

EAN Fact Sheet

Country profile of Portugal

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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	Portugal	WHO Europe
All Neurological Disorders					
DALYs	589,911	5,909	2,879	-51.3%	-29.0%
Deaths	25,874	265	83	-68.7%	-43.2%
Prevalence	5,450,468	45,763	45,748	0.0%	0.3%
YLDs	240,631	1,559	1,509	-3.3%	2.9%
YLLs	349,252	4,349	1,370	-68.5%	-44.4%
Alzheimer's disease and other dementias					
DALYs	138,949	444	433	-2.6%	-2.5%
Deaths	8,557	26	25	-3.3%	-2.8%
Prevalence	203,138	673	659	-2.0%	-2.1%
YLDs	42,884	140	137	-1.9%	-2.6%
YLLs	96,065	304	295	-2.9%	-2.5%
Chromosomal abnormalities					
DALYs	611	10	8	-14.0%	-12.3%
Prevalence	6,629	110	95	-13.9%	-12.8%
YLDs	611	10	8	-14.0%	-12.4%
Covid-19 (neurological)					
DALYs	2,057	-	17	-	-
Prevalence	20,678	-	168	-	-
YLDs	2,057	-	17	-	-
Cystic echinococcosis					
DALYs	2	0.02	0.02	-28.8%	-18.3%
Prevalence	9	0.08	0.07	-12.2%	-9.0%
YLDs	2	0.02	0.02	-28.7%	-18.4%
Diabetic neuropathy					
DALYs	61,535	140	291	107.2%	98.1%
Prevalence	487,502	1,108	2,295	107.1%	97.9%
YLDs	61,535	140	291	107.2%	98.1%

Down syndrome					
DALYs	376	6	5	-22.3%	-19.6%
Prevalence	4,003	67	52	-22.6%	-20.7%
YLDs	376	6	5	-22.4%	-19.8%
Encephalitis					
DALYs	1,765	17	16	-4.4%	-30.1%
Deaths	63	0.30	0.36	22.4%	-15.9%
Prevalence	207	1.82	1.43	-21.7%	-13.6%
YLDs	20	0.19	0.15	-18.6%	-12.0%
YLLs	1,744	17	16	-4.3%	-31.0%
Epilepsy					
DALYs	15,717	128	124	-3.5%	-12.6%
Deaths	326	1.26	1.63	29.5%	3.9%
Prevalence	32,864	229	269	17.4%	3.3%
YLDs	7,752	67	64	-4.2%	-11.3%
YLLs	7,965	62	60	-2.8%	-14.3%
Guillain-Barre Syndrome					
DALYs	74	0.52	0.52	0.0%	12.4%
Prevalence	251	1.75	1.75	0.2%	12.4%
YLDs	74	0.52	0.52	0.2%	12.4%
Idiopathic intellectual disability					
DALYs	1,561	23	17	-25.5%	-19.7%
Prevalence	32,086	482	349	-27.6%	-21.2%
YLDs	1,561	23	17	-25.5%	-19.7%
Klinefelter syndrome					
DALYs	6	0.05	0.05	5.1%	5.7%
Prevalence	484	6.11	6.56	7.4%	5.5%
YLDs	6	0.05	0.05	5.0%	5.5%

