

EAN Fact Sheet

Country profile of The Netherlands

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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)		The Netherlands	WHO Europe
	2021	1990	2021		
All Neurological Disorders					
DALYs	756,109	3,321	2,652	-20.1%	-29.0%
Deaths	29,486	111	75	-32.7%	-43.2%
Prevalence	8,860,044	46,484	47,023	1.2%	0.3%
YLDs	343,840	1,414	1,452	2.7%	2.9%
YLLs	412,225	1,907	1,200	-37.1%	-44.4%
Alzheimer's disease and other dementias					
DALYs	192,570	482	475	-1.5%	-2.5%
Deaths	11,653	28.41	27.94	-1.7%	-2.8%
Prevalence	278,819	711	700	-1.5%	-2.1%
YLDs	57,812	149	145	-2.9%	-2.6%
YLLs	134,758	333	330	-0.8%	-2.5%
Chromosomal abnormalities					
DALYs	1,307	9.88	10.12	2.4%	-12.3%
Prevalence	14,296	110	113	2.6%	-12.8%
YLDs	1,307	9.88	10.12	2.4%	-12.4%
Covid-19 (neurological)					
DALYs	3,417	-	17	-	-
Prevalence	34,245	-	173	-	-
YLDs	3,417	-	17	-	-
Diabetic neuropathy					
DALYs	57,972	127	187	47.5%	98.1%
Prevalence	452,348	996	1,452	45.8%	97.9%
YLDs	57,972	127	187	47.5%	98.1%
Down syndrome					
DALYs	847	5.94	6.16	3.7%	-19.6%
Prevalence	9,096	66	68	2.7%	-20.7%
YLDs	847	5.94	6.16	3.7%	-19.8%

Encephalitis					
DALYs	1,182	8	6	-25.5%	-30.1%
Deaths	45	0.17	0.15	-10.6%	-15.9%
Prevalence	934	5.25	4.42	-15.7%	-13.6%
YLDs	95	0.55	0.48	-13.3%	-12.0%
YLLs	1,087	7	6	-26.4%	-31.0%
Epilepsy					
DALYs	25,146	123	132	7.0%	-12.6%
Deaths	373	1.03	1.36	32.3%	3.9%
Prevalence	64,696	311	347	11.7%	3.3%
YLDs	14,866	79	80	1.3%	-11.3%
YLLs	10,280	44	52	17.4%	-14.3%
Guillain-Barre Syndrome					
DALYs	116	0.42	0.52	25.1%	12.4%
Prevalence	393	1.40	1.75	25.1%	12.4%
YLDs	116	0.41	0.52	25.1%	12.4%
Idiopathic intellectual disability					
DALYs	1,337	13	9	-32.8%	-19.7%
Prevalence	29,496	273	191	-30.1%	-21.2%
YLDs	1,337	13	9	-32.8%	-19.7%
Klinefelter syndrome					
DALYs	12	0.04	0.05	7.4%	5.7%
Prevalence	914	6.37	6.75	6.0%	5.5%
YLDs	12	0.04	0.05	7.4%	5.5%

