Global Burden of Neurological Disorders: From Global Burden of Disease Estimates to Actions

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Neurological disorders are increasingly recognized as one of the most prevalent disorders with high burden to the patients, their families, and society. However, until recently there were no accurate estimates of the burden of neurological disorders on the global, regional, and national levels as well as their trends over the last 3 decades.

This gap in the knowledge was filled in the recent series of 11 *The Lancet Neurology* papers on the prevalence, incidence, deaths, and disability-adjusted life years (DALYs; the sum of years of life lost and years lived with disability) of 15 neurological disorders in 195 countries from 1990 to 2016 derived from the Global Burden of Disease, Injuries, and Risk Factors 2016 Study (GBD 2016).

Neurological disorders included in the analysis were tetanus, meningitis, encephalitis, stroke, brain and other nervous system cancers, traumatic brain injury, spinal cord injury, Alzheimer's disease and other dementias, Parkinson's disease, multiple sclerosis, motor neuron disease, idiopathic epilepsy, migraine, tension-type headache, and a residual category of other less common neurological disorders. All estimates were presented by age and sex and each location was grouped into 1 of 5 quintiles based on its sociodemographic index (a summary indicator of income per capita, years of schooling,

and total fertility rate) value in 2016. The estimates showed that globally, in 2016, neurological disorders were the leading cause of DALYs (276 [95% UI 247–308] million) and second leading cause of deaths (9.0 [8.8–9.4] million). The absolute number of deaths and DALYs from all neurological disorders combined increased (deaths by 39% [34–44], DALYs by 15% [9–21]) but their age-standardized rates decreased (deaths by 28% [–30 to –26], DALYs by 27% [–31 to –24]) between 1990 and 2016. The only neurological disorders that showed a decrease on both rates and absolute numbers of deaths and DALYs were tetanus, meningitis, and encephalitis. The 4 largest contributors of neurological DALYs were stroke (42.2% [38.6–46.1]), migraine (16.2% [11.7–20.8]), Alzheimer's and other dementias (10.4% [9.0–12.1]), and meningitis (7.9% [6.6–10.4]). For the combined neurological disorders, age-standardized DALY rates were significantly higher in men than in women (male to female ratio 1.12 [1.05–1.20]), but headaches, Alzheimer's and other dementias, and multiple sclerosis were more common and caused more burden in women (male to female ratio ranging from 0.54 [0.53–0.56] for migraine to 0.90 [0.88–0.92] for Alzheimer's and other dementias). With the exception of stroke, and to a lesser

extent Alzheimer's disease and other dementias, the 84 risks quantified in GBD explain little to none of the burden of neurological disorders. Overall, it was shown that the burden of neurological disorders over the last 27 years has increased and is likely to be increased in the future due to aging of the population and population growth, thus placing an increasing demand on already overstretched resources and services for patients with neurological disorders. There is an urgent need to im-

prove prevention and management of neurological disorders across the globe.

These findings were presented and discussed at the Global Burden of Disease Brain Summit in Auckland, New Zealand (November 27, 2018; <https://nisan.aut.ac.nz/about-the-institute/global-burden-of-disease-brain-summit>) devoted to the launch of *The Lancet Neurology* series of the 11 neurological papers based on the GBD 2016 estimates.