

EAN Fact Sheet

Country profile of Italy

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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	Italy	WHO Europe
All Neurological Disorders					
DALYs	3,261,963	3,696	2,714	-26.6%	-29.0%
Deaths	146,600	133	74	-44.2%	-43.2%
Prevalence	31,642,029	47,004	47,231	0.5%	0.3%
YLDs	1,410,602	1,523	1,556	2.2%	2.9%
YLLs	1,851,123	2,173	1,157	-46.7%	-44.4%
Alzheimer's disease and other dementias					
DALYs	1,008,203	517	507	-1.8%	-2.5%
Deaths	64,759	31.5	29.7	-5.6%	-2.8%
Prevalence	1,427,946	693	759	9.6%	-2.1%
YLDs	299,548	141	157	11.1%	-2.6%
YLLs	708,655	375	350	-6.6%	-2.5%
Chromosomal abnormalities					
DALYs	3,132	9.23	7.66	-17.0%	-12.3%
Prevalence	33,383	103	85	-17.9%	-12.8%
YLDs	3,132	9.23	7.66	-17.0%	-12.4%
Covid-19 (neurological)					
DALYs	10,366	-	14	-	-
Prevalence	95,559	-	136	-	-
YLDs	10,366	-	14	-	-
Cystic echinococcosis					
DALYs	43	0.10	0.06	-43.8%	-18.3%
Prevalence	194	0.40	0.26	-36.9%	-9.0%
YLDs	43	0.10	0.06	-43.8%	-18.4%
Diabetic neuropathy					
DALYs	254,601	113	207	82.7%	98.1%
Prevalence	2,029,105	886	1,638	84.9%	97.9%
YLDs	254,601	113	207	82.7%	98.1%

Down syndrome					
DALYs	2,092	6.22	4.66	-25.1%	-19.6%
Prevalence	21,930	69	51	-26.6%	-20.7%
YLDs	2,092	6.22	4.66	-25.1%	-19.8%
Encephalitis					
DALYs	12,324	17	17	5.0%	-30.1%
Deaths	435	0.29	0.40	37.4%	-15.9%
Prevalence	11,408	16	14	-11.2%	-13.6%
YLDs	1,148	1.74	1.57	-9.8%	-12.0%
YLLs	11,177	15	16	6.7%	-31.0%
Epilepsy					
DALYs	73,243	94	101	7.0%	-12.6%
Deaths	1,541	0.57	1.22	113.1%	3.9%
Prevalence	171,592	263	253	-3.7%	3.3%
YLDs	39,261	68	59	-14.4%	-11.3%
YLLs	33,982	26	42	63.7%	-14.3%
Guillain-Barre Syndrome					
DALYs	624	0.66	0.70	5.6%	12.4%
Prevalence	2,110	2.23	2.36	5.6%	12.4%
YLDs	624	0.66	0.70	5.5%	12.4%
Idiopathic intellectual disability					
DALYs	7,233	16	14	-11.2%	-19.7%
Prevalence	149,063	332	291	-12.3%	-21.2%
YLDs	7,233	16	14	-11.2%	-19.7%
Klinefelter syndrome					
DALYs	25	0.03	0.03	6.1%	5.7%
Prevalence	1,904	4.18	4.52	8.0%	5.5%
YLDs	25	0.03	0.03	6.0%	5.5%

