograd	351	1319	1079	64
9	Macvanski	227	112	77	28
10	Kolubarski	245	76	57	36
11	Podunavski	229	72	65	36
12	Branicevski	255	82	56	34
13	Sumadijski	333	203	158	57
14	Pomoravski	293	122	91	47
15	Borski	342	64	54	49
16	Zajecarski	346	92	42	40
17	Zlatiborski	256	144	90	34
18	Moravicki	221	86	70	36
19	Raski	255	164	95	31
20	Rasinski	222	91	67	31
21	Nisavski	388	364	260	73
22	Toplicki	257	45	31	38
23	Pirotski	288	44	29	35
24	Jablanicki	256	99	63	32
25	Pcinjski	259	104	65	33

Regions	County	Num.physician,obstetric & gynaecological group	Number of mid-year female population (estimates)	Number of obs-gin physicians per 100,000 female poluation, 2019, Serbia NUTS3 level	Number of physicians, paediatric specialties
1	Severnobacki	18	92195	20	27
2	Srednjebanatski	24	88472	27	20
3	Severnobanatski	19	69137	27	26
4	Juznobanatski	31	140889	22	39
5	Zapadnobacki	14	87249	16	22
6	Juznobacki	82	320302	26	159
7	Sremski	29	150552	19	45
8	Beograd	352	894199	39	472
9	Macvanski	34	139941	24	62
10	Kolubarski	22	81623	27	30
11	Podunavski	26	93539	28	45
12	Branicevski	28	84770	33	33
13	Sumadijski	53	143595	37	88
14	Pomoravski	36	101381	36	54
15	Borski	17	56807	30	24
16	Zajecarski	11	54026	20	24
17	Zlatiborski	42	133899	31	66
18	Moravicki	24	100990	24	44
19	Raski	42	153369	27	69
20	Rasinski	28	112260	25	37
21	Nisavski	60	183601	33	105
22	Toplicki	13	41065	32	26
23	Pirotski	10	41242	24	24
24	Jablanicki	28	99357	28	36
25	Pcinjski	37	97043	38	51

Regions	County	Number of persons younger than 20 y.o.	Number of ped physicians per 100,000 patients younger than 20 y.o.	Number of physicians working in hospitals	% of physicians working in hospitals	Number of general practitioners	Number of general practitioners, per 100000 pop.
1	Severnobacki	33906	80	195	51	85	48
2	Srednjebanatski	33188	60	209	52,8	108	62
3	Severnobanatski	24864	105	185	54,7	62	46
4	Juznobanatski	53516	73	422	69,3	142	51
5	Zapadnobacki	30156	73	190	51,2	82	48
6	Juznobacki	127876	124	902	47,5	283	46
7	Sremski	56479	80	192	34,7	155	52
8	Beograd	335988	140	3189	53,6	830	49
9	Macvanski	53247	116	335	53,3	151	54
10	Kolubarski	29156	103	216	54,3	93	57
11	Podunavski	35037	128	233	55,1	86	46
12	Branicevski	29096	113	214	50,7	97	59
13	Sumadijski	52078	169	396	42,3	160	57
14	Pomoravski	34621	156	333	57,6	106	54
15	Borski	18451	130	228	60	73	66
16	Zajecarski	16362	147	228	62,1	71	67
17	Zlatiborski	50457	131	367	54	182	69
18	Moravicki	36733	120	229	52,2	96	48
19	Raski	74367	93	425	54,7	140	46
20	Rasinski	39111	95	223	45,3	112	51
21	Nisavski	66029	159	642	45,9	224	62
22	Toplicki	15977	163	110	51,4	54	65
23	Pirotski	13512	178	117	48,5	61	73

24	Jablanicki	37371	96	251	49,4	128	64
25	Pcinjski	43516	117	236	46,5	81	41

Regions	County	Number of general practitioners 2020	Number of GPs per 100.000 pop, 2020	Number of GPs per 100.000 pop age 20 years and more, 2020	Number of dentists	Number of dentists, per 100000 pop.
1	Severnobacki	95	54	66	37	21
2	Srednjebanatski	95	55	68	38	22
3	Severnobanatski	63	47	58	27	20
4	Juznobanatski	164	60	74	31	11
5	Zapadnobacki	72	43	52	37	22
6	Juznobacki	315	51	64	164	27
7	Sremski	152	52	64	63	21
8	Beograd	832	49	61	347	20
9	Macvanski	92	34	42	62	22
10	Kolubarski	54	34	41	62	38
11	Podunavski	72	39	49	43	23
12	Branicevski	87	53	65	31	19
13	Sumadijski	230	82	101	65	23
14	Pomoravski	83	43	52	44	22
15	Borski	38	35	42	25	22
16	Zajecarski	58	56	66	22	21
17	Zlatiborski	118	45	56	59	22
18	Moravicki	75	38	47	41	21
19	Raski	159	52	69	80	26
20	Rasinski	105	48	58	49	22
21	Nisavski	291	81	100	111	31
22	Toplicki	28	34	42	27	32
23	Pirotski	41	50	59	18	22
24	Jablanicki	106	54	67	50	25
25	Pcinjski	183	94	121	63	32

Regions	County	Number of pharmacists	Number of pharmacists, per 100000 pop.	Number of nurses	Number of nurses, per 100000 pop.	Number of nurses working in hospitals	% of nurses working in hospitals	Number of midwives	Number of midwives, per 100000 pop.
1	Severnobacki	39	22	812	455	510	62,8	76	43
2	Srednjebanatski	17	10	904	520	603	66,7	32	18
3	Severnobanatski	6	4	757	559	532	70,3	30	22
4	Juznobanatski	26	9	1511	545	1245	82,4	59	21
5	Zapadnobacki	9	5	753	440	481	63,9	39	23
6	Juznobacki	63	10	3528	570	2054	58,2	233	38
7	Sremski	42	14	1064	358	528	49,6	68	23
8	Beograd	606	36	11583	684	7421	64,1	664	39
9	Macvanski	48	17	1310	472	824	62,9	60	22
10	Kolubarski	29	18	854	527	588	68,9	16	10
11	Podunavski	38	21	843	456	550	65,2	67	36
12	Branicevski	57	34	949	573	567	59,7	52	31
13	Sumadijski	57	20	1644	584	809	49,2	109	39
14	Pomoravski	33	17	1172	594	779	66,5	55	28
15	Borski	5	4	754	678	516	68,4	92	83
16	Zajecarski	48	45	738	696	548	74,3	46	43
17	Zlatiborski	73	27	1377	518	917	66,6	123	46
18	Moravicki	50	25	891	449	556	62,4	82	41
19	Raski	67	22	1508	495	940	62,3	99	33
20	Rasinski	44	20	1014	457	570	56,2	59	27
21	Nisavski	104	29	2332	647	1364	58,5	136	38
22	Toplicki	19	23	515	619	310	60,2	14	17
23	Pirotski	23	27	480	573	291	60,6	37	44
24	Jablanicki	3	2	970	488	541	55,8	75	38
25	Pcinjski	22	11	918	467	434	47,3	76	39

Annex 2: Interview Protocol to collect perceptions and experiences regarding medical deserts from the relevant stakeholders

Principles

Interviewees should be announced that they are invited for a discussion about "access to medical services", in order to avoid inducing them answers.

Knowledge accumulated in social science indicates that during in-depth interviews, the most efficient strategy in terms of gain knowledge is to bring the interviewee in a familiar situation, and to let the interviewee to have the apparent control over the discussion, simply guiding the interviewee towards the themes relevant for the interests of the study.

This might seem inefficient in terms of time-management, but in fact is so productive in terms of gathered information, that overcomes the costs of increasing the duration of the interview.

The structure of the interview should be like in a conversation: the succession of themes is not standardized, but it follows the normal logic of the conversation. The interviewer intervenes rarely, simply to influence the interviewee to lead the conversation in the desired directions, and does not express judgements of value, or personal/professional opinions.

Each of the following themes can appear at any time into conversation, and they are not ordered in a given pattern.

Themes to be addressed in the Interview

- Which are the criteria that you consider when you think about access to medical services?

  [the aim is to see whether they spontaneously discuss about access to health care provision in terms of density of services, distance to practices, etc.]

- If you think about distance to doctors/practices/health care provision, is there a certain maximal distance that should be considered as minimal standard?

- Is density of population related in any way to accessing health care services?

- If considering medical desertification, on each of the following criteria [###], starting with which threshold would you say that a locality is a medical desert?
  [###] criteria are mentioned based on the indicators available for each country.
  The question is specifically asked for each indicator.

- On how many of these dimensions (indicators) should a locality be a desert in order to be considered an actual desert?

- If you think about specific localities in our country, can you name one or several? Which ones?

- When deciding whether a locality is a medical desert, should one compare its situation to other localities or standards? Which ones?

