

COMMUNITY PAPER

Global Brain Health – Action urgently required!

A Policy Brief of the Global Health Hub Germany Community on Non-communicable Diseases

About the authors

The policy paper reflects the results of the discussions in the Hub Community. Written contributions to this policy paper were provided by: Winkler AS*, Roth LF*, Diner S, Nguessan JE, Welte T, Knauss S, Yildiz A, Klug SJ, and Chakraborty S*, on behalf of the Hub Community on Non-communicable diseases

What is Brain Health and Why Does it Matter for Global Health?

The brain is one of the most important organs of the human body (Wang et al. 2020), impacting all aspects of our lives – from childhood to old age. According to the World Health Organization (WHO) position paper (Optimizing Brain Health through the Life Course), brain health can be defined as "the state of brain functioning across cognitive, sensory, socio-emotional, behavioral, and motor domains, allowing a person to realize their full potential over the life course, irrespective of the presence or absence of disorders" (WHO 2022a). A healthy brain throughout the life course is not only instrumental to achieving the Sustainable Development Goal (SDG) 3 'Good Health and Well-Being' but also intersects with other SDGs such as fostering innovation and economic growth (SDG 8, 9), improving education (SDG 4), gender equality (SDG 5), and ending poverty (SDG1) (Eyre et al. 2023).

A healthy brain throughout the life course is not only instrumental to achieving the Sustainable Development Goal (SDG) 3 'Good Health and Well-Being' but also intersects with other SDGs such as fostering innovation and economic growth (SDG 8, 9), improving education (SDG 4), gender equality (SDG 5), and ending poverty (SDG1).

(Eyre et al. 2023)

A healthy brain matters for resilient economic development driven by human capital formation. The importance of a knowledge economy for countries to remain competitive – including in the context of technological development and artificial intelligence, requires a stronger focus on critical thinking and lifelong learning (World Economic Forum 2024). Population aging and a growing number of 60-plus workers globally have led to increased statutory retirement age in many countries. Healthy aging is becoming an economic and social imperative (Pilipiec et al. 2020). Caregiving for people living with brain disorders is costly from the economic and social perspective (Harvard 2016), and it often prompts relatives to drop out of the labor force, disproportionately affecting women, who often bear the burden of care work (Heger and Korfhage 2020). Given the relationships between brain health and economic development, the OECD – of which Germany is a member – has launched a neuroscience-inspired policy initiative focusing on "brain capital" (OECD 2024). Brain capital formation as a policy imperative cannot be ignored anymore by countries in the Global North and South (Smith et al. 2021) and should become an intrinsic element of our policy advocacy for SDG 3 Good Health and Well-Being investments.

Understanding Brain Health and its Determinants

The most comprehensive definition of brain health includes neurological, neurosurgical, psychiatric, and neurodevelopmental disorders. However, the WHO, with their definition mentioned above, mainly refers to neurological brain disorders, including psychiatric co-morbidities (Winkler et al. 2024). In 2019 and 2021, 33.5% and 43.1% of the population, respectively, suffered from neurological disorders (The Lancet 2020, GBD 2024), and one in two people will develop one or more psychiatric disorders in their lifetime (McGrath et al. 2023). Neurological disorders are the number one cause of disability and the number two cause of death globally, with stroke, migraine, dementia, meningitis, and epilepsy, amongst others, representing the highest burden (GBD 2019, GBD 2024). This burden increases exponentially if psychiatric disorders are added (GBD 2022). There are considerable differences in the age distribution of neurological disorders. Alzheimer's disease and dementias cause the greatest burden in middle to older ages, while migraine and tension-type headache significantly contribute to the burden in young and middle-aged adults with significant consequences for individuals, the workplace, healthcare systems and society (Feigin et al. 2020; Shimizu et al. 2021; Eltrafi et al. 2023). Disaggregated data from the 2016 GBD study shows that the burden of neurological disorders is highest in low-income and middle-income countries (LMICs) (Knauss et al. 2019). These numbers are expected to increase further as populations grow and age.

Brain health determinants are complex, reflecting many economic, social, and health system dimensions, and demonstrate synergies with other important areas for health, including infectious and non-communicable diseases (NCDs) as well as One Health and planetary health. According to the WHO, the key brain determinants include (i) physical health, (ii) healthy environments, including the impact of climate change, (iii) safety and security, (iv) learning and social connection, and (v) access to quality health services (WHO 2022a). People living in poverty in LMICs and high-income countries (HICs) are affected exponentially, undermining the impact of poverty reduction programs. Brain health equity is an essential concept since certain population groups are left behind even with the availability of treatments (The Lancet 2021).

