

Intersectoral Global Action Plan on Epilepsy and Other Neurological Disorders 2022 – 2031

First draft

June 2021

In November 2020, the Seventy-third World Health Assembly (WHA) adopted resolution WHA73.10 requesting the Director-General, *inter alia*, to develop an Intersectoral global action plan on epilepsy and other neurological disorders in consultation with Member States to ensure a comprehensive, coordinated response across multiple sectors.

The World Health Organization (WHO) Secretariat is following a clear process to develop the Intersectoral global action plan on epilepsy and other neurological disorders. In March 2021, the WHO Secretariat published a discussion paper on the Intersectoral global action plan on epilepsy and other neurological disorders. Member States, United Nations (UN) agencies and relevant non-State actors were subsequently invited to share their comments in response to the discussion paper through virtual and web-based consultations until mid-April 2021. Following the consultations, the WHO Secretariat published online the consolidated comments received on the discussion paper at the end of April 2021.

This first draft of the Intersectoral global action plan on epilepsy and other neurological disorder has been developed based on the input received on the discussion paper and outlines the scope, vision, goal, and strategic objectives as well as specific actions for Member States, the WHO Secretariat, and international and national partners.

The next steps in the process are:

- Member States, UN agencies and relevant non-State actors are invited to submit their comments in response to the first draft through web-based and virtual consultations until the first week of August 2021.
- By mid- August 2021, a summary of all comments received from Member States, UN agencies and relevant non-State actors during the consultation process will be posted on the website.
- The outcomes of the consultations will serve as input for the WHO Secretariat to prepare a revised draft of the Intersectoral global action plan on epilepsy and other neurological disorders that will be submitted for review at the 150th session of the Executive Board.
- Considering any guidance provided by the 150th session of the WHO Executive Board, the Seventy-fifth World Health Assembly may be invited to consider the Intersectoral global action plan for epilepsy and other neurological disorders.

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BACKGROUND

1. In November 2020, the Seventy-third World Health Assembly (WHA) adopted resolution WHA73.10 requesting the Director-General, inter alia, to develop an Intersectoral global action plan on epilepsy and other neurological disorders in consultation with Member States to ensure a comprehensive, coordinated response across multiple sectors.
2. The Intersectoral global action plan on epilepsy and other neurological disorders builds on previous global resolutions, decisions, reports and commitments, including Resolution WHA68.20 (2015) on the global burden of epilepsy and the need for coordinated action at the country level to address its health, social and public knowledge implications.
3. The Intersectoral global action plan on epilepsy and other neurological disorders aims to improve access to care and treatment, for people already living with neurological disorders while preventing neurological disorders and promoting brain health and development across the life course. It seeks to support recovery, well-being and participation of people living with neurological conditions, while reducing associated mortality, morbidity, and disability, and addressing stigma and discrimination through multidisciplinary and multisectoral approaches.

OVERVIEW OF THE GLOBAL SITUATION

4. In adults, disorders of the nervous system are the leading cause of disability adjusted life years (DALYs) and the second leading cause of death globally, accounting for 9 million deaths per year. The four largest contributors of neurological DALYs in 2016 were stroke (42.2%), migraine (16.3%), dementia (10.4%) and meningitis (7.9%)¹. Globally, in 2016, 52.9 million children younger than 5 years had developmental disabilities and 95% of these children live in low- and middle-income countries (LMICs)².
5. The high burden associated with neurological disorders is met by profound inequities. Nearly 80% of the 50 million people with epilepsy live in LMICs where treatment gaps exceed 75% in most low-income countries and 50% in most middle-income countries³. Disabilities associated with neurological conditions disproportionately affect women, older people, those living in poverty, rural or remote areas, and other vulnerable populations. Children from underprivileged households, indigenous populations and ethnic minorities are also at significantly higher risk of experiencing disability associated with neurological conditions. Internally displaced or stateless persons, refugees and migrants also experience particular challenges in accessing services for neurological disorders.
6. Many neurological conditions are preventable, including 25% of epilepsy cases. Numerous determinants, including risk and protective factors, are also known to impact brain development in early life and brain health across the life course. Protective factors for brain development in early life include components such as access to education, social connection and support, healthy diets, sleep, and physical activity.
7. Worldwide, people living with neurological disorders and disabilities associated with neurological conditions continue to experience discrimination and human rights violations. For this reason, a human rights perspective grounded in the International Covenant on Civil and Political Rights⁴, the International Covenant on Economic, Social and Cultural Rights⁵, the UN Convention on the Rights of Persons with Disabilities (CRPD)⁶, the Convention on the Rights of the Child⁷ and other relevant international and regional human rights instruments underpins the Intersectoral global action plan on epilepsy and other neurological disorders.
8. Ensuring that appropriate health system building blocks are in place is particularly important to improving the quality of life of people living with neurological disorders. The implementation of appropriate policy and legislative frameworks is crucial and should aim to ensure quality care, the provision of financial and social protection benefits (including protection from out-of-pocket expenditures borne by individuals and their families), and the protection, promotion and safeguarding of rights of persons with neurological disorders. Comprehensive

¹ [https://www.thelancet.com/journals/laneur/article/PIIS1474-4422\(18\)30499-X/fulltext](https://www.thelancet.com/journals/laneur/article/PIIS1474-4422(18)30499-X/fulltext)

² [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(18\)30309-7/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(18)30309-7/fulltext)

³ <https://www.who.int/publications/i/item/epilepsy-a-public-health-imperative>

⁴ International Covenant on Civil and Political Rights. <https://www.ohchr.org/en/professionalinterest/pages/ccpr.aspx>

⁵ International Covenant on Economic, Social and Cultural Rights <https://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>

⁶ United Nations (UN) Convention on the Rights of Persons with Disabilities. <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>

⁷ Convention on the Rights of the Child. <https://www.ohchr.org/en/professionalinterest/pages/crc.aspx>

responses aimed at tackling neurological disorders should be firmly grounded in a social and economic determinants of health approach.

9. Health systems have not yet adequately responded to the burden of neurological disorders across the life course. While approximately 70% of people with neurological disorders live in LMICs, this need is poorly recognized with only 28% of low-income countries having a dedicated policy for neurological disorders. Worldwide, public health system expenditure on neurological disorders also remains low. WHO's Neurology Atlas 2017 highlights an imbalance in health system supply and demand with only 12% of countries surveyed reporting a separate budget line for neurological disorders⁸.
10. Currently, the number of health workers specialized in neurological health is insufficient in both high-income countries and LMICs. In fact, the median neurological workforce (defined as the total number of adult neurologists, neurosurgeons and child neurologists) in low-income countries is 0.1 per 100,000 compared to 7.1 per 100,000 population in high-income countries⁹.
11. The ongoing COVID-19 pandemic highlights the relevance of neurology to global public health and its significance within broader global health dialogues. Headache, impaired sense of smell and taste, agitation, delirium, seizures, stroke and meningo-encephalitis all represent neurological manifestations associated with COVID-19¹⁰. Long term manifestations such as cognitive impairment may also be associated with the post-COVID condition. Certain underlying neurological conditions represent a risk factor for hospitalization due to COVID-19, especially for older adults. The Intersectoral global action plan on epilepsy and other neurological disorders represents an unprecedented opportunity to address the impact of neurological disorders through a comprehensive response throughout and following the pandemic.

SCOPE

12. The term “neurological disorders” is used to denote conditions of the central and peripheral nervous systems that include epilepsy, headache disorders (including migraine), neurodegenerative disorders (including dementia and Parkinson's disease), cerebrovascular diseases (including stroke), neuroinfectious/neuroimmunological disorders (including meningitis, HIV, cerebral malaria, and multiple sclerosis), neurodevelopmental disorders (including intellectual developmental disorders and autism spectrum disorders) and traumatic brain and spinal cord injuries.
13. In line with WHO's International Classification of Functioning, Disability and Health (ICF)¹¹, functioning and disability are considered the result of interactions between neurological conditions and contextual factors. For this reason, a holistic approach is adopted to account for medical, individual, social, and environmental influences.
14. Addressing the needs of people with neurological conditions begins with increasing understanding and awareness and addressing stigma and discrimination which act as barriers to seeking health care and which impact an individual's life and wellbeing. Rather than adopting a disease-specific structure, the Intersectoral global action plan on epilepsy and other neurological disorders uses an integrated, person-centered framework for the prevention, diagnosis, treatment, and care of people with neurological disorders, as many of these conditions share risk factors and/or require a similar systems-based approach. Enhancing epilepsy prevention, treatment and care can represent an important entry point for, and foundation to build upon, services for other neurological disorders.
15. The prevention of neurological disorders rests upon the promotion and development of optimal brain health across the life course. Good brain health is a state in which every individual can learn, realize their potential, and optimize their cognitive, psychological, neurophysiological, and behavioral responses while adapting to changing environments.
16. Other relevant areas or disciplines of public health are closely intertwined with and impact neurological disorders such as mental health, violence, injuries, noncommunicable and infectious diseases and environmental health. Many neurological conditions are interwoven in other WHO strategies, action plans or World Health Assembly

⁸ <https://www.who.int/publications/i/item/atlas-country-resources-for-neurological-disorders>

⁹ <https://www.who.int/publications/i/item/atlas-country-resources-for-neurological-disorders>

¹⁰ Favas TT, Dev P, Chaurasia RN, et al. Neurological manifestations of COVID-19: a systematic review and meta-analysis of proportions. *Neurological Sciences*. 2020.