- Should one consider county-level standards, national standards, regional-standards (regions within Europe, such as Western Balkans or Western-Europe, or CEE]), European standards, world-wide standards?
  [only for local level]

  - Is [your locality] a medical desert? Why? (Why not?)

  - How did the locality become a medical desert in the first place?

  - Do people here think at the locality as disadvantaged from health care provision? Why? (Why not?)

- Do people access only health care providers in the locality or also from neighboring areas?

[The interviewee is shown the desertification map/classification that was created based on STEP 1]

- This is a map/classification that we have been created based on existing information. We are interested to know whether your professional opinion corresponds to these findings. Would you say that the map/classification fits what you know about [your country]?
  (additional questions, which should be asked only if the interviewees do not address them spontaneously: is anything that surprises you? Why? Would you say that you trust such results? If not – show them partial maps. Do they correspond to what you expected? Is there a locality that could be considered desert and it is not? What makes THAT locality desert? Is there a locality that is not a desert in your opinion and in the map is desert or close to desertification? Which are the particularities of that locality)

Again, let remember that themes should be addressed in the order that naturally derives from conversation. The interviewee should be allowed to address the themes that are relevant for his/her person, and it is preferable that the interviewee comes to discussing the mentioned themes without being specifically asked about them.

For each theme, the interviewee is expected to elaborate more than a yes/no answer. If not doing it, the interviewer can determine the interviewee to be more specific by asking one or several of the following questions:

- Can you elaborate, please?
- Which are the arguments for your opinion?
- Can you give an example?

Further specifications

GPDR agreements should be signed prior to interviewing. The signed protocol should include obligation of the research team that no personal information will be offered to other persons than the research team, and any citing/verbatim will be anonymized prior to be included in any report. All interviews should be recorded and later transcribed and translated into English. No other person should be present during the interview, except for the interviewer and the interviewee.

Each interview should be recorded.

Data analysis

Each interview will be coded through short conclusions written by the interviewer for each of the themes considered in the interview guide. A list of additional codes will be jointly developed by the partners after having all indicators collected in Step 1.

Furthermore, the interviews are analysed with the aim to see whether changes should be implemented in the thresholds. Therefore, a specific section should discuss this issue.

Outputs for step 4

The set of recorded interviews.

The set of written descriptions of the interviews

The corresponding section in the report depicted in Section 2.

Annex 3. Questionnaire in Serbian

Percepcija i iskustva STEJKHOLDERA u VEZI „MEDICINSKIH PUSTINJA“

- mesta u kojima stanovništvo nema pristup zdravstvenoj zaštiti-

Poštovani,

Međunarodni stručnjaci danas koriste izraz „MEDICINSKA PUSTINJA“ da označe mesta u kojima stanovništvo nema pristup zdravstvenoj zaštiti. Ovaj intervju/upitnik je usmeren na to da se usaglase percepcije i iskustva stejkholdera u vezi sa pojmom i kriterijumima za identifikaciju medicinskih pustinja, uzrocima njihovog nastanka, i preporukama za rešavanje. Upitnik je sastavljen od strane stručnjaka koji su članovi EU projekata „AHEAD“ i „Pillars of Health“, koji vodi WEMOS is Holandije (www.ahead.health ,www.pillars-of-health.eu). Medijski edukativni centar (MEC, https://www.mediaeducationcentre.eu/eng/?page_id=3861) iz Srbije učestvuje u projektu, i za potrebe ove analize anagažovao je domaće eksperte da sa Vama urade istraživanje. Upitnik i/ili Intervju se sprovodi na osnovu Zakona o zaštiti podataka o ličnosti i za to nam je potrebna Vaša saglasnost:

saglasna / saglasan

Da li nam dozvoljavate da u analizi prikupljenih podataka koristimo vaše podatke ili zahtevate da ostanete anonimni? Ukoliko nam dozvolite da koristimo vaše lične podatke molim Vas da napišete kako želite da Vas predstavimo (na primer: titula, ime i prezime, organizacija ili institucija i Vaša funkcija

Hvala Vam!

1. Kako doživljavate izraz „medicinska pustinja“? Da li je to adekvatan naziv da se nazovu mestau/u kojima stanovništvo nema dostupnu/pristupačnu zdravstvenu zaštitu? Da li biste predložili neki drugi naziv?

ODGOVOR

2. Prema Vašem mišljenju, koje kriterijume treba koristiti za identifikaciju medicinskih pustinja?

ODGOVOR

3. Da li u smislu gorepomenutih kriterijuma postoje standardi koje treba razmatrati? Ako su Vam poznati, možete li ih navesti?

ODGOVOR

4. Da li smatrate da takve standarde treba postaviti na nivou okruga, ili kao nacionalne standarde, regionalne standarde (na primer, za regiona Evrope, kao što je Zapadni Balkan, Zapadna Evropa, ili Centralna i Istočna Evropa), evropski standard, i svetski standard?

ODGOVOR

5. Da li dostupnost i pristupačnost zdravstvene zaštite u jednom mestu (na primer, u jednoj medicinskoj pustinji) treba porediti sa situacijom u drugim mestima ili standardima? _____Ako da, sa kojima od njih? Molimo Vas, zaokružite broj u tabeli:

	Veoma malo	Malo	Mnogo	Veoma mnogo
Porediti sa standardom koji su uspostavili stručnjaci	1	2	3	4
Porediti sa prosekom za oblast/okrug	1	2	3	4
Porediti sa nacionalnim prosekom	1	2	3	4
Porediti sa prosekom [sa nekim evropskim prosekom] (npr., za Zapadnu Evropu, Istočnu Evropu, itd.]	1	2	3	4
Porediti sa prosekom za EU	1	2	3	4
Porediti sa prosekom za OECD	1	2	3	4

6. Molimo Vas da za svaki od 7 indikatora u narednoj tabeli navedete (zaokružite broj) u kojoj meri smatrate da je primeren za definisanje medicinskih usluga.

	Veoma malo	Malo	Mnogo	Veoma mnogo
1. Da u mestu postoji ordinacija lekara opšte prakse	1	2	3	4
2. Najveća fizička udaljenost domaćinstva na lokalitetu do ordinacije lekara opšte prakse	1	2	3	4
3. Broj lekara opšte prakse u mestu na 1.000 stanovnika	1	2	3	4
4. Najduže vreme potrebno da se fizički stigne do ordinacije lekara opšte prakse	1	2	3	4
5. Vreme čekanja na uslugu kod lekara opšte prakse	1	2	3	4
6. Broj lekara opšte prakse u okolnim mestima	1	2	3	4
7. (broj) stanovnika u obližnjim mestima	1	2	3	4
1. Da u mestu postoji služba za hitnu medicinsku pomoć/urgentno medicinsko zbrinjavanje	1	2	3	4
2. Najveća fizička udaljenost domaćinstva na lokalitetu do službi za hitnu medicinsku pomoć/urgentno zbrinjavanje	1	2	3	4
3. Na lokalitetu, broj službi za hitnu medicinsku	1	2	3	4

pomoć/urgentno zbrinjavanje na 1.000 stanovnika				
4. Vreme potrebno da se stigne do službi za hitnu medicinsku pomoć/urgentno zbrinjavanje	1	2	3	4
5. Vreme čekanja na uslugu službi za hitnu medicinsku pomoć/urgentno zbrinjavanje	1	2	3	4
6. Broj službi za hitnu medicinsku pomoć/urgentno zbrinjavanje u obližnjim mestima	1	2	3	4
7. (broj) stanovnika u obližnjim mestima	1	2	3	4
1. Da u mestu postoji apoteka	1	2	3	4
2. Najveća fizička udaljenost domaćinstva na lokalitetu do apoteka	1	2	3	4
3. Broj apoteka u mestu na 1.000 stanovnika	1	2	3	4
4. Najduže vreme potrebno da se fizički stigne do apoteka	1	2	3	4
5. Vreme čekanja na uslugu u apotekama	1	2	3	4
6. Broj apoteka u obližnjim mestima	1	2	3	4
7. (broj) stanovnika u obližnjim mestima	1	2	3	4

7. Koliko indikatora od gore pomenutih 7, treba koristiti za identifikaciju medicinskih pustinja (mesta u kome stvarno nema pristupa zdravstvenoj zaštiti)?

   a. **7** od sedam b. **6** od sedam c. **5** od sedam d. **4** od sedam e. **3** od sedam f. **2** od sedam g. **1** od sedam

8. Ako razmišljate o FIZIČKOJ udaljenosti do lekara/ordinacija/mesta na kome se pruža zdravstvena zaštita, da li postoji određena najveća udaljenost koju treba razmatrati kao standard?

