

# EAN Fact Sheet

Country profile of Croatia

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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 (thousands)	Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Croatia	WHO Europe
<b>All Neurological Disorders</b>					
DALYs	260,749	5,807	3,413	-41.2%	-29.0%
Deaths	10,088	233	102	-56.0%	-43.2%
Prevalence	2,048,366	42,144	42,445	0.7%	0.3%
YLDs	109,633	1,676	1,709	1.9%	2.9%
YLLs	151,109	4,131	1,704	-58.8%	-44.4%
<b>Alzheimer's disease and other dementias</b>					
DALYs	38,485	397	383	-3.6%	-2.5%
Deaths	2,050	21	20	-2.6%	-2.8%
Prevalence	65,215	671	647	-3.5%	-2.1%
YLDs	13,322	138	132	-4.5%	-2.6%
YLLs	25,163	259	251	-3.1%	-2.5%
<b>Chromosomal abnormalities</b>					
DALYs	192	6.94	7.44	7.2%	-12.3%
Prevalence	2,128	78	84	7.7%	-12.8%
YLDs	192	6.94	7.44	7.2%	-12.4%
<b>Covid-19 (neurological)</b>					
DALYs	2,106	-	40	-	-
Prevalence	21,121	-	408	-	-
YLDs	2,106	-	40	-	-
<b>Cystic echinococcosis</b>					
DALYs	4	0.11	0.09	-24.6%	-18.3%
Prevalence	19	0.42	0.37	-12.2%	-9.0%
YLDs	4	0.11	0.09	-24.3%	-18.4%
<b>Diabetic neuropathy</b>					
DALYs	29,818	228	361	58.3%	98.1%
Prevalence	235,400	1,797	2,841	58.1%	97.9%
YLDs	29,818	228	361	58.3%	98.1%

<b>Diabetic syndrome</b>					
DALYs	136	4.82	5.27	9.3%	-19.6%
Prevalence	1,522	55	59	8.9%	-20.7%
YLDs	136	4.82	5.27	9.3%	-19.8%
<b>Encephalitis</b>					
DALYs	441	5	9	61.6%	-30.1%
Deaths	14	0.08	0.19	142.0%	-15.9%
Prevalence	983	21	19	-10.9%	-13.6%
YLDs	97	2.23	2.03	-8.9%	-12.0%
YLLs	344	3	6	113.2%	-31.0%
<b>Epilepsy</b>					
DALYs	8,303	222	179	-19.5%	-12.6%
Deaths	98	1.48	1.62	9.6%	3.9%
Prevalence	20,177	535	444	-17.0%	3.3%
YLDs	4,979	152	110	-27.4%	-11.3%
YLLs	3,324	71	69	-2.5%	-14.3%
<b>Guillain-Barre Syndrome</b>					
DALYs	21	0.418	0.420	0.5%	12.4%
Prevalence	72	1.41	1.42	0.5%	12.4%
YLDs	21	0.418	0.420	0.5%	12.4%
<b>Idiopathic intellectual disability</b>					
DALYs	462	17	12	-24.6%	-19.7%
Prevalence	10,282	369	283	-23.5%	-21.2%
YLDs	462	17	12	-24.6%	-19.7%
<b>Klinefelter syndrome</b>					
DALYs	1	0.015	0.016	3.3%	5.7%
Prevalence	68	2.14	2.22	3.7%	5.5%
YLDs	1	0.015	0.016	3.2%	5.5%

