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First comprehensive estimates of disease burden from neurological disorders and their trends in every state of India from 1990 to 2019

- The contribution of non-communicable and injury-related neurological disorders to the total disease burden more than doubled in India from 1990 to 2019, whereas the contribution of communicable neurological disorders reduced during this period by three-quarters.
- The burden of non-communicable neurological disorders is increasing in India mainly due to ageing of the population.
- While communicable diseases contributed to the majority of total neurological disorders burden in children younger than 5 years, non-communicable neurological disorders were the highest contributor in all other age groups.
- Stroke, headache disorders, and epilepsy are the leading contributors to neurological disorders burden in India. The contribution of all neurological disorders to disease burden in India is shown in the table on page 8 of this press release.
- Stroke caused 699,000 deaths in India in 2019, which was 7.4% of the total deaths in the country.
- The burden of many neurological disorders varied considerably between the states, which has significant implications for the policies and programmes to reduce this burden.
- Among the known risk factors for neurological disorders burden, high blood pressure, air pollution, dietary risks, high fasting plasma glucose, and high body-mass index are the leading contributors.

New Delhi, 14 July 2021 – The first comprehensive estimates of disease burden due to neurological disorders and their trends in every state of India from 1990 published in *The Lancet Global Health* by the **India State-Level Disease Burden Initiative**. These neurological disorders include non-communicable neurological disorders (stroke, headache disorders, epilepsy, cerebral palsy, Alzheimer’s disease and other dementias, brain and central nervous system cancer, Parkinson’s disease, multiple sclerosis, motor neuron diseases, and other neurological disorders), communicable neurological disorders (encephalitis, meningitis, and tetanus), and injury-related neurological disorders (traumatic brain injuries and spinal cord injuries). The findings in this paper highlight that the contribution of non-communicable neurological disorders and neurological injuries to the total disease burden has more than doubled between 1990 and 2019. The burden of many neurological disorders vary substantially across the states of India.

The state-specific findings described in this scientific paper highlight the extent of the effort needed in each state to reduce the burden of neurological disorders through state-specific health system responses aimed at increasing awareness, early identification, cost-effective treatment, and rehabilitation. The trends over about three decades reported in this research paper utilized all available data sources from India, which enabled more robust estimates of neurological disorder burden across India than those available so far.

Prof Vinod Paul, Hon’ble Member NITI Aayog said on the release of the findings, “This scientific paper presents a comprehensive perspective of the burden of neurological disorders over the last thirty years, and systematically highlights the variations between the states. Several government policies and initiatives are in place to address the burden of neurological disorders across India, however more focused efforts are required for the planning of specific neurology services in each state. There is a

need to address the shortage of trained neurology workforce, and strengthen early detection and cost-effective management of neurological disorders in the country to deal with their growing burden.”

Prof Balram Bhargava, Secretary to the Government of India, Department of Health Research, Ministry of Health & Family Welfare, and Director General, ICMR said “This research paper provides the first consolidated estimates on the burden of most neurological disorders for every state of India from 1990 to 2019. Neurological disorders contribute 10% of the total disease burden in India. There is a growing burden of non-communicable neurological disorders in the country, which is mainly attributable to ageing of the population. The findings presented in this research paper are useful for health-care planning at the state level to reduce the neurological disorders burden.”

Prof Gagandeep Singh, Professor, Dayanand Medical College, and the first author of the paper said, “The analysis in this paper highlights key issues related to trends of neurological disorders in the states of India. Epilepsy is a common neurological disorder in India. While the prevalence of epilepsy has increased over the past three decades, it is gratifying to note that India has made some gains in reducing premature deaths and morbidity of people with epilepsy over this period by reducing treatment gaps. There is however a need to scale up treatment coverage of epilepsy in governmental schemes such as the Rashtriya Bal Swasthya Karyakram and Ayushman Bharat. Policies and practices focusing on safe births, preventing head injury and stroke would help in averting a substantial proportion of epilepsies.”

Prof Lalit Dandona, Director of the India State-Level Disease Burden Initiative, who is Honorary Distinguished Scientist at ICMR, Distinguished Professor at PHFI, and senior author of this paper said, “This study based on collaboration with leading neurology experts in India provides policy-relevant insights into the trends of neurological disorders across the states. While the burden of infectious neurological disorders has fallen in India, this burden is higher in less developed states. On the other hand, the burden of neurological disorders related to injury is higher in more developed states. Among non-communicable neurological disorders, stroke is the third leading cause of death in India, and dementias are the fastest growing neurological disorder. These and other findings in the paper have important implications for planning to reduce the growing burden of neurological disorders in India.”

Prof N Girish Rao, Professor, National Institute of Mental Health and Neuro Sciences, and a co-author on this paper said, “Headache is the commonest neurological disorder affecting 1 in 3 Indians, and is often neglected in terms of public health priority. It is the second leading contributor to the disease burden from neurological disorders in India. Migraine affects females more than males, greatly affecting adults in the working age population. Headaches, especially migraine, need to be recognised as a public health problem and included under the national NCD programme. The time is right for ushering structured headache services in India and develop standards of quality of care, else the missed opportunity is huge.”