ODGOVOR

9. Koju maksimalnu dozvoljenu udaljenost domaćinstva do lekara/ordinacija/pružaoca zdravstvenih usluga treba razmatrati kao standard za adekvatan pristup zdravstvenoj zaštiti? Molimo Vas, dopunite tabelu:

Maksimalno dozvoljena udaljenost domaćinstva koju treba smatrati standardom		
	Fizička (npr. kilometri)	**Vremenska (npr. minuti, sati)**
...do lekara opšte prakse		
....do apoteka		
...do službe hitne medicinske pomoći		

10. Da li je gustina naseljenosti na bilo koji način povezana sa pristupom uslugama zdravstvene zaštite?_____ Molimo Vas, zaokružite broj u tabeli:

Po Vašem mišljenju…	Veoma malo	Malo	Mnogo	Veoma mnogo
...gustina naseljenosti je u vezi sa pristupanjem uslugama zdravstvene zaštite	1	2	3	4
...u [Srbiji] postoje mesta u kojima nema pristupa zdravstvenoj zaštiti	1	2	3	4
...mesto u kome Vi živite je u nepovoljnom položaju u pogledu pružanja zdravstvene zaštite	1	2	3	4

11. Ako se razmatra važnost dostupnost i pristupačnost za identifikaciju „medicinskih pustinja“ (mesta u kome nema pristupa zdravstvenoj zaštiti), molimo Vas da predložene kriterijume u narednoj tabeli rangirate po važnosti (od 1 najvažniji do 4 najmanje važan):

Kriterijumi dostupnosti	Rang
Da u blizini postoji ordinacija lekara opšte prakse	
Da u blizini postoji služba hitne medicinske pomoći / urgentnog medicinskog zbrinjavanja	
Da u blizini postoje apoteke	
Da u blizini postoji bolnica	
Kriterijumi pristupačnosti	Rang
Fizička udaljenost do mesta na kome se pruža zdravstvena zaštita	
Vremenska udaljenost do mesta na kome se pruža zdravstvena zaštita	
Vreme čekanja	
Broj stanovnika po lekaru	

12. Pri pominjanju reči „blizina“ u prethodnom pitanju, molimo Vas da rangirate važnost navedene udaljenosti do ordinacija lekara opšte medicine / do apoteke / službe za hitno (urgentno) medicinsko zbrinjavanje. Za svaku navedenu udaljenost treba zaokružiti broj u narednoj tabeli:

Ordinacija lekara opšte medicine se nalaze u oblasti koja je udaljena	Veoma malo	Malo	Mnogo	Veoma mnogo
do 1km od domaćinstva	1	2	3	4
1 do 5 km od domaćinstva	1	2	3	4
5 do 10km od domaćinstva	1	2	3	4
10 do 20km od domaćinstva	1	2	3	4
20 do 30km od domaćinstva	1	2	3	4
Apoteke se nalaze u oblasti koja je udaljena	Veoma malo	Malo	Mnogo	Veoma mnogo
do 1km od domaćinstva	1	2	3	4
1 do 5 km od domaćinstva	1	2	3	4
5 do 10km od domaćinstva	1	2	3	4
10 do 20km od domaćinstva	1	2	3	4
20 do 30km od domaćinstva	1	2	3	4
Službe za hitnu pomoć / (urgentno) medicinsko zbrinjavanje se nalaze u oblasti koja je udaljena	Veoma malo	Malo	Mnogo	Veoma mnogo
do 1km od domaćinstva	1	2	3	4
1 do 5 km od domaćinstva	1	2	3	4
5 do 10km od domaćinstva	1	2	3	4
10 do 20km od domaćinstva	1	2	3	4
20 do 30km od domaćinstva	1	2	3	4

13. Molimo Vas da je pažljivo pogledate mape urađene na osnovu postojećih podataka i da odgovorite u kojoj se meri slažete sa sledećim tvrdnjama u pratećoj tabeli (Napomena: u mapama, siva boja - urbani deo ili nema svih potrebnih podataka).

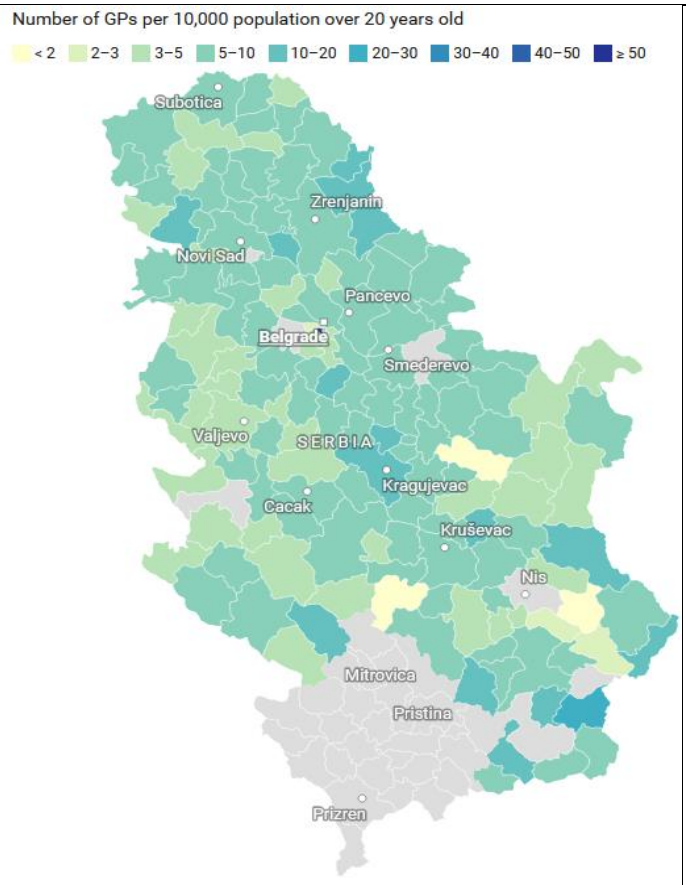
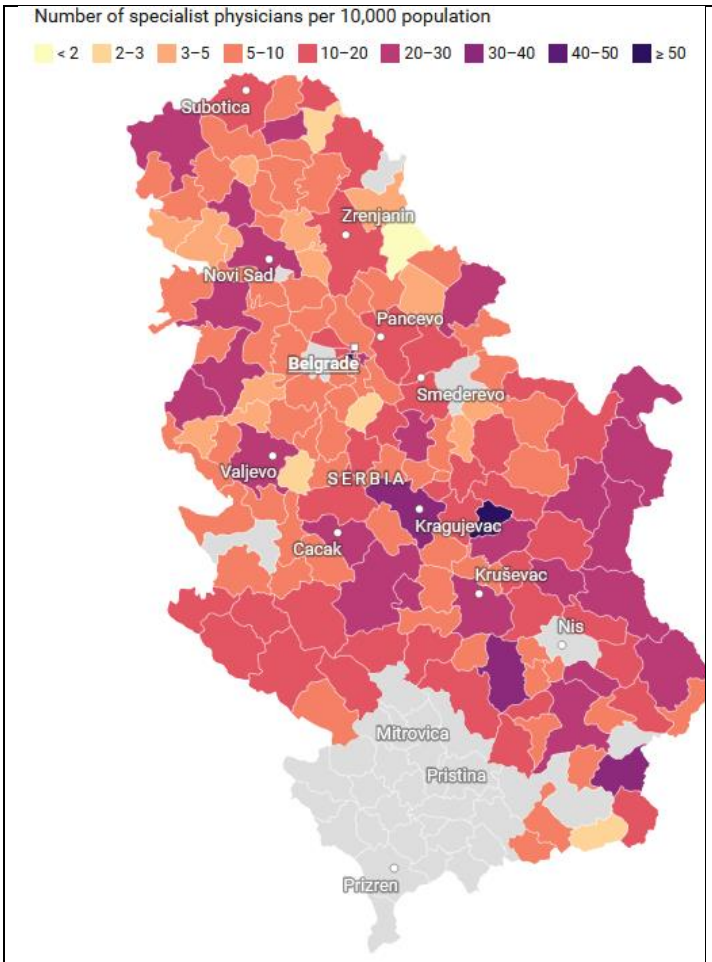
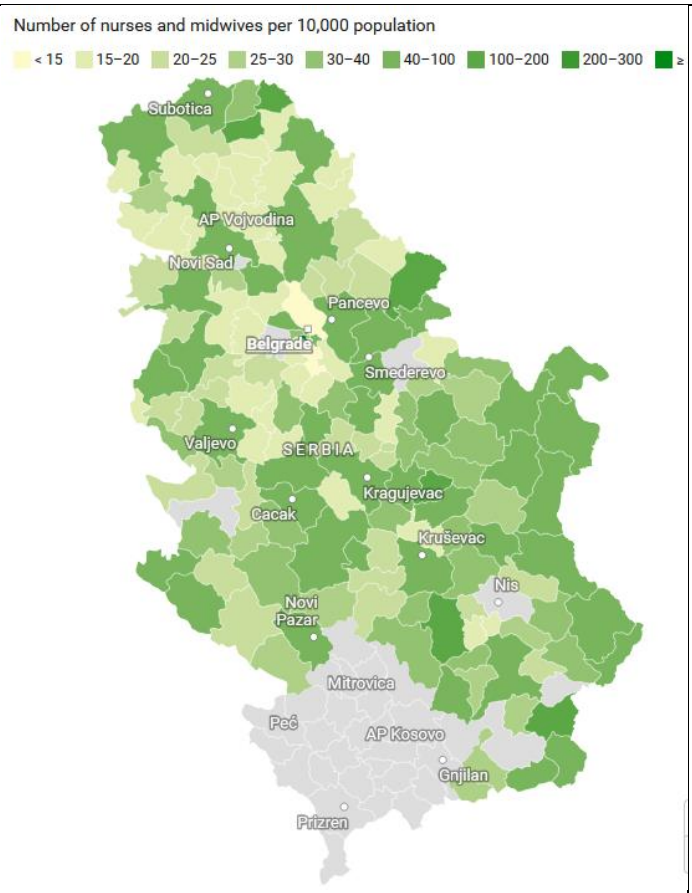