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Italy	WHO Europe	
Meningitis						
DALYs	5,820	28	10	-65.8%	-80.5%	
Deaths	196	0.41	0.19	-52.8%	-75.4%	
Prevalence	8,562	42	11	-73.8%	-66.7%	
YLDs	701	4	1	-73.4%	-64.6%	
YLLs	5,119	24	9	-64.6%	-81.3%	
Migraine						
DALYs	438,569	710	717	1.0%	0.04%	
Prevalence	11,636,930	19,088	19,244	0.8%	0.3%	
YLDs	438,569	710	717	1.0%	0.04%	
Motor neuron disease						
DALYs	39,784	33.15	37.51	13.1%	37.5%	
Deaths	1,749	0.88	1.31	49.3%	54.1%	
Prevalence	8,960	6.49	8.70	34.0%	19.8%	
YLDs	1,902	1.38	1.85	33.9%	19.5%	
YLLs	37,882	31.77	35.66	12.2%	38.5%	
Multiple sclerosis						
DALYs	33,337	30	37	24.2%	-5.0%	
Deaths	547	0.37	0.47	28.3%	-12.5%	
Prevalence	74,249	65	87	32.5%	26.4%	
YLDs	18,451	17	22	32.2%	25.5%	
YLLs	14,885	13	15	14.1%	-22.2%	
Nervous system cancer						
DALYs	124,499	183	142	-22.5%	-3.3%	
Deaths	4,771	4.76	4.12	-13.4%	10.8%	
Prevalence	17,839	22	25	15.5%	35.9%	
YLDs	2,463	2.65	2.82	6.3%	25.3%	
YLLs	122,035	180	139	-22.9%	-3.7%	

Neurosyphilis						
DALYs	24	0.07	0.02	-67.0%	-43.6%	
Prevalence	357	0.87	0.47	-46.1%	-11.7%	
YLDs	24	0.07	0.02	-67.1%	-43.4%	
Other neurological disorders						
DALYs	52,925	77	64	-17.5%	25.8%	
Deaths	1,754	1.63	1.36	-16.8%	45.0%	
YLDs	14,828	12	20	64.4%	62.9%	
YLLs	37,859	65	44	-32.7%	14.2%	
Parkinson's disease						
DALYs	141,125	90	79	-12.0%	5.6%	
Deaths	8,971	4.74	4.55	-3.9%	4.0%	
Prevalence	186,889	161	113	-29.6%	21.9%	
YLDs	25,959	23	16	-28.9%	21.4%	
YLLs	115,166	68	63	-6.4%	2.0%	
Spinal cord injury						
DALYs	80,449	134	102	-23.9%	-26.9%	
Prevalence	292,201	476	361	-24.1%	-21.9%	
YLDs	80,449	134	102	-23.9%	-26.9%	
Stroke						
DALYs	870,798	1,485	524	-64.7%	-52.6%	
Deaths	61,859	88	31	-65.0%	-55.6%	
Prevalence	726,983	816	583	-28.6%	-19.2%	
YLDs	106,699	111	81	-26.9%	-18.9%	
YLLs	764,099	1,374	443	-67.7%	-55.3%	

	Counts (thousands)		Age-standardized rate (per 100 000 people)		Percentage change, 1990-2021	
	2021	1990	2021	Italy	WHO Europe	
Tension-type headache						
DALYs	50,176	70.83	71.46	0.9%	-1.6%	
Prevalence	21,839,653	33,585	33,572	-0.04%	-0.8%	
YLDs	50,176	70.83	71.46	0.9%	-1.6%	
Tetanus						
DALYs	264.54	1.38	0.20	-85.4%	-97.3%	
Deaths	16.38	0.06	0.01	-83.5%	-95.8%	
Prevalence	2.15	0.007	0.002	-73.7%	-32.0%	
YLDs	0.25	0.001	0.0002	-78.2%	-6.8%	
YLLs	264.28	1.38	0.20	-85.4%	-97.5%	
Traumatic Brain Injury						
DALYs	52,308	82	55	-32.1%	-28.2%	
Prevalence	399,763	617	417	-32.4%	-28.0%	
YLDs	52,308	82	55	-32.1%	-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.

