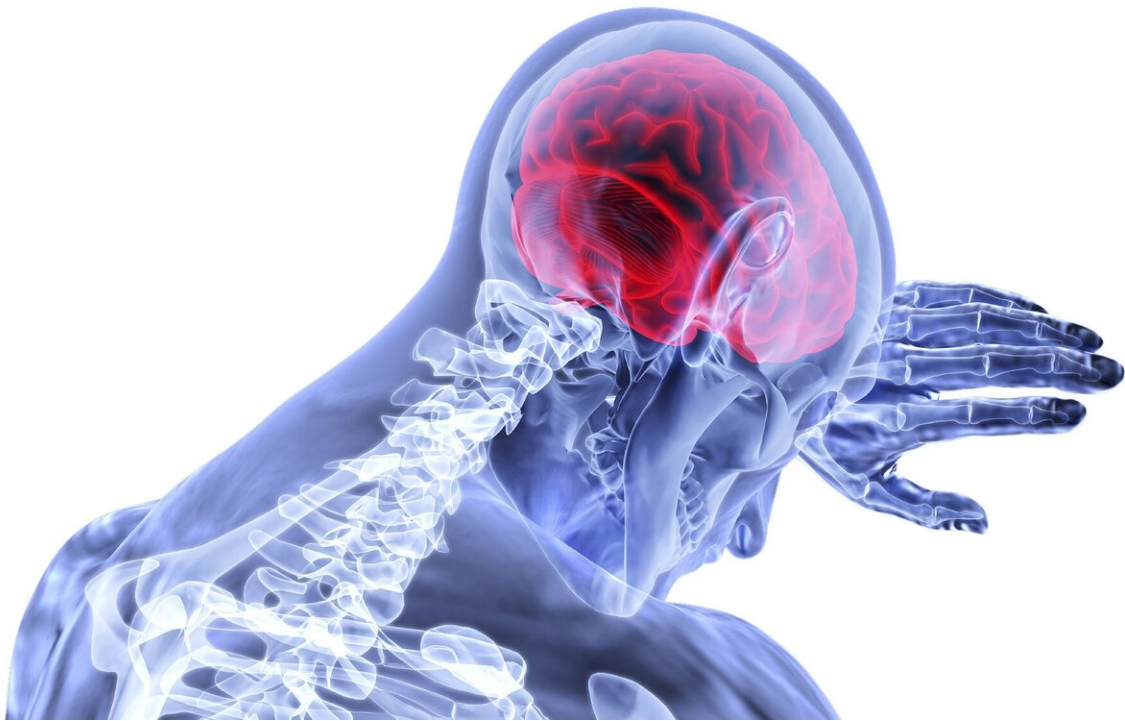


# **Stroke could cause nearly 10 million deaths annually by 2050 and cost up to \$2 trillion per year, new report warns**

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Unless urgent action is taken, the number of people who die from stroke globally is estimated to increase by 50% by 2050 to 9.7 million deaths per year, with annual costs as high as US\$2.3 trillion possible, according

to a new report on pragmatic solutions to reduce the global burden of stroke: a World Stroke Organization–*Lancet Neurology* Commission. The authors' analysis forecasts growing health and economic impacts from stroke between 2020 and 2050, which will disproportionately affect LMICs.

Based on a review of evidence-based guidelines, recent surveys, and in-depth interviews with [stroke](#) experts around the world, the authors make evidence-based pragmatic recommendations to reduce the global burden, including measures to improve stroke surveillance, prevention, [acute care](#), and rehabilitation.

The number of people who suffer a stroke, die from, or remain disabled by the condition globally has almost doubled over the past 30 years, with the vast majority of those affected in LMICs, where prevalence of the condition is increasing at a faster rate than in HICs.

If the [current trends](#) continue, one of the World Health Organization's key Sustainable Development Goals (SDGs) will not be met. SDG 3.4 aims to reduce the 41 million [premature deaths](#) from non-communicable diseases—including stroke—by one third by 2030. While achieving these would require US\$140 billion in new spending between 2023 and 2030, the financial benefits would outweigh the costs by ten-to-one.

Professor Valery L. Feigin, of Auckland University of Technology, New Zealand, and Commission co-chair, said, "Stroke exerts an enormous toll on the world's population, leading to the death and permanent disability of millions of people each year, and costing billions of dollars."

"Precisely forecasting the health and economic impacts of stroke decades into the future is inherently challenging given the levels of uncertainty involved, but these estimates are indicative of the ever-increasing burden we will see in the years ahead unless urgent, effective

action is taken."

## **Fast-growing burden of disease, mostly affecting LMICs**

In the new Commission, the authors used the Global Burden of Disease (GBD) study methods to provide estimates of stroke burden between 2020 and 2050 in HICs, LMICs and by major GBD world regions and age. Taking into account population growth and aging in most countries, their analysis indicates the number of people who die annually from stroke globally will increase by 50%, rising from 6.6 million in 2020 to 9.7 million in 2050.

The number of stroke deaths in LMICs is projected to rise sharply—widening the gap with HICs—by increasing from 5.7 million in 2020 to 8.8 million in 2050. In contrast, stroke deaths in HICs are estimated to remain largely unchanged at around 900,000 between 2020 and 2050. This indicates that the proportion of global stroke deaths that occur in LMICs will increase from 86% in 2020 to 91% in 2050.

