

EAN Fact Sheet

Country profile of Serbia

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The EAN is pleased to present this fact sheet to each and every national neurological society, offering key insights into the latest epidemiological, economic, and demographic trends. This data aims to support informed decision-making and enhance understanding of neurological conditions on both national and European level with information provided by three EAN projects: the [“Burden of Neurological Disease in Europe”](#) study, the EAN [“COst of Illness in Neurology in EUrope \(COIN-EU\)”](#) project, the EAN NNS 2021-2022 survey.

Burden of Disease in Europe – Collaboration with IHME

Neurological disorders are the second most common cause of disability and premature death in the European Region and their prevalence and burden will likely increase with the progressive ageing of the European population. Greater attention to neurological diseases must be paid by health authorities for prevention and care. For this reason, the European Academy of Neurology is conducting research on gaining and analysing reliable data on the number of patients with neurological diseases.

These data are obtained from the currently most developed data base, the [Global Burden of Disease \(GBD\)](#) study of the Institute for Health Metrics and Evaluation (IHME), University of Washington, Seattle. The burden of neurological disorders in Europe was calculated for the year 2021 as prevalence, mortality, disability-adjusted life-years (DALYs), years of life lost (YLLs), and years lived with disability (YLDs) for the countries in the EU and the WHO European region for a total of 26 neurological disorders.

The study in Europe is run by the EAN and led by Prof. Dr. Günther Deuschl, Dr. Maurizio Leone and Maria Konti, M.Sc., in close collaboration with the leading scientists of the IHME Institute.

In the table below, you will find the national total counts for DALYs, YLDs, YLLs, prevalence, and deaths, the age-standardised rates by neurological disorder category for the years 1990 and 2021, and the percentage change for both of your country and the WHO Europe.

Diseases with counts less than one have been excluded and the number of decimal points has been adjusted individually for each disease.

	Counts	Age-standardized rate		Percentage change, 1990-2021	
	(thousands)	1990	2021	Serbia	WHO Europe
All Neurological Disorders					
DALYs	758,583	7,806	5,000	-35.9%	-29.0%
Deaths	33,879	358	196	-45.3%	-43.2%
Prevalence	4,368,839	42,265	42,735	1.1%	0.3%
YLDs	226,829	1,713	1,781	3.9%	2.9%
YLLs	531,744	6,092	3,219	-47.2%	-44.4%
Alzheimer's disease and other dementias					
DALYs	66,360	383	379	-1.1%	-2.5%
Deaths	3,476	20.31	19.91	-2.0%	-2.8%
Prevalence	111,694	636	639	0.3%	-2.1%
YLDs	22,950	132	131	-0.3%	-2.6%
YLLs	43,410	252	248	-1.6%	-2.5%
Chromosomal abnormalities					
DALYs	290	7	5	-34.4%	-12.3%
Prevalence	3,200	84	54	-35.0%	-12.8%
YLDs	290	7	5	-34.5%	-12.4%
Covid-19 (neurological)					
DALYs	4,900	-	45	-	-
Prevalence	50,751	-	473	-	-
YLDs	4,900	-	45	-	-
Cystic echinococcosis					
DALYs	12	0.13	0.11	-11.8%	-18.3%
Prevalence	48	0.41	0.43	6.4%	-9.0%
YLDs	12	0.13	0.11	-12.0%	-18.4%
Diabetic neuropathy					
DALYs	71,333	278	455	63.5%	98.1%
Prevalence	561,416	2,175	3,571	64.2%	97.9%
YLDs	71,333	278	455	63.5%	98.1%

