

EAN Fact Sheet

Country profile of Germany

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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)	(per 100 000 people)		Germany	WHO Europe
	2021	1990	2021		
All Neurological Disorders					
DALYs	4,408,683	3,766	2,804	-25.5%	-29.0%
Deaths	171,017	130	71	-45.6%	-43.2%
Prevalence	44,499,524	46,119	46,945	1.8%	0.3%
YLDs	2,063,430	1,561	1,626	4.1%	2.9%
YLLs	2,344,980	2,204	1,178	-46.5%	-44.4%
Alzheimer's disease and other dementias					
DALYs	1,288,751	511	509	-0.4%	-2.5%
Deaths	78,577	29.50	29.25	-0.8%	-2.8%
Prevalence	1,995,249	810	821	1.4%	-2.1%
YLDs	414,050	169	169	-0.3%	-2.6%
YLLs	874,700	342	340	-0.5%	-2.5%
Chromosomal abnormalities					
DALYs	4,887	8.29	8.11	-2.2%	-12.3%
Prevalence	53,416	93	91	-1.9%	-12.8%
YLDs	4,887	8.29	8.11	-2.2%	-12.4%
Covid-19 (neurological)					
DALYs	12,005	-	12	-	-
Prevalence	100,266	-	101	-	-
YLDs	12,005	-	12	-	-
Diabetic neuropathy					
DALYs	242,447	57	146	153.5%	98.1%
Prevalence	1,818,902	432	1,090	152.4%	97.9%
YLDs	242,447	57	146	153.5%	98.1%
Down syndrome					
DALYs	3,183	5.09	4.94	-2.9%	-19.6%
Prevalence	34,284	57	55	-3.5%	-20.7%
YLDs	3,183	5.09	4.94	-3.0%	-19.8%

Encephalitis					
DALYs	12,368	7	12	69.1%	-30.1%
Deaths	459	0.13	0.29	129.3%	-15.9%
Prevalence	10,070	10	9	-9.1%	-13.6%
YLDs	996	1.06	1.00	-6.0%	-12.0%
YLLs	11,372	6	11	82.3%	-31.0%
Epilepsy					
DALYs	198,454	176	188	6.5%	-12.6%
Deaths	3,147	110	186	69.5%	3.9%
Prevalence	548,165	457	539	17.9%	3.3%
YLDs	127,100	124	126	1.2%	-11.3%
YLLs	71,354	52	62	19.2%	-14.3%
Guillain-Barre Syndrome					
DALYs	716	0.44	0.60	37.5%	12.4%
Prevalence	2,419	1.47	2.02	37.5%	12.4%
YLDs	716	0.44	0.60	37.5%	12.4%
Idiopathic intellectual disability					
DALYs	6,375	14	9	-39.4%	-19.7%
Prevalence	137,945	296	187	-36.7%	-21.2%
YLDs	6,375	14	9	-39.4%	-19.7%
Klinefelter syndrome					
DALYs	38	0.03	0.03	6.5%	5.7%
Prevalence	2,916	4.29	4.62	7.7%	5.5%
YLDs	38	0.03	0.03	6.5%	5.5%

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Germany	WHO Europe	
Meningitis						
DALYs	6,868	44	9	-79.9%	-80.5%	
Deaths	221	0.73	0.17	-76.0%	-75.4%	
Prevalence	2,414	10	3	-73.3%	-66.7%	
YLDs	194	0.84	0.23	-72.3%	-64.6%	
YLLs	6,674	43	9	-80.1%	-81.3%	
Migraine						
DALYs	615,738	696	707	1.6%	0.0%	
Prevalence	16,539,322	18,764	19,204	2.3%	0.3%	
YLDs	615,738	696	707	1.6%	0.0%	
Motor neuron disease						
DALYs	56,597	35.08	37.44	6.7%	37.5%	
Deaths	2,395	1.08	1.33	23.3%	54.1%	
Prevalence	12,379	7.14	8.90	24.7%	19.8%	
YLDs	2,629	1.52	1.89	24.7%	19.5%	
YLLs	53,969	33.56	35.55	5.9%	38.5%	
Multiple sclerosis						
DALYs	61,999	44	47	7.7%	-5.0%	
Deaths	1,352	0.77	0.83	7.7%	-12.5%	
Prevalence	107,807	72	90	26.3%	26.4%	
YLDs	26,804	18	23	25.4%	25.5%	
YLLs	35,195	26	24	-4.9%	-22.2%	
Nervous system cancer						
DALYs	192,140	170	158	-7.0%	-3.3%	
Deaths	7,151	4.24	4.60	8.4%	10.8%	
Prevalence	16,034	12	19	48.9%	35.9%	
YLDs	2,644	1.77	2.29	29.7%	25.3%	
YLLs	189,495	168	155	-7.3%	-3.7%	