	Counts	Age-standardized rate		Percentage change, 1990-2021	
	(thousands)	(per 100 000 people)		The Netherlands	WHO Europe
	2021	1990	2021		
Meningitis					
DALYs	3,054	70	20	-71.1%	-80.5%
Deaths	98	1.10	0.41	-63.3%	-75.4%
Prevalence	740	13	4	-68.2%	-66.7%
YLDs	61	1.11	0.36	-67.3%	-64.6%
YLLs	2,993	69	20	-71.1%	-81.3%
Migraine					
DALYs	109,685	596	629	5.5%	0.04%
Prevalence	2,944,901	16,016	17,015	6.2%	0.3%
YLDs	109,685	596	629	5.5%	0.04%
Motor neuron disease					
DALYs	14,812	46.99	50.98	8.5%	37.5%
Deaths	634	1.51	1.85	22.7%	54.1%
Prevalence	3,315	9.86	11.91	20.7%	19.8%
YLDs	696	2.09	2.51	19.8%	19.5%
YLLs	14,117	44.90	48.47	8.0%	38.5%
Multiple sclerosis					
DALYs	12,709	47	51	8.1%	-5.0%
Deaths	265	0.84	0.87	3.9%	-12.5%
Prevalence	22,160	80	96	19.3%	26.4%
YLDs	5,548	21	24	18.5%	25.5%
YLLs	7,161	27	27	-0.1%	-22.2%
Nervous system cancer					
DALYs	32,314	153	137	-10.3%	-3.3%
Deaths	1,141	3.92	3.91	-0.3%	10.8%
Prevalence	4,842	22	26	18.6%	35.9%
YLDs	619	2.46	2.76	12.2%	25.3%
YLLs	31,695	151	134	-10.7%	-3.7%

Neurosyphilis					
DALYs	6	0.04	0.02	-43.4%	-43.6%
Prevalence	95	0.58	0.45	-21.4%	-11.7%
YLDs	6	0.04	0.02	-43.5%	-43.4%
Other neurological disorders					
DALYs	23,312	91	104	14.7%	25.8%
Deaths	800	1.97	2.54	28.7%	45.0%
YLDs	4,642	12	24	91.9%	62.9%
YLLs	18,625	78	80	2.4%	14.2%
Parkinson's disease					
DALYs	37,285	101	94	-6.8%	5.6%
Deaths	2,115	5.53	5.16	-6.7%	4.0%
Prevalence	64,546	162	169	4.1%	21.9%
YLDs	9,057	23	24	4.1%	21.4%
YLLs	28,228	78	70	-10.0%	2.0%
Spinal cord injury					
DALYs	15,508	79	69	-12.2%	-26.9%
Prevalence	56,582	282	248	-12.0%	-21.9%
YLDs	15,508	79	69	-12.2%	-26.9%

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	The Netherlands	WHO Europe	
Stroke						
DALYs	199,280	1,254	545	-56.5%	-52.6%	
Deaths	12,361	67	31	-54.1%	-55.6%	
Prevalence	251,373	1,260	804	-36.2%	-19.2%	
YLDs	36,001	178	112	-37.3%	-18.9%	
YLLs	163,279	1,075	433	-59.7%	-55.3%	
Tension-type headache						
DALYs	13,227	68	68	0.0%	-1.6%	
Prevalence	6,476,061	34,995	34,985	-0.03%	-0.8%	
YLDs	13,227	68	68	0.0%	-1.6%	
Traumatic Brain Injury						
DALYs	11,007	47	42	-11.1%	-28.2%	
Prevalence	84,129	352	315	-10.5%	-28.0%	
YLDs	11,007	47	42	-11.1%	-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.