Down syndrome					
DALYs	164	5	3	-46.9%	-19.6%
Prevalence	1,800	58	30	-47.8%	-20.7%
YLDs	164	5	3	-47.0%	-19.8%
Encephalitis					
DALYs	2,845	38	28	-26.7%	-30.1%
Deaths	89	0.81	0.67	-17.4%	-15.9%
Prevalence	1,806	19	16	-14.7%	-13.6%
YLDs	176	1.96	1.69	-13.5%	-12.0%
YLLs	2,669	35.57	25.81	-27.4%	-31.0%
Epilepsy					
DALYs	15,555	235	159	-32.1%	-12.6%
Deaths	170	2.10	1.41	-32.9%	3.9%
Prevalence	35,936	426	371	-12.8%	3.3%
YLDs	9,547	136	99	-27.2%	-11.3%
YLLs	6,008	99	60	-38.8%	-14.3%
Guillain-Barre Syndrome					
DALYs	25	0.37	0.26	-28.5%	12.4%
Prevalence	84	1.23	0.88	-28.4%	12.4%
YLDs	25	0.37	0.26	-28.4%	12.4%
Idiopathic intellectual disability					
DALYs	1,386	20	17	-11.5%	-19.7%
Prevalence	29,827	448	378	-15.7%	-21.2%
YLDs	1,386	20	17	-11.5%	-19.7%
Klinefelter syndrome					
DALYs	3	0.02	0.02	11.5%	5.7%
Prevalence	196	2.61	2.89	10.8%	5.5%
YLDs	3	0.02	0.02	11.5%	5.5%

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Serbia	WHO Europe	
Meningitis						
DALYs	863	73	10	-86.4%	-80.5%	
Deaths	22	0.99	0.18	-81.4%	-75.4%	
Prevalence	1,969	53	20	-63.2%	-66.7%	
YLDs	160	5	2	-61.4%	-64.6%	
YLLs	704	68	8	-88.1%	-81.3%	
Migraine						
DALYs	50,906	519	515	-0.8%	0.04%	
Prevalence	1,325,082	13,646	13,545	-0.7%	0.3%	
YLDs	50,906	519	515	-0.8%	0.04%	
Motor neuron disease						
DALYs	264	2.03	2.30	13.3%	37.5%	
Deaths	7	0.03	0.05	63.9%	54.1%	
Prevalence	302	3.39	3.34	-1.4%	19.8%	
YLDs	64	0.72	0.71	-1.4%	19.5%	
YLLs	200	1.31	1.59	21.5%	38.5%	
Multiple sclerosis						
DALYs	4,685	37.94	38.42	1.3%	-5.0%	
Deaths	103	0.80	0.74	-7.1%	-12.5%	
Prevalence	5,753	37	50	38.0%	26.4%	
YLDs	1,478	10	13	36.9%	25.5%	
YLLs	3,207	28	25	-10.7%	-22.2%	
Nervous system cancer						
DALYs	27,169	267	218	-18.2%	-3.3%	
Deaths	966	6.75	6.62	-1.8%	10.8%	
Prevalence	2,065	17	20	17.0%	35.9%	
YLDs	331	2.51	2.72	8.1%	25.3%	
YLLs	26,838	264	216	-18.5%	-3.7%	

Neurocysticercosis						
DALYs	3,274	36.94	23.55	-36.3%	-42.5%	
Prevalence	14,726	134.91	104.67	-22.4%	-32.8%	
YLDs	3,273	36.91	23.54	-36.2%	-42.5%	
YLLs	1	0.03	0.01	-73.4%	-70.7%	
Neurosyphilis						
DALYs	3	0.02	0.03	6.8%	-43.6%	
Prevalence	72	0.52	0.69	33.4%	-11.7%	
YLDs	3	0.02	0.03	6.7%	-43.4%	
Other neurological disorders						
DALYs	7,733	100	75	-24.6%	25.8%	
Deaths	182	1.46	1.34	-8.6%	45.0%	
YLDs	2,392	18	25	37.8%	62.9%	
YLLs	5,332	81	50	-38.7%	14.2%	
Parkinson's disease						
DALYs	14,988	110	83	-24.2%	5.6%	
Deaths	868	7	5	-31.3%	4.0%	
Prevalence	16,655	86	94	10.1%	21.9%	
YLDs	2,323	12	13	8.5%	21.4%	
YLLs	12,664	98	70	-28.3%	2.0%	
Spinal cord injury						
DALYs	8,110	88	76	-14.0%	-26.9%	
Prevalence	30,881	281	283	0.6%	-21.9%	
YLDs	8,110	88	76	-14.0%	-26.9%	