Abdullahi A, Candan SA, Abba MA, et al. Neurological and musculoskeletal features of COVID-19: a systematic review and meta-analysis. *Frontiers in Neurology*. 2020.

¹¹ International Classification of Functioning, Disability and Health. <https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health>

(WHA) resolutions. In addition, neurological disorders have strategic links to health systems and universal health coverage including the full range of essential health services, from health promotion to prevention, treatment, rehabilitation, and palliative care. The Intersectoral global action plan on epilepsy and other neurological disorders takes a life-course approach recognising that there are strong linkages between maternal, newborn, child and adolescent health, reproductive health and ageing, brain health and neurological disorders.

17. Linking the Intersectoral global action plan on epilepsy and other neurological disorders with other global commitment reflects WHO's responsiveness to focusing on the impact on people's health and working in a cohesive and integrated manner (see Table 1).

Health systems	<ul style="list-style-type: none"> • UN Political declaration on universal health coverage (2019)¹² • Declaration of Astana on primary health care (2018)¹³ • WHA 67.22 Resolution on access to essential medicine (2014)¹⁴ • Global strategy on human resources for health: workforce (2030)¹⁵ • WHA 71.8 Resolution on Improving Access Assistive Technology (2018)¹⁶ • WHA 60.29 Resolution on Health technologies (2007)¹⁷ • Global action plan for the Decade of Action for Road Safety 2011-2020¹⁸
Mental health, neurological and substance use conditions	<ul style="list-style-type: none"> • Global strategy to reduce the harmful use of alcohol (2010)¹⁹ • Comprehensive mental health action plan 2013–2030²⁰ • WHA 67.8 Resolution on the management of autism spectrum disorders (2014)²¹ • WHA 68.20 Resolution to address the global burden of epilepsy (2015)²² • Global action plan on the public health response to dementia 2017–2025²³ • EB146(14) Accelerating action to reduce the harmful use of alcohol (2020)²⁴ • WHA73.10 Global actions on epilepsy and other neurological disorders (2020)²⁵ • EB148(3) Promoting mental health preparedness and response for public health (2021)²⁶
Noncommunicable diseases	<ul style="list-style-type: none"> • Global action plan for the prevention and control of noncommunicable diseases 2013-2030²⁷ • Global disability action plan 2014–2021²⁸ • UN Political Declaration on noncommunicable diseases (2018)²⁹ • WHO's rehabilitation 2030 initiative³⁰
Infectious diseases	<ul style="list-style-type: none"> • Global strategy and targets for tuberculosis prevention, care and control after 2015³¹ • Global health sector strategy on HIV 2016–2021: towards ending AIDS³² • Global technical strategy for malaria 2016-2030³³ • Decision EB146(6) on meningitis prevention and control (2020)³⁴
Neglected tropical diseases	<ul style="list-style-type: none"> • Decision EB146(14) on neglected tropical diseases (2020)³⁵

¹² <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/07/FINAL-draft-UHC-Political-Declaration.pdf>

¹³ <https://www.who.int/docs/default-source/primary-health/declaration/gcphc-declaration.pdf>

¹⁴ https://apps.who.int/gb/ebwha/pdf_files/WHA67-REC1/A67_2014_REC1-en.pdf

¹⁵ <https://apps.who.int/iris/bitstream/handle/10665/250368/9789241511131-eng.pdf;jsessionid=ECEE59BA695E2DC5722FFFE3B2870841?sequence=1>

¹⁶ https://apps.who.int/gb/ebwha/pdf_files/WHA71/A71_R8-en.pdf

¹⁷ https://www.who.int/healthsystems/WHA60_29.pdf

¹⁸ https://www.who.int/roadsafety/decade_of_action/plan/en/

¹⁹ https://www.who.int/substance_abuse/activities/esrhua/en/

²⁰ <https://www.who.int/publications/i/item/9789241506021>

²¹ https://www.who.int/mental_health/maternal-child/WHA67.8_resolution_autism.pdf

²² https://www.who.int/health-topics/brain-health#tab=tab_1

²³ <https://www.who.int/publications/i/item/global-action-plan-on-the-public-health-response-to-dementia-2017---2025#:~:text=The%20Global%20action%20plan%20on,dementia%20on%20communities%20and%20countries.>

²⁴ <https://www.who.int/news/item/28-03-2020-who-to-accelerate-action-to-reduce-the-harmful-use-of-alcohol>

²⁵ https://www.who.int/health-topics/brain-health#tab=tab_1

²⁶ https://apps.who.int/gb/ebwha/pdf_files/EB148/B148_CONF5-en.pdf

²⁷ <https://www.who.int/publications/i/item/9789241506236>

²⁸ <https://apps.who.int/iris/handle/10665/199544>

²⁹ <https://digitallibrary.un.org/record/1648984?ln=en>

³⁰ <https://www.who.int/initiatives/rehabilitation-2030>

³¹ https://www.who.int/tb/post2015_TBstrategy.pdf?ua=1

³² <https://apps.who.int/iris/bitstream/handle/10665/246178/WHO-HIV-2016.05-eng.pdf>

³³ https://www.who.int/docs/default-source/documents/global-technical-strategy-for-malaria-2016-2030.pdf?sfvrsn=c82afec_0

³⁴ [https://apps.who.int/gb/ebwha/pdf_files/EB146/B146\(6\)-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/EB146/B146(6)-en.pdf)

³⁵ https://apps.who.int/gb/ebwha/pdf_files/EB146/B146_14-en.pdf

	<ul style="list-style-type: none"> Ending the neglect to attain the Sustainable Development Goals: a road map for neglected tropical diseases 2021–2030³⁶
Family and Child Health	<ul style="list-style-type: none"> Global strategy for women’s, children’s and adolescent’s health 2016–2030³⁷ INSPIRE: Seven strategies for Ending Violence Against Children (2016)³⁸ Global accelerated action for the health of adolescents (AA-HA!): guidance to support country implementation (2017)³⁹ Nurturing Care Framework (2018)⁴⁰
Ageing and Health	<ul style="list-style-type: none"> Global strategy (2016-2030) and action plan on ageing and health (2016-2020)⁴¹ The Decade of Healthy Ageing (2021-2030)⁴²
Environment and climate change	<ul style="list-style-type: none"> Climate change and human health: risks and responses (2003)⁴³ Improvement of health through safe and environmentally sound waste management (2010)⁴⁴ Minamata convention (2014)⁴⁵ Public health impacts of exposure to mercury and mercury compounds: the role WHO and ministry of public health in the implementation of the Minamata Convention (2014)⁴⁶ The role of the health sector in the strategic approach to international chemicals management towards the 2020 goal and beyond (2016)⁴⁷ Preventing disease through healthy environments: a global assessment of the burden of disease from environmental risks (2016)⁴⁸ Global strategy on health, environment and climate change (2019)⁴⁹
Social determinants of health	<ul style="list-style-type: none"> EB148.R2 on social determinants of health (2021)⁵⁰
Human rights	<ul style="list-style-type: none"> International Covenant on Civil and Political Rights (1966)⁵¹ International Covenant on Economic, Social and Cultural Rights (1966)⁵² United Nations Convention on the Rights of the Child (1989)⁵³ United Nations Convention on the Rights of Persons with Disabilities (2006)⁵⁴

18. The Intersectoral global action plan on epilepsy and other neurological disorders provides the vision, goal, guiding principles, strategic objectives and their action areas and targets. It suggests a range of proposed actions for Member States, the WHO Secretariat and international and national partners. While targets are defined for achievement globally, each Member State can be guided by these to set its own national targets, taking into account national circumstances and challenges.

VISION

19. The vision of the Intersectoral global action plan on epilepsy and other neurological disorders is a world in which:

- i. brain health is valued, promoted and protected;
- ii. neurological disorders are prevented and treated, mortality and morbidity are avoided and the quality of life of people with neurological disorders and their carers is improved; and

³⁶ <https://apps.who.int/iris/handle/10665/332094>

³⁷ [https://www.un.org/youthenvoy/2020/12/the-global-strategy-for-womens-childrens-and-adolescents-health-2016-2030/#:~:text=The%20Global%20Strategy%20\(2016%2D2030,not%20only%20survives%2C%20but%20thrives,](https://www.un.org/youthenvoy/2020/12/the-global-strategy-for-womens-childrens-and-adolescents-health-2016-2030/#:~:text=The%20Global%20Strategy%20(2016%2D2030,not%20only%20survives%2C%20but%20thrives,)

³⁸ <https://www.who.int/publications/i/item/inspire-seven-strategies-for-ending-violence-against-children>

³⁹ <https://apps.who.int/iris/bitstream/handle/10665/255415/9789241512343-eng.pdf?sequence=1>

⁴⁰ <https://apps.who.int/iris/bitstream/handle/10665/272603/9789241514064-eng.pdf?sequence=1&isAllowed=y>

⁴¹ <https://www.who.int/ageing/GSAP-Summary-EN.pdf>

⁴² <https://www.who.int/initiatives/decade-of-healthy-ageing#:~:text=The%20United%20Nations%20Decade%20of,of%20older%20people%2C%20their%20families%2C>

⁴³ <https://www.who.int/globalchange/publications/climchange.pdf>

⁴⁴ <https://apps.who.int/iris/handle/10665/3099>

⁴⁵ <https://www.mercuryconvention.org/>

⁴⁶ <https://www.who.int/publications/i/item/resolution-wha67.11.-public-health-impacts-of-exposure-to-mercury-and-mercury-compounds-the-role-of-who-and-ministries-of-public-health-in-the-implementation-of-the-minamata-convention>

⁴⁷ <https://apps.who.int/iris/handle/10665/252784>

⁴⁸ <https://www.who.int/publications/i/item/9789241565196>

⁴⁹ <https://apps.who.int/iris/handle/10665/331959>

⁵⁰ https://apps.who.int/gb/ebwha/pdf_files/EB148/B148_R2-en.pdf

⁵¹ International Covenant on Civil and Political Rights. <https://www.ohchr.org/en/professionalinterest/pages/ccpr.aspx>

⁵² International Covenant on Economic, Social and Cultural Rights <https://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>

⁵³ Convention on the Rights of the Child. <https://www.ohchr.org/en/professionalinterest/pages/crc.aspx>

⁵⁴ <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>

- iii. people affected by neurological disorders fulfil their potential with equal rights, opportunities, respect and autonomy.