Prof K Srinath Reddy, President, Public Health Foundation of India said, “The rise of non-communicable disease related risk factors, as leading contributors to neurological disorders and resultant disability in India, is not a surprise. It reflects the demographic, socio-economic and nutrition transitions that have steered the shift in our epidemiological profile over the past 30 years. What is helpful is the recognition that much of this burden of disease and disability is related to modifiable risk factors which can be reduced at the population level and corrected at the individual level. We need policy, health system and personal level actions to achieve healthy ageing across a long life course.”

Prof Christopher Murray, Director of the Institute for Health Metrics and Evaluation at the University of Washington’s School of Medicine said “These results show us the importance of looking at the subnational level and at different age groups to truly understand disease burden within a country. While non-communicable diseases were the largest contributor to health loss from neurological disorders for most age groups, communicable diseases were the largest contributor for children under 5 years of age. The pattern also varies considerably between the states. The data make a strong argument for the importance of locally-tailored health policies to address gaps and strengthen health system neurology services.”

The findings reported in the paper published today are part of the Global Burden of Disease Study 2019. The analytical methods of this study have been refined over a quarter century of scientific work, which has been reported in more than 16,000 peer-reviewed publications, making it the most widely used approach globally for disease burden estimation. These methods enable standardized comparisons of health loss caused by different diseases and risk factors, between different geographies, sexes, and age groups, and over time in a unified framework.

The paper published in *The Lancet Global Health* today:

The burden of neurological disorders across the states of India: the Global Burden of Disease Study 1990–2019. *Lancet Global Health*. 14 July 2021.

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About the India State-Level Disease Burden Initiative

The India State-Level Disease Burden Initiative was launched in 2015 as a collaborative effort between the Indian Council of Medical Research, Public Health Foundation of India, Institute for Health Metrics and Evaluation, and a number of other key stakeholders in India, including academic experts and institutions, government agencies and other organizations, under the aegis of the Ministry of Health & Family Welfare. Over 300 leading scientists and experts representing about 100 institutions across India are engaged with this collaborative work.

The first set of findings by the India State-Level Disease Burden Initiative on the variations in epidemiological transition across the states of India were presented in a *Report* released by the Vice-President and Health Minister of India and in a scientific paper published in *The Lancet* in November 2017:

- Indian Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation. India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi: ICMR, PHFI, and IHME, 2017.
[https://main.icmr.nic.in/sites/default/files/reports/2017 India State Level Disease Burden Initiative Full Report.pdf](https://main.icmr.nic.in/sites/default/files/reports/2017%20India%20State%20Level%20Disease%20Burden%20Initiative%20Full%20Report.pdf)
- India State-Level Disease Burden Initiative Collaborators. Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016 in the Global Burden of Disease Study. *Lancet* 2017; 390: 2437–2460. PMID: 29150201.
[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(17\)32804-0/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(17)32804-0/fulltext)

These findings have received high-level policy attention, including reference to these state-level findings in the Economic Survey of India released in early 2018, which is considered one of the most important policy planning instruments in India. In 2019, the findings from this Initiative were utilised in a major government policy report for the Economic Advisory Council to the Prime Minister. Over the past few years, the following peer-reviewed open access papers and a commentary have been published in the Lancet journals describing trends of diseases and risk factors in the states of India.

- India State-Level Disease Burden Initiative CVD Collaborators. The changing patterns of cardiovascular diseases and their risk factors in the states of India: the Global Burden of Disease Study 1990–2016. *Lancet Global Health* 2018; 6: e1339–e1351. PMID: 30219317.
[https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(18\)30407-8/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30407-8/fulltext)
- India State-Level Disease Burden Initiative Diabetes Collaborators. The increasing burden of diabetes and variations among the states of India: the Global Burden of Disease Study 1990–2016. *Lancet Global Health* 2018; 6: e1352–e1362. PMID: 30219315.
[https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(18\)30387-5/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30387-5/fulltext)
- India State-Level Disease Burden Initiative CRD Collaborators. The burden of chronic respiratory diseases and their heterogeneity across the states of India: the Global Burden of Disease Study 1990–2016. *Lancet Global Health* 2018; 6: e1363–e1374. PMID: 30219316.
[https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(18\)30409-1/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30409-1/fulltext)
- India State-Level Disease Burden Initiative Cancer Collaborators. The burden of cancers and their variations across the states of India: the Global Burden of Disease Study 1990–2016. *Lancet Oncology* 2018; 19: 1289–1306. PMID: 30219626.
[https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(18\)30447-9/fulltext](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(18)30447-9/fulltext)
- India State-Level Disease Burden Initiative Suicide Collaborators. Gender differentials and state variations in suicide deaths in India: the Global Burden of Disease Study 1990–2016. *Lancet Public Health* 2018; 3: e478–e489. PMID: 30219340.
[https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(18\)30138-5/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(18)30138-5/fulltext)