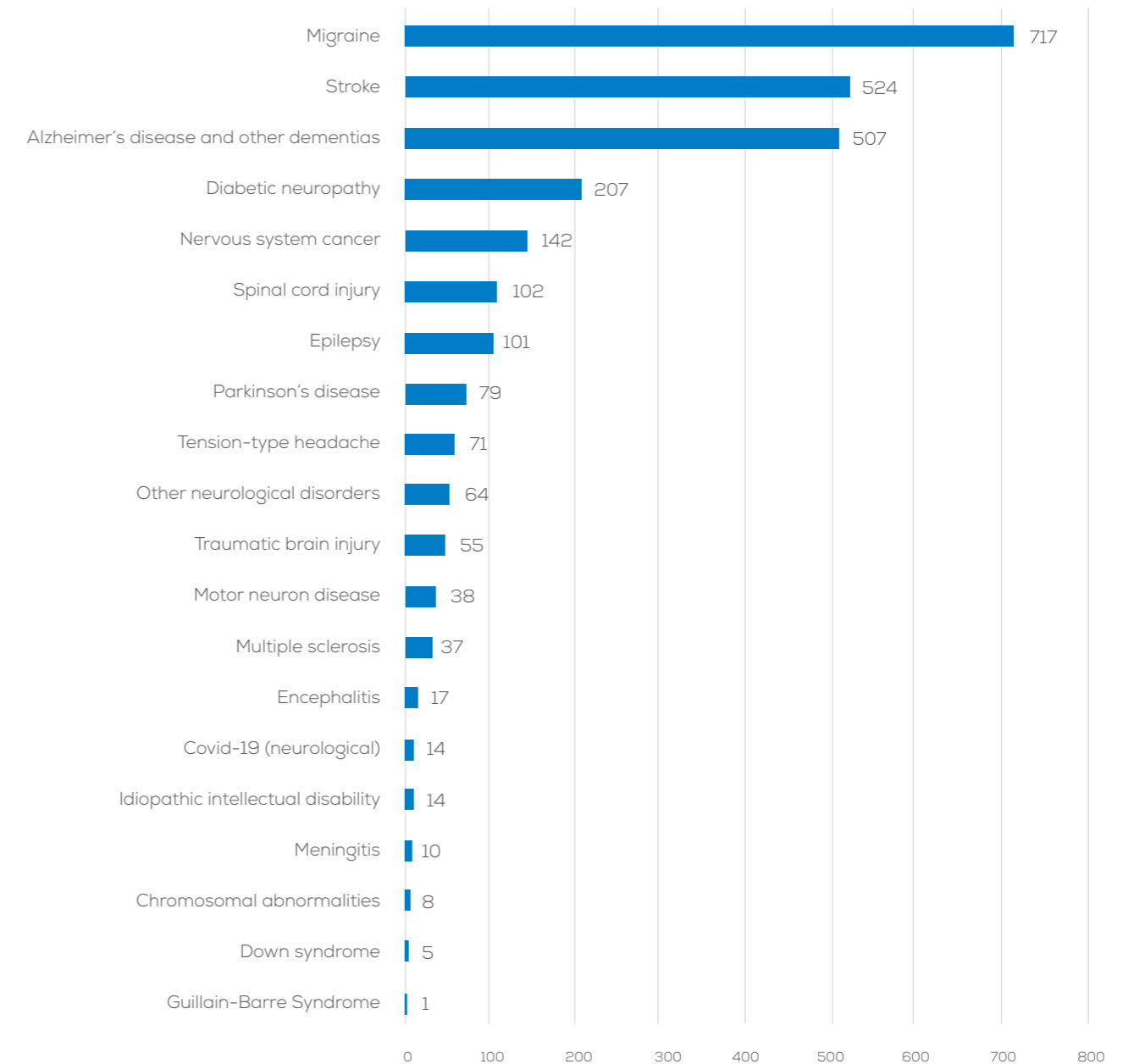


Figure 1: National age-standardised DALYs per 100 000 population by neurological disorder in 2021.

