

EAN Fact Sheet

Country profile of Luxembourg

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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)		Luxembourg	WHO Europe
	2021	1990	2021		
All Neurological Disorders					
DALYs	22,044	4,164	2,414	-42.0%	-29.0%
Deaths	710	160	58	-63.5%	-43.2%
Prevalence	319,550	44,792	44,766	-0.1%	0.3%
YLDs	11,742	1,473	1,452	-1.4%	2.9%
YLLs	10,301	2,691	961	-64.3%	-44.4%
Alzheimer's disease and other dementias					
DALYs	3,796	326	308	-5.4%	-2.5%
Deaths	233	17.61	17.72	0.6%	-2.8%
Prevalence	5,610	551	474	-14.0%	-2.1%
YLDs	1,175	115	98	-14.5%	-2.6%
YLLs	2,621	211	210	-0.5%	-2.5%
Chromosomal abnormalities					
DALYs	35	7.37	6.98	-5.3%	-12.3%
Prevalence	387	82	77	-5.6%	-12.8%
YLDs	35	7.37	6.98	-5.3%	-12.4%
Covid-19 (neurological)					
DALYs	119	-	16	-	-
Prevalence	1,172	-	159	-	-
YLDs	119	-	16	-	-
Diabetic neuropathy					
DALYs	1,804	96	182	88.7%	98.1%
Prevalence	14,235	760	1,431	88.4%	97.9%
YLDs	1,804	96	182	88.7%	98.1%

Down syndrome					
DALYs	22	4.41	4.01	-9.1%	-19.6%
Prevalence	237	49	44	-9.9%	-20.7%
YLDs	22	4.41	4.01	-9.1%	-19.8%
Encephalitis					
DALYs	15	1.80	1.73	-3.9%	-30.1%
Deaths	57	9	7	-14.6%	-13.6%
Prevalence	6	0.90	0.80	-10.8%	-12.0%
YLDs	9	0.90	0.93	3.6%	-31.0%
YLLs	845	36	24	-31.9%	-31.0%
Epilepsy					
DALYs	1,157	179	161	-10.4%	-12.6%
Deaths	15	1.52	1.62	6.8%	3.9%
Prevalence	3,067	409	440	7.6%	3.3%
YLDs	722	113	104	-7.9%	-11.3%
YLLs	435	66	57	-14.6%	-14.3%
Guillain-Barre Syndrome					
DALYs	4	0.52	0.52	0.8%	12.4%
Prevalence	14	1.76	1.77	0.7%	12.4%
YLDs	4	0.52	0.52	0.7%	12.4%
Idiopathic intellectual disability					
DALYs	52	13	9	-34.7%	-19.7%
Prevalence	1,095	278	186	-33.2%	-21.2%
YLDs	52	13	9	-34.7%	-19.7%
Klinefelter syndrome					
Prevalence	24	4.33	4.59	6.1%	5.5%

	Counts	Age-standardized rate		Percentage change, 1990-2021	
	(thousands)	(per 100 000 people)		Luxembourg	WHO Europe
	2021	1990	2021		
Meningitis					
DALYs	47	43	9	-79.9%	-80.5%
Deaths	1	0.69	0.16	-76.5%	-75.4%
Prevalence	50	24	7	-71.0%	-66.7%
YLDs	4	2.07	0.62	-69.8%	-64.6%
YLLs	43	41	8	-80.4%	-81.3%
Migraine					
DALYs	4,473	643	642	-0.2%	0.04%
Prevalence	116,292	16,976	16,915	-0.4%	0.3%
YLDs	4,473	643	642	-0.2%	0.04%
Motor neuron disease					
DALYs	282	34.18	30.53	-10.7%	37.5%
Deaths	11	1.08	1.10	1.6%	54.1%
Prevalence	78	8.14	9.03	10.9%	19.8%
YLDs	16	1.73	1.92	10.9%	19.5%
YLLs	265	32.45	28.61	-11.8%	38.5%
Multiple sclerosis					
DALYs	382	44	43	-4.0%	-5.0%
Deaths	6	0.78	0.65	-16.3%	-12.5%
Prevalence	777	75	90	20.4%	26.4%
YLDs	196	19	23	20.2%	25.5%
YLLs	186	25	20	-22.2%	-22.2%
Nervous system cancer					
DALYs	1,258	223	149	-33.3%	-3.3%
Deaths	43	6	4	-24.6%	10.8%
Prevalence	308	35	40	14.5%	35.9%
YLDs	34	3.86	4.00	3.7%	25.3%
YLLs	1,225	219	145	-33.9%	-3.7%