Figure 1 siva boja- urbani deo/nema podataka

13.1	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4

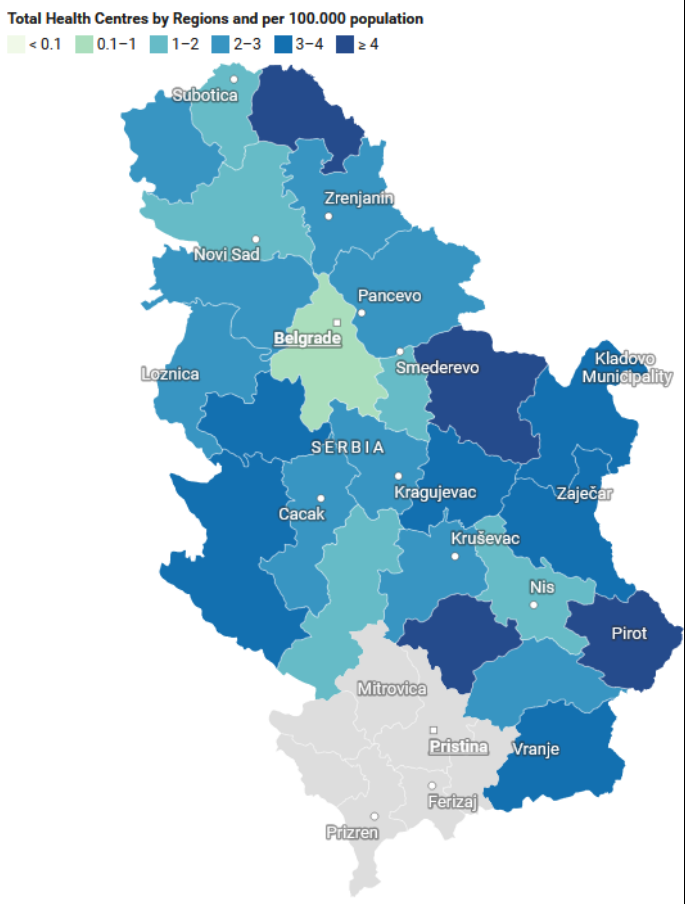


13.2	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4



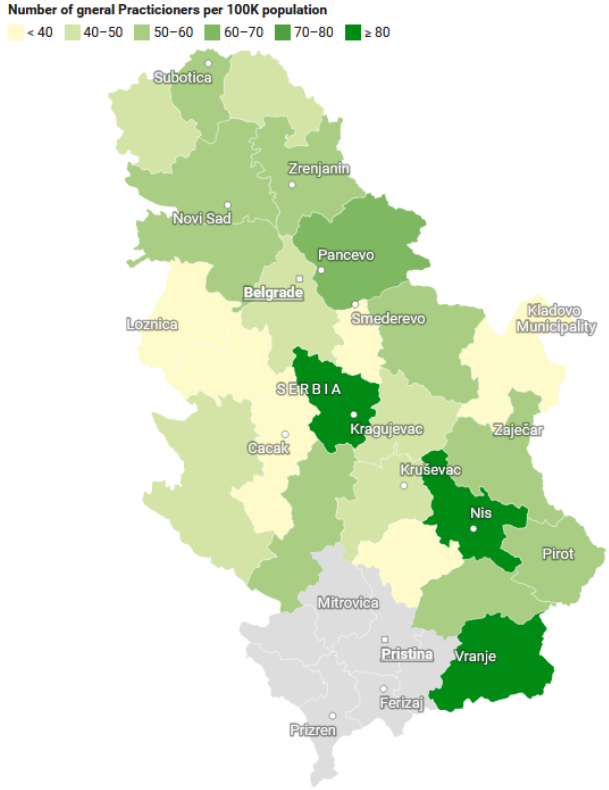
13.3	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4

Total number of primary health care centers per 100,000 population in 2020 across di
Serbia

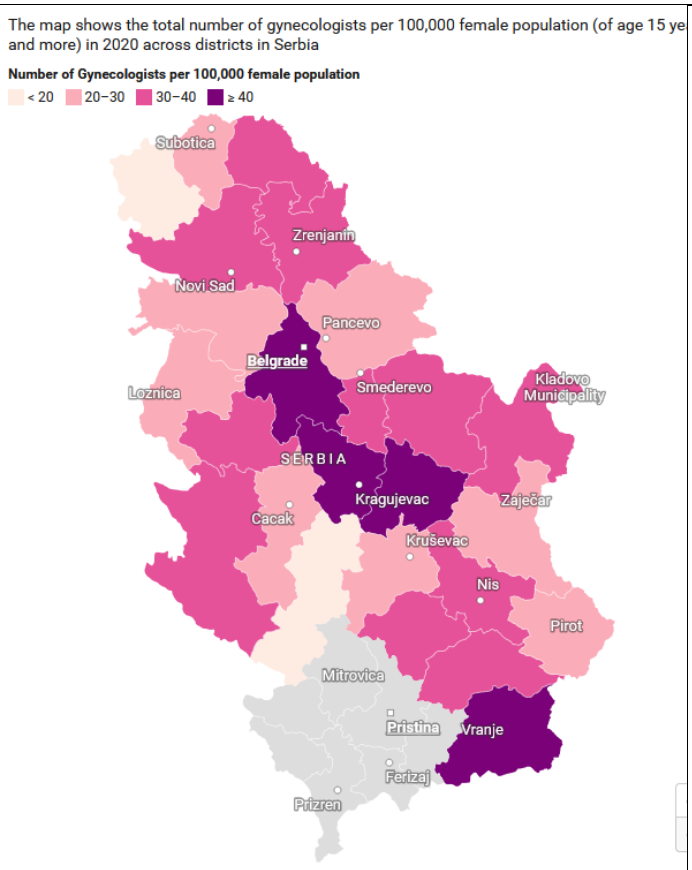


13.4	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4

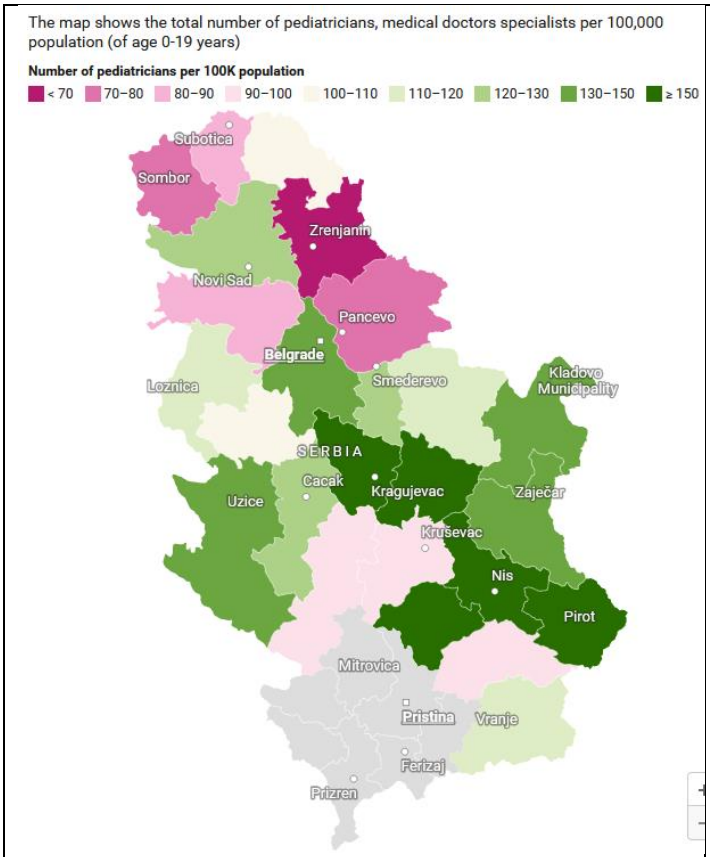
The map shows the Total number of general practitioners per 100,000 population (of age 20 yea and more) in 2020 across districts in Serbia. Health Statistical Yearbook 2020. Belgrade: IPHS, 2021.