- Bhargava B, Paul VK. Informing NCD control efforts in India on the eve of Ayushman Bharat. *Lancet* 2018.
[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(18\)32172-X/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)32172-X/fulltext)
- India State-Level Disease Burden Initiative Air Pollution Collaborators. The impact of air pollution on deaths, disease burden, and life expectancy across the states of India: the Global Burden of Disease Study 2017. *Lancet Planetary Health* 2019; 3: e26-e39. PMID: 30528905.
[https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(18\)30261-4/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30261-4/fulltext)
- India State-Level Disease Burden Initiative Malnutrition Collaborators. The burden of child and maternal malnutrition and trends in its indicators in the states of India: the Global Burden of Disease Study 1990-2017. *Lancet Child & Adolescent Health* 2019; 3: 855-870. PMID: 31542357.
[https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642\(19\)30273-1/fulltext](https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(19)30273-1/fulltext)
- India State-Level Disease Burden Initiative Mental Disorders Collaborators. The burden of mental disorders across the states of India: the Global Burden of Disease Study 1990-2017. *Lancet Psychiatry* 2020; 7: 148-161. PMID: 31879245.
[https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(19\)30475-4/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(19)30475-4/fulltext)
- India State-Level Disease Burden Initiative Road Injury Collaborators. Mortality due to road injuries in the states of India: the Global Burden of Disease Study 1990-2017. *Lancet Public Health* 2020; 5: e86-e98. PMID: 31879251.
[https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(19\)30246-4/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(19)30246-4/fulltext)
- India State-Level Disease Burden Initiative Child Mortality Collaborators. Subnational mapping of under-5 and neonatal mortality trends in India: the Global Burden of Disease Study 2000–2017. *Lancet* 2020; 395: 1640–58. PMID: 32413293.
[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30471-2/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30471-2/fulltext)
- India State-Level Disease Burden Initiative CGF Collaborators. Mapping of variations in child stunting, wasting and underweight within the states of India: the Global Burden of Disease Study 2000-2017. *EClinicalMedicine* 2020; 22: 100317. PMID: 32510044.
[https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370\(20\)30061-4/fulltext](https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(20)30061-4/fulltext)
- India State-Level Disease Burden Initiative Air Pollution Collaborators. Health and economic impact of air pollution in the states of India: the Global Burden of Disease Study 2019. *Lancet Planetary Health* 2021; 5: e25-e38. PMID: 33357500.
[http://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30298-9/fulltext](http://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30298-9/fulltext)

The India State-Level Disease Burden Initiative plans to continue providing comprehensive findings and projections to better inform health policy formulation and health system development across India.

The Indian Council of Medical Research (ICMR), is the apex government body in India for the formulation, coordination and promotion of biomedical and health research. It is one of the oldest medical research bodies in the world. Besides the headquarters in New Delhi, ICMR has 26 research institutes, centres and units across India. ICMR funds both intramural and extramural research in India. The priorities of ICMR coincide with the national health priorities and have the goal of reducing the total burden of disease and to promote health and well-being of India's population. As part of this agenda, ICMR is interested in improving the estimates of disease burden and risk factors in India, especially at the sub-national levels, for better health planning, policy framing and fund allocation. <http://www.icmr.nic.in>

The Public Health Foundation of India (PHFI) is a premier public health institution in India with presence across the country. It collaborates with multiple constituencies including Indian and international academia, state and central governments, multi- and bi-lateral agencies, and civil society groups. The vision of PHFI is to strengthen India's public health institutional and systems capability and provide knowledge to achieve better health outcomes for all through strengthening training, research and policy development in public health. As part of this vision, PHFI has major interest in improving the robustness of sub-national disease burden estimates to inform health action and in evaluating the impact of large-scale population health interventions. www.phfi.org

The Institute for Health Metrics and Evaluation (IHME) is a global research institute at the University of Washington in Seattle that provides independent, rigorous, and comparable measurement of the world's most important health problems and evaluates the strategies used to address them. IHME aims to identify the best strategies to build a healthier world by measuring health, tracking program performance, finding ways to maximize health system impact and developing innovative measurement systems to provide a foundation for informed decision-making that will ultimately allocate resources to best improve population health. www.healthdata.org

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Contribution of each neurological disorder to the total neurological disease burden in India, 2019

Neurological disorders	Percentage of total neurological disorders disease burden (DALYs)
Non-communicable disorders	82.8
Stroke	37.9
Headache disorders	17.5
<i>Migraine</i>	16.0
<i>Tension-type headache</i>	1.6
Epilepsy	11.3
<i>Idiopathic epilepsy</i>	6.4
<i>Secondary epilepsy</i>	5.0
Cerebral palsy	5.7
Alzheimer's disease and other dementias	4.6
Brain and central nervous system cancer	2.2
Parkinson's disease	1.8
Multiple sclerosis	0.2
Motor neuron disease	0.1
Other neurological disorders	1.3
Communicable disorders	11.2
Encephalitis	5.3
Meningitis	4.8
Tetanus	1.1
Injuries	6.0
Traumatic brain injuries	4.1
Spinal cord injuries	1.9

DALYs are disability-adjusted life-years. This is a comprehensive measure of disease burden that is calculated by adding years of life lost due to premature deaths and years lived with disability weighted for the severity of disability for each neurological disorder.