	Counts (thousands)	Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Portugal	WHO Europe
Meningitis					
DALYs	1,428	99	15	-84.4%	-80.5%
Deaths	48	1.47	0.30	-79.4%	-75.4%
Prevalence	344	16	3	-81.5%	-66.7%
YLDs	28	1.35	0.26	-80.4%	-64.6%
YLLs	1,400	98	15	-84.4%	-81.3%
Migraine					
DALYs	71,559	657	656	-0.2%	0.04%
Prevalence	1,903,085	17,715	17,693	-0.1%	0.3%
YLDs	71,559	657	656	-0.2%	0.04%
Motor neuron disease					
DALYs	5,999	25.68	31.76	23.7%	37.5%
Deaths	253	0.70	1.11	59.4%	54.1%
Prevalence	1,264	5.39	7.53	39.7%	19.8%
YLDs	268	1.15	1.60	39.7%	19.5%
YLLs	5,730	24.53	30.16	23.0%	38.5%
Multiple sclerosis					
DALYs	2,966	18.39	18.37	-0.1%	-5.0%
Deaths	60	0.31	0.31	1.8%	-12.5%
Prevalence	4,872	30.73	31.62	2.9%	26.4%
YLDs	1,257	8.14	8.28	1.7%	25.5%
YLLs	1,710	10.25	10.09	-1.6%	-22.2%
Nervous system cancer					
DALYs	25,963	194	168	-13.8%	-3.3%
Deaths	992	4.63	4.94	6.7%	10.8%
Prevalence	2,553	20	24	20.6%	35.9%
YLDs	382	2.33	2.68	15.3%	25.3%
YLLs	25,582	192	165	-14.1%	-3.7%

Neurosyphilis					
DALYs	7	0.05	0.04	-10.3%	-43.6%
Prevalence	80	0.67	0.58	-13.2%	-11.7%
YLDs	7	0.05	0.04	-10.2%	-43.4%
Other neurological disorders					
DALYs	7,398	61	55	-8.5%	25.8%
Deaths	208	1.14	1.04	-8.9%	45.0%
YLDs	2,273	11	18	66.3%	62.9%
YLLs	5,097	50	38	-24.6%	14.2%
Parkinson's disease					
DALYs	21,773	67	73	8.7%	5.6%
Deaths	1,337	4.00	4.11	2.9%	4.0%
Prevalence	30,913	78	112	44.0%	21.9%
YLDs	4,344	11	16	44.1%	21.4%
YLLs	17,429	56	57	1.8%	2.0%
Spinal cord injury					
DALYs	10,392	149	73	-50.9%	-26.9%
Prevalence	38,244	493	264	-46.3%	-21.9%
YLDs	10,392	149	73	-50.9%	-26.9%
Stroke					
DALYs	204,026	3,711	764	-79.4%	-52.6%
Deaths	14,030	226	44	-80.4%	-55.6%
Prevalence	121,105	1,296	580	-55.3%	-19.2%
YLDs	17,498	179	80	-55.4%	-18.9%
YLLs	186,528	3,532	684	-80.6%	-55.3%

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Portugal	WHO Europe	
Tension-type headache						
DALYs	8,716	69	70	0.8%	-1.6%	
Prevalence	3,747,590	32,438	32,429	-0.03%	-0.8%	
YLDs	8,716	69	70	0.8%	-1.6%	
Traumatic Brain Injury						
DALYs	7,029	83	43	-48.6%	-28.2%	
Prevalence	53,574	623	320	-48.6%	-28.0%	
YLDs	7,029	83	43	-48.6%	-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.