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Croatia	WHO Europe	
<b>Meningitis</b>						
DALYs	634	80	16	-80.0%	-80.5%	
Deaths	16	1.23	0.27	-77.6%	-75.4%	
Prevalence	1,516	63	30	-51.6%	-66.7%	
YLDs	122	5	3	-50.2%	-64.6%	
YLLs	512	74	13	-82.2%	-81.3%	
<b>Migraine</b>						
DALYs	23,744	519	516	-0.5%	0.0%	
Prevalence	615,855	13,686	13,584	-0.7%	0.3%	
YLDs	23,744	519	516	-0.5%	0.0%	
<b>Motor neuron disease</b>						
DALYs	1,620	17.75	26.04	46.6%	37.5%	
Deaths	59	0.44	0.76	72.1%	54.1%	
Prevalence	217	4.31	4.64	7.7%	19.8%	
YLDs	46	0.92	0.99	7.7%	19.5%	
YLLs	1,574	16.84	25.05	48.8%	38.5%	
<b>Multiple sclerosis</b>						
DALYs	1,436	31	23	-25.1%	-5.0%	
Deaths	33	0.73	0.45	-38.5%	-12.5%	
Prevalence	1,833	21	32	56.1%	26.4%	
YLDs	477	6	9	52.3%	25.5%	
YLLs	959	26	15	-42.1%	-22.2%	
<b>Nervous system cancer</b>						
DALYs	13,848	223	218	-2.1%	-3.3%	
Deaths	570	6	7	21.2%	10.8%	
Prevalence	2,069	24	40	65.9%	35.9%	
YLDs	272	2.96	4.41	48.9%	25.3%	
YLLs	13,576	220	214	-2.8%	-3.7%	

<b>Neurocysticercosis</b>						
DALYs	1,671	45.14	24.48	-45.8%	-42.5%	
Prevalence	7,991	185.86	115.41	-37.9%	-32.8%	
YLDs	1,671	45.12	24.48	-45.8%	-42.5%	
<b>Neurosyphilis</b>						
DALYs	1	0.013	0.009	-24.9%	-43.6%	
Prevalence	16	0.44	0.33	-23.9%	-11.7%	
YLDs	1	0.012	0.009	-24.6%	-43.4%	
<b>Other neurological disorders</b>						
DALYs	2,628	52	55	4.9%	25.8%	
Deaths	51	0.74	0.73	-1.3%	45.0%	
YLDs	1,213	19	27	46.1%	62.9%	
YLLs	1,407	33	27	-18.0%	14.2%	
<b>Parkinson's disease</b>						
DALYs	8,554	96	84	-13.2%	5.6%	
Deaths	521	6	5	-15.6%	4.0%	
Prevalence	9,772	91	99	9.8%	21.9%	
YLDs	1,357	13	14	8.9%	21.4%	
YLLs	7,197	84	70	-16.5%	2.0%	
<b>Spinal cord injury</b>						
DALYs	4,678	93	85	-8.2%	-26.9%	
Prevalence	18,162	328	323	-1.4%	-21.9%	
YLDs	4,678	93	85	-8.2%	-26.9%	
<b>Stroke</b>						
DALYs	110,342	3,543	1,174	-66.9%	-52.6%	
Deaths	6,675	195	66	-66.2%	-55.6%	
Prevalence	72,488	1,114	884	-20.6%	-19.2%	
YLDs	13,290	201	161	-19.9%	-18.9%	
YLLs	97,052	3,343	1,014	-69.7%	-55.3%	

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Croatia	WHO Europe	
<b>Tension-type headache</b>						
DALYs	3,657	72.99	73.08	0.1%	-1.6%	
Prevalence	1,372,487	29,993	29,954	-0.1%	-0.8%	
YLDs	3,657	72.99	73.08	0.1%	-1.6%	
<b>Traumatic Brain Injury</b>						
DALYs	7,968	150	121	-19.8%	-28.2%	
Prevalence	55,305	1,023	825	-19.3%	-28.0%	
YLDs	7,968	150	121	-19.8%	-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.

