

## LABOR MARKET NEEDS ANALYSIS University of Belgrade

Requirements for determining the number of specializations in the field of Pain medicine for the needs of the market in different countries may at first act terminologically surprising, but essentially and realistically, it reflects the diversity of supply in relation to the heterogeneous forms of ownership among health care providers. Also, the diversity of citizens' health care needs, as health care seekers, and physicians and other health care providers definitely has all the characteristics of supply and demand, as main features of every market.

In this regard, it is useful to analyze all service providers of different sizes, forms of ownership and status, regardless of whether they are large and prestigious hospitals, university clinics, institutes or hospitals in private or charitable ownership, private practices or individual ordinations. All health care providers offer citizens the services they need to meet their health needs in different ways.

Citizens satisfy their health care needs, mostly thanks to very well-developed forms of information and communication (the Internet and the media), especially in order to solve their health problem in the best and most efficient manner.

Among the criteria that are most often present in the standardization of certain specialties, the **number of hospital beds** is used. Thus, in the health care legislation of Serbia, in the standardization of the number of required doctors in Surgery, Internal medicine and other disciplines, the number of beds is taken as the basis for calculating the staff at: all stationary, day care hospitals, emergency care units, laboratory diagnostics in pathohistology, microbiology and transfusiology, in hospital pharmacy, radiological diagnostics, physical medicine and rehabilitation, social medicine, diet preparation work, with administrative and technical workers (20 surgeons per 100 beds or 18 internists or 15 dermatovenerologists per 100 beds, for example). We should mention an example of anesthesia in the relevant Rulebook “in anesthesiology with reanimatology - one Medical Doctor specializing in anaesthesiology with reanimatology and two nurses - technicians with a higher or secondary school degree per 16 surgical beds, that is, one anesthetist per each operating room, anesthesiology clinic, pain clinic and an anesthetist in the intensive care and care unit (base monitoring)”.

Statistical data indicate that the number of beds is constantly decreasing, apparently due to significant improvements in diagnostic methods and the nature of treatment procedures in the first place of acute illnesses, but this criterion as an element for standardizing staff in the treatment of pain should also be taken with reserve.

**Health care condition** of the population measured by morbidity and mortality is a very important element for standardizing the staff in the treatment of pain. Since pain as a clinical manifestation is a symptom of almost all diseases, including delivery as a physiological act, the case of malignant diseases is a good illustration of the size and severity of the problem that must be addressed in the later stages of the disease, in particular during the terminal phases of the disease. However, we will focus only on the few diseases that are most represented or require increased activities and care measures.

According to the National Cancer Register, the number of cancer patients ranged from 9,898 in 1990 to 26,949 in 2014. Also, the number of deaths, from 9,814 in 1990 to 15,152 deaths from cancer in 2014. (Tables 3 and 4 taken from the publication “Incidence and mortality from cancer in Central Serbia” of the Institute of Public Health of Serbia).

Tabela 3. Broj novoobolelih osoba od raka prema polu, centralna Srbija, 1990-2014. godina

*Table 3. Number of new cancer cases by sex, Central Serbia, 1990 - 2014*

Pol (Sex)	Godine (Years)																								
	1990*	1991*	1992*	1993*	1994*	1995*	1996*	1997*	1998*	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Muškarci (Male)	4879	4479	4417	2900	2639	3101	8987	9412	9788	9964	11270	12110	12449	12330	12801	12679	12035	13475	13261	14012	13625	14130	13860	13668	13791
Žene (Female)	5019	4696	4174	3354	3250	3935	8236	8562	9053	9661	10853	11249	11449	11394	11954	11690	11758	12187	11974	12651	12531	12819	12358	12456	12571
Ukupno (Total)	9898	9175	8591	6254	5889	7036	17223	17974	18841	19625	22123	23359	23898	23724	24755	24369	23793	25662	25235	26663	26156	26949	26218	26124	26362

\* subregistracija (subregistration)

Tabela 4. Broj umrlih osoba od raka prema polu, centralna Srbija, 1990-2014. godina