GOAL

20. The goal of the Intersectoral global action plan on epilepsy and other neurological disorders is to reduce the stigma, impact and burden of neurological disorders, including associated mortality, morbidity and disability, and to improve the quality of life of people of all ages with neurological disorders.
21. In order to achieve the above stated vision and goal, leverage epilepsy prevention, treatment and care as an entry point.

STRATEGIC OBJECTIVES

22. The Intersectoral global action plan on epilepsy and other neurological disorders has the following strategic objectives:
 - To raise the prioritization and strengthen governance for neurological disorders.
 - To provide effective, timely and responsive diagnosis, treatment and care for neurological disorders.
 - To implement strategies to promote brain health and development and prevent neurological disorders.
 - To foster research and innovation and strengthen information systems for neurological disorders.
 - To strengthen the public health approach to epilepsy and promote synergies with other neurological disorders.

GUIDING PRINCIPLES

23. The Intersectoral global action plan on epilepsy and other neurological disorders relies on the following six guiding principles that are universally applicable and relevant to each of the goals and strategic objectives described in this document.
 - i. **People-centered primary healthcare and universal health coverage**

All people with neurological disorders and their families should participate in and have equitable access, without discrimination or risk of financial hardship, to a broad range of promotive, preventive, diagnostic, treatment, rehabilitation, palliative and social care, as well as to essential, safe, affordable, effective and quality medicines and other health products.
 - ii. **Integrated approach to care across the life course**

Integrated care for neurological disorders is essential for achieving better promotion, prevention, treatment and care outcomes. This is particularly important given the multimorbidity of neurological disorders with one another, and with other health conditions which are often linked by common risk factors that can be prevented. Care for neurological disorders requires close alignment to other existing services and programmes in line with The Framework on Integrated, People-centered Health Services (IPCHS)⁵⁵. Additionally, policies, programmes and services for the prevention and management of neurological disorders need to take account of health and social care needs at all stages of the life course. These include (but are not limited to) promotion of maternal and newborn health (including preconception, antenatal and postnatal care, and maternal nutrition), healthy growth and development of children, adolescents and youth, communicable and noncommunicable diseases, environmental and workplace health, immunization, maternal, newborn, mental health, disability, healthy ageing and social care.

⁵⁵ https://www.who.int/service-delivery-safety/areas/people-centred-care/Framework_Q-A.pdf?ua=1

- iii. **Evidence-based practice**
Scientific evidence and/or best practices enable the development of public health policies and interventions for the prevention and management of neurological disorders that are cost-effective, sustainable and affordable. This includes existing knowledge, real-world, practice-based evidence, the preferences of people with neurological disorders, and culturally-based experience as well as the generation of new evidence towards finding disease-modifying treatments or cure, effective prevention and innovative models of care, and improving the quality of life of people with neurological disorders.
- iv. **Intersectoral action**
A comprehensive and coordinated response to neurological disorders requires partnerships and collaboration among all stakeholders. Achieving such collaboration requires leadership at governmental level, clear delineation of roles and responsibilities amongst stakeholders, innovative coordination mechanisms including public-private partnerships, and engagement of all relevant sectors, such as health, social services, education, environment, finance, employment, justice, and housing, as well as partnerships with civil society, academia and private sector actors.
- v. **Empowerment of persons with neurological disorders**
The social, economic and educational needs and freedoms of persons and families affected by neurological disorders should be promoted, prioritized and protected. People with neurological disorders, their carers, local communities and organizations that represent them should be empowered through engagement and consultative mechanisms in care planning and service delivery including for the prevention and management of neurological disorders, as well as policy and legislation development and programme implementation, advocacy, and research, monitoring and evaluation.
- vi. **Gender, equity and human rights**
Mainstreaming a gender perspective on a systems-wide basis in all efforts to implement public health responses to neurological disorders is central to creating inclusive, equitable, economically productive and healthy societies. Equitable and universal access to high-impact interventions for people with neurological disorders and their carers, and a focus on reaching the most vulnerable population groups, including migrants, children, women, older people and those living in poverty and emergency settings, are crucial to realizing the rights of people with neurological disorders and reducing stigma and discrimination. Implementation of the Intersectoral global action plan on epilepsy and other neurological disorders must explicitly address disparities specific to each national context including related to age, gender, disability associated with neurological conditions, socioeconomic status, and geography and reduce inequalities, consistent with the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs)⁵⁶, the UN CRPD⁵⁷ and other international and regional human rights instruments.

OBJECTIVE 1: TO RAISE THE PRIORITIZATION AND STRENGTHEN GOVERNANCE FOR NEUROLOGICAL DISORDERS

- 24. A broad public health approach grounded in principles of universal health coverage and human rights-based health and social care is needed to improve the care and quality of life of people with neurological disorders. To achieve this, strengthening governance for neurological disorders is critical and involves ensuring strategic policy frameworks are established, supported by effective oversight, regulatory, and accountability mechanisms through cooperation between governments, health care providers and people with neurological disorders, their carers, and organizations that represent them.
- 25. The integration and mainstreaming of neurological disorders within relevant national policies, legislation within and beyond the health sector including in education, social protection and employment is important to meet the multifaceted needs of people with neurological disorders.

⁵⁶ UN Sustainable Development agenda. <https://www.un.org/sustainabledevelopment/development-agenda/>

⁵⁷ United Nations (UN) Convention on the Rights of Persons with Disabilities. <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>

26. Health financing is a core function of health systems that can enable progress towards achieving universal health coverage. It involves designing and implementing policies to ensure effective health system governance and service arrangements including through revenue raising (such as through government budgets, compulsory or voluntary prepaid insurance schemes), pooling funds and purchasing services (such as the allocation of resources to health service providers) to ensure access to timely, affordable and quality services, supports and treatment for neurological disorders.
27. Effective advocacy can influence political will and mobilize resources to support policy prioritization of neurological disorders, including interlinkages with achieving broader international commitments such as those enshrined in the UN SDGs, and the UN CRPD.

1.1 Advocacy

28. Advocacy represents the first step in raising awareness and better public understanding of neurological disorders, helping to address stigma and discrimination and prevent human rights violations. Advocacy also includes public and political awareness of burden of and impact due to neurological disorders and dissemination of evidence related to the effectiveness of interventions, including to promote brain health and prevent and treat neurological disorders, in order to improve health-seeking behaviour and access to prevention and care.
29. Effective advocacy including public awareness campaigns require tailoring to reflect each country's cultural context and close involvement of people with neurological disorders in order to achieve health and social outcomes and improve the quality of life of people with neurological disorders, their carers and the broader community within which they live. Public awareness campaigns should include information on prevention such as hygiene, safe food practices and sanitation to prevent common neurological infections; the importance of social emotional learning for better brain health and child development; availability of effective medicines and services from detection to diagnosis, treatment and care.

Actions for Member States

30. Engage all relevant stakeholders, including people with neurological disorders and their carers, to develop awareness raising programmes to improve understanding of neurological disorders, to promote brain health and prevent and manage neurological disorders across the life course, including to identify and overcome barriers to health-seeking behaviours.
31. Establish national and regional collaboration and knowledge exchange mechanisms to raise awareness of the burden of disease associated with neurological disorders and the availability of effective interventions as well as to facilitate access to appropriate, evidence-based promotive, preventive, management and care services for people with neurological disorders.
32. Lead and coordinate a multisectoral advocacy strategy aimed at reducing stigma, discrimination and human rights violations of people with neurological disorders and which is responsive to specific vulnerable groups across the life course and integrated within broader health promotion strategies.

Actions for the Secretariat

33. Engage and include people with neurological disorders, their carers and organizations that represent them in decision-making within WHO's own processes on issues that concern them through meaningful and structured mechanisms.
34. Promote, disseminate and support the implementation of best practices for awareness raising and the reduction of stigma and discrimination and for enhancing interlinkages between neurological disorders, existing WHO strategies and their accountability frameworks and other global commitments such as the UN SDGs and the UN CRPD.
35. Provide technical support to policy-makers at national, regional and global levels to recognize the need to prioritise neurological disorders and integrate them into policies and plans at all levels.

Actions for international and national partners

36. In partnership with other stakeholders, advocate for increasing the visibility of neurological disorders in SDGs and other existing and new global commitments, and to prioritize neurological disorders in policy agendas by raising awareness of the social and economic impact of neurological disorders and the benefits of effective treatments.