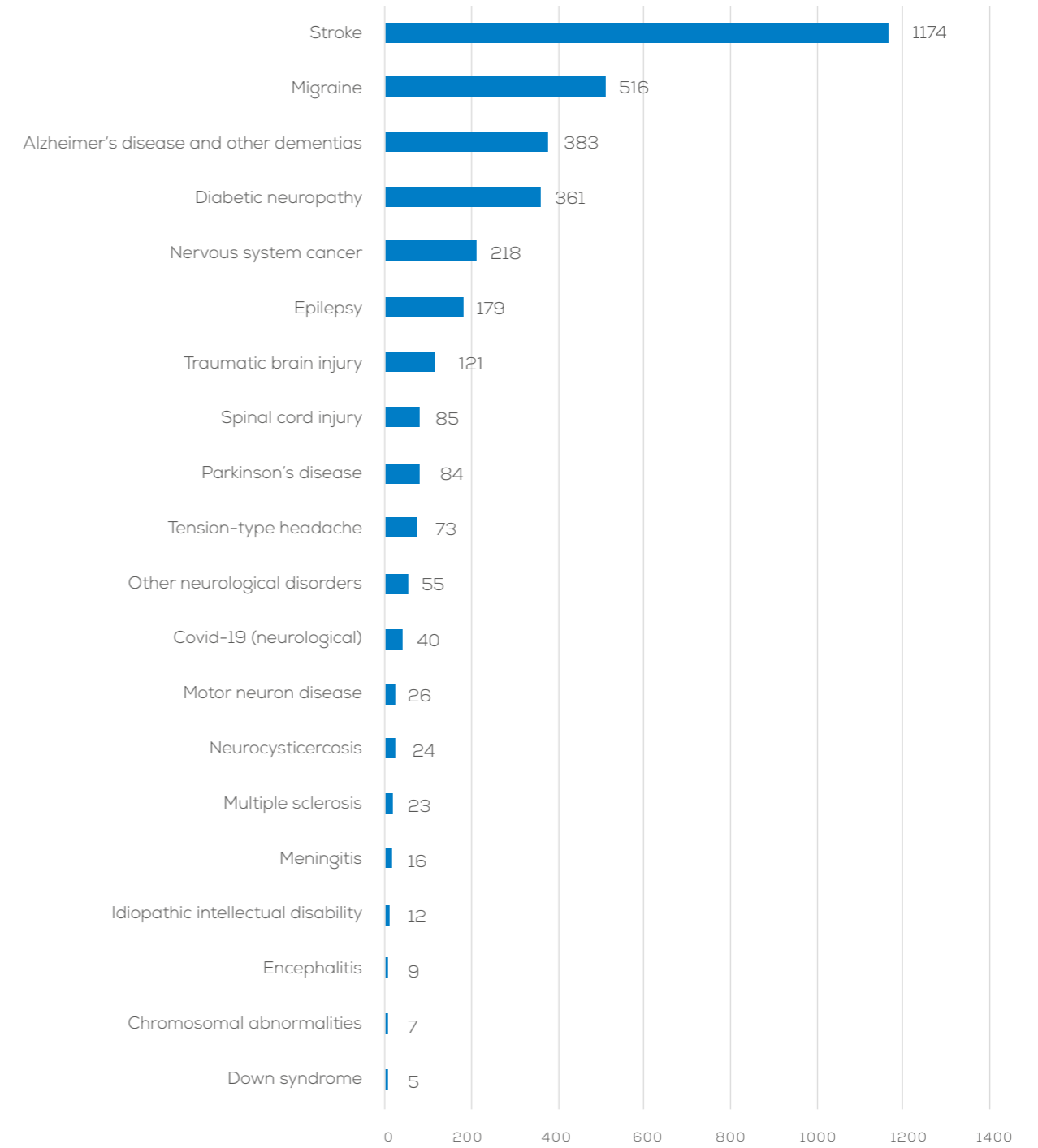


Figure 1: National age-standardised DALYs per 100 000 population by neurological disorder in 2021.