	Counts	Age-standardized rate		Percentage change, 1990-2021	
	(thousands)	(per 100 000 people)		Serbia	WHO Europe
	2021	1990	2021		
Stroke					
DALYs	458,173	5,410	2,696	-50.2%	-52.6%
Deaths	27,995	318	160	-49.6%	-55.6%
Prevalence	151,578	1,358	1,006	-25.9%	-19.2%
YLDs	27,473	246	182	-26.1%	-18.9%
YLLs	430,700	5,164	2,514	-51.3%	-55.3%
Tension-type headache					
DALYs	7,707	73	73	0.0%	-1.6%
Prevalence	2,937,511	29,963	29,928	-0.1%	-0.8%
YLDs	7,707	73	73	0.0%	-1.6%
Tetanus					
DALYs	11	0.71	0.06	-91.1%	-97.3%
Deaths	1	0.042	0.004	-91.2%	-95.8%
YLLs	11	0.71	0.06	-91.1%	-97.5%
Traumatic Brain Injury					
DALYs	11,822	123	98	-20.1%	-28.2%
Prevalence	81,584	830	669	-19.4%	-28.0%
YLDs	11,822	123	98	-20.1%	-28.2%

Table 1: National total counts for DALYs, YLDs, YLLs, prevalence, and deaths, age-standardised rates by neurological disorder category for 1990 and 2021, and percentage change of 1990-2021. Diseases with counts less than one have been excluded and the number of decimal points has been adjusted individually for each disease.

Neurological conditions

In figure 1 below, the top 20 neurological disorders are ranked based on the national age-standardised rate of DALYs per 100 000 population in 2021 for all age groups.