Neurosyphilis						
DALYs	29	0.03	0.02	-35.8%	-43.6%	
Prevalence	412	0.48	0.39	-19.4%	-11.7%	
YLDs	29	0.03	0.02	-35.8%	-43.4%	
Other neurological disorders						
DALYs	89,426	71	82	16.2%	25.8%	
Deaths	2,445	1.16	1.50	29.7%	45.0%	
YLDs	29,622	18	32	76.3%	62.9%	
YLLs	59,530	53	50	-4.5%	14.2%	
Parkinson's disease						
DALYs	221,855	73	95	30.2%	5.6%	
Deaths	12,434	4.11	4.88	18.8%	4.0%	
Prevalence	421,893	94	186	98.5%	21.9%	
YLDs	58,354	13	26	94.9%	21.4%	
YLLs	163,501	60	69	15.6%	2.0%	
Spinal cord injury						
DALYs	92,232	108	84	-22.0%	-26.9%	
Prevalence	339,410	375	304	-19.1%	-21.9%	
YLDs	92,232	108	84	-22.0%	-26.9%	
Stroke						
DALYs	1,167,395	1,610	576	-64.2%	-52.6%	
Deaths	62,834	88	26	-70.1%	-55.6%	
Prevalence	1,961,477	1,346	1,093	-18.8%	-19.2%	
YLDs	288,214	187	153	-18.3%	-18.9%	
YLLs	879,181	1,422	423	-70.3%	-55.3%	

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Germany	WHO Europe	
Tension-type headache						
DALYs	71,616	72.27	72.21	-0.1%	-1.6%	
Prevalence	30,566,292	32,541	33,108	1.7%	-0.8%	
YLDs	71,616	72.27	72.21	-0.1%	-1.6%	
Tetanus						
DALYs	5.33	0.097	0.003	-97.1%	-97.3%	
YLLs	5.29	0.097	0.003	-97.1%	-97.5%	
Traumatic Brain Injury						
DALYs	63,554	64	48	-24.2%	-28.2%	
Prevalence	487,321	477	363	-23.9%	-28.0%	
YLDs	63,554	64	48	-24.2%	-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.