*Table 4. Number of death cancer cases by sex, Central Serbia, 1990 - 2014*

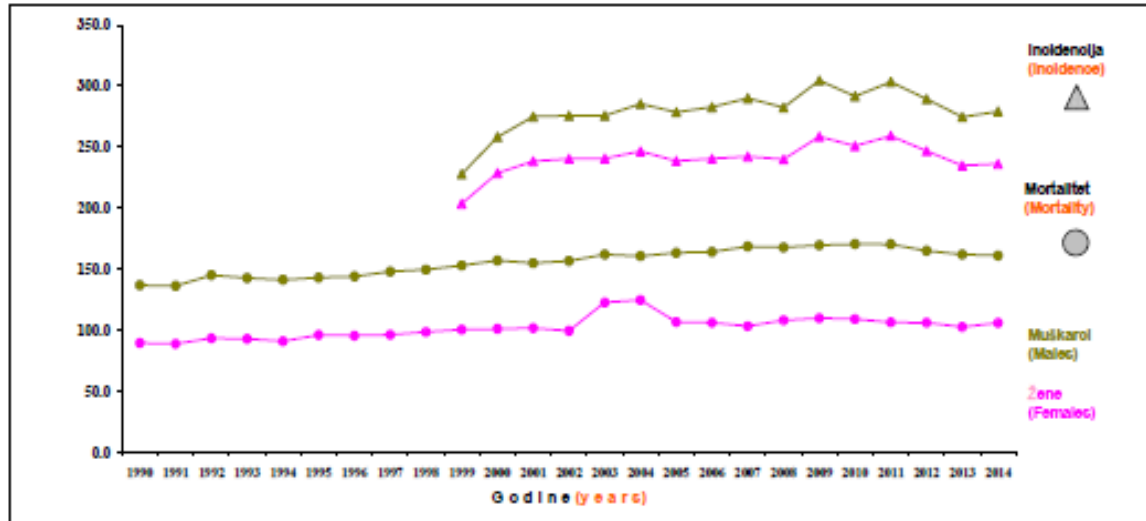
Pol (Sex)	Godine (Years)																								
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Muškarci (Male)	5612	5658	6083	6093	6146	6287	6488	6736	6874	6962	7206	7149	7496	7655	7728	7858	7968	8290	8338	8506	8605	8592	8694	8597	8553
Žene (Female)	4202	4303	4544	4581	4569	4907	4919	5052	5288	5350	5447	5553	5571	5832	5980	6142	6146	6083	6317	6536	6448	6332	6557	6406	6599
Ukupno (Total)	9814	9961	10627	10674	10715	11194	11407	11788	12162	12312	12653	12702	13067	13487	13708	14000	14114	14373	14655	15042	15053	14924	15251	15063	15152

Standardized rates of incidence and mortality are also illustrative in terms of the number of newborns and cancer deaths in Serbia (Figure 2 taken from the publication “Incidence and mortality from cancer in Central Serbia” of the Institute of Public Health of Serbia).

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Slika 2. Standardizovana incidencija i mortalitet od raka na 100.000 stanovnika, centralna Srbija, 1990–2014. godina  
Figure 2. Standardized cancer incidence and mortality rates per 100.000 population, Central Serbia, 1990 - 2014



The number of services as a basis for calculation of staff by normative is used in the clinical biochemical laboratory and dialysis, taking into account the fact that for the overall staff standardization, factors such as infrastructure and human resources of health care systems are very important.

The documents governing palliative care are based on a calculation of 599 patients requiring palliative care per 100,000 inhabitants, and regarding the criteria for staff requirements, we also use the number of inhabitants - 12 health care professionals per 100,000 inhabitants, is also recommended. For a tertiary level of health care, 1 doctor is recommended for 250 beds.

Data on the number of surgeries may be of interest due to acute post-operative pain, but should be observed with certain reservations as there are indications that the number of surgeries is decreasing (according to Eurostat data, the 10 most common surgical procedures in the period 2010-2015, as well as the overall the number of operations in hospitals in Serbia in the same period).

The data from the Clinical Hospital Center “Dr Dragiša Mišović - Dedinje” are interesting, including diseases requiring additional activities of staff on the management of prolonged pain conditions, such as malignant diseases, neurological diseases and patients on palliative treatment.