Other neurological disorders					
DALYs	461	70	63	-10.1%	25.8%
Deaths	12	1.37	1.19	-13.3%	45.0%
YLDs	173	15	26	67.5%	62.9%
YLLs	287	54	37	-32.2%	14.2%
Parkinson's disease					
DALYs	1,085	96	94	-1.5%	5.6%
Deaths	64	5.47	5.28	-3.4%	4.0%
Prevalence	1,746	116	157	35.8%	21.9%
YLDs	246	16	22	35.6%	21.4%
YLLs	839	79	72	-9.2%	2.0%
Spinal cord injury					
DALYs	809	135	101	-25.4%	-26.9%
Prevalence	2,914	467	359	-23.2%	-21.9%
YLDs	809	135	101	-25.4%	-26.9%
Stroke					
DALYs	5,174	2,090	463	-77.9%	-52.6%
Deaths	323	125	26	-79.2%	-55.6%
Prevalence	5,450	935	561	-39.9%	-19.2%
YLDs	783	129	79	-38.9%	-18.9%
YLLs	4,391	1,961	384	-80.4%	-55.3%
Tension-type headache					
DALYs	570	75.00	74.98	-0.03%	-1.6%
Prevalence	228,971	32,300	32,280	-0.1%	-0.8%
YLDs	570	75.00	74.98	-0.03%	-1.6%

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Luxembourg	WHO Europe	
Traumatic Brain Injury						
DALYs	497	81	57	-28.8%	-28.2%	
Prevalence	3,758	606	431	-29.0%	-28.0%	
YLDs	497	81	57	-28.8%	-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.