Stroke, migraine, dementias, meningitis, and epilepsy are the most common neurological causes of disability, leading to an increasing disease burden both in HICs and LMICs (GBD 2019). As an example, in many LMICs, epilepsy continues to generate a significant burden of diseases, especially among rural households and people living below the poverty line. Furthermore, due to demographic and lifestyle changes, cognitive decline/dementia and stroke are on the rise, particularly in LMICs (GBD 2019; Knauss et al. 2019). Non-communicable risk factors that are impacting global health and well-being and that are also relevant for brain health are reflected in the WHO 5x5 framework (tobacco and alcohol

consumption, lack of physical exercise, poor nutrition leading to under- or overnutrition, and air pollution) (WHO 2017a) and predispose not only to some of the above-mentioned neurological disorders but also to psychiatric illness, either primary or secondary. For example, the fastest-growing risk factor for stroke between 1990 and 2019 was high body-mass index (GBD 2021). According to the WHO and the American Stroke Association, over 80% of strokes are preventable (WHO 2015). This is also true for 25% of epilepsy cases, including communicable (e.g., neurocysticercosis) and non-communicable causes (stroke, head trauma, etc.) (WHO 2019).

There is an urgent need to identify and implement prevention strategies, complemented by implementation research and data gathering to facilitate early diagnosis and intervention and thereby reduce the disease burden in vulnerable populations (Feigin et al. 2020). Moreover, a reduction in age-standardized Disability-Adjusted Life Years (DALYs) and mortality rates from 1990 to 2016 can be linked to advancements in preventing and managing especially communicable neurological disorders and strokes. The noticeable disparity in the decline

rates between LMICs and HICs (to the disadvantage of LMICs) underscores the unequal accessibility, intensity, comprehensiveness, and quality of preventive interventions across regions. This emphasizes the urgency to address and rectify these disparities within LMICs (Feigin et al. 2020). Without the urgent implementation of effective primary prevention strategies, the burden of neurological disorders will probably continue to grow across the world, particularly in low-income countries.

Apart from improvement of management and prevention of neurological disorders in HICs and LMICs, much is to be gained from addressing neurological disorders at a larger scale and within the broader concept of brain health, including psychiatric conditions. A synergistic approach to health and well-being with a focus on integrated health services and delivery platforms (prevention, treatment, care, and rehabilitation across the disease spectrum) – all within the framework of primary health care and universal health coverage – represents an innovative and often financially attractive approach, especially in low-resource settings (Patel et al. 2015).

Global Brain Health Implementation Approaches and Germany's Role

In this post-industrial era, and with the rapid rise of technologically enabled services, there is an increasing demand for a skilled and knowledgeable workforce. Brain health literacy includes knowledge of brain disorders,

their management and prevention, navigating brain health services, and overall access to brain health information (WHO 2022b). Countries must prioritize optimizing brain health across the life course by adopting a

systemic approach. This entails innovative approaches to primary and secondary prevention and utilizing innovative technologies to address the scarcity of infrastructure and qualified personnel – a challenge many LMICs face.

Germany wields substantial influence and carries a significant responsibility in the realm of global health. As a country, it could play a key role in promoting global brain health, not only by implementing successful practices within Germany but also by adapting and sharing these approaches for the benefit of low-resource settings. Germany can also step up and raise awareness of the concept of brain health and its power to create synergies across disciplines and sectors and its below-mentioned brain health implementation tools for HICs and LMICs.

Drawing from a global evidence review, the WHO has outlined exemplary measures for WHO member states to optimize brain health based on the key determinants discussed earlier in this policy brief (WHO 2022a). These action points require a whole-of-government and whole-of-society approach, similar to other areas of global health, whereas they have not yet systematically been applied to brain health. The WHO Intersectoral Global Action Plan on epilepsy and other neurological disorders (IGAP) 2022-2031 addresses neurological/neurosurgical disorders and psychiatric co-morbidities (WHO

2023a). The IGAP uses epilepsy as an important tracer and entry point to tackle all other neurological and neurosurgical conditions and provides a political roadmap for the WHO and Member States with a 10-year goal to "[...] reduce the stigma, impact, and burden of neurological disorders, including their associated mortality, morbidity, and disability, and to improve the quality of life of people with neurological disorders, their careers and families". The action plan proposes five strategic objectives with ten global targets, structured around integrated and person-centered care throughout the life course (WHO 2023a). The plan emphasizes evidence-informed policy and practice, guided by a comprehensive public health strategy highlighting a human rights-based approach. However, the WHO IGAP is not the only implementation tool for brain health by the WHO; there are other highly relevant tools, such as the Comprehensive Mental Health Action Plan geared toward psychiatric disorders (WHO 2021), the Mental Health Gap Action Programme (mhGAP) guideline for mental, neurological, and substance use disorders (WHO 2023b) and the WHO document Towards a Dementia Action Plan that provides information to WHO member states on developing and implementing a dementia action plan within a broader framework for brain health (WHO 2017b).