## DALYs per 100 000 population

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

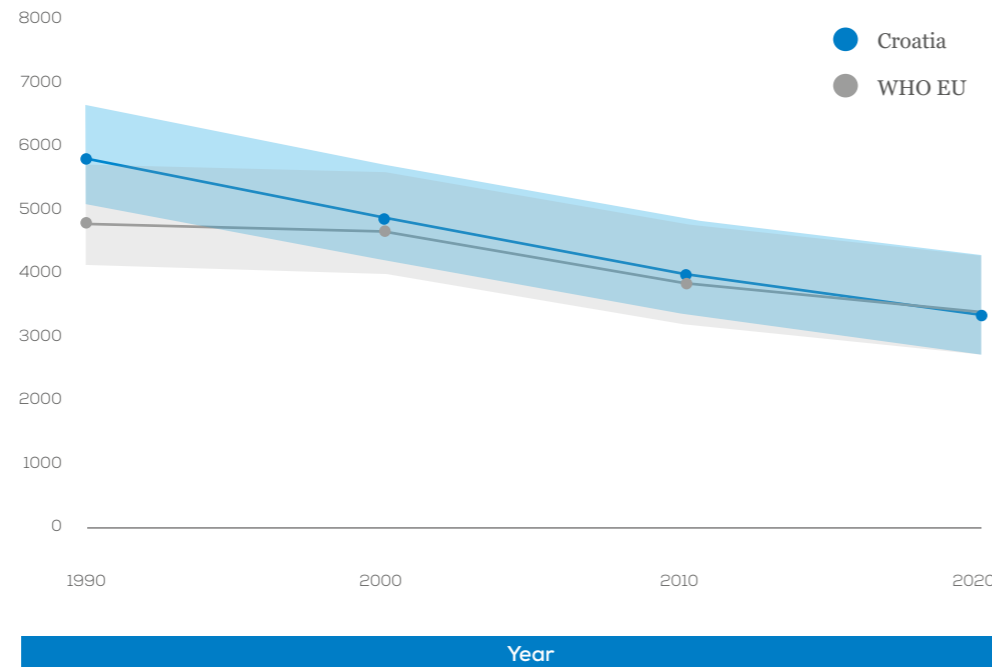


Figure 2: Age-Standardized DALYs per 100 000 population over the last 3 decades.

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

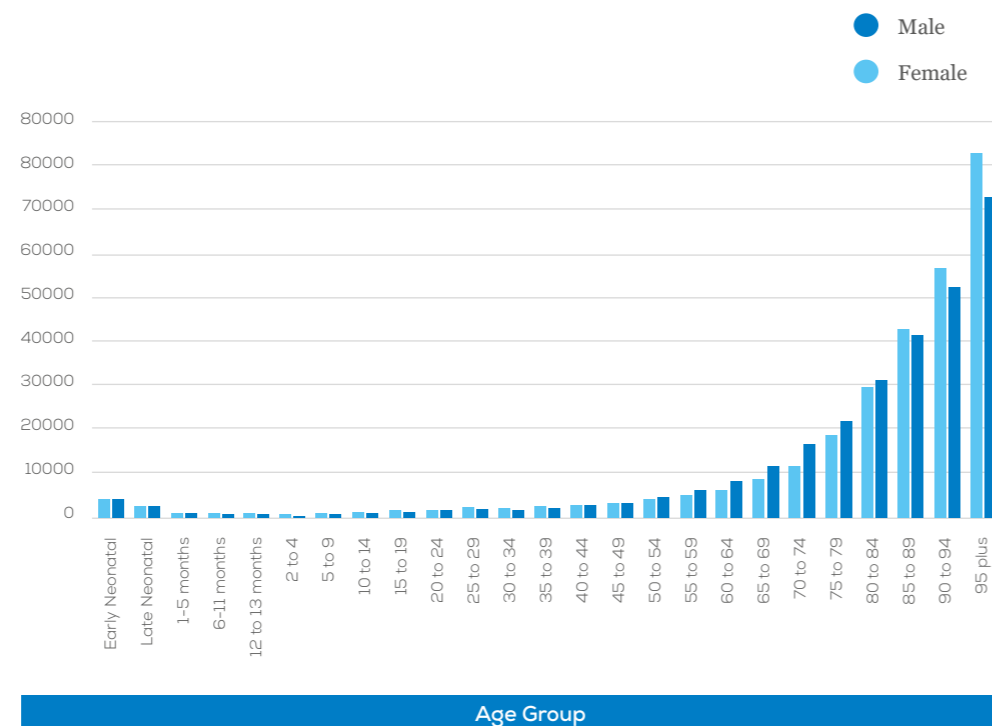


Figure 3: National DALYs per 100 000 population by age group and sex in 2021.

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 **Croatia** 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
Headache disorders	2,539.9	1,324.2	480.2	735.4
Sleep disorders	1,580.7	997.5	-	583.2
Alzheimer's disease and other dementias	952.5	411.1	541.3	0.1
Traumatic brain injury	505.4	261.7	158.2	85.5
Polyneuropathies	179.4	118.3	-	61.1
Stroke	123.6	37.6	73.0	13.1
Parkinson's disease	56.7	39.1	15.7	1.9
Idiopathic epilepsy	41.0	12.5	-	28.5
Multiple sclerosis	25.2	16.4	3.7	5.0
Brain and central nervous system cancer	8.6	5.2	3.4	-
Meningitis	1.8	1.8	-	-
Motor neuron disease	1.7	1.0	0.5	0.2
<b>Total Costs:</b>	<b>6,016.4</b>	<b>3,226.4</b>	<b>1,276.0</b>	<b>1,514.0</b>

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.