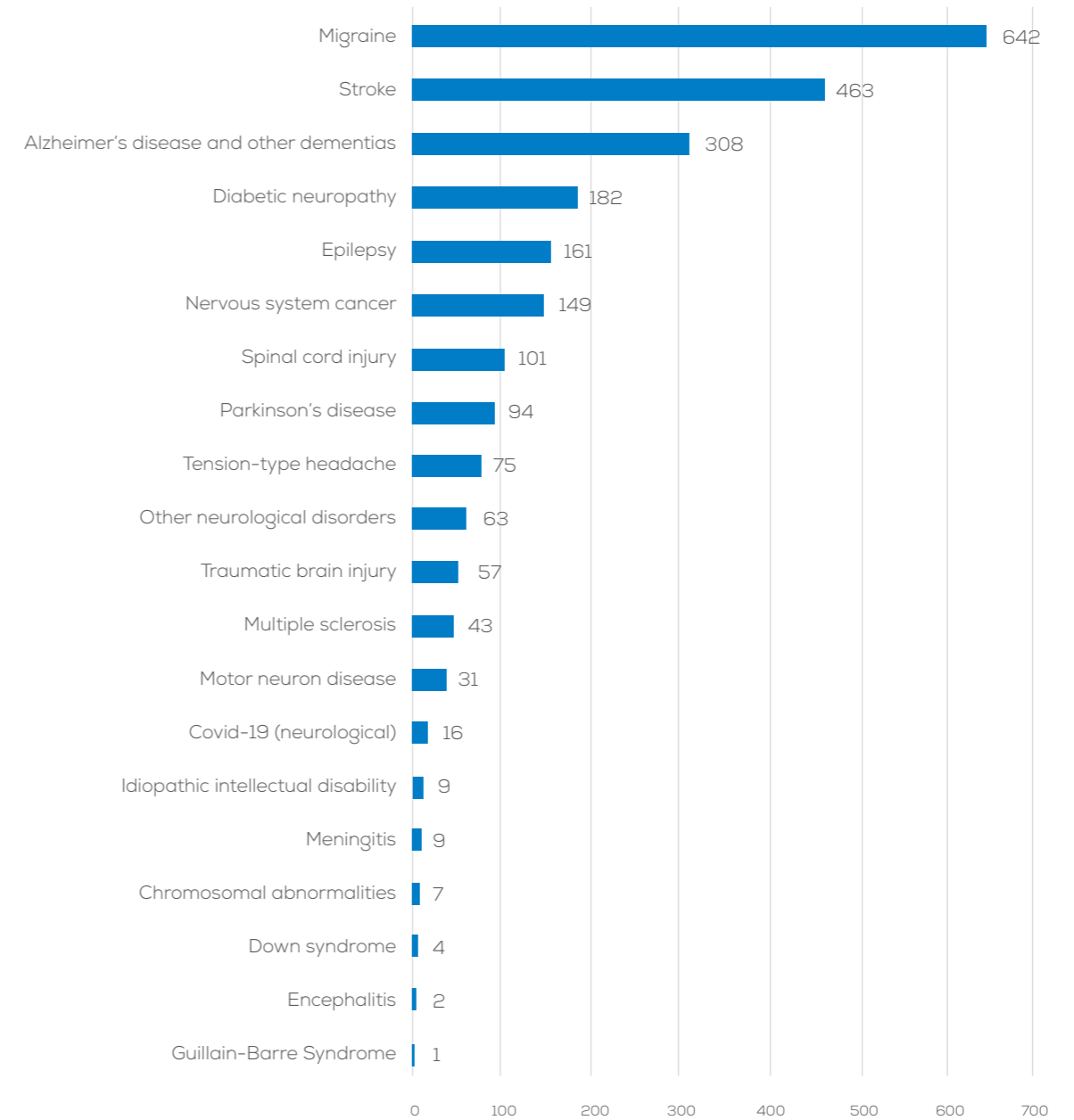


Figure 1: National age-standardised DALYs per 100 000 population by neurological disorder in 2021.

