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Global, regional, and national burden of stroke, 1990–2016: a syste 

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Global, regional, and national burden of stroke, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016.

GBD 2016 Stroke Collaborators.

Collaborators (273)

Abstract

BACKGROUND: **Stroke** is a leading cause of mortality and disability worldwide and the economic costs of treatment and post-**stroke** care are substantial. The **Global Burden of Diseases, Injuries, and Risk Factors Study (GBD)** provides a **systematic**, comparable method of quantifying health loss by **disease**, age, sex, year, and location to provide information to health systems and policy makers on more than 300 causes of **disease** and injury, including **stroke**. The results presented here are the estimates of **burden** due to overall **stroke** and ischaemic and haemorrhagic **stroke** from **GBD 2016**.

METHODS: We report estimates and corresponding uncertainty intervals (UIs), from 1990 to **2016**, for incidence, prevalence, deaths, years of life lost (YLLs), years lived with disability (YLDs), and disability-adjusted life-years (DALYs). DALYs were generated by summing YLLs and YLDs. Cause-specific mortality was estimated using an ensemble modelling process with vital registration and verbal autopsy data as inputs. Non-fatal estimates were generated using Bayesian meta-regression incorporating data from registries, scientific literature, administrative records, and surveys. The Socio-demographic Index (SDI), a summary indicator generated using educational attainment, lagged distributed income, and total fertility rate, was used to group countries into quintiles.

FINDINGS: In **2016**, there were 5.5 million (95% UI 5.3 to 5.7) deaths and 116.4 million (111.4 to 121.4) DALYs due to **stroke**. The **global** age-standardised mortality rate decreased by 36.2% (-39.3 to -33.6) from 1990 to **2016**, with decreases in all SDI quintiles. Over the same period, the **global** age-standardised DALY rate declined by 34.2% (-37.2 to -31.5), also with decreases in all SDI quintiles. There were 13.7 million (12.7 to 14.7) new **stroke** cases in **2016**. **Global** age-standardised incidence declined by 8.1% (-10.7 to -5.5) from 1990 to **2016** and decreased in all SDI quintiles except the middle SDI group. There were 80.1 million (74.1 to 86.3) prevalent cases of **stroke** globally in **2016**; 41.1 million (38.0 to 44.3) in women and 39.0 million (36.1 to 42.1) in men.

INTERPRETATION: Although age-standardised mortality rates have decreased sharply from

1990 to **2016**, the decrease in age-standardised incidence has been less steep, indicating that the **burden of stroke** is likely to remain high. Planned updates to future GBD iterations include generating separate estimates for subarachnoid haemorrhage and intracerebral haemorrhage, generating estimates of transient ischaemic attack, and including atrial fibrillation as a risk factor.

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