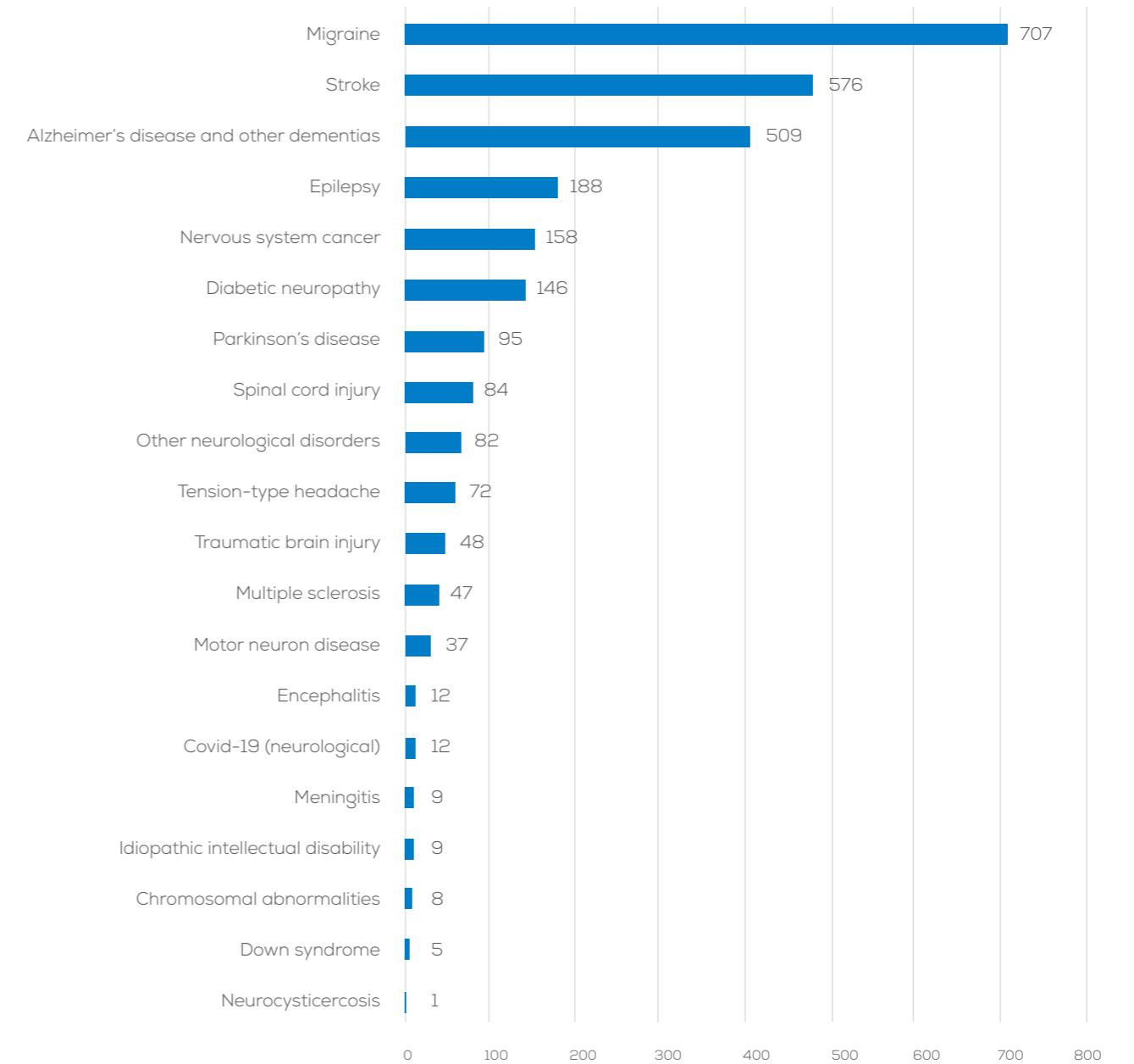


Figure 1: National age-standardised DALYs per 100 000 population by neurological disorder in 2021.

DALYs per 100 000 population

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

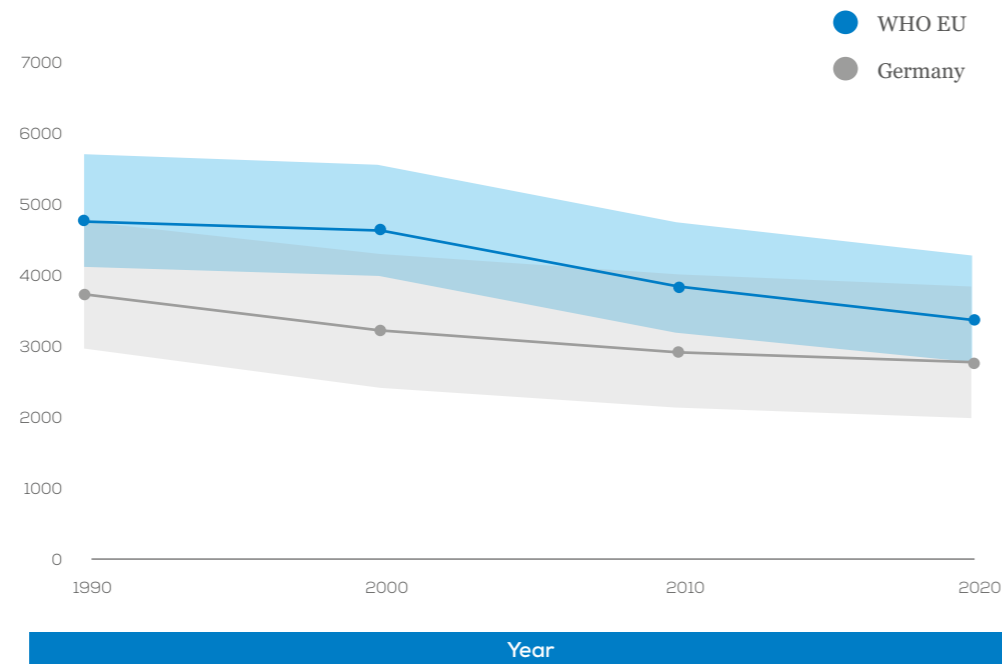


Figure 2: Age-Standardized DALYs per 100 000 population over the last 3 decades.