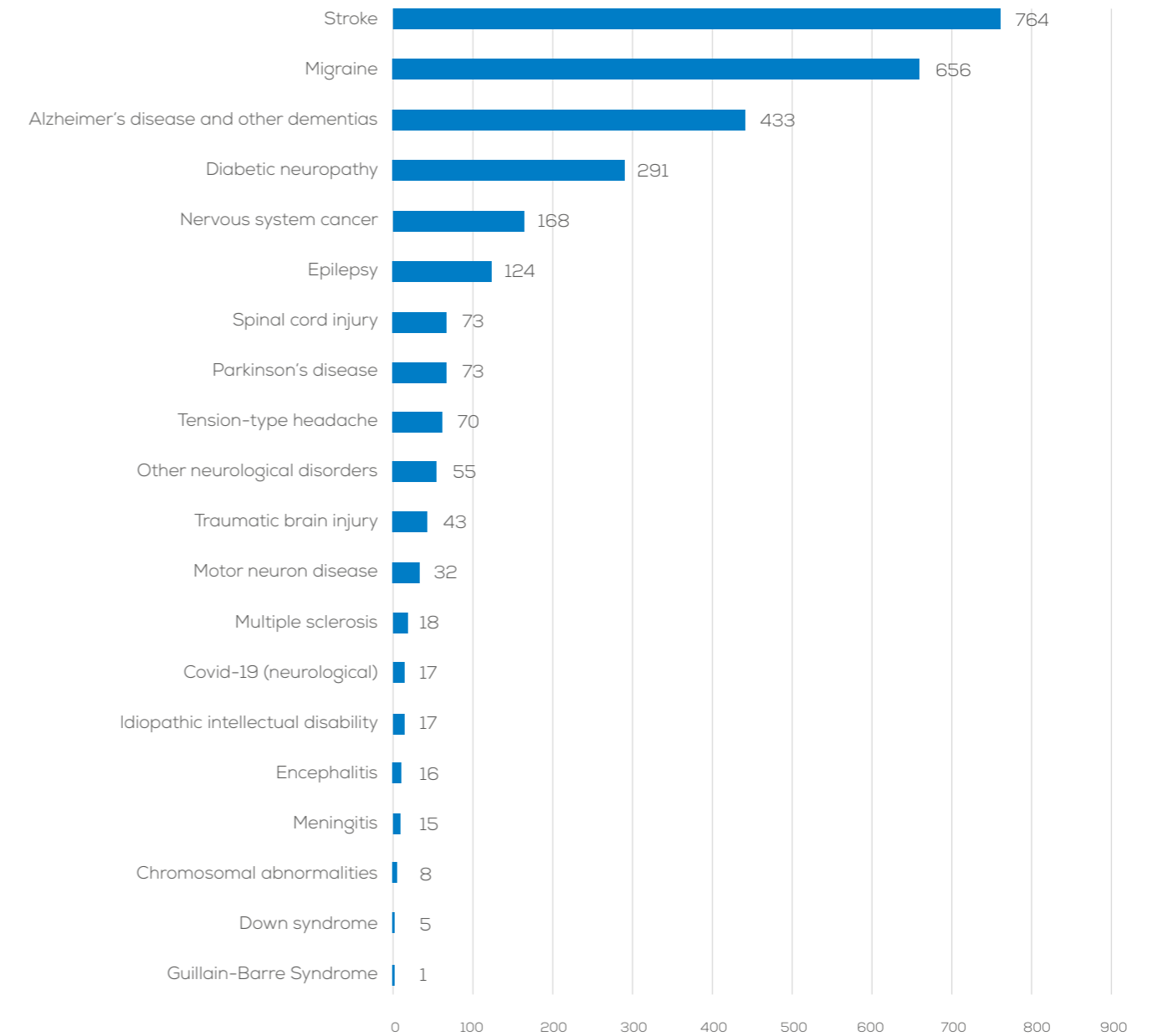


Figure 1: National age-standardised DALYs per 100 000 population by neurological disorder in 2021.