Proposed Policy Options for Germany to Position Global Brain Health

The global health strategy of the Federal Government of Germany (2020) under the motto 'Responsibility – Innovation – Partnership: Shaping Global Health Together' provides a good framework for promoting brain health globally, such as preventing diseases and developing adequate responses, whilst emphasizing the need for more innovative approaches to address social determinants (e.g., poverty, living conditions, and education), behaviors (e.g., smoking, alcohol consumption, lack of physical activity, and poor diet), and environmental factors (holistic approaches to the environment, climate change, and public health).

Some specific areas of policy and programmatic engagement for Germany in favor of global brain health could include:

- Visibility: Step up efforts and raise awareness of brain disorders and the policy visibility of brain health among G20 countries, with Germany serving as an ambassador for good brain health.** A policy paper – Building Resilient Economic and Health Systems through Tackling Brain Health – could be commissioned to support this effort. This could be drafted by the Global Health Hub Germany NCD Community, bringing together the voices of public and private sector actors and aligning with the G20 Brazil 2024 theme of Building a Just World and a Sustainable Planet (G20 Brazil 2024), while reflecting on previous G20 presidencies such as Germany 2017 (Shaping an Interconnected World).
- Integration: Apply interdisciplinary and intersectoral actions for brain health, including its determinants, to understand what Germany and LMICs are already doing for brain health and where there may be additional opportunities for synergistic action in the global health context.** The WHO position paper on Optimizing Brain Health Across the Life Course identifies exemplary intersectoral actions to address brain health determinants. These exemplary actions overlap with maternal and child health programs, infectious diseases programs as well as mental health programs. For example, strengthening breastfeeding policies and programs is good for maternal and child health and brain health, and enhancing vector control for infectious diseases (e.g., Zika virus) is vital for brain health, as are water, sanitation, and hygiene actions. Programs addressing depression and anxiety and related conditions such as social isolation and overuse of social media, all contribute to good brain health and these relationships can be further supported and made visible to policy makers (Patel et al. 2015, Limenih et al. 2023).
- Prevention: Learn from the positive experience of current hospital partnerships to design prevention partnerships for NCDs and overall step-up collaboration on reducing exposure to risk factors globally.** Obesity, hypertension, high cholesterol, and diabetes, among others, are risk factors for poor brain health and are also growing pandemics globally, especially in LMICs.

Many LMIC governments want to address prevention programs, yet implementation experience is limited. Synergies with other programs, such as cardiovascular, respiratory, and psychiatric disorders, infectious diseases (e.g., HIV/AIDS) and cancer should be explored.

- **Research: Drive brain health research, including through public-private partnerships.** The WHO has identified their areas for brain health research: (i) Intervention research (e.g., supporting the design of prevention strategies through the life course, developing cost-effective pharmacological and non-pharmacological interventions), (ii) implementation research including health systems evaluation, and (iii) epidemiological and cost of disease research. However, brain health research, and in particular research into neurological disorders at a global level, has received hardly any funding to date. It is recommended that new funding streams for global brain health research be created or integrated into existing funding mechanisms, e.g., for NCDs or mental health, with research on neurological disorders such as stroke, dementia, and epilepsy being particularly suitable for integration.

About the Global Health Hub Germany

The Global Health Hub Germany offers all individuals and institutions active in the field of global health the opportunity to connect in an independent network across eight different stakeholder groups: International organisations, youth, politics, foundations, think tanks, business, science, and civil society. The members of the Hub work together on current issues of global health. The interdisciplinary exchange generates themes, issues and solutions that the Hub brings to policymakers to support informed policy-making and advance global health. Founded in 2019, the Hub now has around 2000 members. For more information: www.globalhealthhub.de

About the Hub Communities

The Hub Communities are working groups led by the members of the Global Health Hub Germany themselves. They meet regularly to exchange ideas, share expertise, and work together on global health issues. If you would like to join a Hub Community or learn more about their work, contact Merle Wangerin, Head of Community Management: merle.wangerin@globalhealthhub.de

Published by:

Global Health Hub Germany

c/o Deutsche Gesellschaft für Internationale
Zusammenarbeit (GIZ) GmbH
Köthener Str. 2-3, 10963 Berlin, Deutschland
Phone: +49 30 59 00 20 210
info@globalhealthhub.de
www.globalhealthhub.de

Version:

March/2024

References

1. Eltrafi A, Shrestha S, Ahmed A, et al. Economic burden of chronic migraine in OECD countries: a systematic review. *Health Econ Rev.* 2023; 13: 43. DOI: [10.1186/s13561-023-00459-2](https://doi.org/10.1186/s13561-023-00459-2).
2. Eyre HA, Occhipinti JA, Murray L, et al. How Brain Capital Can Drive Progress on UN's Sustainable Development Goals. Center for Health and Biosciences; 2021. Retrieved from: [https://www.thelancet.com/journals/laneur/article/PIIS1474-4422\(24\)00031-0/fulltext](https://www.thelancet.com/journals/laneur/article/PIIS1474-4422(24)00031-0/fulltext).
3. Feigin VL, Vos T, Nichols E, et al. The global burden of neurological disorders: translating evidence into policy. *Lancet Neurol.* 2020; 19(3): 255-265. DOI: [10.1016/S1474-4422\(19\)30411-9](https://doi.org/10.1016/S1474-4422(19)30411-9).
4. G20 2024. Investment in health must be constant, defends Tedros Adhanom, of the WHO, in an exclusive interview for the G20 website; 2024. Retrieved from: <https://www.g20.org/en/news/investment-in-health-must-be-constant-defends-tedros-adhanom-of-the-who-in-an-exclusive-interview-for-the-g20-website>.
5. GBD 2016 Neurology Collaborators. Global, regional, and national burden of neurological disorders, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol.* 2019; 18(5): 459-480. DOI: [10.1016/S1474-4422\(18\)30499-X](https://doi.org/10.1016/S1474-4422(18)30499-X).
6. GBD 2019 Stroke Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Neurol.* 2021; 20(10): 795-820. DOI: [10.1016/S1474-4422\(21\)00252-0](https://doi.org/10.1016/S1474-4422(21)00252-0).
7. GBD Study Collaborators. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Psychiatry.* 2022; 9(2): 137-150. DOI: [10.1016/S2215-0366\(21\)00395-3](https://doi.org/10.1016/S2215-0366(21)00395-3).
8. GBD 2021 Nervous System Disorders Collaborators. Global, regional, and national burden of disorders affecting the nervous system, 1990-2021: a systematic analysis for the Global Burden of Disease Study. *Lancet.* 2024; 23(4): 344-381. DOI: [10.1016/S1474-4422\(24\)00038-3](https://doi.org/10.1016/S1474-4422(24)00038-3). Epub 2024 Mar 14.
9. Harvard University. The (not-so-hidden) costs of caregiving - Harvard Health. 2016. Retrieved from: <https://www.health.harvard.edu/blog/not-hidden-costs-caregiving-201606309852>.
10. Heger D, Korfhage T. Short- and Medium-Term Effects of Informal Eldercare on Labor Market Outcomes. *Feminist Economics.* 2020; 26(4): 205-227. DOI: [10.1080/13545701.2020.1786594](https://doi.org/10.1080/13545701.2020.1786594).
11. Knauss S, Stelzle D, Emmrich JV, Korsnes MS, Sejvar JJ, Winkler AS. An Emphasis on Neurology in low and middle-income countries. *Lancet Neurol.* 2019; 18:1078-1079. DOI: [10.1016/S1474-4422\(19\)30392-8](https://doi.org/10.1016/S1474-4422(19)30392-8).
12. Limenih G, MacDougall A, Wedlake M, Nouvet E. Depression and Global Mental Health in the Global South: A Critical Analysis of Policy and Discourse.