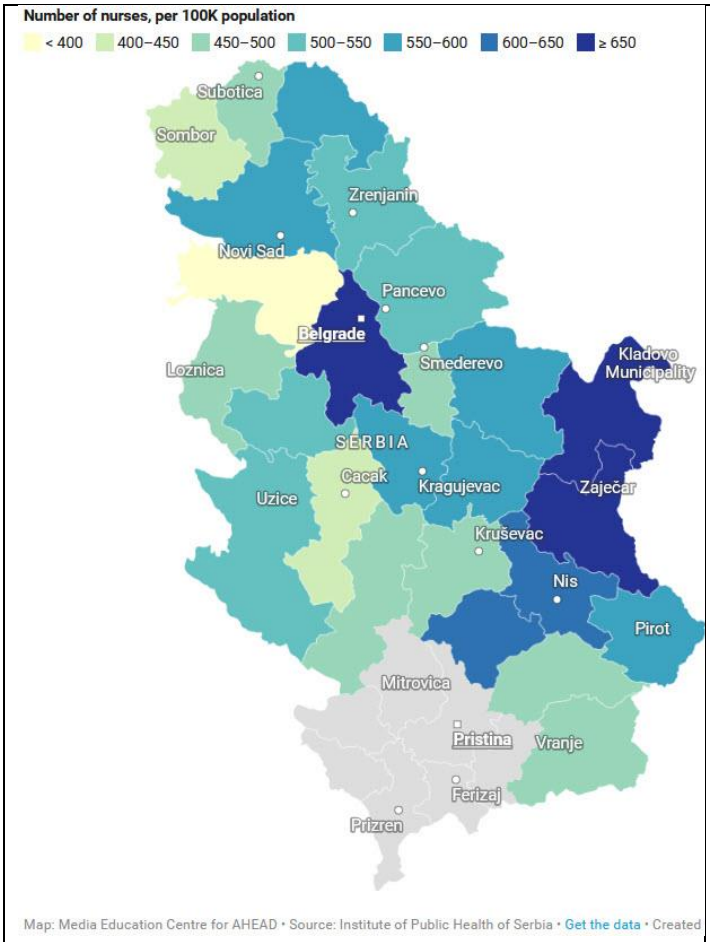
13.5	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4



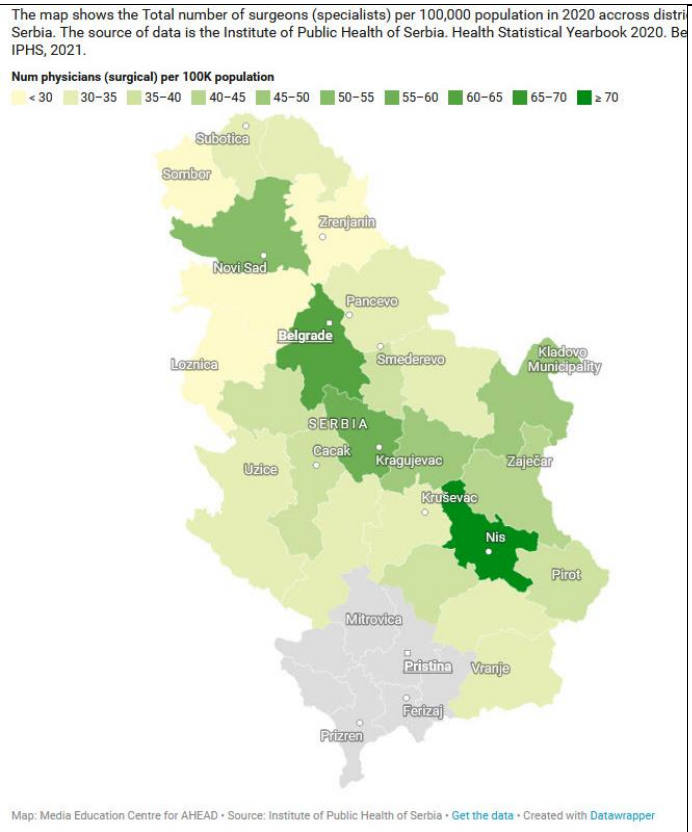
13.6	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4



13.7	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4



13.8	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4



13.9	Veoma malo	Malo	Mnogo	Veoma mnogo
Mapa odgovara mojim saznanjima o situaciji u Srbiji	1	2	3	4
Mapa nije iznenađujuća.	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **nema** pristup zdravstvenoj zaštiti	1	2	3	4
Postoje mesta koja su pogrešno klasifikovana kao mesta u kojima stanovništvo **ima** pristup zdravstvenoj zaštiti.	1	2	3	4
Mapa odgovara mojim saznanjima o razlikama u Srbiji	1	2	3	4
Pozicija na kome se nalazi moje mesto je u skladu sa mojim očekivanjima.	1	2	3	4

Hvala na izdvojenom vremenu!

Annex 4. Media analysis methodology and list of articles considered

- Search methodology

We searched news and media articles, using google.com and news.google.com for published in Serbia, about Serbia, and about specific Serbian regions, counties or municipalities discussing:

Physical access barriers such as:

- Limited access to trained primary health care personnel (GPs, pharmacies and pharmacists, community health centres and their personnel) is indicated by density (number of medical staff/population or number of centers/population). The access depends on the demographic composition of the population served by those HW (it is based on the assumption that age determines to a great extent the need for health services) and should be compared to national standards. We can consider it for primary health care only (GPs, pharmacies and pharmacists, community health centres), or we can add to it advanced care (ob-gyn, other specialities), if available, at the level they are available in each country (community, district/county, region).
- Distance to primary healthcare facilities (GPs, pharmacies and pharmacists, community health centres) that are available
- Average time to reach health facility or patient by the emergency services (at county and locality level)

Some of the **reasons** that underpin this limited access (to investigate through further research):

- Rurality
- Lack of investment in infrastructure (including health infrastructure, roads, and landscape challenges)
- Poor retention strategies for medical personnel
- Others;

Some of the **solutions** to resolve limited access (to investigate through further research):

- Investment in infrastructure (including health infrastructure, roads)
- Investment in alternative medical services like e-health, telemedicine.
- Others;

Social barriers (that arise from social constructions, including the acceptability of services to patients and affordability) such as:

- High cost of health care (insurance costs, extra billing, informal payments, etc)
- Care not covered under the statutory package
- Cultural sensitivity and context appropriateness of the care that is being offered

Some of the **reasons** that underpin this limited social access (to investigate through research):

- Demographics of the population (age, gender, specific population groups?)
- Cultural aspects and context appropriateness of the care that is being offered (such as the type of relationship medical personnel - patient / paternalistic vs based on collaboration, language barriers, etc).
- Others;

Some of the **solutions** to overcome social barriers (to investigate through further qualitative research):

- Investment in health education, health promotion, preventive services
- Investments in health literacy at community level
- Investment in alternative medical services like e-health, telemedicine.
- Others;

Policy barriers that arise from policy level limitations, including inappropriate distribution of health services, health workers or inability to meet the needs

These can include but is not limited to:

- Lack of specialist personnel or (concentration of the specialist personnel in big cities)
- Lack of technology or (concentration of technology and providers of specialized medical care in the big cities)
- Lack of adequate training
- Long waiting time to reach specialist personnel
- Others;

Some of the **reasons** that underpin this limited policy-driven access (to investigate through further qualitative research):

- High workload
- Lack of health workforce planning
- Lack of long-term planning
- Others;

Some of the **solutions** to overcome policy barriers (to investigate through research):

- better health workforce planning (based on a good evaluation of the needs)
- better long-term planning
- investments in the stakeholders at local level to build resilient communities
- Others.

- Articles selected and analyzed for the media analysis

Title	If you are looking for a job, read which occupations are most in demand in Zajecar, Kragujevac, Zrenjanin, Bor, Subotica, Nis, Sabac, Uzice, Novi Pazar and Novi Sad. Ako tražite posao, pročitajte koja su zanimanja najtraženija u Zaječaru, Kragujevcu, Zrenjaninu, Boru, Subotici, Nišu, Šapcu, Užicu, Novom Pazaru i Novom Sadu
Year – month	2022, May
Original article (link)	https://www.danas.rs/vesti/ekonomija/ako-trazite-posao-procitajte-koja-su-zanimanja-najtrazenija-u-zajecaru-kragujevcu-zrenjaninu-boru-subotici-nisu-sapcu-uzicu-novom-pazaru-i-novom-sadu/
Municipality/County	Novi Pazar/Raški okrug Novi Sad/Južnobački okrug
Contents regarding medical deserts	However, there are also cities, such as Novi Pazar, where **pharmacists, doctors**, professors, economists and lawyers are in demand. By the way, there

	are about 23,000 people on the records of the unemployed of the National Employment Service in Novi Pazar, which is convincingly the most compared to cities of similar size in Serbia. Among the most sought after in Novi Sad are, among highly educated profiles, electrical engineers, IT experts, electrical engineers, mechanical and construction engineers with appropriate licenses, mathematicians, foreign language teachers, **doctors, pharmacists**, financial experts - accountants.
Comment	General lack of medical personnel.