DALYs per 100 000 population

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

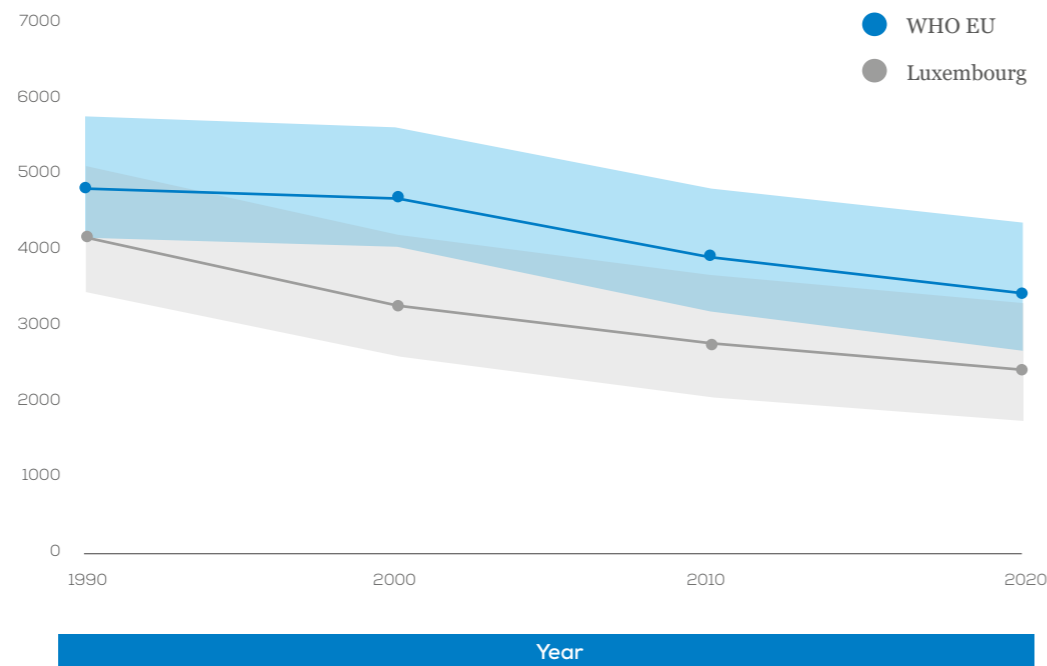


Figure 2: Age-Standardized DALYs per 100 000 population over the last 3 decades.

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

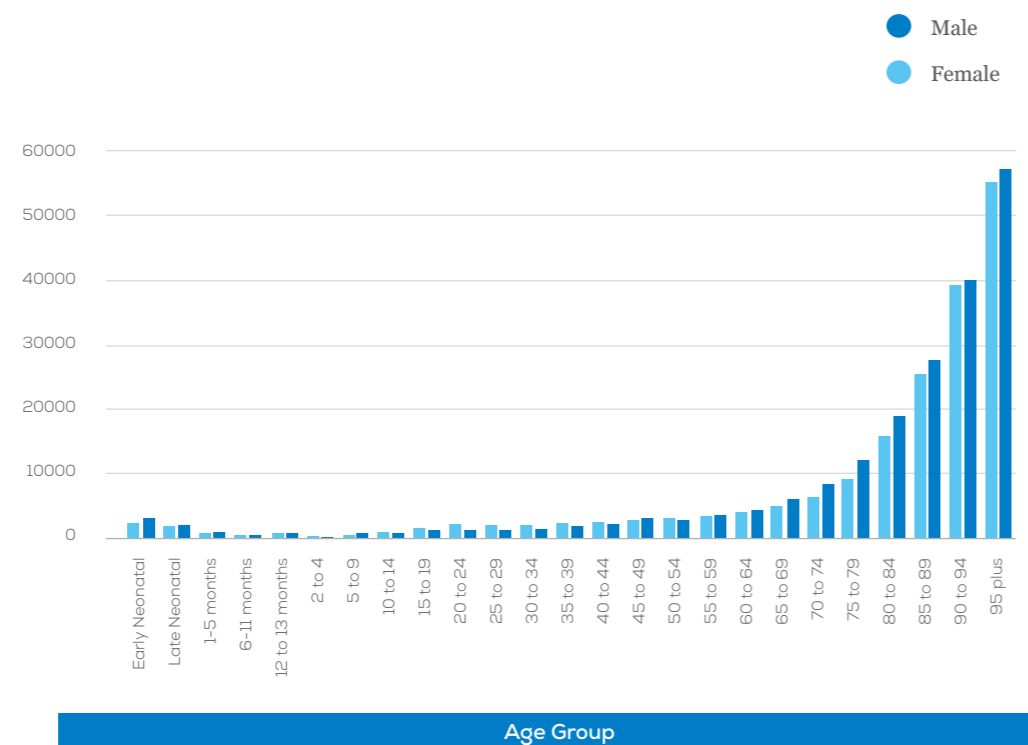


Figure 3: National DALYs per 100 000 population by age group and sex in 2021.