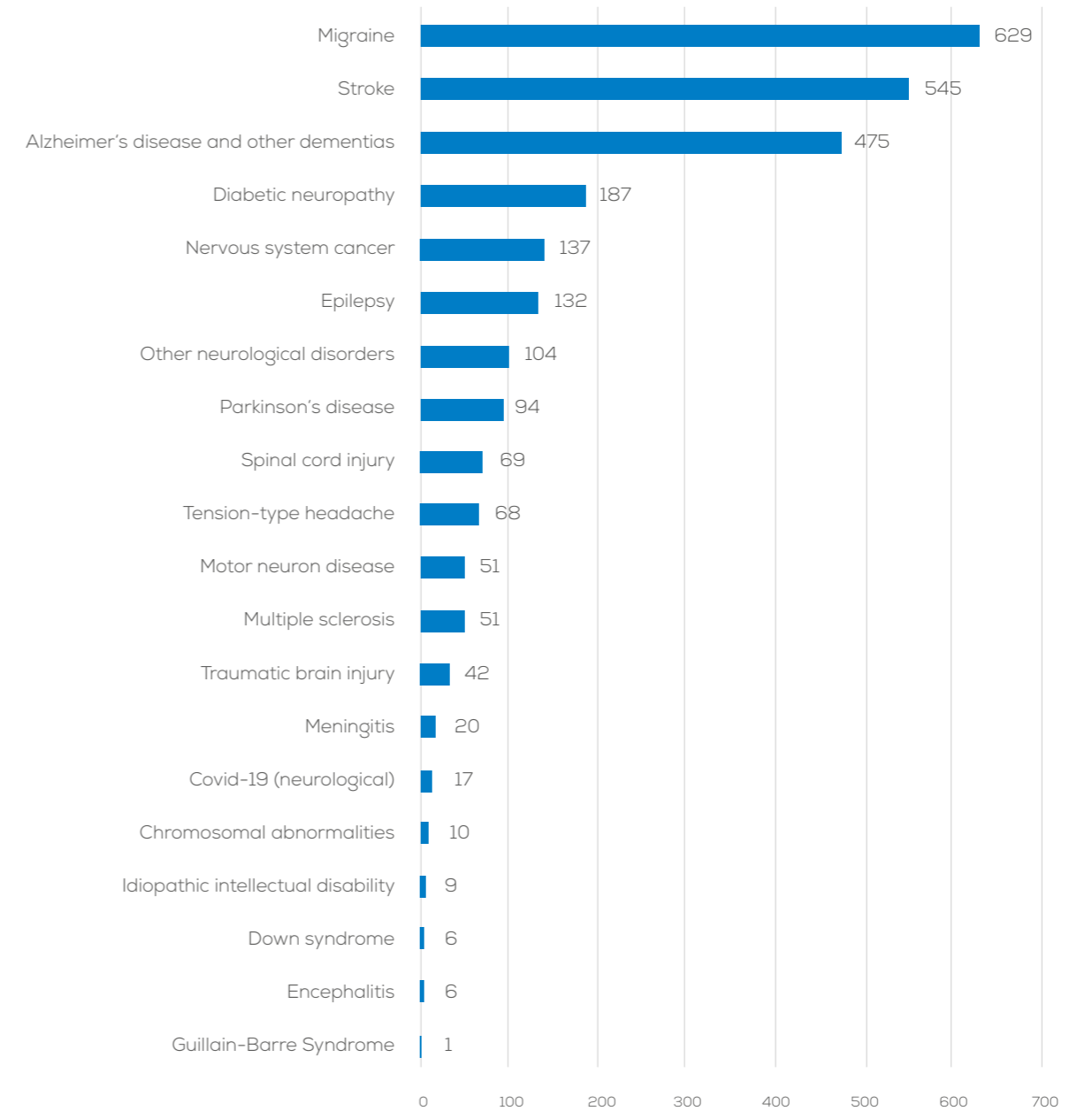


Figure 1: National age-standardised DALYs per 100 000 population by neurological disorder in 2021.