37. Support advocacy efforts aimed at protecting the human rights of people with neurological disorders, redressing inequities in access to neurological services for vulnerable populations and reducing stigma and discrimination. Ensure people with neurological disorders are included in activities of the wider community to foster cultural, social and civic participation and enhance their autonomy.
38. Provide a platform for dialogue between associations and organizations of people with neurological disorders and their carers, health and social workers, government sectors and other relevant actors at international, regional and national levels with inclusion of youth, older people and ensuring gender-balanced representation. Engage with different sectors such transportation, education and employment in advocacy efforts for increasing the independence and autonomy of people with neurological disorders.

1.2 Policy, plans and legislation

39. The development of comprehensive, multisectoral policies, plans and legislation based on scientific evidence and social experiences strengthens governance for neurological disorders and ensures the complex needs of people with neurological disorders are addressed within the context of each country.
40. Collaboration between people with neurological disorders, technical experts who generate evidence, policy makers and programme managers who formulate, adapt and implement policy/plans and legislation, and health care professionals who provide care and services to people with neurological disorders and their carers, are essential to ensuring development and implementation of evidence-based policies and plans across sectors.
41. Legislation impacting the lives of people with neurological disorders, for example, for people living with epilepsy, are frequently outdated and fail to protect and promote their human rights. This leads to barriers in accessing appropriate and affordable health and social care. It is crucial to revise discriminatory laws, where they exist, for example, those related to education, employment and women's rights, and ensure they are more inclusive to protect people with these conditions from discrimination and human rights violations.
42. Given the interlinkages between neurological disorders and other public health areas, numerous opportunities exist to integrate neurological disorders into policies and plans for these disciplines, for instance, on noncommunicable diseases, mental health, maternal, children and adolescent health, ageing and disability.

Actions for Member States

43. Develop or review, update and strengthen and implement national and/or subnational policies, plans and legislation relating to neurological disorders, whether as separate instruments or integrated into other planned multisectoral actions for noncommunicable diseases, mental health, disability and other relevant areas across the care continuum of all ages. These undertakings should be developed in collaboration with relevant stakeholders and address the continuum from prevention, diagnosis, treatment, and care. Formulate and implement national policies and legislation in consultation with people with neurological disorders and their carers, and other stakeholders to promote and protect their rights, and prevent stigma and discrimination.
44. Establish monitoring and accountability mechanisms for resource allocation, including by setting up a focal point, unit or functional division responsible for neurological disorders within the health ministry (or equivalent body).
45. Review disability policies and laws to make them more inclusive for people with neurological disorders including employment regulations and labour laws that govern public and private sectors and strengthening mechanisms to address claims and complaints related to human rights violations and discrimination against people with neurological disorders through impartial recourse processes.

Actions for the Secretariat

46. Offer technical support, tools and guidance to Member States to:
 - i. share knowledge and evidence-based best practices to inform the development, strengthening and implementation of national and/or subnational policies, plans and legislation for an integrated, multisectoral response to neurological disorders;
 - ii. strengthen accountability mechanisms and strategies to resolve claims and complaints to address human rights violations and discrimination as related to people with neurological disorders for example, employment, driving, access to education, fertility and women's rights;
 - iii. adopt legislation to ensure universal access to financial, social and disability benefits for people with neurological disorders and their carers.

Actions for international and national partners

47. Actively engage stakeholders across sectors to inform the development and implementation of evidence-based policies, plans and legislation, paying explicit attention to the human rights of people with neurological disorders and their carers and to prevent stigma and discrimination.
48. Create and strengthen associations and organizations of people with neurological disorders, their families and carers, and foster their collaboration with other existing organizations as partners in the prevention and treatment of neurological disorders.
49. Facilitate knowledge exchange and dialogue among associations of people with neurological disorders, their carers and families along with health and social workers and government to ensure UN CRPD principles such as empowerment, engagement and inclusion are embedded in legislation to promote the health of people with disabilities associated with neurological disorders⁵⁸.

1.3 Financing

50. Neurological disorders lead to increased costs for governments, communities, families and individuals, and productivity losses for economies. People with neurological disorders and their families face significant financial hardship due to health and social care costs as well as reduced or forgone income compounded by lack of universal health insurance across both LMICs and high-income countries with limited investment and resources to address neurological conditions.
51. Appropriately funded policies and programmes are required to ensure access to prevention, diagnosis, treatment and care for people with neurological disorders and their carers and to reduce the financial impact of out-of-pocket health and social care costs.
52. There is an urgent need for resource mobilization strategies and approaches to increase investment in different areas including early interventions, new technologies, diagnostic methods and training of specialists and non-specialists especially in LMICs.

Actions for Member States

53. Ensure sustainable funding for policies, plans and programmes for prevention and management of neurological disorders through dedicated domestic budgetary allocations, efficient and rational utilization of resources, voluntary innovative financing mechanisms and other means including multilateral, bilateral, pooled funding and public-private partnerships.
54. Produce and/or utilize the most recent data on the epidemiological and economic burden of neurological disorders, as well as the economic evidence base for investment and the projected costs of intervention scale-up, in order to make informed decisions on budgets that are proportionate to the scale of the burden in the country.
55. Develop financial and social protection mechanisms including national health insurance plans and social security benefits to address direct and indirect costs related to accessing health care (such as transportation costs) and ensure affordable and accessible care for persons with neurological conditions, their carers and families.

Actions for the Secretariat

56. Promote collaboration and knowledge exchange at international, regional and national levels to strengthen the knowledge about the economic impact of investment for neurological disorders.
57. Offer technical support, tools and guidance to Member States to strengthen national capacity to engage in multisectoral resource planning, budgeting and expenditure monitoring on neurological disorders.
58. Create guidance to inform the development of funding mechanisms that address the direct and indirect health care costs for persons with neurological disorders, in line with universal health coverage principles.

Actions for international and national partners

59. Support Member States in mobilizing sustainable financial resources and identifying functional gaps in resource allocation to support the implementation, monitoring and evaluation of national and/or subnational policies, programmes and services for neurological disorders.

⁵⁸ Convention on the Rights of Persons with Disabilities (CRPD) (adopted by the United Nations General Assembly in resolution 61/106, December 2006)

60. Support the participation of people with neurological disorders and their carers in decision-making processes related to international financing mechanisms.
61. Support the development of innovative funding models such as an international assistance fund, which helps to subsidize and fund costs of diagnostics and therapeutics as well as offset costs associated with referral such as for travel and specialist services and interventions.

OBJECTIVE 2: TO PROVIDE EFFECTIVE, TIMELY AND RESPONSIVE DIAGNOSIS, TREATMENT, AND CARE FOR NEUROLOGICAL DISORDERS

62. Neurological disorders are important causes of mortality, morbidity and disability requiring concerted intersectoral efforts to address the needs of people at risk of, or living with, neurological disorders through equitable access to effective health care, community-based, social, educational and vocational interventions and services.
63. Integrating care for neurological disorders into primary, secondary and tertiary health care levels and providing essential medicines, diagnostics, training, and support for healthcare workers, carers and families of people with neurological disorders are actions consistent with the principles of universal health coverage⁵⁹ and the 2030 Agenda for Sustainable Development and its goals⁶⁰.
64. A strong health system that embraces a people-centred and coordinated care approach and is directed towards ensuring effective, timely and responsive diagnosis, treatment and care for neurological disorders over sustained periods is needed to improve the well-being and quality of life of people with neurological disorders, as well as avoiding complications, reducing hospitalization and costly interventions, and preventing premature death and disability.

2.1 Care pathways

65. Developing multi-disciplinary care for people with neurological disorders requires evidence-based protocols and practices, organization by stages of care, incorporation of human rights principles and a life-course approach.
66. Services and care pathways need to be responsive to the needs of people with neurological disorders, their carers and families, and inclusive of vulnerable population groups, including socioeconomically disadvantaged individuals, children, older people, people affected by domestic and gender-based violence, prisoners, refugees, displaced populations, and migrants, indigenous populations, and others, specific to each national context.
67. A care pathway should be orientated to each stage of the life course from pregnancy to early childhood to care for older adults. This includes continuing care for children and adolescents with neurological disorders as they adapt to the challenges of transitioning into adulthood.
68. Neurological conditions impact peoples' functioning and commonly reduce their mobility, communication, cognitive functioning and self-care which require rehabilitation. However, the rehabilitation needs for people with neurological disorders are profoundly unmet with only 16% of countries reporting specialized neurorehabilitation services and only 17% reporting general rehabilitation units that offer neurorehabilitation⁶¹.
69. Due to the complex needs and high levels of dependency and morbidity of people with neurological disorders, a range of coordinated health and social care is essential including early care interventions as well as long-term and palliative care, to provide relief from pain, provide psychosocial, spiritual and advance care planning support and to enhance quality of life..
70. When possible, care pathways should include neurosurgical facilities for surgical procedures important in the care of neurological conditions such as tumors, epilepsy, Parkinson's disease and acute ischemic stroke.

Actions for Member States

71. Develop an evidence-based pathway of coordinated health and social services for people with neurological disorders across the life course within the universal health coverage benefits package to ensure access to quality

⁵⁹ <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/07/FINAL-draft-UHC-Political-Declaration.pdf>

⁶⁰ <https://www.un.org/sustainabledevelopment/development-agenda/>

⁶¹ <https://www.who.int/publications/i/item/atlas-country-resources-for-neurological-disorders>

care when and where required. This includes integration at multiple levels of the health and social care system for example through multidisciplinary care teams, service directories, medical health records and referral mechanisms.