DALYs per 100 000 population

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

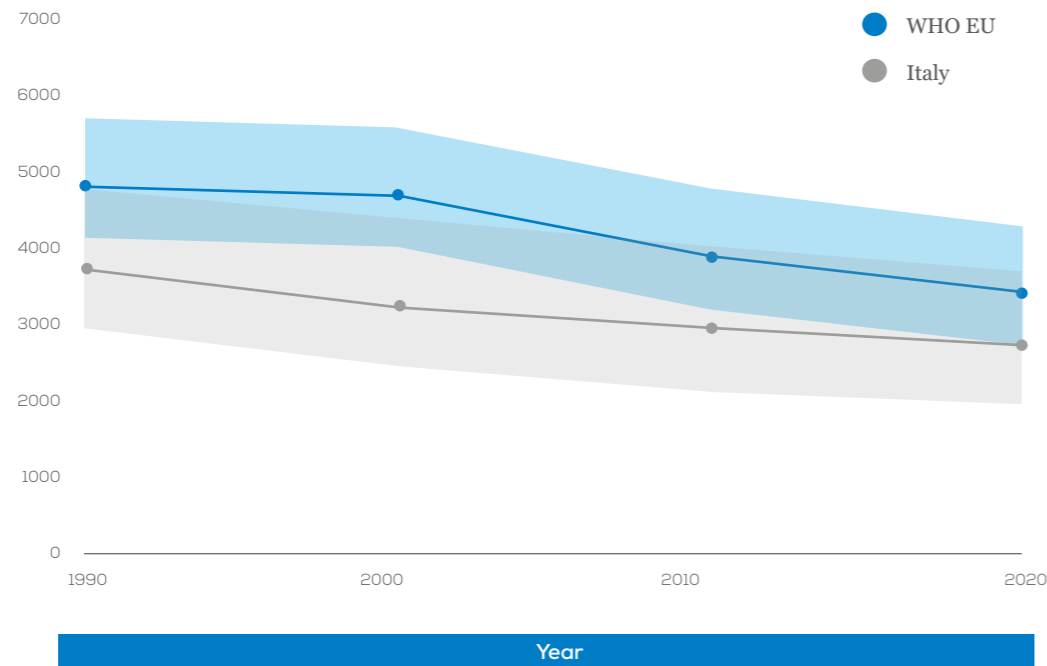


Figure 2: Age-Standardized DALYs per 100 000 population over the last 3 decades.

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

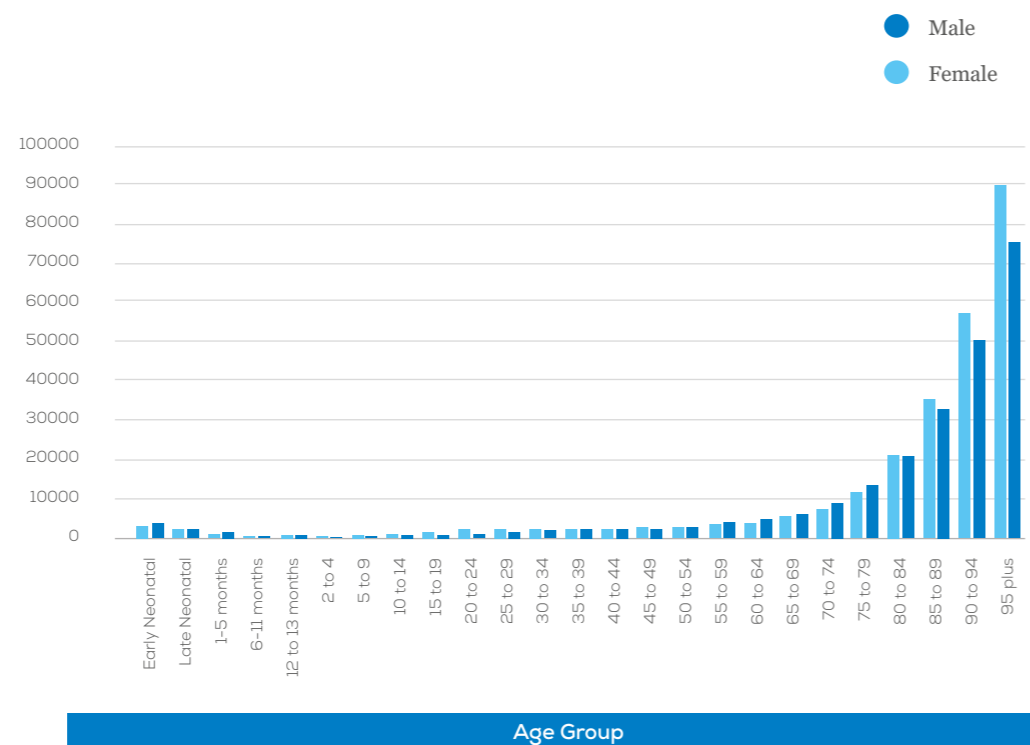


Figure 3: National DALYs per 100 000 population by age group and sex in 2021.