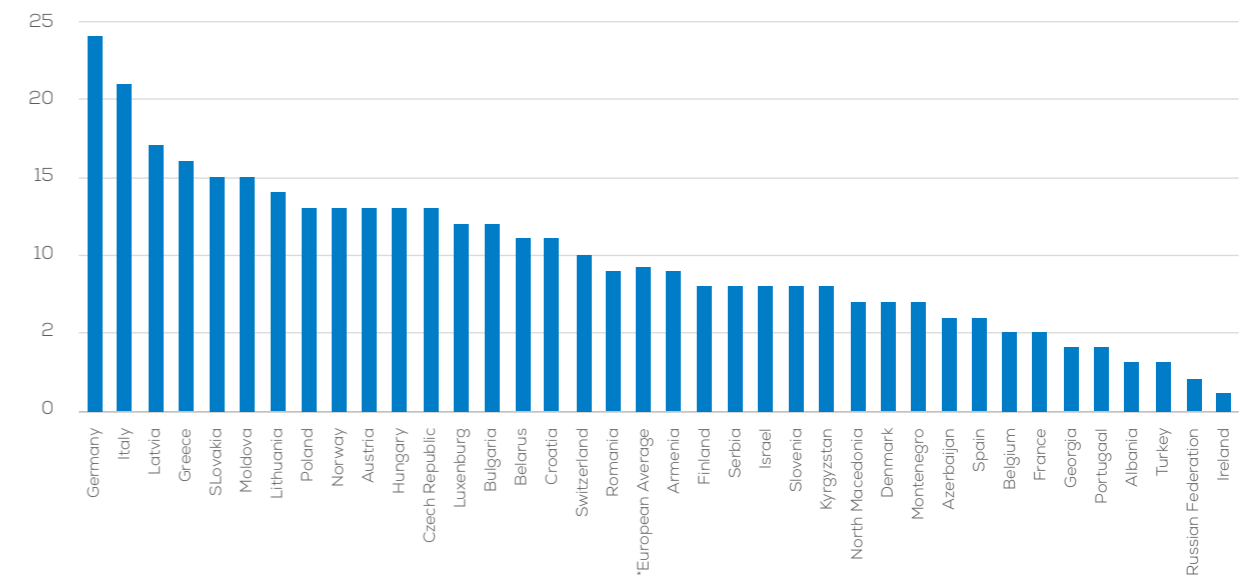


Figure 4: Number of neurologists (fully specialised and in training) per 100 000 population.