- i. Enhance equitable access to quality care for acute (emergency) and chronic neurological conditions;
 - ii. Strengthen care at primary, secondary and tertiary levels including medical and surgical facilities;
 - iii. Develop community-based neurological services with involvement of formal and informal care providers (such as traditional healers), and promotion of self-care;
 - iv. Promote continuity of care between providers and health system levels including referral and follow-up. Primary care services should be supported by specialist services in hospitals and community health services with efficient referral and back-referral mechanisms.
72. Develop strategies to rationalize resources and enhance effective collaboration across public, private and nongovernmental actors through:
- i. the implementation of context-specific, innovative, and integrated models of care, from diagnosis to end-of-life across health and social sectors;
 - ii. the promotion, implementation and scaling up of digital health solutions and technologies across health and social care system actors and system levels;
 - iii. the creation of multidisciplinary health and social care teams and networks and capacity building of health and social care professionals and volunteers.
73. Review existing neurological and related services and programmes, such as those on mental health, maternal, newborn, child and adolescent health, immunization and other relevant communicable and noncommunicable disease programmes to identify opportunities for integration of prevention, early diagnosis and management of neurological disorders.
- i. Ensure equitable access to rehabilitation for disabilities associated with neurological conditions by strengthening health systems at all levels from highly specialized in-patient settings through to community delivered rehabilitation.
 - ii. Develop new and/or strengthen existing services, guidance and protocols to support the implementation of palliative care coordination and referral mechanisms as well as ensuring equitable access to palliative care for people with neurological disorders.
74. Proactively identify and provide appropriate care and support to population groups at particular risk for neurological disorders or who have poor access to services, such as socioeconomically disadvantaged individuals, older people and others specific to each national context.
75. In partnership with humanitarian actors, integrate support needs into emergency preparedness plans to enable access to safe and supportive services for persons with pre-existing or emergency-induced neurological disorders such as traumatic injuries.
76. Empower people with neurological disorders and their carers to participate in service planning and delivery. Enable them to make informed choices and decisions about care that meets their needs by providing evidence-based, accessible information such as health education programmes which include a clear breakdown of the care pathway from detection and diagnosis to treatment (including self-care) and care access.

Actions for the Secretariat

77. Provide guidance and technical support to Member States in integrating cost-effective interventions for neurological disorders, their risk factors, and comorbidities into health systems and universal health coverage benefit packages.
78. Provide technical support to Member States to document and share best practices of evidence-based standards of care across the life-course including service delivery and multidisciplinary care coordination, emphasizing prevention, diagnosis, treatment, rehabilitation and palliative care for people with neurological conditions.
79. In partnership with international multilateral agencies, regional agencies, subnational intergovernmental and nongovernmental organizations, offer technical assistance and policy guidance to support needs in emergency preparedness and enable access to safe, supportive services for those with neurological conditions.

Actions for international and national partners

80. Actively engage all relevant stakeholders across sectors to inform the development and implementation of multisectoral and multidisciplinary care coordination and integrated neurological care pathways across the continuum, including prevention, diagnosis, treatment, rehabilitation and palliative care.
81. Facilitate knowledge exchange and dialogue to review and update rehabilitation, palliative care policies and community-based health services reconstruction efforts following humanitarian emergencies in collaboration with relevant international multilateral agencies, regional agencies, intergovernmental agencies, and organizations representing people with neurological disorders and other civil society organizations.
82. In partnership with international and national multilateral agencies, generate evidence and develop tools to support programmes aimed at accessing integrated care (including rehabilitation and palliative care) for people with neurological disorders.
83. Facilitate initiatives in partnership with relevant stakeholders to support and encourage people with neurological disorders, their families and carers to access neurological care and services through evidence-based, user-friendly information and training tools such as iSupport and/or by establishing national helplines and websites with accessible information.

2.2 Medicines, diagnostics and other health products

84. Medicines, diagnostics and other health products such as assistive technology, biological products, cell and gene therapy are essential for prevention, diagnosis and treatment to reduce mortality and morbidity and improve the quality of life of people with neurological disorders.
85. Essential medicines have a crucial role for both the prevention and treatment of neurological disorders. For example, levodopa can dramatically improve the quality of life for those with Parkinson's disease and antibiotics are a life saving treatment for meningitis, however, shortages can prevent access to first choice WHO recommended antibiotics in many countries. Medicines for multiple sclerosis exist that slow disease progression and improve quality of life for many people, but their availability is limited in LMICs. Controlled medicines are needed for the treatment of pain and palliative care and, when not accessible, can cause needless suffering.
86. Appropriate use of diagnostics can reduce morbidity through early detection and supports monitoring to slow disease progression. Even when effective diagnostic tools are available, they may not be affordable or accessible due to limited laboratory infrastructure, equipment and trained personnel. For example, neuroimaging, lumbar puncture and microscopy are widely used methods for diagnosing neurological disorders but they require appropriately trained personnel for maintaining and using the devices.
87. Assistive technology enables people to live healthy, productive, independent, and dignified lives. Assistive technology reduces the need for formal health and support services, long-term care and the work of carers. Few people in need have access to assistive technology due to high costs and a lack of awareness, availability, trained personnel, policy, and financing. Strengthening rehabilitation services could increase the provision of assistive devices to those who need it most.

Actions for Member States

88. Ensure that essential, safe, affordable, effective and quality medicines and health products for neurological disorders on the WHO Essential Medicine List are available through appropriate policy, legislative, regulatory and procurement systems including access to controlled medicines while minimizing the risk of diversion and misuse. Identify key barriers to accessing essential, safe, affordable, effective and quality medicines and health products across population groups (including in emergency settings) and strategies to systematically address these.
89. Promote the appropriate, transparent and sustainable use of essential medicines, including generics, for the prevention and management of neurological disorders through measures such as quality assurance of medical products, preferential or accelerated registration procedures, generic substitution, preferential use of the international non-proprietary names, financial incentives where appropriate and training of prescribers and consumers. Include evidence-based strategies to systematically address the treatment of co-morbidities, and drug interactions such as polypharmacy in older people⁶².

62 [WHO-UHC-SDS-2019.11-eng%20\(1\)](#)

90. Ensure availability, access and use of appropriate relevant diagnostics such as microscopy, neuroimaging technology (including Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and genetic testing) by training technicians and health care workers in the use of these technologies and improving infrastructure.
91. Establish transparent regulatory frameworks, resources, and capacity to ensure quality, safety and ethical standards are met for medical products, such as biotherapeutic treatments and assistive devices such as hearing aids, wheelchairs, spectacles and prostheses.
92. Improve the availability of life-saving technologies and essential medicines for managing neurological disorders during humanitarian emergencies.

Actions for the Secretariat

93. Offer technical support to Member States to increase equitable access to medicines, diagnostics and other health products for people with neurological disorders, including through the setting of norms and standards at global level, evidence-based context-specific regulatory guidance, good practices for standards-based procurement and manufacturing, and technical, legislative and regulatory training.
94. Provide targeted support to Member States to achieve global and national objectives related to access to medicines for people with neurological disorders, including by strengthening national regulatory and procurement systems, developing innovative health financing mechanisms and facilitating collaboration between regional agencies, intergovernmental agencies, national and/or subnational health authorities and the private sector, including pharmaceutical, diagnostics and other health product companies.
95. Update the WHO Essential Medicine List, WHO model formulary, WHO Essential Diagnostic List and other relevant documents to ensure they are up-to-date and appropriate for neurological conditions and ensure that pathways are in place so that the effective treatments and diagnostics are considered in a timely manner when they emerge.
96. Provide technical support for ensuring up-to-date, evidence-based diagnostic and treatment guidelines for neurological disorders are in place, as needed.

Actions for international and national partners

97. Encourage all relevant stakeholders to engage in activities to promote efforts aimed at improving access to affordable, safe, effective and quality medicines, diagnostics and other health products, such as neuroimaging.
98. Support global, regional, intergovernmental, national and/or subnational strengthening of regulatory and procurement processes (including through pooled procurement, innovative health financing mechanisms health human resource capacity building) to ensure access to and appropriate use of medicines, diagnostics and other health products.
99. Encourage involvement of people with neurological disorders and their carers in the development and implementation processes for new technologies so that decisions on access to care are person-centered.

2.3 Health workers' capacity building, training and support

100. The combination of adequate neurological workforce (adult neurologists, child neurologists, neurosurgeons), other health-care providers including psychologists, psychiatrists, neuroradiologists, EEG technicians, physical therapists, occupational therapists and speech therapists as well as competent primary health care workers who are trained in identifying and managing neurological disorders is central to achieving improved health outcomes. Building primary health care capacity, starting with general physicians, nurses, and pediatricians, provides an important opportunity to improve prevention, diagnosis, treatment and for people with neurological disorders and promote brain health across the life course.
101. Training and education of a multidisciplinary workforce including general and specialized health care professionals, social care workers, rehabilitation specialists trained in neurological conditions, laboratory technicians, pharmacists, biomedical engineers, community health workers, family carers, and traditional healers, where appropriate, is required to ensure the appropriate use of available medicines and diagnostics, leverage existing resources and reduce mortality, morbidity and improve quality of life⁶³.