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

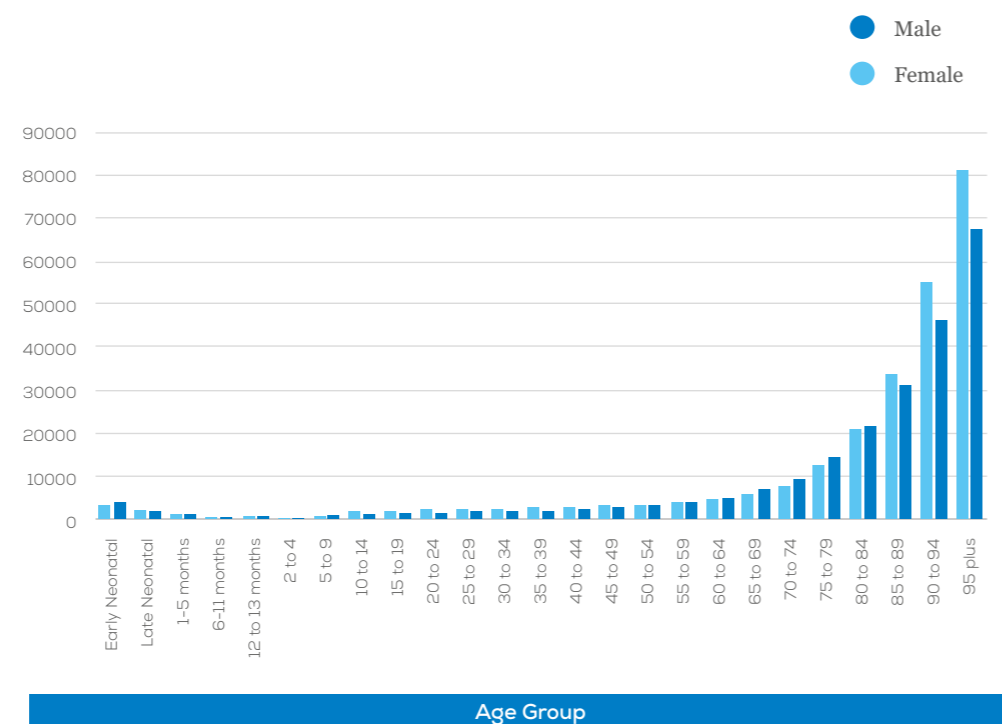


Figure 3: National DALYs per 100 000 population by age group and sex in 2021.

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 **Germany** 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
Sleep disorders	105,895.3	52,145.4	-	53,749.9
Headache disorders	94,057.4	28,571.5	18,362.5	47,123.3
Alzheimer's disease and other dementias	51,776.4	21,923.6	29,815.6	37.2
Stroke	17,893.1	11,347.9	5,666.6	878.6
Traumatic brain injury	8,193.9	3,277.7	1,981.2	2,935.0
Polyneuropathies	6,509.4	3,210.2	-	3,299.1
Idiopathic epilepsy	6,209.8	2,868.9	-	3,341.0
Parkinson's disease	5,688.0	4,866.0	589.6	232.4
Multiple sclerosis	3,510.4	2,209.3	480.5	820.6
Motor neuron disease	381.5	245.1	92.5	43.9
Brain and central nervous system cancer	157.8	95.6	62.2	-
Meningitis	16.2	16.2	-	-
Total Costs:	300,289.1	130,777.4	57,050.7	112,461.0

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.