- Int J Soc Determinants Health Health Serv. 2023. DOI: [10.1177/27551938231220230](https://doi.org/10.1177/27551938231220230)
13. McGrath JJ, Al-Hamzawi A, Alonso J, et al. Age of onset and cumulative risk of mental disorders: a cross-national analysis of population surveys from 29 countries. *Lancet Psychiatry*. 2023; 10(9): 668-681. DOI: [10.1016/S2215-0366\(23\)00193-1](https://doi.org/10.1016/S2215-0366(23)00193-1).
 14. OECD. New Approaches to Economic Challenges: Neuroscience Inspired Policy Initiative. NAEC and Neuro - New Approaches for Economic Challenges. 2024. Retrieved from: <https://www.oecd.org/naec/brain-capital/>.
 15. Patel V, Chisholm D, Parikh R, et al. Addressing the burden of mental, neurological, and substance use disorders: key messages from Disease Control Priorities, 3rd edition. *Lancet*. 2016; 16; 387(10028):1672-1685. DOI: [10.1016/S0140-6736\(15\)00390-6](https://doi.org/10.1016/S0140-6736(15)00390-6).
 16. Pilipiec P, Groot W, Pavlova M. The Effect of an Increase of the Retirement Age on the Health, Well-being, and Labor Force Participation of Older Workers: A Systematic Review. *J Popul Aging*. 2020; 14: 271-315. DOI: [10.1007/s12062-020-09280-9](https://doi.org/10.1007/s12062-020-09280-9).
 17. Shimizu T, Sakai F, Miyake H, et al. Disability, quality of life, productivity impairment and employer costs of migraine in the workplace. *J Headache Pain*. 2021; 22: 29. DOI: [10.1186/s10194-021-01243-5](https://doi.org/10.1186/s10194-021-01243-5).
 18. Smith E, Ali D, Wilkerson B, et al. A Brain Capital Grand Strategy: Toward Economic Reimagination. *Mol Psychiatry*. 2021; 26: 3-22. DOI: [10.1038/s41380-020-00918](https://doi.org/10.1038/s41380-020-00918).
 19. The Federal Government of Germany. Global Health Strategy of the German Federal Government. 2020. Retrieved from: <https://www.bundesgesundheitsministerium.de/en/international/shaping-global-health-policy/global-health-strategy>.
 20. The Lancet. Global Health Metrics. Neurological disorders—Level 2 cause. 2020. Retrieved from: <http://www.thelancet.com/pb-assets/Lancet/gbd/summaries/diseases/neurological-disorders.pdf>.
 21. The Lancet. Brain health and its social determinants. *Lancet*. 2021; 398(10305): 1021. DOI: [10.1016/S0140-6736\(21\)02085-7](https://doi.org/10.1016/S0140-6736(21)02085-7).
 22. Wang Y, Pan Y, Li H. What is brain health and why is it important? *BMJ*. 2020; 371: m3683. DOI: [10.1136/bmj.m3683](https://doi.org/10.1136/bmj.m3683).
 23. Winkler AS, Gupta S, Patel V, et al. Global Brain Health – the time to act is now. *Lancet Global Health*. 2024; Mar 14: S2214-109X(23)00602-2. doi: [10.1016/S2214-109X\(23\)00602-2](https://doi.org/10.1016/S2214-109X(23)00602-2). Online ahead of print.
 24. World Economic Forum. This is the one skill everybody needs in the age of AI. World Economic Forum. 2024. Retrieved from: <https://www.weforum.org/agenda/2024/01/this-is-the-one-skill-everybody-needs-in-the-age-of-ai/>.
 25. World Health Organization. Cardiovascular diseases: Avoiding heart attacks and strokes. 2015. Retrieved from: <https://www.who.int/news-room/questions-and-answers/item/cardiovascular-diseases-avoiding-heart-attacks-and-strokes>.
 26. World Health Organization. Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of non-communicable diseases. Geneva. 2017a. Retrieved from: <https://www.who.int/publications/i/item/WHO-NMH-NVI-17.9>.

27. World Health Organization. Global action plan on the public health response to dementia 2017–2025. Geneva. 2017b. Retrieved from: <https://www.who.int/publications/i/item/global-action-plan-on-the-public-health-response-to-dementia-2017---2025>.
28. World Health Organization. Epilepsy: a public health imperative. Summary. Geneva. 2019. Retrieved from: <https://www.who.int/publications/i/item/epilepsy-a-public-health-imperative>.
29. World Health Organization. Comprehensive mental health action plan 2013–2030. Geneva. 2021. Retrieved from: <https://www.who.int/publications/i/item/9789240031029>.
30. World Health Organization. Optimizing brain health across the life course: WHO position paper. Geneva. 2022a. License: CC BY-NC-SA 3.0 IGO. Retrieved from: <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/>.
31. World Health Organization. Health literacy development for the prevention and control of non-communicable diseases. Geneva. 2022b. Retrieved from: <https://www.who.int/publications/i/item/9789240055391>.
32. World Health Organization. Intersectoral global action plan on epilepsy and other neurological disorders 2022–2031. Geneva. 2023a. Retrieved from: <https://www.who.int/publications/i/item/9789240076624>.
33. World Health Organization. Mental Health Gap Action Programme (mhGAP) guideline for mental, neurological and substance use disorders. Geneva. 2023b. Retrieved from: <https://www.who.int/publications/i/item/9789240084278>.