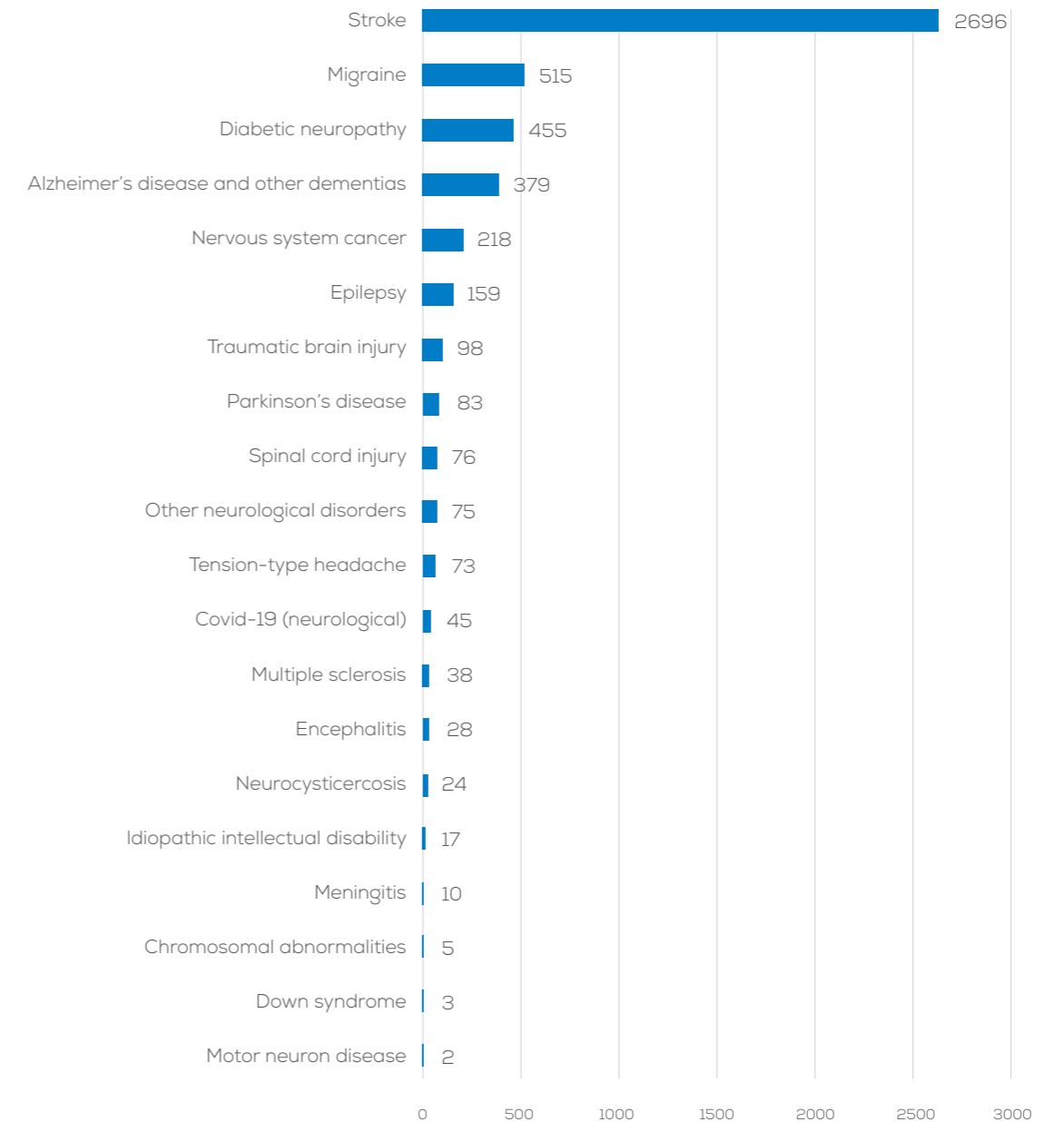


Figure 1: National age-standardised DALYs per 100 000 population by neurological disorder in 2021.

DALYs per 100 000 population

In order to show how the diseases are evolving both in **Serbia** and the European Region, we present the temporal pattern of DALYs per 100 000 population over the last three decades in the figure below:

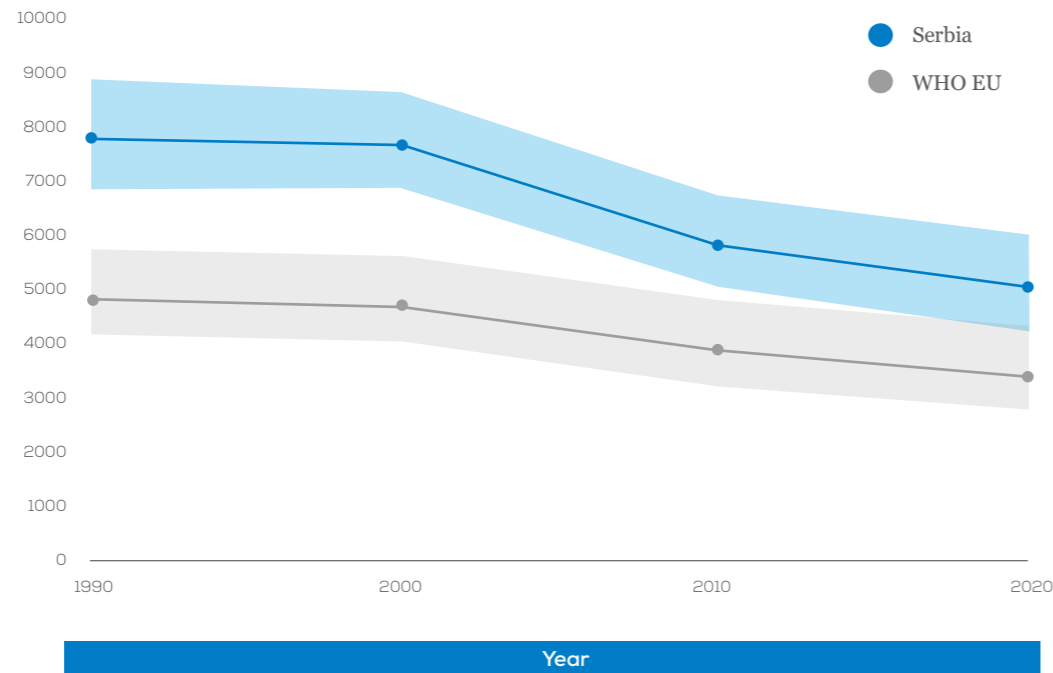


Figure 2: Age-Standardized DALYs per 100 000 population over the last 3 decades.