63. <https://apps.who.int/iris/bitstream/handle/10665/250368/9789241511131-eng.pdf?jsessionid=ECEE59BA695E2DC5722FFFE3B2870841?sequence=1>

Actions for Member States

102. Identify and apply context-appropriate evidence to establish:
- i. appropriately resourced programmes and policies to address projected health workforce needs for the future in light of demographic changes and the prevalence of diseases such as dementia, stroke and Parkinson's disease due to increased population ageing;
 - ii. adequate compensation and incentives for health and social care workers trained in neurological disorders to work in underserved areas and promote the retention of these workers in those areas;
 - iii. protection of health care workers and ensure that their rights are being upheld.
103. Strengthen health and social care workforce capacity to rapidly identify and address neurological disorders, including common comorbid conditions such as infectious diseases, hypoxic-ischemic perinatal brain injury and noncommunicable diseases. These initiatives should focus on enhanced capacity of the existing workforce, both specialist as well as primary healthcare workers and include:
- i. implementing various modes of training programmes (e.g., mhGAP, elearning courses) for general and specialized health and social care workers to deliver evidence-based, culturally appropriate and human rights-oriented neurological care including addressing stigma and discrimination for all people across the life course;
 - ii. developing career tracks for neurological workforce by strengthening postgraduate training and work in partnership with medical societies to raise awareness on the attractiveness of working in brain health;
 - iii. expanding existing educational curricula and providing continuing education for health workers in the care of people with neurological disorders.
 - iv. expanding the role of the neurological workforce to encompass supervision and support of general health workers in providing neurological interventions;
 - v. harnessing the potential of community health workers and strengthening collaboration with other informal care providers, such as traditional healers, with effective training, support and supervision.
 - vi. ensuring that people with neurological disorders are involved in the development and delivery of training, as appropriate.
104. Support health and social care workers to implement and scale services using information and communication technologies such as telemedicine, internet/mobile phone technologies to expand the neurological care to remote and low-resource settings and to support home-based services.

Actions for the Secretariat

105. Support Member States with adequate tools to incorporate neurological care needs in the routine planning for health workers. Such planning approaches should be based on best available data and follow a rigorous health labour market approach. Planning considerations should include the identification of service gaps, neurological care training requirements and core competencies for health and social workers in the field, as well as for advanced neurological care training.
106. Support Member States to build health and social care workforce capacity as well as for informal care providers by promoting, strengthening and developing guidance, tools and the application of competency-based training models required for the diagnosis, treatment and care of neurological disorders.

Actions for international and national partners

107. Facilitate the exchange of information on best practices and dissemination of findings in health workers' development and training to support national efforts related to the prevention, management, and care of people with neurological disorders.
108. Support the implementation of capacity building programmes, including training and education, for general and specialized health care workers to identify neurological disorders and provide evidence-based interventions to promote diagnosis, treatment and care for neurological disorders.
109. Support national authorities in the development of appropriate health care infrastructure and institutional capacity for training of health personnel for strengthening health systems and expanding quality services.

2.4 Carer support

110. Neurological disorders have a profound impact on individuals, their families and communities. Due to their chronic course, people with neurological disorders often require ongoing care provided in large part by informal carers.
111. Carers can be defined by their relationship to the person with a neurological condition and their care input. Many carers are relatives or extended family members, but close friends, neighbours and paid lay persons or volunteers can also take on caregiving responsibilities. Carers provide “hands-on” care and support for people with neurological disorders and play a significant role in organizing life-long care delivered by others.
112. Challenges for carers include stress, role strain, financial burden, social isolation and, bereavement in the event of loss of loved ones. The roles and challenges may vary depending upon the age of the carer and is also different when caring for children, adolescents or older adults.
113. Caring for a person with a neurological disorder may affect the carer’s own health, well-being and social relationships. The Global action plan on the public health response to dementia⁶⁴ identifies key actions to support carers that are also relevant to neurological conditions.

Actions for Member States

114. Provide accessible and evidence-based information on available resources in the community such as training programmes, to navigate the health and social system, respite services and other resources tailored to the needs of carers of people with neurological disorders to enable people with neurological disorders to live in the community and to prevent carer stress and health problems.
115. Within the context of community-based neurological care, provide training programmes, in collaboration with relevant NGOs, for health care and social care staff in the identification and reduction of carer stress.
116. Develop or strengthen mechanisms to protect carers of people with neurological disorders, such as through the implementation of social and disability benefits, (such as pension, leave or flexible time) and policies and legislation aimed at reducing discrimination and supporting carers beyond their caregiving role across all settings.
117. Develop mechanisms to involve carers in care planning, with attention being given to the wishes and preferences of people with neurological disorders and their families.

Actions for the Secretariat

118. Support Member States in developing and evaluating evidence-based information, data, training programmes and respite services for carers of people with neurological disorders through a multisectoral approach that is in line with the United Nations Convention on the Rights of Persons with Disabilities (CRPD)⁶⁵.
119. Facilitate access to affordable, evidence-based resources for carers of people with neurological disorders to improve knowledge and skills related to neurological disorders, reduce emotional stress, improve coping, self-efficacy and health, using resources such as WHO’s mental health Gap Action Programme (mhGAP⁶⁶), iSupport⁶⁷, mDementia⁶⁸, Caregivers skills training package (CST) for children with developmental disorders⁶⁹ and other education, skills training and social support.

Actions for international and national partners

120. Increase awareness of the impact of caring for people with neurological disorders, including the need to protect carers from discrimination, support their ability to continue to provide care through disease progression, and promote self-advocacy.
121. Assist in implementing culturally-sensitive, context-specific and person-centred training programmes for carers and families to promote well-being and enhance knowledge and caregiving skills across the progression of neurological disorders starting with existing resources such as WHO’s iSupport and mhGAP.

⁶⁴ <https://www.who.int/publications/i/item/global-action-plan-on-the-public-health-response-to-dementia-2017---2025#:~:text=The%20Global%20action%20plan%20on,dementia%20on%20communities%20and%20countries.>

⁶⁵ <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>

⁶⁶ <https://www.who.int/teams/mental-health-and-substance-use/mental-health-gap-action-programme>

⁶⁷ <https://www.who.int/publications/i/item/9789241515863>

⁶⁸ <https://apps.who.int/iris/bitstream/handle/10665/339846/9789240019966-eng.pdf>

⁶⁹ <https://ummeed.org/wp-content/uploads/2019/01/Caregivers-Skills-Training-Program.pdf>

OBJECTIVE 3: TO IMPLEMENT STRATEGIES FOR THE PROMOTION OF BRAIN HEALTH AND PREVENTION OF NEUROLOGICAL DISORDERS

122. The promotion of brain health and the prevention of neurological disorders across the life course involves reducing modifiable risk factors and enhancing protective factors including during critical periods of brain development.
123. It includes promoting optimal brain development across the life course, starting with pregnancy, children and adolescents, encouraging healthy behaviour, infectious disease control, implementing interventions to prevent head and spinal trauma and preventing exposure to environmental pollutants.
124. Interventions to promote brain health require a life-course approach linked with healthy ageing to create an environment and opportunities to enable people to flourish throughout their lives.
125. Universal health coverage represents a key component to promoting brain health and well-being and extending life expectancy for all. An important element includes addressing social and economic determinants through a coordinated multi-sectoral response.

3.1 Promotion of optimal brain development in children and adolescents

126. The early stages of life, including the fetal stage and birth, present a particularly important opportunity to promote brain health and prevent neurological disorders. In early life, a child's brain develops and adapts rapidly in response to the surrounding environment, nutrition, and stimulation.
127. Optimizing brain development in the formative stages involves creating conditions for nurturing care⁷⁰ and family and parenting support through public policies, programmes and services. These enable communities and caregivers to ensure children's good health, nutrition and protection from threats.
128. Access to formal education, as well as inclusive education for children with disabilities, has also been shown to improve brain health outcomes. All children and adolescents should be able to live, study and socialize in supportive, healthy, and safe environments without stigma, discrimination or bullying. This promotes and protects their health and reduces engagement in risk behaviours.
129. Exposure to early life adversity such as maltreatment, neglect, experience of war or conflict, inadequate maternal nutrition, poor caregiver health, substance use (including alcohol and smoking), congenital infections or birth complications can have a negative impact on the developing brain and carry life-long implications for brain health.
130. Certain environmental pollutants are specifically known to affect neurodevelopment. These include air pollution, heavy metals in soil and water, lead in household paint, mercury in seafood and workplace exposure and pesticides⁷¹. Young children are especially vulnerable to lead toxicity, and even low levels of exposure can result in reduced attention span, behaviour problems and reduced educational attainment.
131. Physical activity can confer health benefits for children and adolescents living with neurological conditions, thus limiting sedentary behaviour such as screen-based entertainment (television and computers) and digital communications, such as mobile phones is recommended. Additionally, adequate sleep regimens maximizes health benefits and brain development for children and adolescents.

Actions for Member States

132. Develop, fund and implement strategies to promote healthy brain development and prevent neurological disorders in childhood and adolescence, focusing on early intervention. Health policies and programmes should address risk factors as well as enhance protective factors (i.e.: education) to both optimize brain development and prevent neurological disorders.
133. Optimize perinatal and child health care including safe labor and delivery to prevent hypoxic-ischemic brain damage, neonatal intensive care, the use of birth attendants, skin to skin contact (kangaroo mother care), breastfeeding, maternal mental health care, adequate nutrition, immunization, and child development interventions for responsive caregiving and early learning in line with the WHO nurturing care framework.