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 **Luxembourg** 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	1,175.2	162.5	58.9	953.7
Sleep disorders	836.2	117.6	-	718.7
Alzheimer's disease and other dementias	195.5	99.9	95.5	0.1
Traumatic brain injury	88.6	12.1	7.3	69.3
Polyneuropathies	68.0	9.0	-	59.0
Parkinson's disease	54.5	49.8	2.1	2.7
Idiopathic epilepsy	41.8	11.4	-	30.4
Stroke	40.1	27.7	9.8	2.5
Multiple sclerosis	21.5	5.1	1.2	15.3
Motor neuron disease	0.8	0.3	0.2	0.4
Brain and central nervous system cancer	0.7	0.4	0.3	-
Meningitis	0.1	0.1	-	-
Total Costs:	2,523.0	495.8	175.2	1,852.1

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.

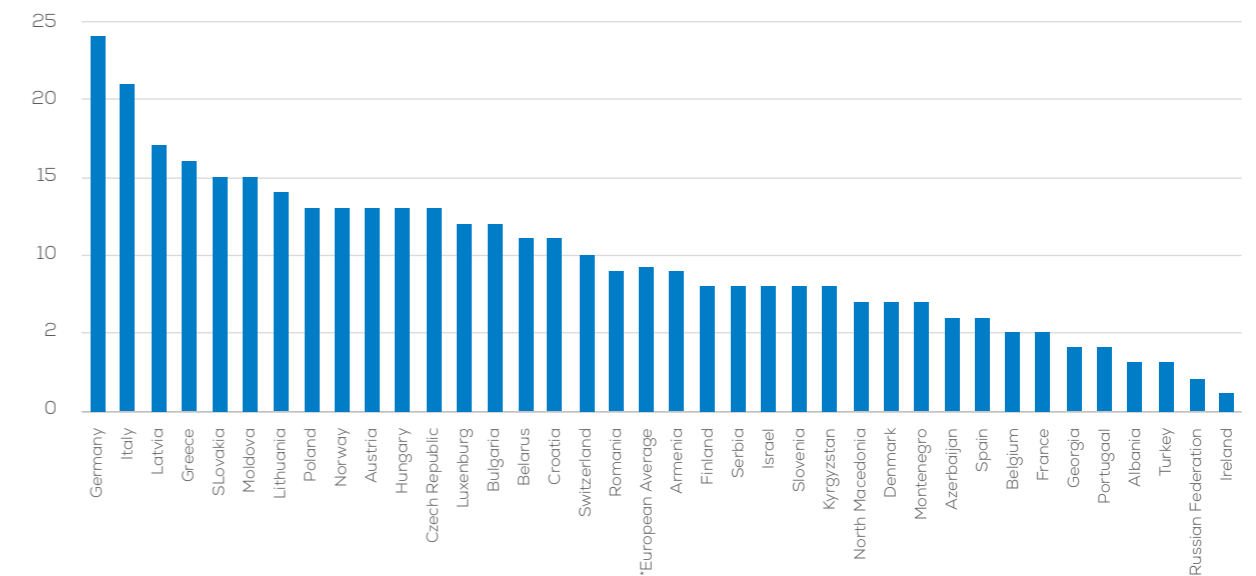


Figure 4: Number of neurologists (fully specialised and in training) per 100 000 population.

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

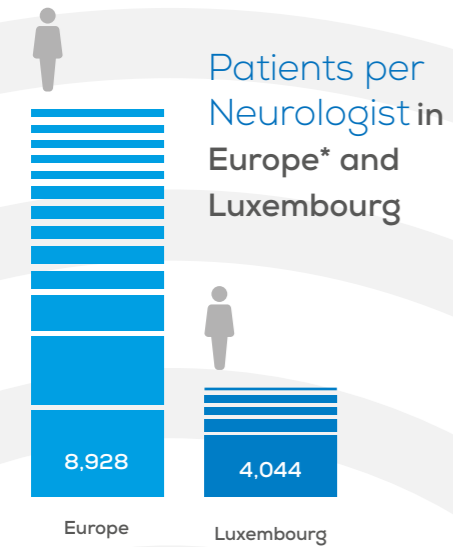
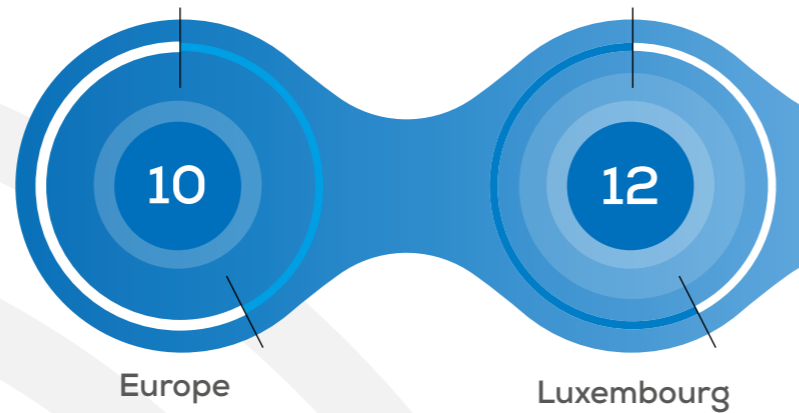