In figure 3 we show the distribution of DALYs rate per 100 000 population by age group divided in female and male:

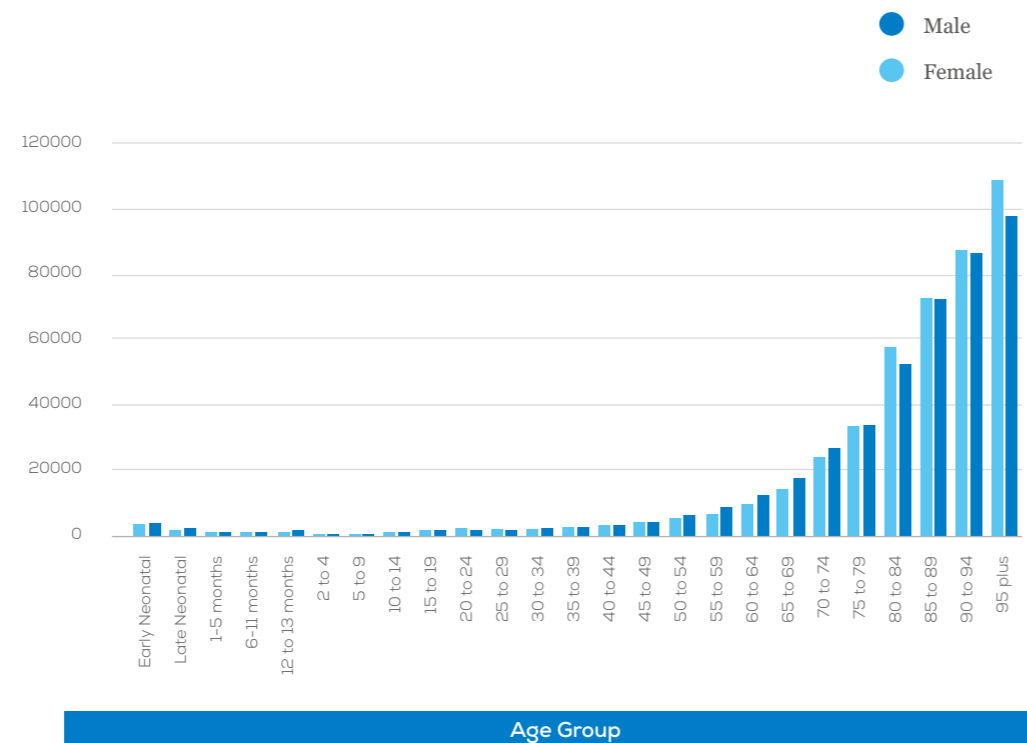


Figure 3: National DALYs per 100 000 population by age group and sex in 2021.

Extensive data and analyses are provided in the published paper and it will be communicated to the National Neurological societies.

COIN-EU (Cost of Illness in Neurology in Europe)

The Cost of Illness in Neurology in Europe (COIN-EU) project, which was launched in 2021, is run by EAN and led by Prof. Richard Dodel, Prof. Uwe Siebert and Prof. Günther Deuschl. This project is overseen at the EAN by Prof. Paul Boon, Prof. Claudio Bassetti and Prof. Thomas Berger.

The aim of the study is to assess disease- and country-specific annual costs for 12 categories of neurological diseases in Europe with a focus on the prevalent adult patient population. Costs have been calculated in three main categories: a) direct health care costs (i.e., all goods and services related to the prevention, diagnosis and treatment of a disorder; e.g. physician visits, hospitalizations and pharmaceuticals), b) informal care costs (i.e. other goods and services related to the disorder; e.g. social services, special accommodation and informal care), and c) indirect costs (i.e., lost productivity due to work absence or early retirement).

As the literature review revealed many gaps in research for many diseases and many countries, the group has developed a method to provide estimations of the above cost categories for the cases where no data are available. Data are imputed for those countries which belong to the same GNI category with countries that do present data. In case none of the countries which belong to the same GNI category present data, then an imputation is not possible.