⁷⁰ <https://www.who.int/pmnch/media/news/2018/wha71-nurturing-care-framework-early-childhood-development/en/>

⁷¹ <https://apps.who.int/iris/handle/10665/204585>

134. In partnership with relevant national regulatory authorities, relevant NGOs and private sector actors, develop, strengthen and monitor national food and nutrition policies and action plans in line with the global strategy for infant and young child feeding⁷², the comprehensive implementation plan on maternal, infant and young child nutrition and WHO's set of recommendations on the marketing of foods and non-alcoholic beverages to children.⁷³
135. Accelerate the full implementation of the WHO Framework Convention on Tobacco Control (FCTC)⁷⁴ to reduce foetal exposure, childhood secondhand smoke exposure and adolescent smoking.
136. Develop and implement, as appropriate, comprehensive and multisectoral national policies and programmes to reduce the harmful use of alcohol,⁷⁵ particularly during pregnancy.
137. Ensure that every adolescent has access to the recommended interventions in the Global strategy for women's, children's and adolescents' health⁷⁶, including in humanitarian and fragile settings. Support interventions to promote adolescent brain health and development and establish, as appropriate, adolescent-friendly spaces as a first response to adolescent needs for protection, psychosocial well-being and nonformal education.
138. Develop appropriately resourced policies for improved provision of quality physical education in educational settings from infant years to tertiary levels, including opportunities for physical activity before, during and after the formal school day. Parks, trees and green areas within urban centres can improve local air quality as well as offer a refuge for children to play. Implement WHO guidelines on physical activity and sedentary behaviour including recommendations on recreational screen time.⁷⁷
139. Strengthen surveillance mechanisms for core indicators of brain health and development in children and adolescents.

Actions for the Secretariat

140. Offer technical support, tools and guidance to Member States, and strengthen national capacity for the promotion of optimal brain development in children and adolescents by:
- i. enhancing leadership within health ministries and other relevant sectors for the development, strengthening and implementation of evidence-based national and/or subnational strategies or plans and associated multisectoral resource planning to optimize brain development in children and adolescents.
 - ii. compiling and sharing knowledge and best practices related to existing policies that address early childhood and adolescent development, including codes of practice and mechanisms to monitor the protection of human rights.

Actions for international and national partners

141. Support development and implementation of global, regional, national and/or subnational policies and programmes for children and adolescents addressing maltreatment, neglect, inadequate maternal nutrition, poor caregiver health, substance use (such as alcohol and smoking), congenital infections, birth complications and environmental pollutants.

3.2 Promoting healthy behaviour across the life course

142. Promoting and emphasizing brain health across the life course includes focusing on healthy behaviour. Growing evidence suggests an interrelationship between many neurological disorders, such as dementia and stroke, with noncommunicable diseases such as hypertension, diabetes and other related risk factors. These risk factors include physical inactivity, obesity, unbalanced diets, tobacco use, and the harmful use of alcohol.

⁷² <https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>

⁷³ <https://www.who.int/publications/i/item/9789241513470>

⁷⁴ https://www.who.int/fctc/text_download/en/#:~:text=The%20WHO%20Framework%20Convention%20on,the%20highest%20standard%20of%20health

⁷⁵ https://apps.who.int/iris/bitstream/handle/10665/44395/9789241599931_eng.pdf?sequence=1

⁷⁶ <https://www.who.int/life-course/partners/global-strategy/globalstrategyreport2016-2030-lowres.pdf>

⁷⁷ <https://www.who.int/publications/i/item/9789240015128>

143. An understanding of the risk factors contributing to the neurological burden of disease can inform preventative measures, and lead to the development of better disease-modifying strategies.
144. Risk factor modification can strengthen the capacity to make healthier choices and follow healthy behavior patterns that foster good brain health and reduce the burden of neurological disorders. Effective urban planning and increased access to sports facilities can help to increase physical activity resulting in social, mental, and brain health benefits, and lowering the risk of various neurological disorders. Exercise and regular physical activity are associated with a better quality of life, physical function, and lower caregiver burden in people with chronic neurological disorders such as Parkinson's disease.
145. Smoking is a risk factor associated with neurological disorders such as stroke, dementia and multiple sclerosis. Second-hand tobacco smoke was estimated to account for 4% of global stroke burden in 2010.⁷⁸
146. Alcohol directly affects the nervous system and can result in neurological disorders such as cerebellar degeneration, neuropathy, myopathy, delirium tremens, and thiamine deficiency leading to Wernicke's encephalopathy or Korsakoff syndrome. It also contributes to road traffic accidents, violence, falls and associated brain and spinal cord injuries.
147. Healthy sleep is necessary for children and adults' overall health and well-being. Irregular sleep can be a risk factor for certain neurological disorders.⁷⁹

Actions for Member States

148. Support actions shown to reduce the risk of neurological disorders across the life course by advancing strategies for healthy behaviours such as cessation of tobacco use and the harmful use of alcohol and increasing physical activity in line with the Global action plan for the prevention and control of noncommunicable diseases⁸⁰, the Global strategy to reduce the harmful use of alcohol⁸¹, WHO Guidelines on physical activity and sedentary behaviour⁸² and WHO Guidelines on risk reduction of cognitive decline and dementia⁸³. These actions should be undertaken in collaboration with relevant intergovernmental agencies, academic institutions and research centres, nongovernmental organizations, and people with neurological disorders, their families and carers.
149. Develop, implement and monitor appropriately resourced, population-wide strategies that promote healthy nutrition and diet as outlined in the WHO Comprehensive implementation plan on maternal, infant and young child nutrition⁸⁴ and the Global action plan for the prevention and control of noncommunicable diseases action plan and 2030 agenda⁸⁵.

Actions for the Secretariat

150. Provide technical support and strengthen global, regional and national capacities and capabilities to:
- i. raise awareness of the links between neurological disorders and other noncommunicable diseases;
 - ii. integrate the reduction and control of modifiable risk factors for neurological disorders by developing evidence-based guidelines for cost-effective, coordinated healthcare interventions and by implementing relevant WHO guidelines into national health planning processes and development agendas;
 - iii. support the formulation and implementation of evidence-based, multisectoral interventions for promoting brain health and reducing the risk of neurological disorders across the life course.
151. Strengthen, share and disseminate evidence to support policy interventions aimed at reducing potentially modifiable risk factors for neurological conditions by promoting healthy workplaces, health-promoting schools and other educational institutions, healthy-cities initiatives, health-sensitive urban development and social and environmental protection.

Actions for international and national partners

78 <https://apps.who.int/iris/handle/10665/204585>

79 https://apps.who.int/iris/bitstream/handle/10665/64100/WHO_MSA_MND_98.3.pdf?sequence=1&isAllowed=y

80 <https://www.who.int/publications/i/item/9789241506236>

81 https://www.who.int/substance_abuse/alcstratenglishfinal.pdf

82 WHO guidelines on physical activity and sedentary behavior: <https://www.who.int/publications/i/item/9789240015128>

83 <https://apps.who.int/iris/bitstream/handle/10665/312180/9789241550543-eng.pdf>

84 http://apps.who.int/iris/bitstream/handle/10665/113048/WHO_NMH_NHD_14.1_eng.pdf?sequence=1

85 <https://www.who.int/publications/i/item/9789241506236>

152. Promote and mainstream population brain health strategies that are age-inclusive, gender-sensitive and equity-based at national, regional and international levels in order to support socially and physically active healthy behaviour for people with neurological disorders, their carers and families.
153. Facilitate knowledge exchange on evidence-based best practices to support actions shown to reduce the risk of neurological disorders across the life course, in line with WHO's Framework Convention on Tobacco Control (FCTC)⁸⁶, the Global strategy to reduce harmful use of alcohol⁸⁷, the Global strategy on diet, physical activity and health⁸⁸ and other relevant strategies.

3.3 Infectious disease control

154. The neurological consequences of infectious diseases such as meningitis, encephalitis, cysticercosis, malaria, HIV, toxoplasmosis and rabies contribute to global morbidity and mortality among the most vulnerable, marginalized populations and can result in lifelong sequelae necessitating specialized follow up care including rehabilitation.
155. Despite advances in global infectious disease control, epidemic infections such as Zika and SARS-CoV-2, have underscored the importance of infectious disease control as a preventative measure for neurological disorders. For example, the COVID-19 pandemic is expected to impact brain health across the life course with a wide spectrum of associated neurological manifestations in the acute and post-acute stages of illness.
156. The emergence of neurotropic zoonotic infections can be attributed to several causes including unsustainable agricultural intensification and increased use and exploitation of wildlife⁸⁹.

Actions for Member States

157. Implement infectious disease management, eradication/elimination/control and immunization programmes based on WHO guidance, such as WHO's Road map for neglected tropical disease 2021–2030⁹⁰ and the Defeating meningitis by 2030 global road map.⁹¹ Include approaches for control of other common and treatable neuroinfectious diseases such as various encephalitides and their respective treatments within the health and agricultural sectors as outlined in WHO's Preventing disease through healthy environments⁹².
158. Support and promote the availability of rapid and affordable diagnostics for infections of the nervous system (e.g.: lumbar puncture, microscopy, imaging).
159. Collaborate with all relevant sectors and stakeholders, including climate change groups and migration authorities, to mitigate risks of emerging infectious diseases that cause neurological disorders. Close coordination and multisectoral action within and beyond health, including vector control, water and sanitation, animal and environmental health and education, will be needed to maximize synergies.
160. Create national operational plans to deliver interventions for neurological diseases in line with a One Health⁹³ approach by developing a coordinated plan outlining stakeholder accountability for human-, animal-, food- and ecosystem-related actions, and treating animals to prevent transmission of neuro-infectious pathogens such as mass dog vaccinations for rabies prevention.