DALYs per 100 000 population

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

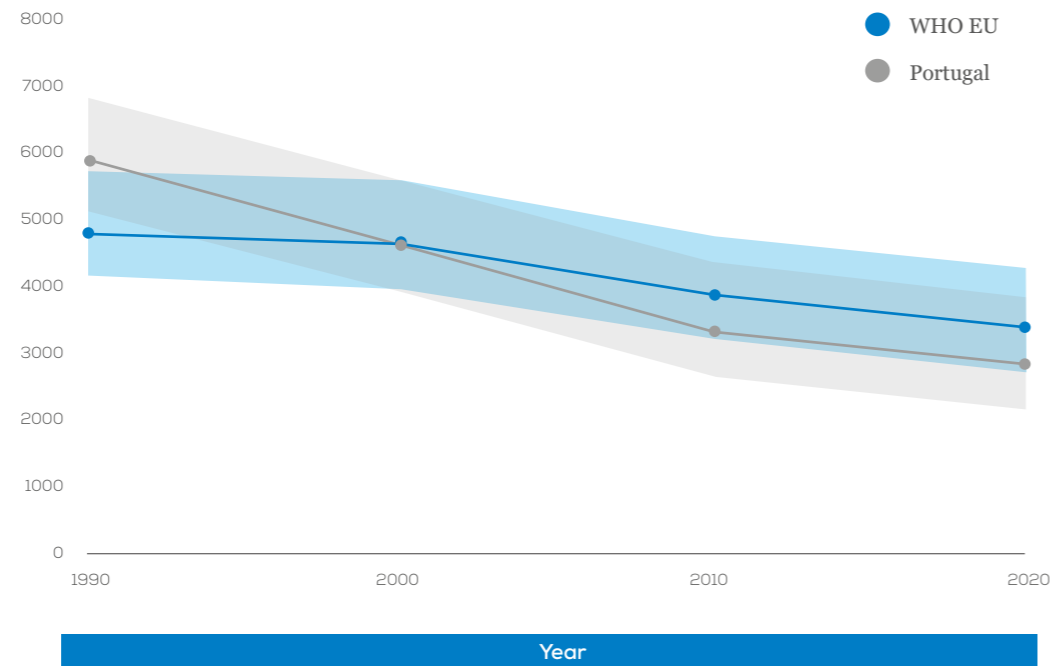


Figure 2: Age-Standardized DALYs per 100 000 population over the last 3 decades.

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

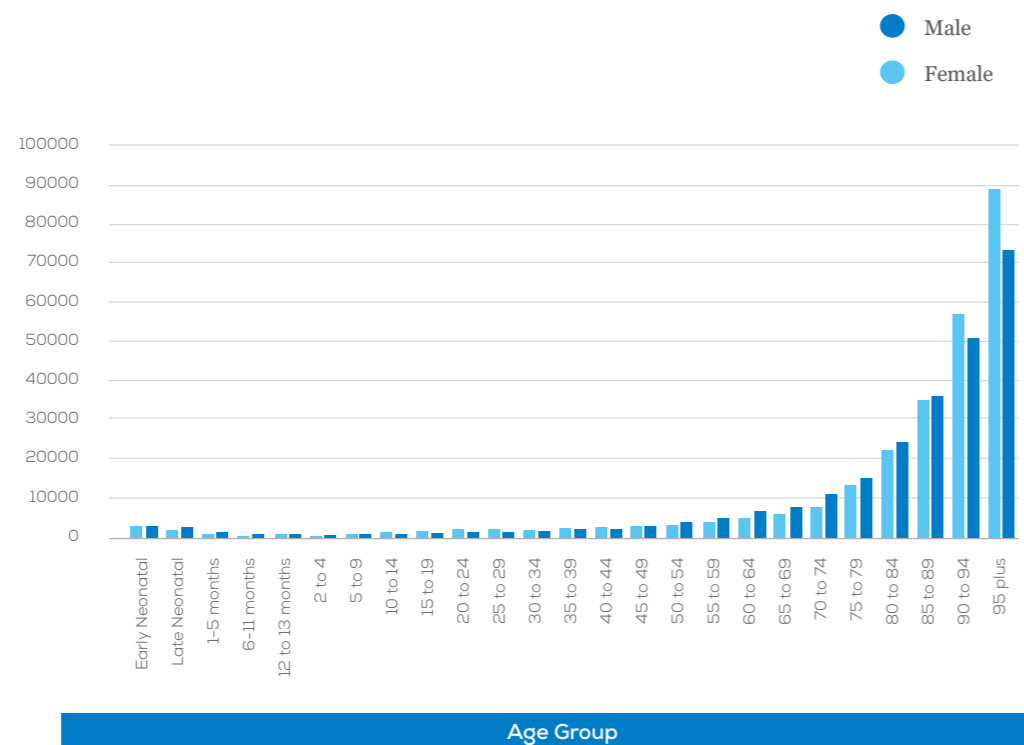


Figure 3: National DALYs per 100 000 population by age group and sex in 2021.

