

# THE ECONOMIC IMPACT OF STROKE IN EUROPE

**Current costs of stroke  
throughout Europe**

**Executive summary**



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## Current costs of stroke throughout Europe

### Executive summary

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## RATIONALE AND OBJECTIVES

This report is the outcome of a study commissioned by the Stroke Alliance for Europe (SAFE) to estimate the economic impact of stroke across 32 countries in Europe.

Stroke is a brain attack, affecting 17 million people worldwide each year.



It is the second most common cause of death<sup>1</sup> and a leading cause of adult physical disability<sup>2</sup>. In 2017, stroke accounted for 438,000 deaths across the 32 European countries in our study<sup>3,4</sup> (EU-28, Iceland, Israel, Norway and Switzerland). In addition, for many survivors, stroke exerts a negative effect on their lives by affecting many functions, hampering, therefore, the ability of survivors to perform usual activities. As a result, stroke is one of the leading causes of disability, and of elevated use of health- and social-care resources, with 8% of the €798 billion cost of brain disorders being attributable to stroke.<sup>5</sup>

Previously, in 2015, we had estimated the overall cost of stroke for the European Union (EU) to be €45 billion.

However, the 2015 study did not include nursing or residential care home costs, which may have biased the estimated costs of stroke downwards, as evidence has shown that stroke is a major predictor of subsequent institutionalisation.

Costing studies such as these enable comparisons between the burden of different diseases and across years. The data can then be used to aid decision makers to prioritise scarce research funds to areas with the highest burden.

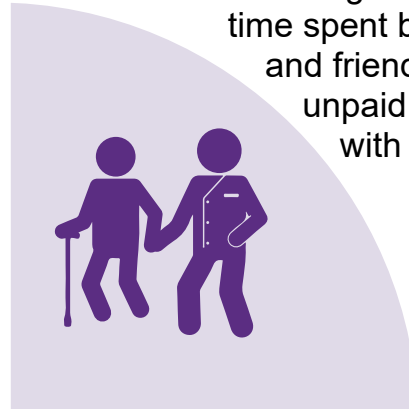
Our main objective is to provide an estimate of the overall economic costs of stroke for all 32 countries in question, by including direct health and social care costs, informal care costs and productivity losses for the year 2017. In addition, and for the first time, we include the costs of long-term institutionalisation in nursing/residential home care settings due to stroke.

The categories of stroke costs included were the following:

**Healthcare costs** – including visits to or from general practitioners and specialist consultations; visits to hospital emergency services; number of days in hospital, including day cases; and the costs of procedures, therapies, and medications.



**Informal care costs** – including the amount of time spent by relatives and friends providing unpaid care for people with stroke.



**Social care costs** – including the number of days spent in a nursing or residential care home.



**Productivity costs** – including the losses accrued due to temporary or permanent absence from work and because of early death before retirement.



We obtained country-specific aggregate data from international and national sources, including the World Health Organisation, the Organisation for Economic Co-operation and Development, the Statistical Office of the European Communities, national ministries of health, and national statistical institutes. These data were supplemented with individual patient-level data from the Survey of Health, Ageing and Retirement in Europe.