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 **Italy** 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	211,390.5	52,183.9	14,777.8	144,428.7
Sleep disorders	36,084.7	18,108.4	-	17,976.3
Alzheimer's disease and other dementias	32,769.5	7,193.7	25,574.1	1.6
Traumatic brain injury	5,649.5	3,200.2	2,149.6	299.8
Polyneuropathies	4,622.3	1,837.2	1,110.5	1,674.6
Stroke	3,243.1	1,723.2	-	1,520.0
Parkinson's disease	2,607.3	1,650.7	838.2	118.5
Idiopathic epilepsy	2,394.6	1,593.6	307.7	493.3
Multiple sclerosis	831.3	445.1	-	386.2
Brain and central nervous system cancer	98.1	56.9	30.5	10.7
Motor neuron disease	92.5	56.0	36.4	-
Meningitis	17.8	17.8	-	-
Total Costs:	299,801.3	88,066.8	44,824.7	166,909.8

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.

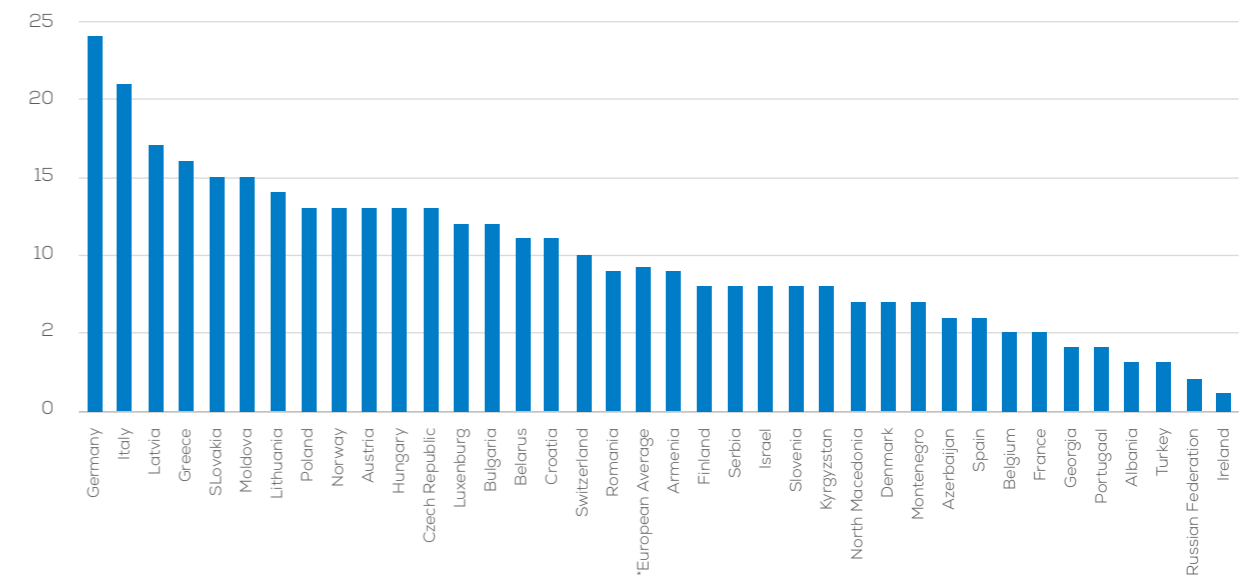


Figure 4: Number of neurologists (fully specialised and in training) per 100 000 population.