In the table below, costs for **Serbia** have been calculated for the diseases with available data, in three main categories where the numbers represent millions € PPP 2019.

million € PPP
2019

Informal Care

Neurological Disorder	Total Costs	Direct Costs	Informal Care Costs	Indirect Costs
Stroke	493.5	241.0	110.7	141.8
Traumatic brain injury	216.7	216.7	-	-
Multiple sclerosis	131.9	111.3	10.4	10.2
Parkinson's disease	97.5	61.1	33.2	3.2
Idiopathic epilepsy	56.2	51.7	-	4.5
Total Costs:	995.8	681.8	154.3	159.7

Table 2: Total, direct, informal care and indirect costs per neurological disorder. Number of diseases depends on the availability of original studies and imputation of data.

NNS Survey 2021

In December 2021, the EAN conducted a survey among the national neurological societies. By combining the data from the Burden of Disease in Europe study across all European Region countries, we can provide demographic data regarding the workforce of neurologists in Europe for the 37 countries who took part in the survey.

The figure below represents the number of neurologists, fully specialised and in training per 100 000 population.

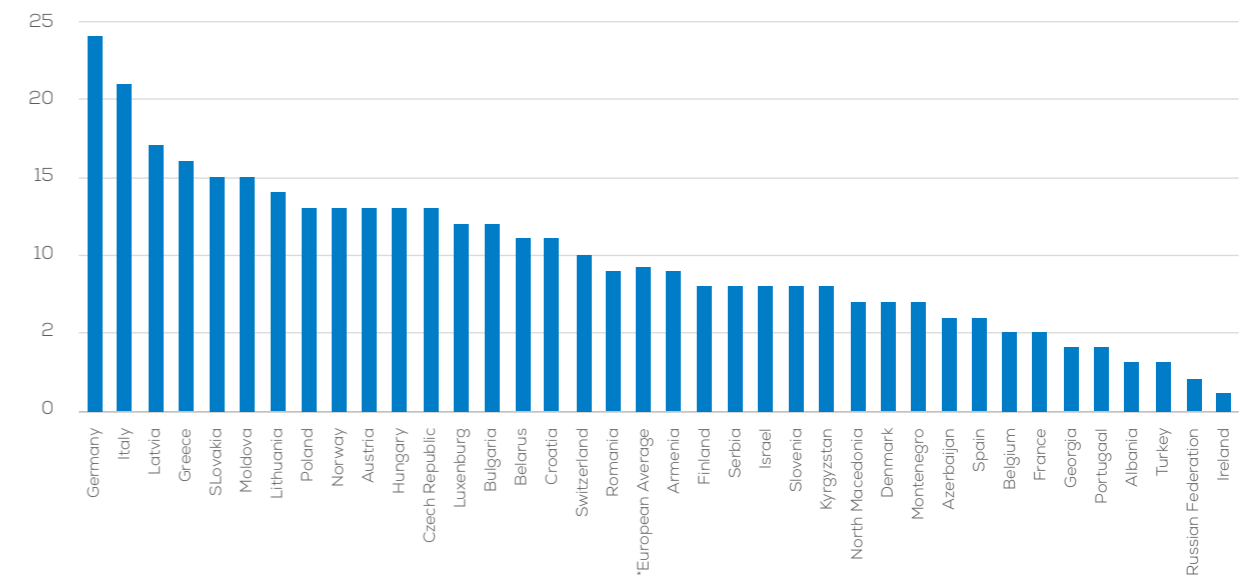


Figure 4: Number of neurologists (fully specialised and in training) per 100 000 population.

In the last figure the number of patients per neurologist is displayed:

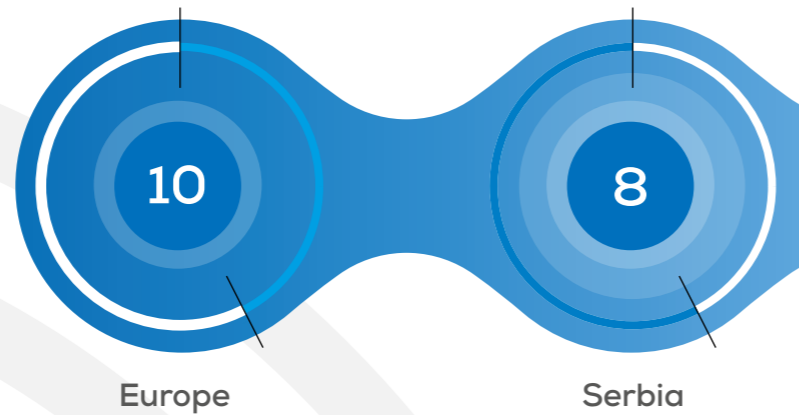


Figure 5: Number of patients per neurologist (fully specialised and in training).