Title	Zrenjanin lacks health workers from various fields Zrenjaninu nedostaju zdravstveni radnici iz različitih oblasti
Year – month	2022, May
Original article (link)	https://ilovezrenjanin.com/vesti-zrenjanin/zrenjaninu-nedostaju-zdravstveni-radnici-iz-razlicitih-oblasti/
Municipality/County	Zrenjanin/Srednjebanatski okrug
Contents regarding medical deserts	One of the consequences of the ban on employment in the public sector is the lack of health workers in health centers and hospitals. In the previous period, many doctors and other medical staff retired or went to private clinics. Also, many health workers have found work outside the borders of our country. It takes time and experience for a doctor to work independently. We checked all the staff that Zrenjanin's health care lacks in the Health Center, the General Hospital "Đorše Joanović" and the Special Hospital for Lung Diseases "Dr Vasa Savić". Like many health centers in Serbia, the Zrenjanin Health Center "Dr Bosko Vrebalov" lacks certain health workers. "A total of 511 people are employed in the Health Center. Out of that, 401 are health workers - 139 doctors, and the rest are medical technicians and nurses.

	The health center does not have enough staff to function without difficult conditions. There is a lack of staff of all profiles, but mostly general practitioners. A dozen doctors would greatly facilitate the functioning of the Zrenjanin Health Center, which is the largest in Vojvodina in terms of the size of the territory it covers and the diversity of the ambulance, and among the first in the entire Republic, "says Zdravko Ždrale, acting. Director of the Health Center "Dr. Bosko Vrebalov". "The health center functions according to precisely determined criteria of the organization of primary health care. It is currently working very hard due to lack of staff. The only legal way to overcome the problems with the lack of staff is through competitions for the employment of certain profiles. Our Health Center is working intensively on staff renewal. "Problems are overcome by constant internal reorganization of staff," our interlocutor added.
Comment	Solution – more doctors employed. Barrier – ban on employment in public facilities by the government.

Title	Media: There is a shortage of doctors in Serb villages in Kosovo Mediji: U srpskim selima na Kosovu nedostaju lekari
Year – month	2022, March
Original article (link)	https://rs.n1info.com/vesti/mediji-u-srpskim-selima-na-kosovu-nedostaju-lekari/
Municipality/County	Goraždevac/Kosovo
Contents regarding medical deserts	Despite the employment of a large number of medical workers in health institutions in Kosovo and Metohija, Suvo Grlo and Banje, as the only villages in the municipality of Skenderaj, still do not have a permanent doctor, locals told Radio Gorazdevac. Residents of Suvo Grlo and Banja in the municipality of Skenderaj say that the

	President of Serbia, Aleksandar Vučić, promised them, during his visit to Laplje Selo, that he would have a permanent doctor. However, according to Nebojsa Tomasevic, that is not the case. "Until 2008, we had a doctor, three nurses, two drivers, a janitor, all that, and since then we have nothing to this day. The last time President Vučić was in Laplje Selo, I presented that problem, they did not solve anything on that issue, "said Tomašević from Suvo Grlo. He added that they have recently started sending doctors for help from the Health Centers in the north. "A month ago, they left Mitrovica to send one doctor every day, which I think is not normal in the 21st century. What is the chosen doctor for? We are not looking for five, six doctors or ten doctors, we are looking for one permanent doctor." , says Tomasevic. **An apartment was built for the doctor in the village. The ambulance has not had a driver, nurse or laboratory assistant for a long time, so patients are forced to travel to Kosovska Mitrovica, which is 40 kilometers away.** "We also sent a letter to the director of the Office for Kosovo and Metohija, Petar Petković, and to President Aleksandar Vučić, but we have no answer. I hope they will hear and see this, and in the end we will have to use other means, neither violent nor threatening. , but legitimate means for a normal person today ", says Tomašević. The Office for Kosovo and Metohija claims that they renovated the village ambulance with all the necessary medical equipment and that the doctor stays in it for at least five days.
Comment	

Title	Not enough doctors in primary care Nedovoljno lekara u primarnoj zaštiti
Year – month	2022, January

Original article (link)	https://www.danas.rs/vesti/drustvo/nedovoljno-lekara-u-primarnoj-zastiti/
Municipality/County	Zrenjanin/Srednjebanatski okrug
Contents regarding medical deserts	Zrenjanin Health Center "Dr Bosko Vrebalov" recently announced a competition for the **admission of six doctors**. Due to the increased volume of work, doctors are offered a job for six months, and one dentist is needed for a certain period of time. According to the words of the director of the Health Center "Dr. Bosko Vrebalov", Dr. **Zdravko Zdrala, this institution chronically lacks doctors and general medicine, but also other specialties.** **Some doctors went to larger centers, and pandemics, illnesses, and vaccination engagement endangered the normal process of work in primary health care institutions.** **There were not so many unemployed doctors in the records of the National Employment Service in Zrenjanin at the time of announcing the competition, and even if everyone responded to the invitation to work for a certain period of time, there would not be enough of them.** The Zrenjanin health center will try to solve the problem with specialist doctors through an internal competition for specializations, according to which one **specialist in general medicine, pediatrics, gynecology, emergency and sports medicine is needed in primary health care.** It is no secret that doctors, especially specialists, do not have enough health in their homes. **The employment ban and poor specialization plans have taken their toll.** **At the Sečanj Health Center, he is struggling with a pediatrician**. The longtime pediatrician has retired and all the efforts of the management to persuade a pediatrician to come to this small border municipality have not borne fruit. Recently, the **Health Center in Zitiste does not have a gynecologist**. The patients are forced to go to Zrenjanin for an examination, and they are even

	sent to Srpska Crnja, because the crowds there are less. **Srpska Crnja is still somehow holding on to the staff.** - In addition to general practitioners, we have a specialist pediatrician and gynecologist, as well as a laboratory. And in all villages a doctor is prescribed. True, in some that have a small population, such as Toba, the doctor does not work every day - says the acting director. **Director of the Health Center Srpska Crnja Dr. Danica Vučurević Đukin.** For now, the **Novi Becej Health Center is working according to standards. This health institution has a gynecology specialist, a pediatric specialist, as well as a laboratory. In the clinics in Novi Milosevo and Kuman, the work was organized in two shifts. In Bočar, the doctor works only in the morning, it is stated in the answer we received from the Novi Bečej Health Center.** **Those familiar with the issue say that it will be increasingly difficult to organize work in health centers in smaller municipalities, because there are not enough doctors in some specialties. It is not easy even in larger areas such as Zrenjanin.**
Comment	Solution – more doctors employed. Barrier – ban on employment in public facilities by the government. Contact: https://ilovezrenjanin.com/kontakt/

Title	WEEKEND BREAKS DO NOT TREAT: Kikinda hospital can not solve the problem of lack of professional medical staff PRELOME VIKENDOM NE LEČE: Kikindska bolnica nikako da reši problem manjka stručnog medicinskog kadra
Year – month	2022, February
Original article (link)	https://www.novosti.rs/srbija/vesti/1083824/prelome-vikendom-lece-kikindska-bolnica-nikako-resi-problem-manjka-strucnog-medicinskog-kadra

Municipality/County	Kikinda/Severnobanatski okrug
Contents regarding medical deserts	The General Hospital in Kikinda, which has a regional character for the North Banat District, **has not been able to solve the problem of lack of professional staff for years.** Currently, this institution lacks 19 doctors of various specialties, two pharmacists and as many as 30 nurses, ie technicians. For now, the biggest problem is citizens who experience **eye injuries, fractures or some other serious trauma in the afternoon or weekend, because the ophthalmologist and orthopedist do not work then, so patients are sent to the hospital in Zrenjanin**, **which is 50 kilometers away**. All patients whose injuries cannot wait until tomorrow are sent there. - We have only one orthopedist and ophthalmologist who work in the clinic from 7 to 14 hours and operations. But we have two orthopedic specialists according to the personnel plan, and they belong to the hospital, so we can't hire an already graduated orthopedist. However, a specialist orthopedist cannot be on duty on his own. This situation will last until one of them completes his training, which means at least two more years. We don't even have a pathologist, so a specialist from Senta has been hired, who comes twice a week - explains Vladimir Prunić, anesthesiologist and assistant director of the hospital. The lack of specialists cannot be solved by hiring retired doctors. According to the contract, one surgeon and a gastroenterologist are working, because two surgeons moved to other institutions this year. - We have three surgeons and three specialists in the department, and one of them is a woman. For the first time, our hospital got a surgeon's wife. Only for a short time, a plastic surgeon worked here. In a few years, we will get an excellent young surgeon - says Dr. Prunić, with whom five other anesthesiologists work, and two doctors are on specialization. The hospital in Kikinda has 512 employees, of which 88 are doctors, 53 are specialists, 32 are on specialization, and three are without specialization. The institution employs 311 nurses and technicians with higher and secondary medical school.