Figure 5: Number of patients per neurologist (fully specialised and in training).

Neurological Diseases in Europe and Luxembourg:

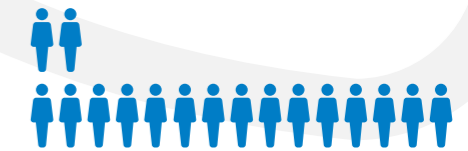
Key Data and Trends from 2021

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



Luxembourg 319,550

WHO Europe 449.278.770



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

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

	WHO Europe	vs	Luxembourg
DALYs	-28.98%		-42.02%
Deaths	-43.19%		-63.52%
Prevalence	0.34%		-0.06%

WHO Europe



Luxembourg**



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

Most prevalent neurological diseases in Luxembourg in

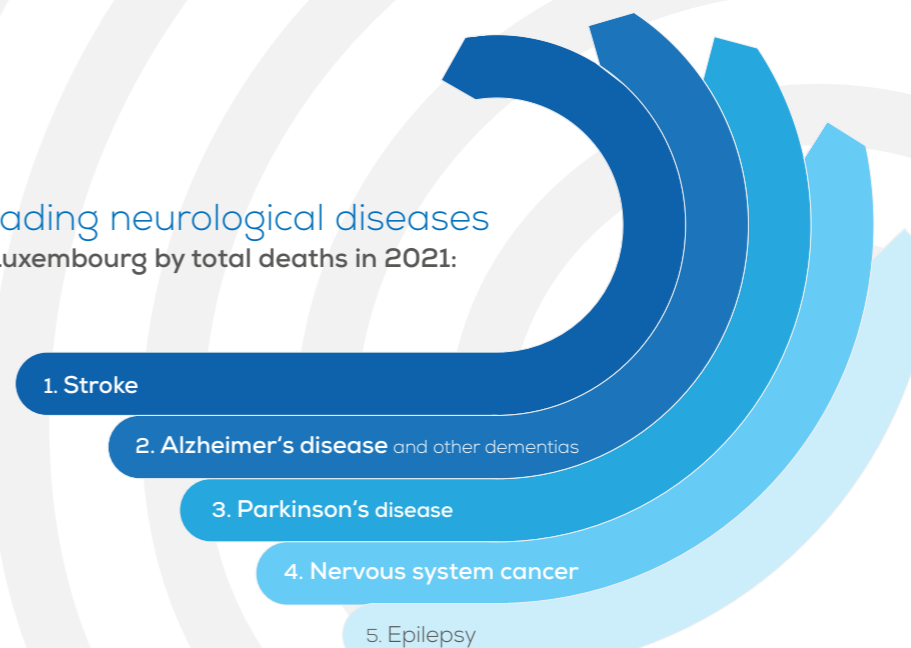
2021

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

	Male	Female
WHO Europe	3,513	3,351
Luxembourg	2,400	2,446

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

Leading neurological diseases in Luxembourg 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.

