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for the GBD 2013 Stroke Expert Panel members

Synopsis

Background—World mapping is an important tool to visualize stroke burden and its trends in various regions and countries.

Objectives—To show geographic patterns of incidence, prevalence, mortality, disability-adjusted life-years (DALYs) and years lived with disability (YLDs), and their trends for ischemic stroke (IS) and hemorrhagic stroke (HS) in the world for 1990 to 2013.

Methodology—Stroke incidence, prevalence, mortality, DALYs and YLDs were estimated following the general approach of the Global Burden of Disease (GBD) 2010 with several important improvements in methods. Data were updated for mortality (through April 2014) and stroke incidence, prevalence, case fatality, and severity through 2013. Death was estimated using an ensemble modelling approach. A new software package, DisMod-MR 2.0 was used as part of a custom modelling process to estimate YLDS. All rates were age-standardized to new GBD estimates of global population. All estimates have been computed with 95% uncertainty intervals (UI).

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Conflict of interest
The authors have no conflict of interest to declare.

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Results—Age-standardized incidence, mortality, prevalence and DALYs/YLDs declined over the period from 1990 to 2013. However, the absolute number of people affected by stroke has substantially increased across all countries in the world over the same time period, suggesting that the global stroke burden continues to increase. There were significant geographical (country and regional) differences in stroke burden in the world, with the majority of the burden borne by low- and middle-income countries.

Conclusions—Global burden of stroke has continued to increase in spite of dramatic declines in age-standardized incidence, prevalence, mortality rates, and disability. Population growth and ageing have played an important role in the observed increase in stroke burden.

Keywords
stroke; atlas; burden; GBD 2013

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Appendix
GBD Stroke Collaborators (in alphabetical order by country)

Argentina (Maria Cecilia Bahit); Australia (Amanda Thrift, Atte Meretoja, Bill Stavreski, Craig Anderson, Edwin Pearse, Geoffrey Donnan, Graeme Hankey, Mark T. Mackay, Stephen Davis, Zanfina Ademi); Austria (Michael Brainin); Azerbaijan (Tural Guliyev); Bahrain (Randah R. Hamadeh); Barbados (Heather Harewood, Karen Springer); Brazil (Iuri da Costa Leite, Jefferson Gomes Fernandes, Norberto Cabral, Paulo Lotufo); Bulgaria (Klara Dokova); Canada (Farshad Pourmalek, Luciano A. Sposato, M. Patrice Lindsay, Patricia Riccio); Chile (Pablo M. Lavados); China (Bin Li, Chuanhua Yu, Guohong Jiang, Jixiang Ma, Maigeng Zhou, Ming Liu, Shankuan Zhu, Wenzhi Wang, Xiaofeng Liang, XXX Deji, Yong Zhang); Colombia (Gabriel Alcalá-Cerra, Gabrielle DeVeber); Denmark (Hanne Christensen, Thomas Truelsen); Egypt (Foad Abd-Allah); Ethiopia (Awoke Temesgen, Berhe Weldearegawi Sahle, Semaw Abera, Yohanaes Adama Melaku); Fiji (Devina Nand); France (Maurice Giroud); Germany (Jost B. Jonas, Matthias Endres, Ronny Westerman); Greece (Konstantinos Stroupoulos); India (Dorairaj Prabhakaran, Jeyaraj Durai Pandian, Man Mohan Mehndiratta, Nobhojit Roy, Panniyammakal Jeemon, Rajeev Gupta, Vasanthan Rajagopalan); Indonesia (Soewarta Kosen, Tati Suryati Warouw);
1. Age-standardized annual prevalence (per 100,000) of ischemic stroke in 2013
2. Age-standardized annual prevalence (per 100,000) of hemorrhagic stroke in 2013
3. Age-standardized annual mortality rates (per 100,000) of ischemic stroke in 2013
4.
Age-standardized annual mortality rates (per 100,000) of hemorrhagic stroke in 2013
5. Age-standardized annual DALYs rates (per 100,000) due to ischemic stroke in 2013
6. Age-standardized annual DALYs rates (per 100,000) due to hemorrhagic stroke in 2013
7. Percent change in age-standardized prevalence due to ischemic stroke for 1990–2013
8. Percent change in age-standardized prevalence due to hemorrhagic stroke for 1990–2013
9. Percent change in age-standardized mortality rates due to ischemic stroke for 1990–2013