Professor Jeyaraj Pandian, President-Elect of the World Stroke Organization, one of the lead authors of the Commission, and lead author of *The Lancet Regional Health—Southeast Asia* journal Series on stroke in Southeast Asia said, "Asia accounted for by far the greatest share of global stroke deaths in 2020 (61%, around 4.1 million deaths) and this is forecast to rise to around 69% by 2050 (around 6.6 million deaths). Though smaller relative to Asia, the number of annual global stroke deaths occurring in Sub-Saharan African countries will rise from 6% in 2020 (403,000) to 8% (765,000) in 2050."

"We have to closely examine what is causing this increase, including the growing burden of uncontrolled risk factors—especially [high blood](#)

[pressure](#), and lack of stroke prevention and care services in these regions. Without [urgent action](#), stroke deaths in Southeast Asia, East Asia, and Oceania could increase by almost 2 million deaths, from 3.1 million in 2020 to potentially 4.9 million in 2050."

While the global death rate among people aged over 60 years is predicted to fall by 36% (566 deaths per 100,000 in 2020 to 362 per 100,000 in 2050), among those under 60 years it is predicted to fall by less than 25% (13 per 100,000 in 2020 to 10 per 100,000 in 2050). The Commission authors say the lesser reduction among younger people might relate to increasing levels of diabetes and obesity in this age group.

## **Huge economic costs, mainly in Asia and Africa**

Economic forecasting indicates the combined cost of stroke, including direct costs and loss of income, will rise from US\$891 billion per year in 2017 to up to US \$2.31 trillion in 2050. The bulk of these economic impacts are forecast to be felt in Asia and Africa.

Projections indicate large increases in direct costs and income losses from stroke in middle-income countries and increases in direct costs in HICs. They also forecast increased [economic impacts](#) in low-income countries, but their overall share in global costs is likely to remain small, given their overall low share in global population and stroke cases.

## **Evidence-based recommendations will greatly reduce the impacts of stroke**

To identify key barriers and facilitators to high-quality stroke surveillance, prevention, acute care and rehabilitation, the Commission authors conducted a qualitative analysis of in-depth interviews with 12 stroke experts from six HICs and six LMICs.

Among the major barriers identified were low awareness of stroke and its risk factors (which include high blood pressure, diabetes mellitus, high cholesterol, obesity, unhealthy diet, sedentary lifestyle, and smoking), and limited surveillance data on stroke risk factors, events, management, and outcomes of stroke. Major facilitators included well-developed stroke organizations and networks that can build capacity for stroke care and research, and universal health care providing population-wide access to evidence-based stroke care.

Based on the findings of the qualitative analysis, the Commission authors make 12 evidence-based recommendations across stroke surveillance, prevention, acute care, and rehabilitation. Key recommendations include:

- Establishing low-cost surveillance systems to provide accurate epidemiological stroke data to guide prevention and treatment.
- Raising public awareness and action to improve healthy lifestyles and prevent stroke through population-wide use of mobile and digital technologies, such as training and awareness-raising videos and apps.
- Prioritizing effective planning of acute stroke care services, capacity building, training, provision of appropriate equipment, treatment and affordable medicines, and adequate resource allocation at national and regional levels.
- Adapting evidence-based recommendations to regional contexts, including training, and support and supervision of community health workers to assist in long-term stroke care.
- Establishing local, national, and regional ecosystems involving all relevant stakeholders to co-create, co-implement and monitor stroke surveillance, prevention, acute care, and rehabilitation.

"One of the most common problems in implementing stroke prevention and care recommendations is the lack of funding. Our Commission

recommends introducing legislative regulations and taxations of unhealthy products (such as salt, alcohol, sugary drinks, trans-fats) by each and every government in the world."

"Such taxation would not only reduce consumption of these products—and therefore lead to the reduction of burden from stroke and major other non-communicable diseases—but also generate a large revenue sufficient to fund not only prevention programs and services for stroke and other major disorders, but also reduce poverty, inequality in health service provision, and improve well-being of the population," said Prof. Feigin.

Professor Mayowa O. Owolabi, of the University of Ibadan, Nigeria and Commission co-chair said, "Investing in evidence-based measures to reduce the global burden of stroke will deliver benefits that go far beyond health alone. As well as delivering health and economic benefits relating to stroke, many of our recommendations would also facilitate reductions in poverty and inequality and boost local economies."

He added, "Every member State of the United Nations has committed to meeting the SDGs but at present few countries are on target to achieve SDG 3.4. Stroke is countable, substantially preventable, treatable, and beatable through the pragmatic solutions recommended by this Commission across the four pillars of the stroke quadrangle (surveillance, prevention, acute care, and rehabilitation)."

"By implementing and monitoring all of the Commission's recommendations, which have a firm evidence base, the global burden of stroke will be reduced drastically this decade and beyond. Not only will this enable us to meet SDG 3.4, as well as other key SDGs, it will improve brain health and the overall well-being of millions of people across the globe now and beyond 2030."

Professor Sheila Martins, of the Universidade Federal of Rio Grande do Sul, Brazil and President of the World Stroke Organization said, "The gaps in stroke services across the world are catastrophic. We need a drastic improvement today, not in 10 years. World Stroke Organization is committed to support and to accelerate the implementation of these recommendations globally through the WSO Implementation Task Force, with stroke experts to advise the establishment of stroke prevention and care and to contribute with educational programs, and through the Global Stroke Alliance meetings rotating in the world facilitating the discussions between stroke experts and policy makers, giving the technical support to the governments to elaborate national plans for stroke and to include stroke care in the Universal Health Coverage packages."

**More information:** Pragmatic solutions to reduce the global burden of stroke: a World Stroke Organization–Lancet Neurology Commission, *The Lancet Neurology* (2023).

[www.thelancet.com/commissions/global-burden-stroke](http://www.thelancet.com/commissions/global-burden-stroke)

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