	Healthcare costs							Social care	Productivity costs		Informal care costs	TOTAL costs	
	Primary care	Outpatient care	Emergency care	Hospital care	Medications	Total health-care	% of total healthcare expenditure		Mortality losses	Morbidity losses		Total	% GDP
AUSTRIA	155	127	30	504	29	845	2.29%	106	94	180	383	1,608	0.44%
BELGIUM	39	38	7	411	31	524	1.24%	328	118	159	354	1,484	0.34%
BULGARIA	11	12	2	31	15	70	1.77%	8	87	6	106	278	0.54%
CROATIA	10	6	8	22	5	50	1.50%	2	31	26	101	211	0.43%
CYPRUS	1	6	2	1	1	11	0.90%	2	5	6	13	37	0.19%
CZECH REP.	25	64	3	280	18	390	3.09%	24	79	32	206	730	0.38%
DENMARK	20	19	6	114	7	166	0.58%	155	124	83	148	677	0.23%
ESTONIA	9	15	2	33	1	61	4.34%	3	14	24	35	137	0.58%
FINLAND	19	161	29	421	10	640	3.12%	133	83	163	92	1,111	0.50%
FRANCE	292	401	87	1,165	199	2,143	0.83%	630	519	1,271	1,260	5,823	0.25%
GERMANY	1,155	1,359	24	6,408	143	9,089	2.60%	866	1,483	1,191	4,971	17,600	0.54%
GREECE	6	11	17	209	41	284	1.93%	36	82	89	160	650	0.36%
HUNGARY	20	37	6	196	28	286	3.42%	13	87	12	168	567	0.46%
ICELAND	8	6	1	11	1	27	1.76%	6	7	5	4	48	0.23%
IRELAND	27	26	23	83	14	172	0.84%	17	67	111	83	451	0.15%
ISRAEL	20	49	36	84	12	201	0.86%	22	57	195	123	597	0.19%
ITALY	250	418	188	2,160	115	3,131	2.08%	375	543	501	2,355	6,905	0.40%
LATVIA	4	8	1	13	3	30	1.90%	3	36	16	59	144	0.53%
LITHUANIA	13	14	1	32	2	62	2.39%	5	47	29	59	203	0.48%
LUXEMBOURG	2	5	0	21	2	29	0.90%	19	6	4	17	75	0.14%
MALTA	1	1	0	7	1	10	1.15%	2	3	5	8	29	0.26%
NETHERLANDS	83	217	12	450	169	932	1.28%	210	247	117	484	1,991	0.27%
NORWAY	43	46	8	211	8	316	0.90%	186	68	277	78	926	0.26%
POLAND	45	261	9	253	67	636	2.29%	89	331	35	421	1,512	0.33%
PORTUGAL	37	60	44	91	24	257	1.53%	15	133	74	304	783	0.40%
ROMANIA	19	61	4	88	26	198	2.33%	33	234	17	333	815	0.43%
SLOVAKIA	32	78	3	55	8	177	3.07%	11	54	22	83	347	0.41%
SLOVENIA	10	8	2	25	4	48	1.41%	9	15	12	45	129	0.30%
SPAIN	427	336	178	569	175	1,685	1.68%	133	274	357	1,109	3,557	0.30%
SWEDEN	121	289	55	311	12	788	1.55%	231	122	122	193	1,455	0.31%
SWITZERLAND	23	13	8	482	33	558	0.75%	307	139	81	170	1,256	0.21%
UK	399	516	123	1,636	101	2,775	1.19%	767	1,044	1,046	1,838	7,470	0.32%
TOTAL EUROPE	3,324	4,669	919	16,378	1,301	26,592	1.65%	4,748	6,235	6,269	15,762	59,605	0.36%

Table 1. Total costs of stroke €, in millions

## RESULTS

In 2017, nearly 1.5 million people suffered a stroke in the 32 European countries under study, 9 million Europeans lived with a stroke, and 438,000 people died due to a stroke<sup>3,4</sup>. The total economic cost of stroke in the 32 European countries under study was €60 billion in 2017 (Table 1).

The healthcare cost of stroke for the 32 healthcare systems was €27 billion, accounting for 1.65% of total

healthcare expenditure (Table 1 – Figure 1). This proportion varied widely by country, with richer countries like Denmark and Switzerland spending 0.58% and 0.75%, respectively, of their overall healthcare expenditure on stroke, compared with other countries like Hungary and Estonia who spent 3.42% and 4.34% of the total healthcare budget on stroke, respectively.