DALYs per 100 000 population

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

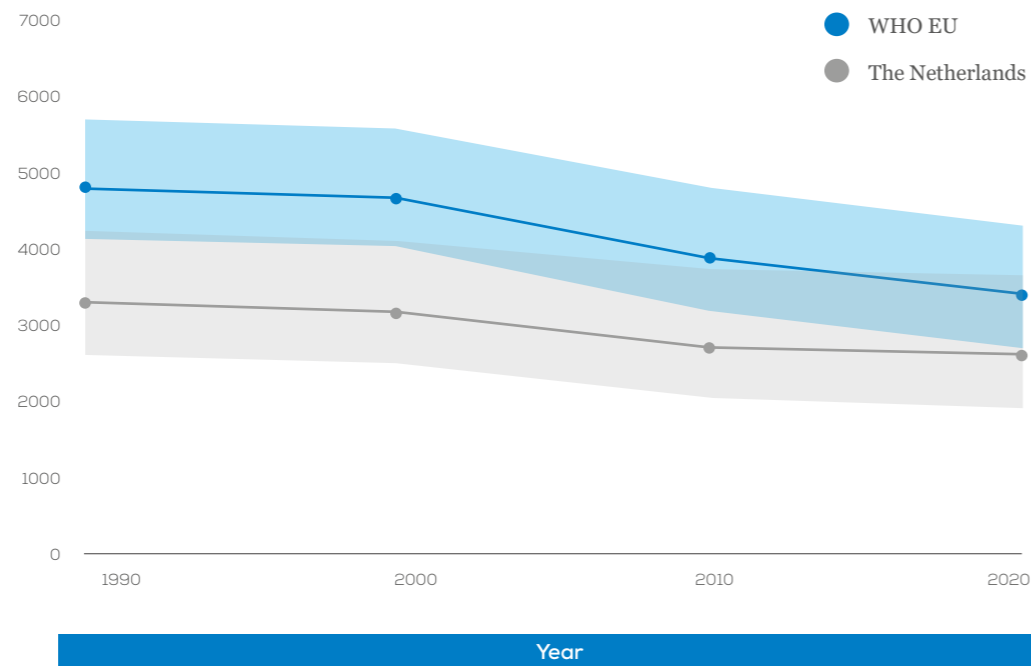


Figure 2: Age-Standardized DALYs per 100 000 population over the last 3 decades.

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

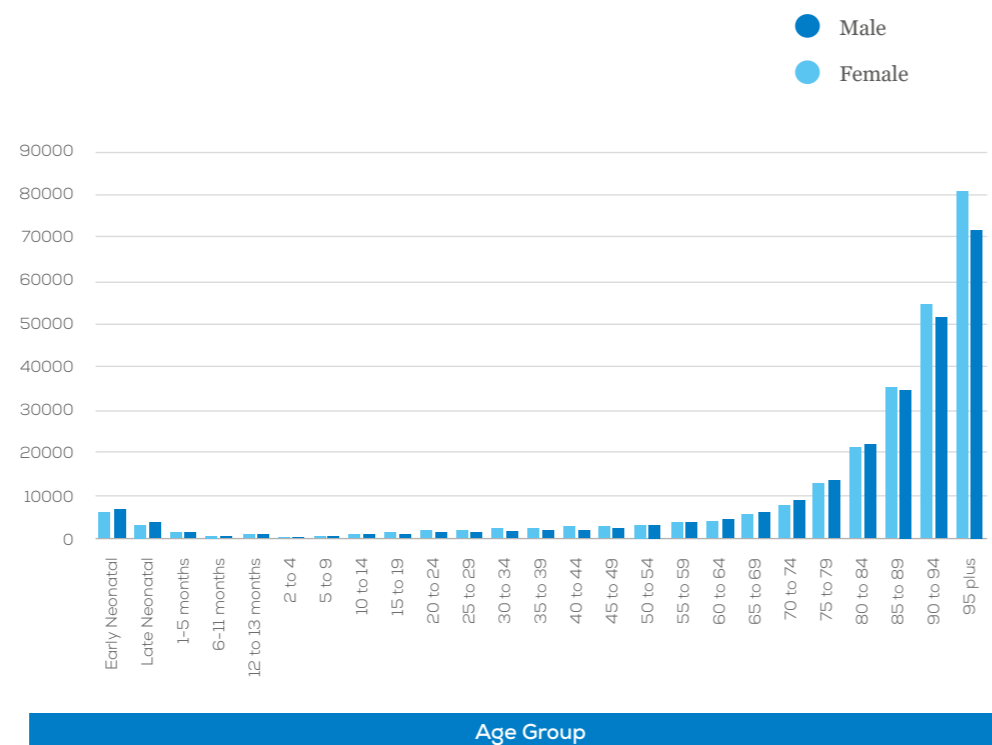


Figure 3: National DALYs per 100 000 population by age group and sex in 2021.