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 **Portugal** 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	9,570.6	5,000.3	1,813.2	2,757.2
Sleep disorders	5,751.0	3,513.5	-	2,237.4
Alzheimer's disease and other dementias	4,359.4	2,259.9	2,098.9	0.6
Polyneuropathies	872.7	537.8	-	334.9
Traumatic brain injury	614.8	273.7	165.4	175.7
Stroke	564.6	167.3	189.6	207.7
Parkinson's disease	169.5	155.6	4.8	9.1
Multiple sclerosis	125.9	87.0	11.4	27.5
Idiopathic epilepsy	96.9	42.1	-	54.8
Brain and central nervous system cancer	17.9	10.8	7.1	-
Motor neuron disease	14.5	8.7	4.6	1.2
Meningitis	2.9	2.9	-	-
Total Costs:	22,160.7	12,059.6	4,295.0	5,806.1

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.

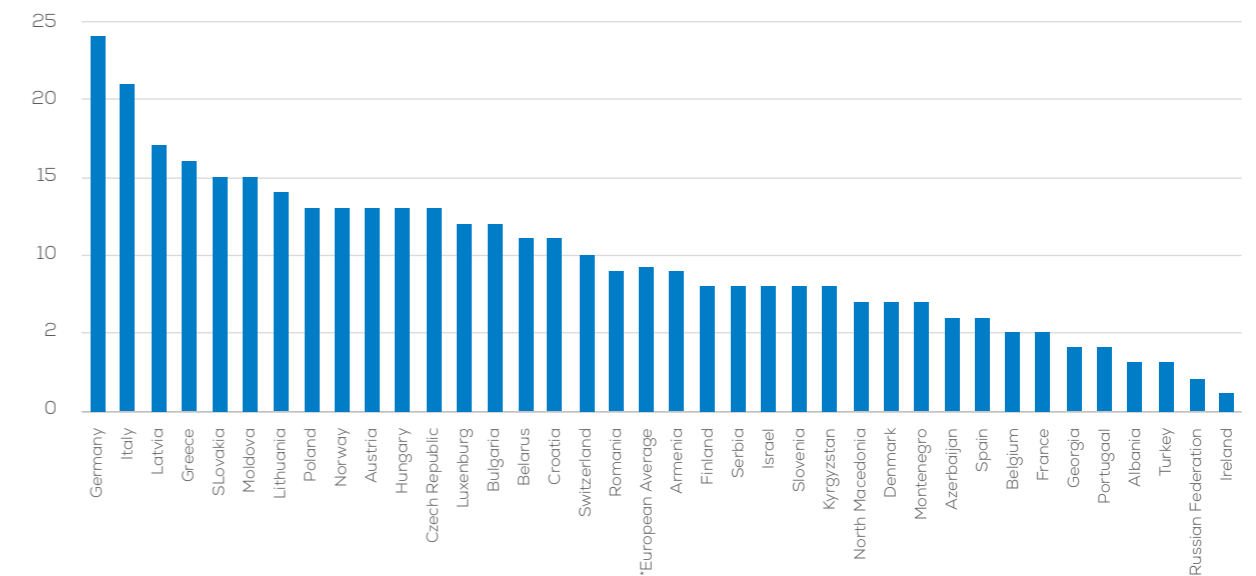


Figure 4: Number of neurologists (fully specialised and in training) per 100 000 population.