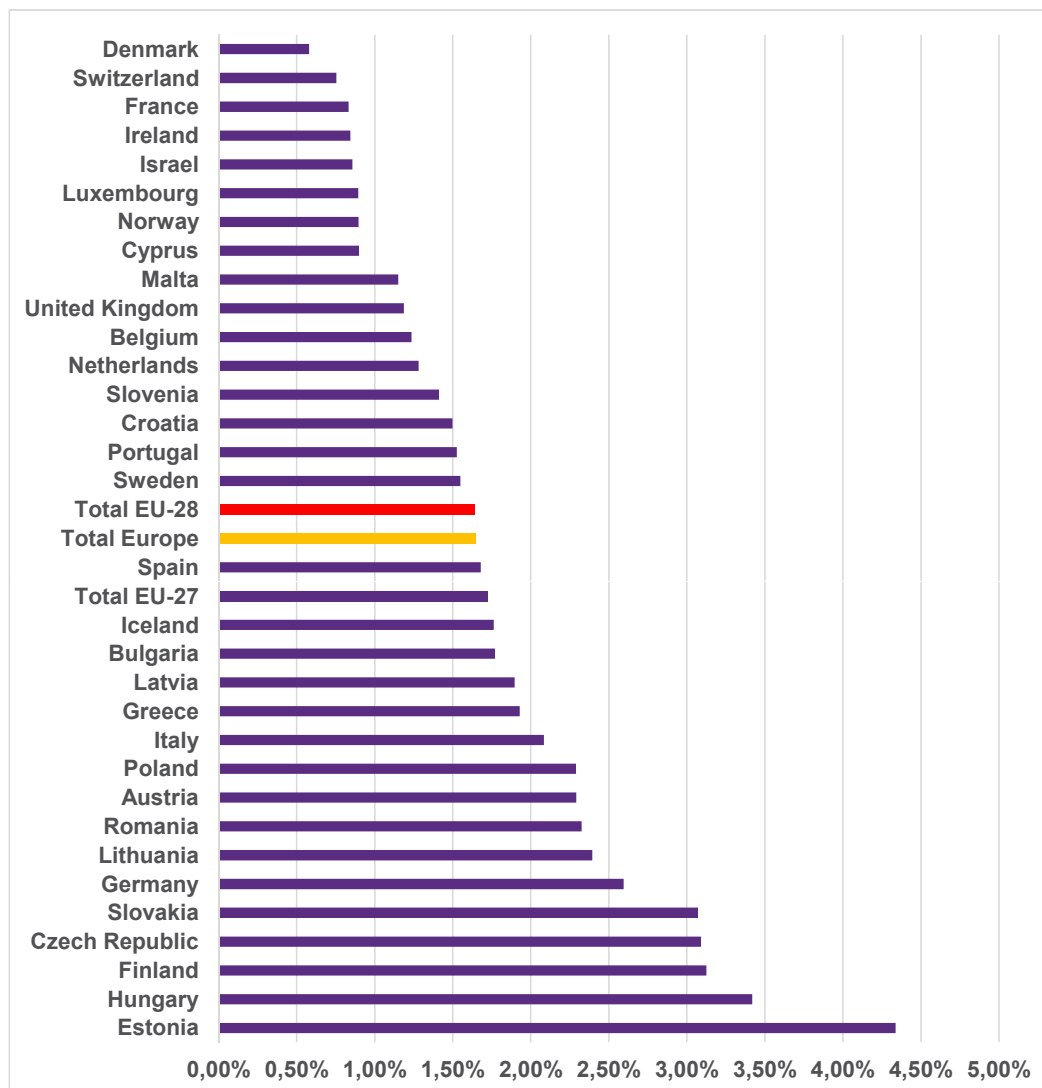


Figure 1. Stroke as a percentage of overall healthcare expenditure

Across Europe there were approximately 43 million days spent in nursing / residential care home due to stroke in 2017.

This resulted in a total cost for European social care systems of €4.7 billion. Overall, stroke-related direct health and social care expenditure across the 32 European countries was €31 billion.

Informal care provided across Europe was valued at €16 billion in 2017 (Table 1). Stroke also accounted for 438,000 deaths in the 32 countries under study, representing 286,000 potential years of work lost, at an estimated cost of €6.2 billion.

Stroke-related work absences accounted for approximately 38 million working-days lost, which accounted for €6.3 billion.

With these 32 European countries having a GDP of €16,658 billion in 2017, stroke accounted for 0.36% of total European GDP (Table 1 and Figure 2).