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 **The Netherlands** 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	18,968.9	7,970.9	-	10,998.1
Headache disorders	15,707.3	2,621.4	3,117.0	9,968.9
Alzheimer's disease and other dementias	12,163.9	8,604.7	3,558.1	11
Stroke	2,824.8	1,759.9	516.8	548.1
Polyneuropathies	1,098.2	476.3	-	621.9
Traumatic brain injury	783.8	180.2	330.9	272.7
Multiple sclerosis	756.5	348.3	127.6	280.5
Parkinson's disease	551.5	365.2	146.7	39.6
Idiopathic epilepsy	341.5	79.0	-	262.5
Motor neuron disease	42.9	24.0	12.8	6.1
Brain and central nervous system cancer	29.7	19.7	10.0	-
Meningitis	5.7	5.7	-	-
Total Costs:	53,274.8	22,455.3	7,819.9	22,999.6

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.

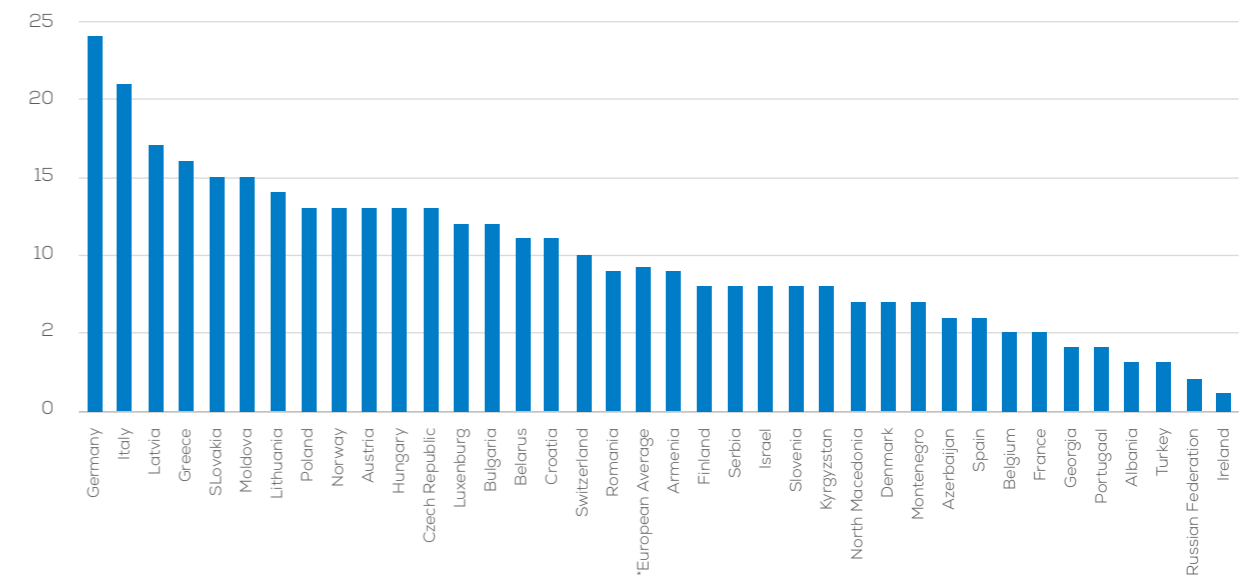


Figure 4: Number of neurologists (fully specialised and in training) per 100 000 population.