Group diagnosis	Individual group diagnosis	Structure diagnosis
C0-C97	3295	60.47
D0-D09	55	1.51
G43,G44,G50,G53,G54,G62	1447	26.56
M50,M51,M31.5,M79	958	17.58
<b>TOTAL</b>	<b>5755</b>	<b>105.62*</b>

\* Total of 5449 patients or 5.62%, have diagnoses from two or more different groups

The numerical prevalence of malignant diseases in comparison to neurological diseases (in the group of diseases characterized by prolonged duration of intense painful conditions registered in 2017 at the “Dr Dragiša Mišović - Dedinje” Clinical Hospital Center) is striking. The fact that in this institution in 2017, 1454 services provided to patients with palliative care are also related to the prevalence of diseases and conditions in which prolonged pain is one of the dominant features. However, it is characteristic that the presence of acute and chronic pain in these diseases requires additional engagement of staff, especially trained for pain therapy.

DIAGNOSIS	Total number of diagnosis	Number per groups	Structure per groups	Overall
C0-C97	-	3295	60.47	3.44
G43,G44,G50,G53,G54,G62	-	1447	26.56	1.51
D00-D09	-	55	1.01	0.06
M50,M51,M31.5,M79	-	958	17.58	1.00
<b>TOTAL</b>	<b>95921</b>	<b>5755</b>	<b>105.62</b>	<b>6.00</b>

Birth as a natural, physiological act and condition that almost exclusively happens in a hospital institution, is accompanied by intense pain, which is why the need is increasing, to relieve pain or even eliminate it. From the data of the Hospital for Gynecology and Obstetrics of the Clinical Hospital Center “Dr Dragiša Mišović – Dedinje”, it is evident that the number of deliveries has been increased by caesarean section and exceeds 30% in the total number of deliveries. It would be too arbitrary to conclude that among the cesarean deliveries there are those who are motivated by the desire to avoid pain, but that is definitely for special analysis, because every imperial cut requires the involvement of anesthetists.

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Number of deliveries, caesarean delivery and epidural anesthesia in the period 2012-2017							
Year	Total number of deliveries	Number of caesarean delivery	Number of births in epidural anesthesia	CD+EA	Other	Participation of caesarean delivery	Participation of epidural anesthesia
1	2	3	4	5(3+4)	6(1-5)	7	8
2012	2158	516	1158	1674	484	23.91	53.66
2013	2080	534	1360	1894	186	25.67	65.38
2014	2111	596	1286	1882	229	28.23	60.92
2015	2166	614	1351	1965	201	28.35	62.37
2016	2116	641	1261	1902	214	30.29	59.59
2017	2211	678	1430	2108	103	30.66	64.68

In the total number of deliveries at the Clinical Hospital Center “Dr Dragiša Mišović – Dedinje”, a very high percentage of births performed in epidural anesthesia is noticeable, and it is also evident that the number of requests for epidural anesthesia in childbirth is on the rise. In addition, it is also undisputed that additional supportive anesthesiology staff is required in order to support this justified trend in the demands of the mother.

A comprehensive approach to the elaboration of elements that can be considered as criteria for standardizing staff in pain medicine, involving the analysis of health care status, number of beds, number of services, number of surgeries, deliveries and epidural anesthesia, palliative care services, confirm previous views on the need for an empirical method in choosing the required criteria.

At the same time, the analyzed data, including certain experiences of the Clinical Hospital Center “Dr Dragiša Mišović – Dedinje”, direct us to the way in which pain clinics are organized and also to the elements in the standardization of staff in palliative care, as criteria that are more objective than others and of the most proximity to our task.

Thus, since there are few or no pain ambulances, in the standardization of staff in the treatment of pain **for inpatient hospital care**, it is possible to start from the recommendation on the need to start the operation of the pain clinic in each hospital, with one specialist for pain therapy:

- 1 specialist in each hospital by the year 2023.

In **outpatient care**, which is equally important for patients who do not need hospital treatment or need to continue therapy after hospital treatment, in the standardization of the staff for pain medicine there should be recommended:

- 1 specialist of pain medicine per 100,000 inhabitants by the year 2023.

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The defined criteria represents a starting point and provides a development dimension in staffing for the next 5 years. As one of the HEPMP Project goals is to strengthen the capacity of higher education and create educational programs, the 5-year-period seems to be an acceptable time span for the development of staff for pain medicine.

To conclude, the production of staff for pain medicine will represent an extension of supply to citizens and their health care needs, so that their response as a health care service seeker can be a signal for adjusting and correcting the criteria in staffing for pain medicine.