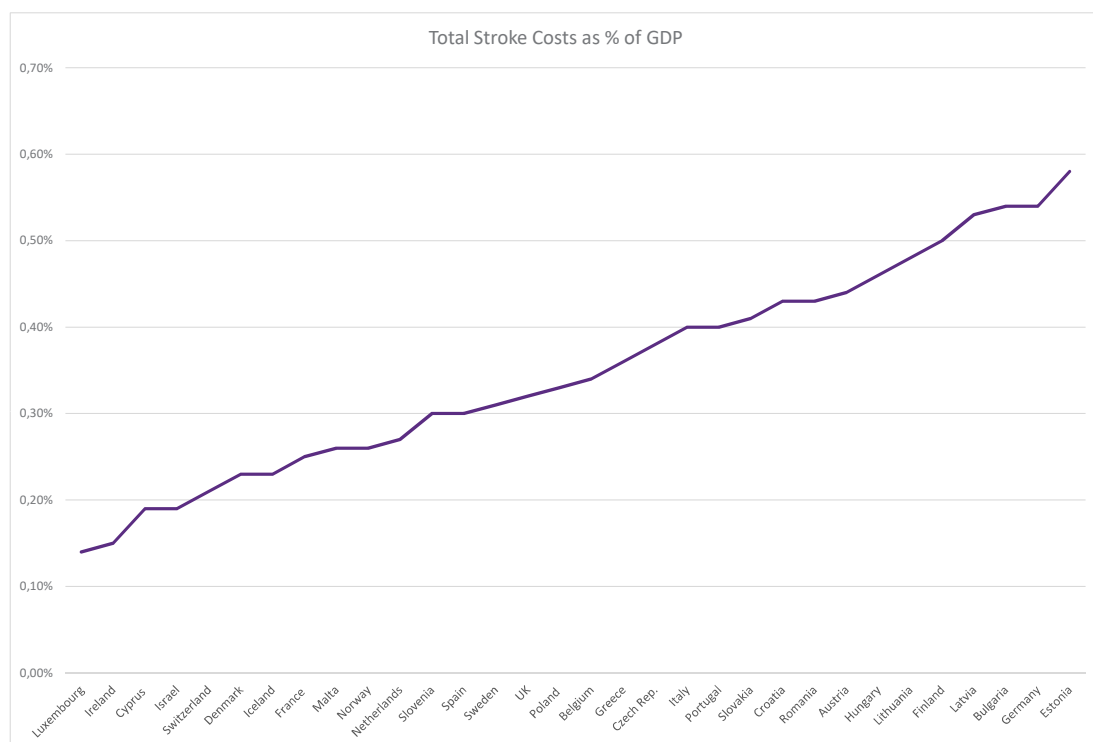


Figure 2. Total Stroke Costs vs GDP

The country with the highest share of GDP lost due to stroke was Estonia at 0.58% followed by Bulgaria and Germany, both at 0.54%. The countries with the lowest share of GDP lost due to stroke were Luxembourg (0.14%), Ireland (0.15%) and Israel (0.19%).

## CONCLUSIONS

We estimated the total cost of stroke across 32 European countries to be €60 billion a year in 2017, of which €27 billion were incurred by healthcare systems. In addition, a further €5 billion were incurred by social care systems.

are rising over time, partly due to an ageing population, making the absolute number of people living with stroke likely to increase throughout Europe.



However, €29 billion, almost half, of the economic burden of stroke was in non-health or social care areas, with an estimated €16 billion in informal care costs and €13 billion in lost productivity due to early death or absence from work.

However, our work provides only a snapshot of the economic consequences posed by stroke to 32 European countries in 2017. It estimates that stroke cost these countries €60 billion a year, and together with the evidence we have gathered over the last 15 years<sup>6</sup>, it indicates that the costs of stroke

Further work commissioned by SAFE will evaluate the number of people having, living and dying from stroke in 2030, 2035 and 2040, and how these increases will impact the economic costs of stroke across the 32 European countries under study. Such future estimates will be useful to policy makers in order to better understand the impact of an ageing population on stroke, and the areas of the economy that are more likely to be affected by the expected increase in the overall number of people living with stroke.



## RECOMMENDATIONS

It is clear that the economic burden of stroke is very high and steps should be taken to acknowledge and reduce it.

SAFE therefore calls on:

### MEMBERS OF THE EUROPEAN PARLIAMENT

to adopt a Resolution, calling on Member States to implement the recommendations of the Stroke Action Plan for Europe and on EU institutions to leverage existing platforms, to put stroke more prominently on the agenda and truly facilitate the exchange of best practice.

### THE EUROPEAN PARLIAMENT AND THE EUROPEAN COMMISSION

to approve a pilot project that supports the international implementation of the Stroke Action Plan for Europe 2018-2030, made by the SAFE and European Stroke Organisation in 2018.<sup>7</sup>

### DG SANTE

to support the creation of a stroke-specific subgroup in the Steering Group on Health Promotion, Disease Prevention and Management of non-communicable diseases and help facilitate discussions about creating national plans for stroke, encompassing the entire chain of care from primary prevention through to life after stroke, in order to better manage and reduce the societal and economic burden of stroke in Europe.

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## About SAFE

The Stroke Alliance for Europe (SAFE) a non-profit-making organisation formed in 2004. It is the voice of stroke patients in Europe, representing a range of patient groups from more than 30 European countries.

SAFE's goal is to decrease the number of strokes in Europe by advocating for better prevention, access to adequate treatment, post-stroke care and rehabilitation.

For more information about SAFE, please visit [www.safestroke.eu](http://www.safestroke.eu).

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