Neurological Diseases in Europe and Serbia:

Key Data and Trends from 2021

Neurologists per 100,000 population in Europe* and Serbia:



Serbia 4,368,839

WHO Europe 449.278.770

Number of patients with a neurological disease in 2021 in the WHO Europe and in Serbia.

Patients per Neurologist in Europe* and Serbia



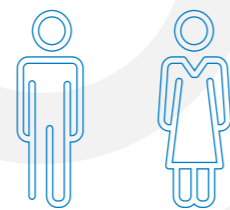
Percentage change of age-standardised DALYs, Deaths and prevalence from 1990 to 2021:

	WHO Europe	vs	Serbia
DALYs	-28.98%		-35.95%
Deaths	-43.19%		-45.31%
Prevalence	0.34%		1.11%

Most prevalent neurological diseases in Serbia in

2021

- 1 Tension-type headache
- 2 Migraine
- 3 Diabetic neuropathy
- 4 Stroke
- 5 Alzheimer's disease and other dementias



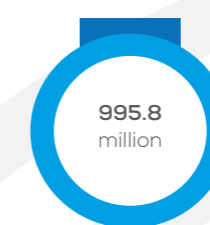
3,513 3,351 WHO Europe
5,109 4,899 Serbia

Age-standardised DALYs rate per 100,000 population in 2021 by sex

WHO Europe

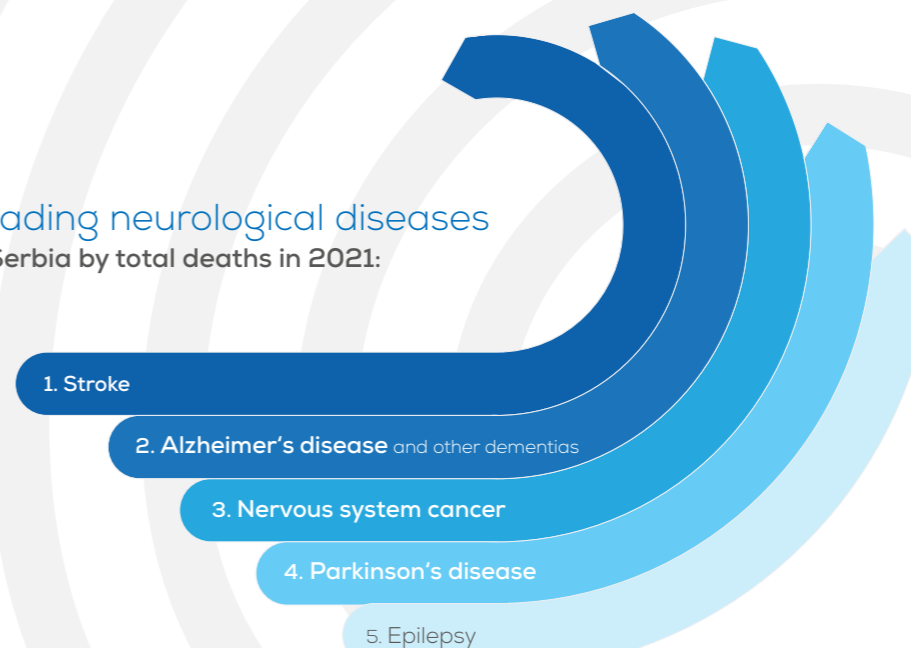


Serbia**



Annual total costs (in million € PPP 2019) for 12 major neurological diseases:

Leading neurological diseases in Serbia by total deaths in 2021:



*Based on data from 37 countries of the WHO European region

**Cost estimates are derived from country-specific data available for specific diseases.