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

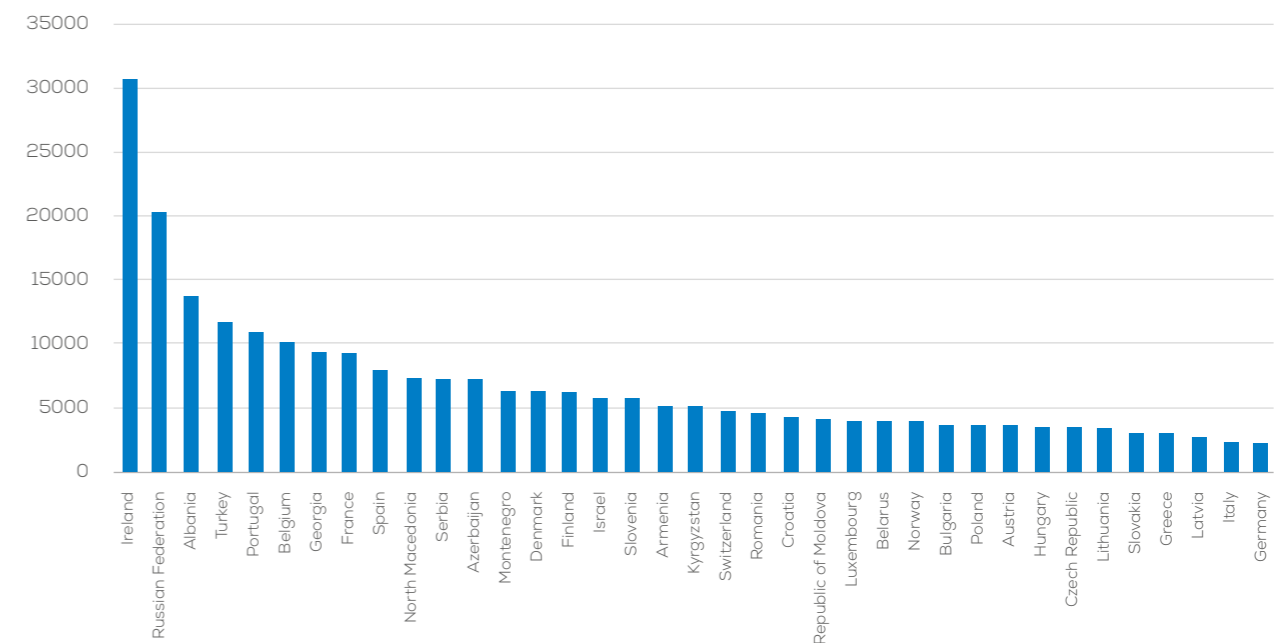
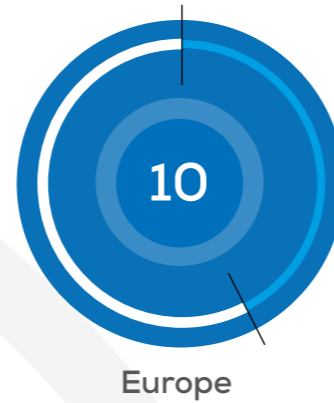


Figure 5: Number of patients per neurologist (fully specialised and in training).

Neurological Diseases in Europe and The Netherlands:

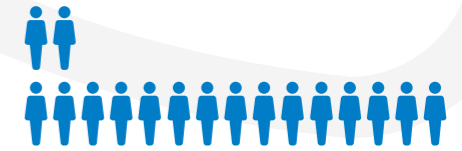
Key Data and Trends from 2021

Neurologists per 100,000 population in Europe*

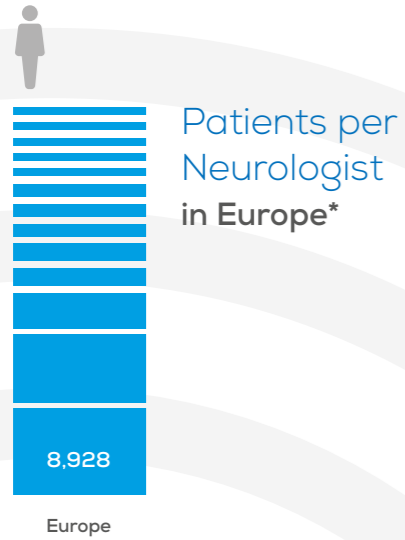


The Netherlands 8,860,044

WHO Europe 449.278.770

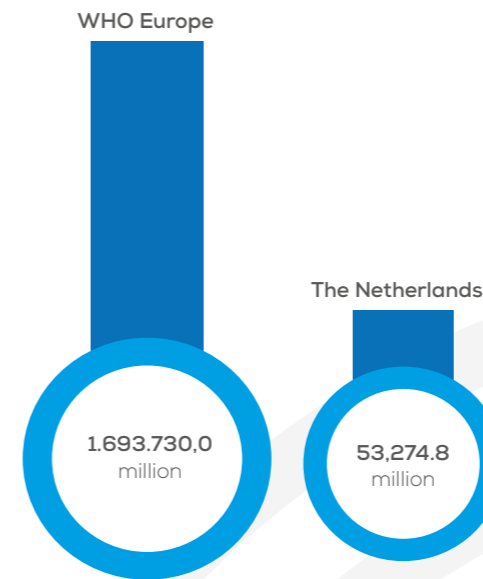


Number of patients with a neurological disease in 2021 in the WHO Europe and in The Netherlands.



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

	WHO Europe	vs	The Netherlands
DALYs	-28.98%		-20.14%
Deaths	-43.19%		-32.69%
Prevalence	0.34%		1.16%

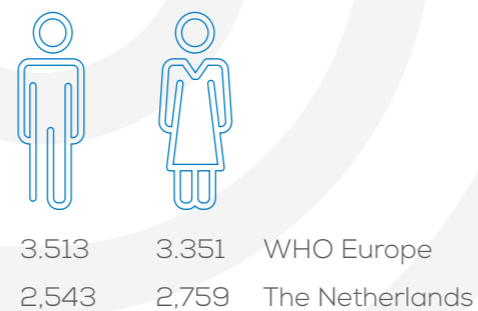


Annual total costs (in million € PPP 2019) for 12 major neurological diseases:

Most prevalent neurological diseases in The Netherlands in

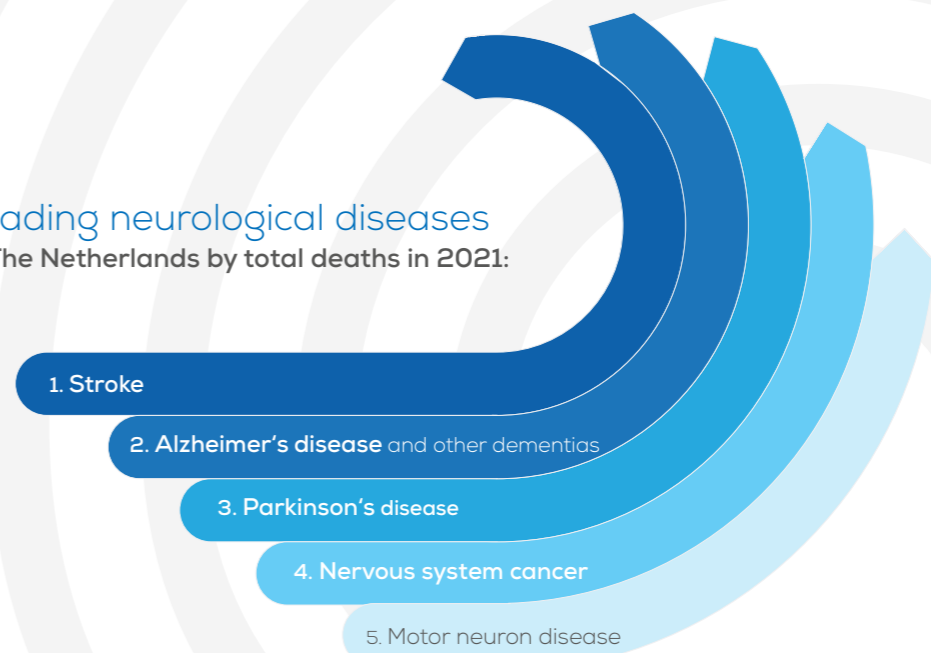
2021

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



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

Leading neurological diseases in The Netherlands 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.