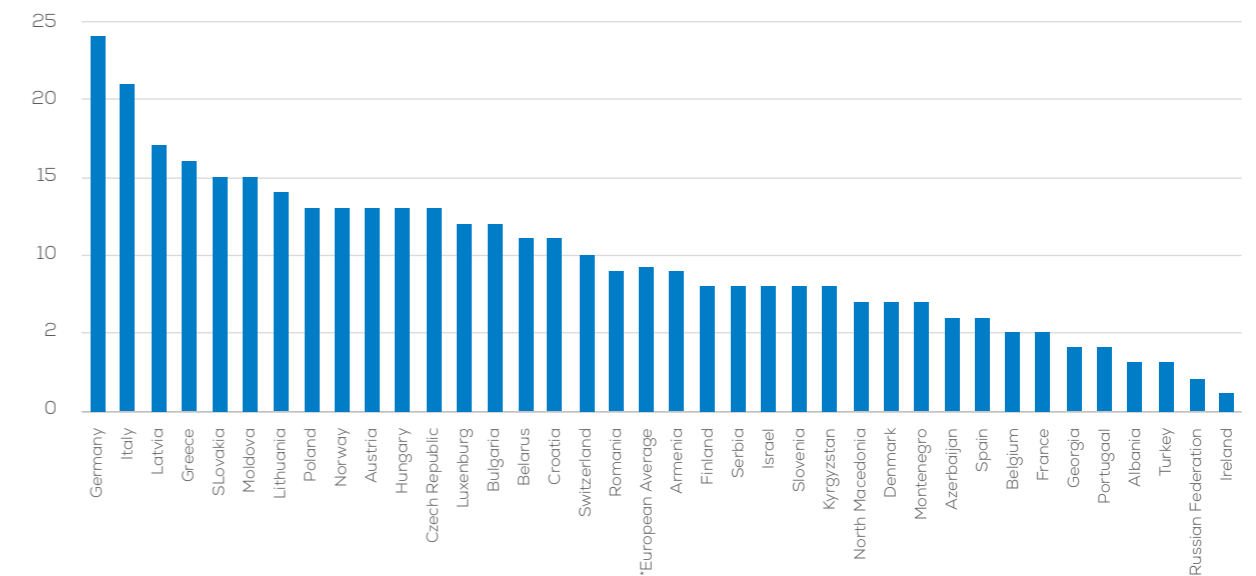


Figure 4: Number of neurologists (fully specialised and in training) per 100 000 population.

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

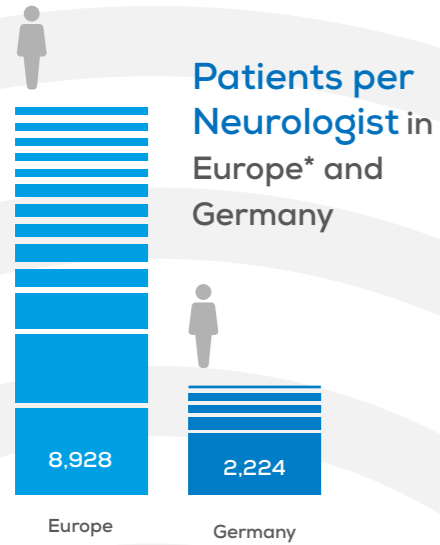
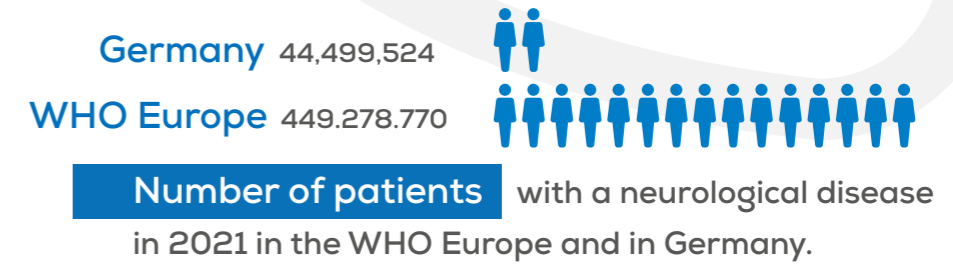
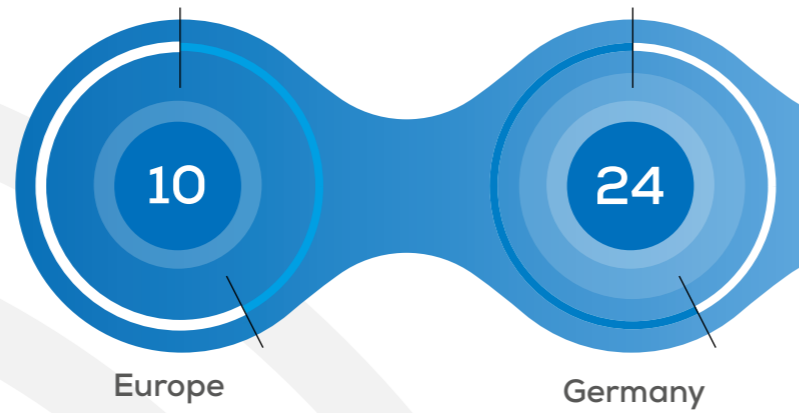


Figure 5: Number of patients per neurologist (fully specialised and in training).