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

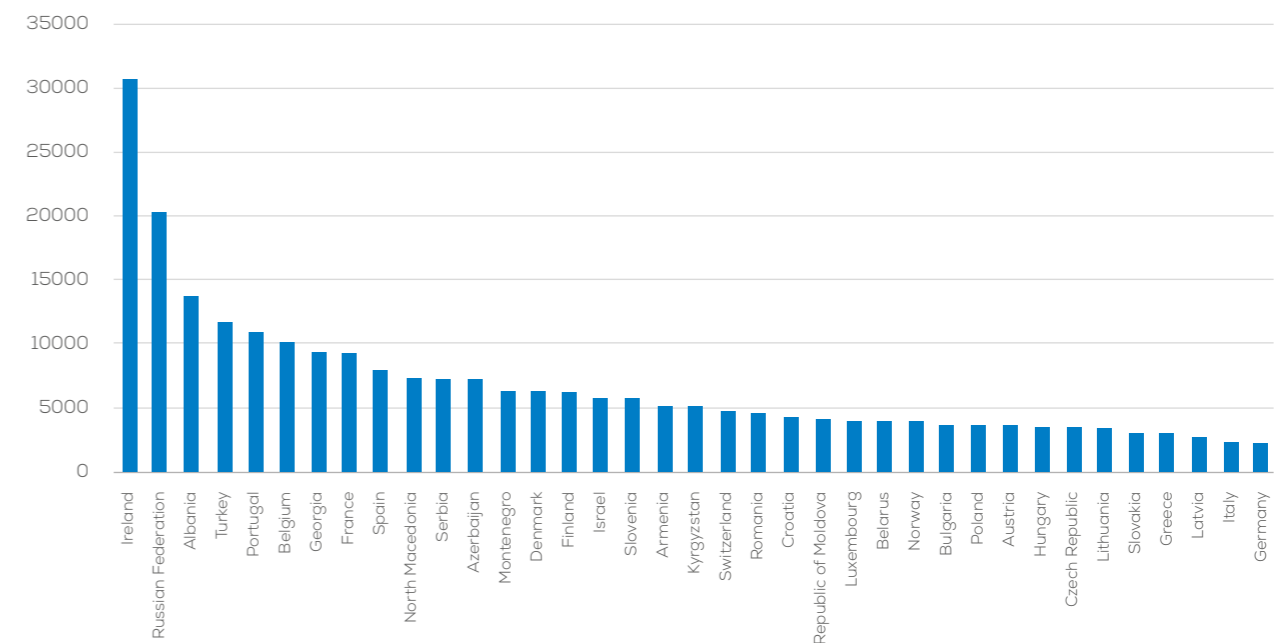
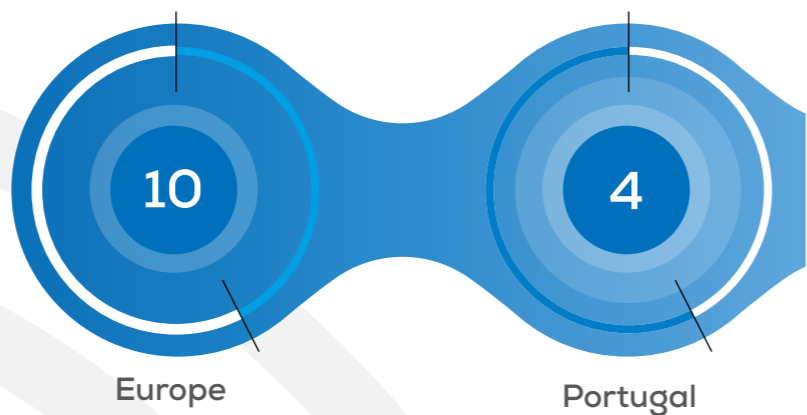


Figure 5: Number of patients per neurologist (fully specialised and in training).