	THREE COMPETITIONS - NO APPLICATIONS There is a shortage of doctors at the Health Center. **Last year, no candidate applied for as many as three competitions. The problem increases because after obtaining a specialization, doctors do not return to Kikinda, but move to other institutions.** - The same problem is in the whole of Serbia, there is a lack of doctors everywhere. **Nobody wants to practice medicine. It is a responsible and expensive job, there is a lot of stress and responsibility, and low salaries.** In addition, Kovid has increased the scope of work by 150 percent and it is becoming increasingly difficult not only for certain specialties, but for everyone in health care - describes Dr. Prunić. COOPERATION WITH ZRENJANIN KIKINDA Hospital is not the only one that has a shortage of doctors. They have the same problem in Zrenjanin. There is a lack of anesthesiologists, so the two institutions help each other. **Patients from Kikinda travel to Zrenjanin for certain problems, and there, Kikinda anesthesiologists also go to help.** - We have a successful agreed cooperation with the hospital in Zrenjanin. We refer our orthopedic and ophthalmological patients to them, and two of our anesthesiologists go there to help - says Dr. Prunić.
Comment	

Title	From the budget of the City of Nis, 25 million dinars for additional staff and equipment in the Health Center and the Pharmacy Institution Iz budžeta Grada Niša 25 miliona dinara za dodatno osoblje i opremu u Domu zdravlja i Apotekarskoj ustanovi
Year – month	2022, March
Original article (link)	https://www.juznevesti.com/Drushtvo/Iz-budzeta-Grada-Nisa-25-miliona-dinara-za-dodatno-osoblje-i-opemu-u-Domu-zdravlja-i-Apotekarskoj-

	ustanovi.sr.html
Municipality/County	Niš/Nišavski okrug
Contents regarding medical deserts	The decision of the City Council to allocate 25 million dinars from the budget of Nis for two republic health institutions - the Health Center and the Pharmacy Institution Nis was adopted at the session of the City Assembly. It was pointed out that the money is intended for new jobs and equipment, but not how much these institutions will receive individually, which is the main objection of the opposition councilors. Đurica Spasić from the Niš Directorate for Social Activities says that the Law on Health Care allows the local self-government to distribute funds to those institutions, even though they are republican. As he stated, the money will be directed towards increasing their accessibility and availability, first of all to procure equipment and additionally hire doctors, nurses and missing technicians. These funds, as before, especially in the kovid pandemic 19, contribute to raising the missing staff, those not provided for in the contract with the Republic Health Insurance Fund, to a slightly higher level, ie to enable specific institutions to hire a doctor. , a nurse, a technician or one of the non-medical staff - says Spasić. He does not specify how those 25 million dinars will be distributed and how much each institution will receive, but he points out that it will be known when individual contracts are signed. After the adoption of the Program, the City of Nis will conclude agreements with health institutions defined by this program, which will regulate mutual rights and obligations regarding the implementation of social health care at the city level, in the interest of better accessibility and accessibility in the use of health care. However, the councilor of the coalition "Nis, my city", Branislav Jovanovic, believes that the money will actually be spent to cover losses, and is asking for information on exactly how much the pharmacies will get, and how much the Health Center will get.

	Why did you provide us with this if you did not give us a distribution plan? I have a strange feeling that this money has been set aside to cover losses. I also have a strange feeling that this is financing jobs, and not improving conditions. It says here that it is for better accessibility and accessibility. What are the pharmacies that are available, so they are not on Kamenicki Vis, so we need to patch the holes to make accessibility better - says Jovanović. It should be reminded that the Program for the implementation of social health care from the Nis budget last year allocated about 73.6 million dinars, but for four institutions, because the Institute for Health Protection of Workers and the Institute for Emergency Medical Aid were also on the list.
Comment	

Title	Residents of the village of Gornja Vranjska near Sabac, without a postman, travel eight kilometers to the doctor Meštani sela Gornja Vranjska kod Šapca, bez poštara, do lekara putuju osam kilometara
Year – month	2022, March
Original article (link)	https://www.danas.rs/vesti/drustvo/mestani-sela-gornja-vranjska-kod-sapca-do-lekara-pesace-osam-kilometara/
Municipality/County	Gornja Vranjska/Šabac/Mačvanski
Contents regarding medical deserts	Residents of the village of Gornja Vranjska near Sabac addressed the Danas editorial office, who, as they say, **in the 21st century have to travel eight kilometers to see a doctor, even though they have a fully equipped health clinic and do not receive mail at their home addresses.** The appeal for people to stay and live in their villages and the promise that their quality of life will be equal to those who live in the city, can often be heard from politicians before the elections.

	How far we are from this promise is best witnessed by the village of Gornja Vranjska, near Sabac, where there has been no trace or voice from doctors and postmen for years. Residents of the village of Gornja Vranjska near Sabac, without a postman, travel eight kilometers to the doctor 2 **"The problem with the health clinic has existed for seven or eight years, due to the lack of medical staff. The city of Sabac previously financed the doctor from the budget, because the Ministry of Health did not allow employment ", says the president of the council of the local community of Goranja Vranjska, Goran Stojićević, for Danas.** "When the government in Sabac changed in 2020, the new city government, led by the Serbian Progressive Party, promised that all health clinics in the rural area would work, but the opposite happened," Stojicevic explains. **Although, as he says, it is a completely arranged facility with all the necessary working conditions, the clinic was opened only for a few days due to vaccination.** **"People are now forced to go to Sabac, instead of reducing costs and saving time. So far, they have not complained so much because there was a pandemic, so we can say that, and a justifiable reason why the clinic is not working. However, now there are no reasons why citizens do not receive primary health care in their village ", says our interlocutor.** The post office in Gornja Vranjska was opened in the House of Culture six years ago, when the suffering of the locals began. "Citizens welcomed the opening of the Post Office with joy, and the local community even gave free space for use. We used to have our postman who went from house to house, but there was a problem due to the lack of people in the Post Office itself and the constant change of employees ", explains Stojićević. He says that for years now, the Post Office has left all the letters in one room of the local community, where the locals themselves sort through piles of letters and try to find their accounts, letters from banks and more. "We appealed many times, wrote letters, went to talks, but there was no progress. We were told that there were not enough employees and that there

	were procedures. We came to the wall, because the Post Office says that no one can change anything and that is how the system works ", claims Stojićević. Danas' reaction sought answers from the authorities at the Sabac Health Center and the Post Office. **"There is no sudden drop in the number of coronavirus patients in Sabac. In December, we had 200, 300 new patients, and now more than 400. Kovid ambulance continues to work in two shifts, "said Dr. Jamina Stankovic, director of the Sabac Health Center, adding that rural ambulances will be launched as soon as the epidemiological situation stabilizes. .** The answer to the question why there are no postmen in Gornja Vranjska, we asked the director of the "Post" Sabac, Adam Aleksić, otherwise an official of the Serbian Progressive Party. When the Danas journalist called him and introduced himself, Aleksić hung up without any comment and his phone was no longer available from that moment on.
Comment	

Title	Epidemiologist Đurić: Health institutions in Serbia are shutting down far from the public eye Epidemiolog Đurić: Zdravstvene ustanove u Srbiji gase se daleko od očiju javnost
Year – month	2022, January
Original article (link)	https://www.danas.rs/vesti/drustvo/epidemiolog-djuric-zdravstvene-ustanove-u-srbiji-gase-se-daleko-od-ociju-javnosti/
Municipality/County	Novi Sad/Južnobački
Contents regarding medical deserts	Epidemiolog Predrag Đurić izjavio je da se **„sasvim tiho i daleko od javnosti“ gasi veliki broj zdravstvenih ustanova u Srbiji, naročito u malim sredinama, što, kako je naveo, vodi ka još većoj centralizaciji**

	upravjanja u zdravstvu. „Teče proces najveće transformacije zdravstvenog sistema u Srbiji nakon Drugog svetskog rata. **On ima za cilj gašenje velikog broja zdravstvenih ustanova, posebno u manjim sredinama i Vojvodini, a minimalno u Beogradu, odnosno dalju centralizaciju upravljanja u zdravstvu i isključivanja građana iz kreiranja zdravstvene politike“, rekao je Đurić za portal Storiteler (Storyteller).** On je ocenio da je zabrinjavajuća činjenica to što je sve više građana spremno da ustane i bori se „da bi se sačuvala tamo neka bara za koju do juče nisu ni čuli ili parkić u kvartu u kojem šetaju svog psa“, **ali zato gotovo niko neće ustati da bi se sačuvao njegov dom zdravlja ili zavod za javno zdravlje.** „Nažalost, iako bitne, pojedine ekološke teme potpuno neopravdano su nametnute kao pitanje života i smrti i potisnule su mnoge druge ključne teme, kao što su i ove zdravstvene ili one iz domena obrazovanja. Od toga korist mogu da imaju samo vlasti, nikako građani. Posebno zabrinjava ćutanje zdravstvenih radnika. Razumljiva je preopterećenost pandemijom i poslom, ali posledice tog ćutanja biće tragične“, kazao je Đurić. Dodao je da je pandemija pokazala koliko su zdravstvo i zdravlje bili decenijama nisko na listi prioriteta političara, a rezultat toga je strašno mali broj zdravstvenih radnika i nizak kvalitet zdravstvenih usluga. **„Primera radi, u Novom Sadu je 2019. godine jedan lekar u službi opšte medicine pokrivao 2.700 pacijenata. Optimalan broj pacijenata trebalo bi da bude 1.000 na jednog izabranog lekara, a idealno 500“, naveo je Đurić.**
Comment	