Neurological Diseases in Europe and Germany:

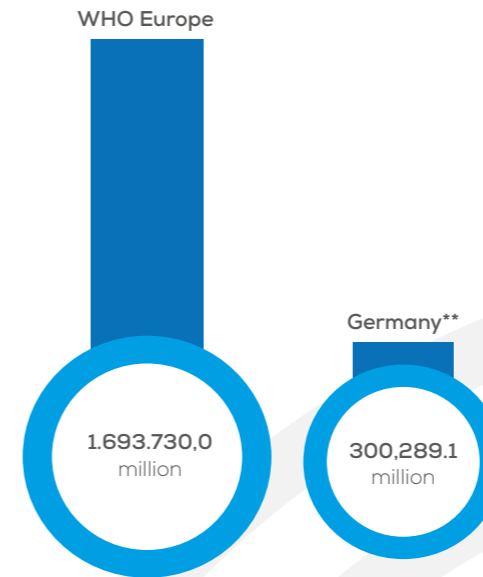
Key Data and Trends from 2021

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



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

	WHO Europe	vs	Germany
DALYs	-28.98%		-25.53%
Deaths	-43.19%		-45.64%
Prevalence	0.34%		1.79%

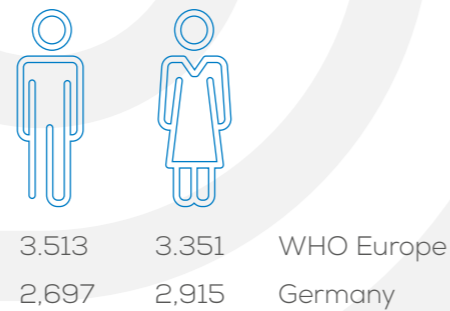


Annual total costs (in million € PPP 2019) for 12 major neurological diseases:

Most prevalent neurological diseases in Germany in 2021

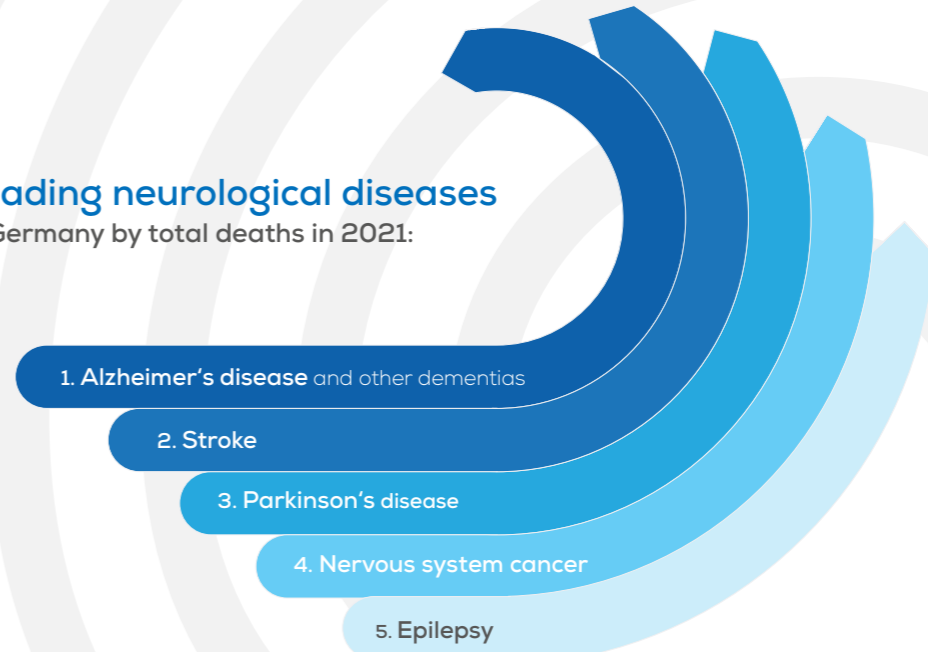
2021

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



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

Leading neurological diseases in Germany 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.