Neurological Diseases in Europe and Portugal:

Key Data and Trends from 2021

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



Patients per Neurologist in Europe* and Portugal



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

	WHO Europe	vs	Portugal
DALYs	-28.98%		-51.28%
Deaths	-43.19%		-68.73%
Prevalence	0.34%		-0.03%

Most prevalent neurological diseases in Portugal in

2021

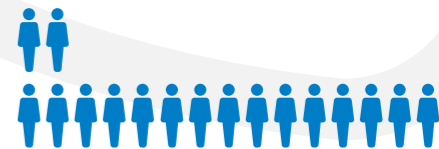
- 1 Tension-type headache
- 2 Migraine
- 3 Diabetic neuropathy
- 4 Alzheimer's disease and other dementias
- 5 Stroke

	WHO Europe	Portugal
Male	3,513	3,351
Female	2,900	2,871

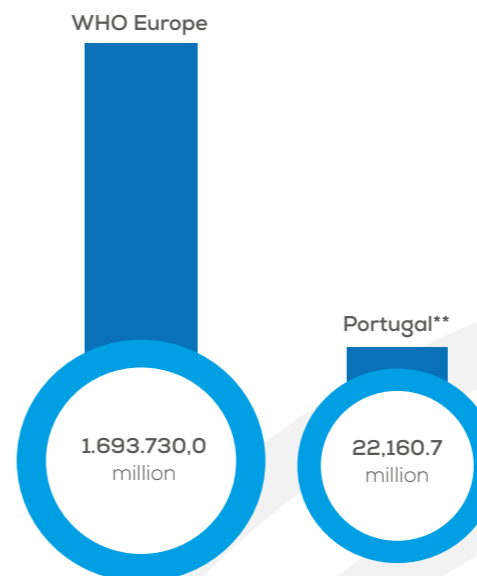
Age-standardised DALYs rate per 100,000 population in 2021 by sex

Portugal 5,450,468

WHO Europe 449.278.770

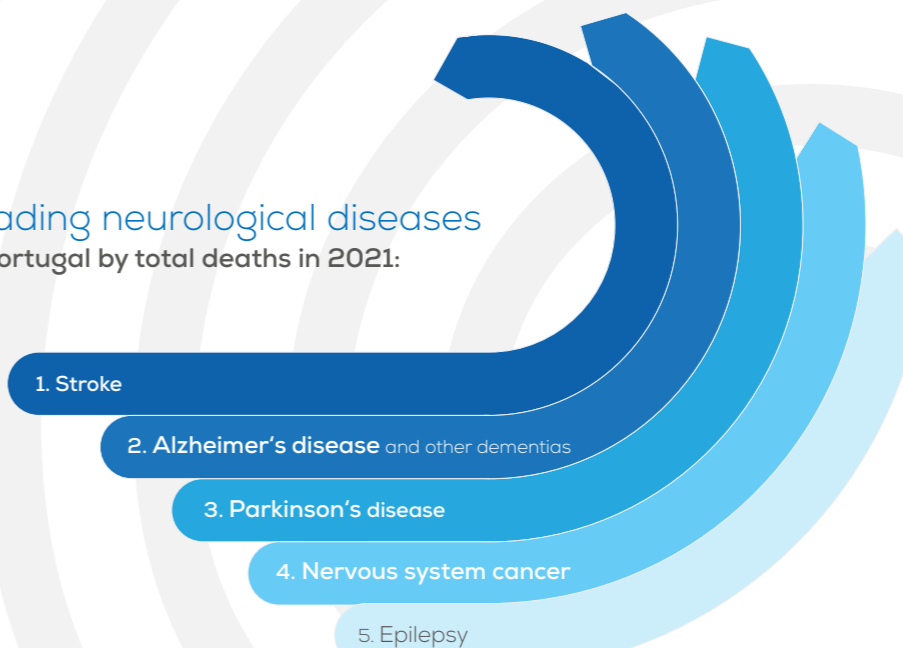


Number of patients with a neurological disease in 2021 in the WHO Europe and in Portugal.



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

Leading neurological diseases in Portugal 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.