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

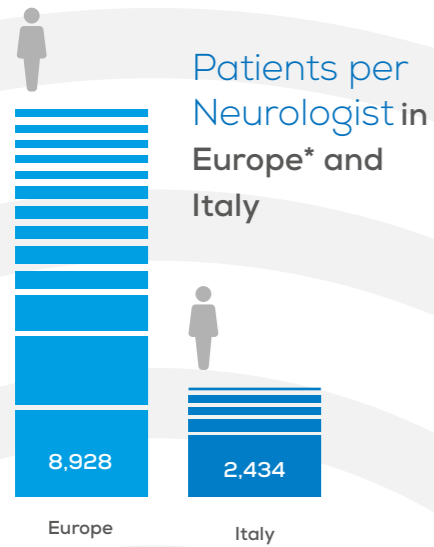
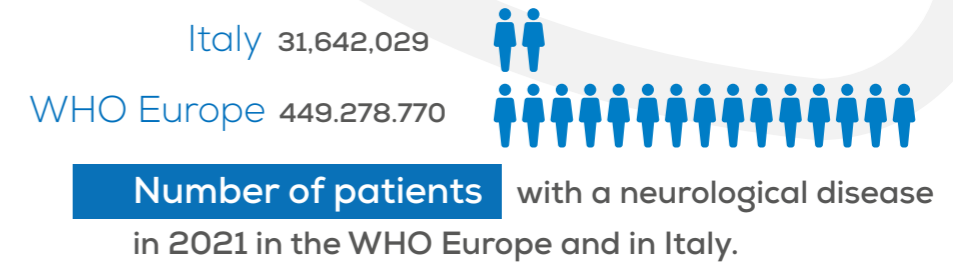
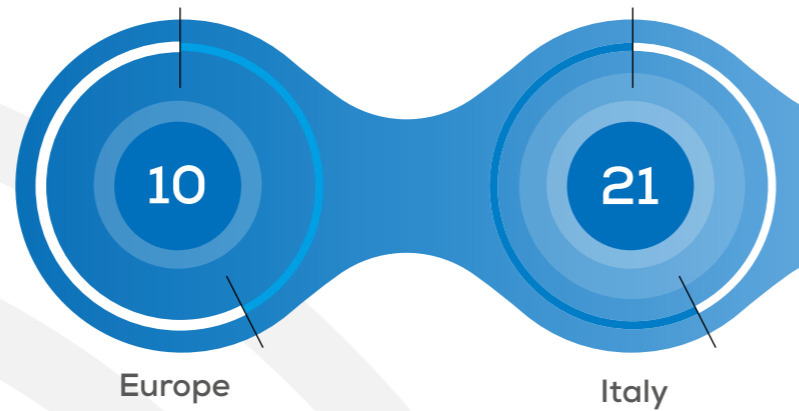


Figure 5: Number of patients per neurologist (fully specialised and in training).

Neurological Diseases in Europe and Italy:

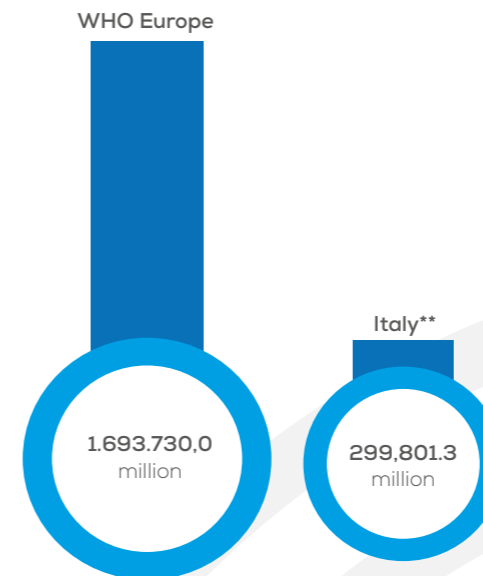
Key Data and Trends from 2021

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



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

	WHO Europe	vs	Italy
DALYs	-28.98%		-26.58%
Deaths	-43.19%		-44.21%
Prevalence	0.34%		0.48%

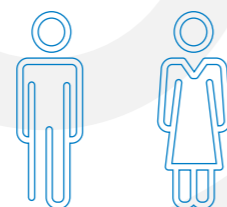


Annual total costs (in million € PPP 2019) for 12 major neurological diseases:

Most prevalent neurological diseases in Italy in

2021

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



3,513 3,351 WHO Europe
2,602 2,821 Italy

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

Leading neurological diseases in Italy by total deaths in 2021:

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

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