Title	10,000 people are missing in the public sector, but that does not mean that it is not already cumbersome: The situation is the worst with health workers and inspectors U javnom sektoru fali 10.000 ljudi, ali to ne znači da on već nije glomazan: Situacija najlošija sa zdravstvenim radnicima i inspektorima
Year – month	2021, June

Original article (link)	https://www.euronews.rs/biznis/biznis-vesti/4640/u-javnom-sektoru-fali-10000-ljudi-ali-to-ne-znaci-da-on-vec-nije-glomazan-situacija-najlosija-sa-zdravstvenim-radnicima-i-inspektorima/vest
Municipality/County	Serbia
Contents regarding medical deserts	The Fiscal Council recently stated in its Opinion on the draft fiscal strategy that Serbia lacks at least 10,000 people in the public sector. This does not mean that it is not already bulky enough, but, on the contrary, that those who work in it are not well distributed. They believe that it is therefore necessary to make a detailed analysis of the number of employees in the public sector. **The biggest problem, along with the lack of health workers**, as they say, is the lack of inspectors in all sectors, from the Tax Administration to agriculture and transport. **The shortage of workers in Serbian health care was especially felt during the epidemic. The president of the Union of Nurses and Technicians, Radica Ilic, says that Serbia lacks 5,000 to 6,000 nurses and technicians. One nurse is for 25 patients, while in the European Union it is significantly different and one nurse goes for three to five patients.**
Comment	

Title	In the last five years, the number of health care employees has decreased by almost 10,000 people U poslednjih pet godina broj zaposlenih u zdravstvu smanjen za gotovo 10.000 ljudi
Year – month	2019, March
Original article (link)	https://novaekonomija.rs/vesti-iz-zemlje/u-poslednjih-pet-godina-broj-zaposlenih-u-zdravstvu-smanjen-za-gotovo-10000-ljudi
Municipality/County	Serbia
Contents regarding	The problem that the Serbian health care system has is generally known: the lack of staff and their departure abroad. Although, according to

medical deserts	estimates, **about 3,500 doctors and 8,000 nurses are currently missing, the recruitment of new people is difficult due to the ban on employment in the public sector**. But despite the ban, more than 3,500 non-medical workers have been employed since its introduction, according to a New Economy study. According to these data, almost every fifth person from the payroll of health institutions in Serbia is a non-medical worker, while in the European Union only every tenth employee does not wear a white coat. Ivana Pavlović, a journalist from Nova Ekonomija, says that the magazine, during a two-year research conducted in cooperation with the EU, found that the number of health employees has decreased by almost **10,000 in the last five years, based on data from the Trampoline Institute and the Fiscal Council.** "Healthcare is the sector in which the number of employees has been reduced the most. In that reduction, the number of healthcare workers has been reduced **by 3,000, medical doctors by almost** 1,000 less, and administrative and technical staff has been reduced by about 5,000 people," said Dana. Dr. Rade Panić: The Ministry of Health is not doing the job it should Anesthesiologist, Dr. Rade Panic from the General Hospital Studenica in Kraljevo, estimates that the Ministry of Health is not doing its job properly, referring to this decline in the number of employees. **"The structure of currently employed in health care does not enable adequate health care for the population, which should be guaranteed to everyone," says Dr. Panic.** **Panic points out that these statistics do not show what is very important - and that is that we have a large number of specialists in short supply.** **"You can't compensate a specialist in a short period of time, it takes at least 10 years to go to school and five more years to have experience to provide that health care properly," the guest of Dana emphasizes live.** The doctor believes that the Minister of Health, Zlatibor Lončar, is not planning the future of the health system. "I think someone is working on buying social peace, and that will completely ruin the health care system in the next 10 years, and maybe

I'm optimistic - maybe even in two," he says.

He points out that the proof of that claim is the engagement of his colleagues who have been retired for two or three years in order to provide the process of twenty-four-hour health care.

Pavlovic says that the number of employees in Serbian health care is slightly lower than the European average, **but that the structure of medical and non-medical staff is not in line with European standards.** She states that the Fiscal Council does not have data on people who are engaged in temporary jobs, that they are under the radar, and that the question is who has that data. They are neither doctors nor nurses, but other educational profiles, due to whose salary money intended for food, cleaning, staff is taken, he adds.

KCS is one of the institutions in which the number of employees has decreased

Pavlović says that KCS is among those institutions in which the number of employees has decreased, and that, according to their research, that health institution had 47 employees engaged in this way.

"The question is for what needs are 50 more people hired, in addition to the administrative and technical staff, because they are not doctors and nurses," says the H1 guest.

The assumption is, based on experience from other public companies and internal data obtained by union employees - probably from dissatisfied colleagues, that these are people employed by political line who either do not do their job, or keep them in some kind of control and, if necessary, activated for party purposes, adds Pavlović.

Panić states that in practice, there are no dismissals of those who do not have a systematized position, but are waiting to retire, and that is how the number of employees is reduced.

"The union and all colleagues expect the data on employees to be clearly visible, so that it would be known who is doing what and how, and if that visibility was reached, they would be amazed," says the doctor.

The Commission for Monitoring Going Abroad itself was astonished by the data on departure and numbers.

He believes that education and health are failing. He also claims that questionnaires on the satisfaction of health workers are being manipulated. It is enough to take a walk in the morning from 5 am

	to the health institutions, and you will see that the patients have been waiting to make an appointment since then, he adds. Panic also referred to the integrated information system, which he said does not work in most institutions, and that it takes more time for doctors, who have to double their time.
Comment	

Title	There is a lack of medics, salaries are disincentives, conditions are bad Nedostaje medicinara, plate destimulativne, uslovi loši
Year – month	2021, November
Original article (link)	https://novaekonomija.rs/vesti-iz-zemlje/hitna-pomo%C4%87-tra%C5%BEi-od-lekara-do-voza%C4%8Da
Municipality/County	Serbia
Contents regarding medical deserts	There is a lack of medics, salaries are disincentives, conditions are bad **The ban on employment in the state sector has resulted in certain sectors, including health, being left without the necessary workers**. According to the assessment of the Fiscal Council, in health care, the Tax Administration and the Customs Administration, inspection services, etc. over 10,000 people are missing. At the beginning of the pandemic, in March 2020, the Ministry of Health issued an order requiring health institutions to hire doctors and medical technicians for an indefinite period of time. However, as BIRN wrote, due to the inaccuracy of the regulation, **institutions often avoided giving contracts to medics "permanently" because it was a lump sum assessment of which staff was really needed**. Due to that, many **health doctors, especially young doctors and technicians, received fixed-term contracts, which include work in difficult conditions in the red zone.** **As Gorica Đokić from the Union of Doctors and Pharmacists previously assessed for Nova ekonomija, the entire system in the**

	Kovid hospital in Batajnica was maintained last year on the "enthusiasm of health workers", mostly young doctors and specialists because they lacked everything else. **Medical workers have been leaving public health for many years. Some of them are moving to the private sector, and others are leaving Serbia.** **The most common reason for that is disincentive salaries, because a specialist doctor in Serbia has only three times higher salary than the lowest salary of an unskilled worker, as written in the analysis of the Fiscal Council.** **The salaries of health workers will increase by 8% next year, it is written in the proposal of the Law on Budget System.**
Comment	

- Other relevant media reports

https://www.novosti.rs/vesti/srbija.73.html:855487-I-stariji-mogu-do-lekara-U-Despotovcu-organizovali-zbrinjavanje-bolesnika

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https://www.novosti.rs/vesti/srbija.73.html:799795-DOM-ZDRAVLjA-U-KULI-BEZ-SPECIJALISTA-Imaju-opremu-fale-lekari

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https://novaekonomija.rs/vesti-iz-zemlje/u-poslednjih-pet-godina-broj-zaposlenih-u-zdravstvu-smanjen-za-gotovo-10000-ljudi

https://pescanik.net/posledice-zabrane-zaposljavanja-u-zdravstvu/

- Other relevant links/texts/information:

http://www.centaronline.org/sr/publikacija/1830/zabrana-zaposljavanja-u-javnom-sektoru-posledice-u-sektoru-zdravstvena-zastita-gradjana