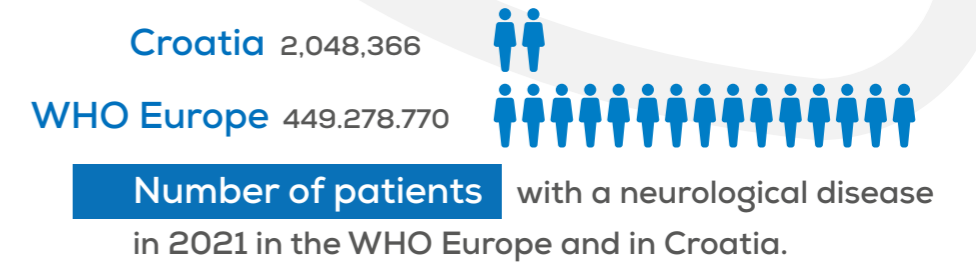
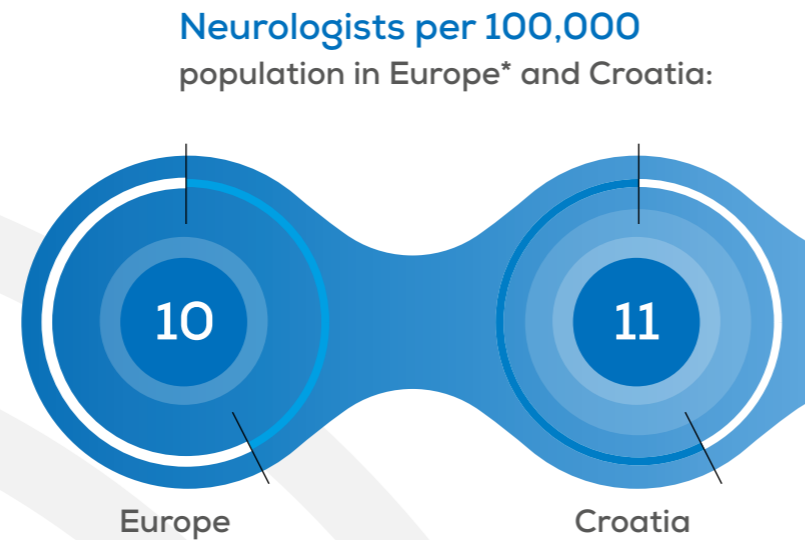
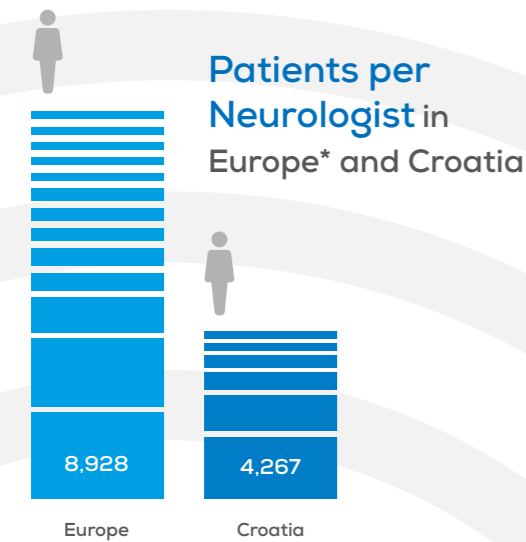
In the last figure the number of patients per neurologist is displayed:



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

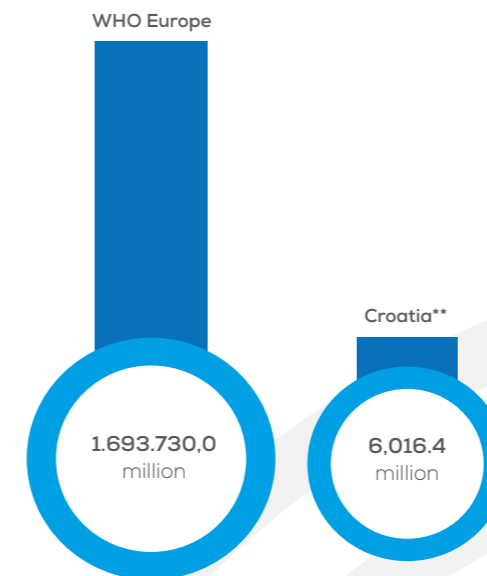
# Neurological Diseases in Europe and Croatia:

Key Data and Trends from 2021



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

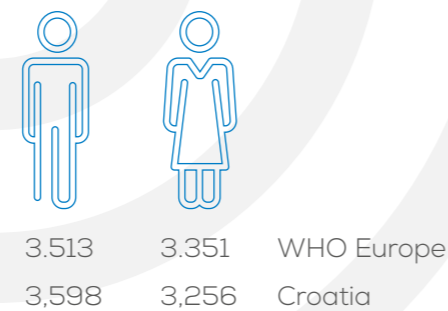
	WHO Europe	vs	Croatia
DALYs	-28.98%		-41.24%
Deaths	-43.19%		-56.02%
Prevalence	0.34%		0.71%



### Most prevalent neurological diseases in Croatia in

# 2021

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



### Leading neurological diseases in Croatia by total deaths in 2021:

1. Stroke
2. Alzheimer's disease and other dementias
3. Nervous system cancer
4. Parkinson's disease
5. Epilepsy

\*Based on data from 37 countries of the WHO European region  
 \*\*Cost estimates are derived from country-specific data available for specific diseases.