Actions for the Secretariat

161. Offer technical support, tools and guidance to Member States to strengthen global, regional and national awareness of infectious disease control including reducing the risk of zoonotic infections, antimicrobial and insecticide resistance and animal or livestock trading and farming policies.

⁸⁶ https://www.who.int/fctc/text_download/en/#:~:text=The%20WHO%20Framework%20Convention%20on,the%20highest%20standard%20of%20health

⁸⁷ https://apps.who.int/iris/bitstream/handle/10665/44395/9789241599931_eng.pdf?sequence=1

⁸⁸ https://www.who.int/dietphysicalactivity/strategy/eb11344/strategy_english_web.pdf

⁸⁹ United Nations Environment Programme and International Livestock Research Institute (2020). Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission. Nairobi, Kenya. <https://digitallibrary.un.org/record/3872023?ln=en>

⁹⁰ WHO's Road map for neglected tropical disease 2021–2030. https://www.who.int/neglected_diseases/Ending-the-neglect-to-attain-the-SDGs--NTD-Roadmap.pdf

⁹¹ WHO's Defeating meningitis by 2030 global road map. <https://www.who.int/initiatives/defeating-meningitis-by-2030>

⁹² WHO Preventing disease through healthy environments: <https://www.who.int/publications/i/item/9789241565196>

⁹³ <https://www.who.int/news-room/q-a-detail/one-health>

Actions for international and national partners

162. Promote multi-stakeholder collaboration within and beyond the health sector, notably for environmental and veterinary health in line with the 2030 Agenda for Sustainable Development and its Sustainable Development Goals⁹⁴.

3.4 Preventing head/spinal trauma and other injuries

163. Traumatic brain injury (TBI) and spinal cord injury (SCI) require complicated and costly medical care. In 2016, there were 27 million new cases of TBI and close to one million new cases of SCI globally⁹⁵. Road traffic injuries and falls constitute the highest number of these new cases; other causes such as child abuse and sports injuries are also preventable.

164. Each year, 37 million falls are severe enough to seek medical attention and mostly affect adults aged 60 years and older, particularly those with comorbidities that impair ambulation such as dementia, Parkinson's disease or multiple sclerosis.

165. Key risk factors for road traffic injuries include speeding, alcohol consumption, non-use of helmets, seat belts and child restraints, inadequate visibility of pedestrians and other road users and inadequate enforcement of traffic laws. Many sport-related injuries can also result in traumatic brain and spinal cord injury.

166. Awareness, laws and policies to educate sports professionals, parents and athletes and implementation of helmet or protective devices policies are needed to prevent some of TBI and SCI⁹⁶.

Actions for Member States

167. Implement the recommendations included in the World report on road traffic injury prevention and proposed by the Commission for Global Road Safety⁹⁷. These include road safety management, safer roads and mobility, safer vehicles, safer road users and increased responsiveness to post-crash emergencies and longer-term rehabilitation for victims.

168. Strengthen information systems to collect data on TBI and SCI arising from road traffic accidents in order to improve understanding on the scale of the issue and its implications.

169. Promote safer contact sports and develop and implement policies and mandatory education for athletes, parents, and coaches to inform about the risks and neurological complications, such as epilepsy, that are associated with TBI and SCI in sports.

170. Develop and implement policies, standards and effective interventions to address unsafe home and community environments including poor lighting, slippery floors, loose rugs, and beds without rails as outlined in the Global strategy and action plan on ageing and health⁹⁸.

Actions for the Secretariat

171. Collect and disseminate evidence and best practices to prevent or reduce TBI and SCI including the prevention of road traffic accidents and falls through implementation of the Global plan for the decade of action for road safety⁹⁹.

172. Provide guidance, evidence-based practices and technical support for early rehabilitation and support to people with TBI and SCI to minimize both physical and psychological impact.

Actions for international and national partners

94 UN Sustainable Development agenda. <https://www.un.org/sustainabledevelopment/development-agenda/>

95 Global, regional, and national burden of traumatic brain injury and spinal cord injury, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol.* 2019 Jan;18(1):56-87

96 Opportunities for Prevention of Concussion and Repetitive Head Impact Exposure in College Football Players: A Concussion Assessment, Research, and Education (CARE) Consortium Study. *JAMA Neurol.* 2021 Feb 1;e205193

97 Commission for Global Road Safety. https://www.who.int/management/programme/health_promotion/MakeRoadsSafe.pdf

98 <https://www.who.int/ageing/GSAP-Summary-EN.pdf>

99 https://www.who.int/roadsafety/decade_of_action/plan/en/

173. Promote multi-stakeholder collaboration to raise awareness about the inherent safety and protective quality of road networks for the benefit of all road users, especially the most vulnerable (e.g., pedestrians, bicyclists and motorcyclists) to prevent TBI and SCI.
174. Encourage the role of international partners to facilitate knowledge sharing and facilitate global, regional, intergovernmental, and national strengthening of policies for safe driving, sports injuries and promotion of national efforts for increasing helmet use in accordance with WHO's Helmets: a road safety manual for decision-makers and practitioners.¹⁰⁰

3.5 Reducing environmental risks

175. Exposure to environmental and occupational hazards can directly influence brain health. For example, in older people, exposure to household and ambient air pollution is considered a potentially modifiable risk factor for the development of dementia and in 2019, approximately 5% of the global stroke burden (in DALYs) was attributable to ambient air pollution¹⁰¹. Across the world, vulnerable communities are subject to greater exposure to environmental toxins due to conditions in which they work and live.
176. As with children, toxin induced encephalopathies including exposure to heavy metals such as lead¹⁰², and mercury can cause serious health and nervous system damage in all age groups. Safe disposal and long-term storage of mercury waste is a global challenge with direct impacts on human health and the environment¹⁰³.
177. Parkinson's disease has been associated with exposure to pesticides and the industrial solvent trichloroethylene (TCE) in occupational and non-occupational settings¹⁰⁴. Additionally, migraines can be triggered by environmental pollutants such as bright lights, poor air quality and noise¹⁰⁵.
178. Climate change is one of several concurrent global environmental changes that simultaneously affect human health and neurological conditions, often in an interactive manner. As an example, the transmission of vector-borne neurotropic viruses such as Zika, Japanese encephalitis and West Nile is jointly affected by climatic conditions, population movement, deforestation, land-use patterns, biodiversity losses, freshwater surface configurations, and human population density¹⁰⁶.

Actions for Member States

179. Link brain health promotion and the prevention of neurological disorders with strategies that focus on promoting healthy living, working and environmental conditions, in line with WHO's guidance on Preventing disease through healthy environments¹⁰⁷.
- i. Accelerate progress towards the global phase out of lead paint through regulatory and legal measures¹⁰⁸.
 - ii. Develop and implement health promotion and protection strategies and programmes across sectors to limit exposure to pesticides and other high-priority chemicals, such as TCE, which have been associated with neurotoxic effects.
 - iii. Address the health aspects of exposure to mercury and mercury compounds through collaboration between health authorities, environment authorities, and others¹⁰⁹.
180. In partnership with nongovernmental organizations, the private sector and other multisectoral stakeholders, integrate environmental determinants specific to brain health and neurological disorders into broader mitigation strategies aimed at reducing the impact of climate change. These include interventions and policies that promote access to clean air (ambient and household) such as reducing the use of fossil fuels and promoting the use of cleaner cook stoves as well as adequate and safe water, sanitation, and hygiene.

100 WHO Helmets: a road safety manual for decision-makers and practitioners. <https://www.who.int/publications/i/item/helmets-a-road-safety-manual-for-decision-makers-and-practitioners>

101. <https://vizhub.healthdata.org/gbd-compare/>

102 World Health Organization. (2020). Global elimination of lead paint: why and how countries should take action: technical brief. World Health Organization. <https://apps.who.int/iris/handle/10665/333840>. License: CC BY-NC-SA 3.0 IGO

103 International programme on chemical safety https://www.who.int/health-topics/chemical-safety#tab=tab_1

104 Ascherio A, Schwarzschild MA. The epidemiology of Parkinson's disease: risk factors and prevention. *Lancet Neurol.* 2016;15(12):1257-72.
Ascherio A, Chen H, Weisskopf MG, O'Reilly E, McCullough ML, Calle EE, et al. Pesticide exposure and risk for Parkinson's disease. *Ann Neurol.* 2006;60(2):197-203.

105 WHO Preventing disease through healthy environments: <https://apps.who.int/iris/handle/10665/204585>

106 WHO Climate Change and health. <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>

107 WHO Preventing disease through healthy environments: <https://apps.who.int/iris/handle/10665/20458>

108 <https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health>

109 WHA67.11. https://apps.who.int/gb/ebwha/pdf_files/WHA67-REC1/A67_2014_REC1-en.pdf

Actions for the Secretariat

181. Provide support to Member States in evaluating and implementing evidence-based options that suit their needs and capacities and in assessing the health impact of public policies regarding air pollution, heavy metals, pesticide and industrial solvents for the prevention of neurological disorders across programmes for environmental health.

Actions for international and national partners

182. Promote at national, regional and international levels, WHO's guidance on Preventing disease through healthy environments¹¹⁰ and highlight the importance of climate change¹¹¹ on brain health, in line with the 2030 Agenda for Sustainable Development and its Sustainable Development Goals¹¹².

183. Collaborate with stakeholders to develop international standards for environmental pollutants (e.g., emissions, second hand smoke, levels of environmental toxins) to help guide legislation.

184. Support research to understand the contribution of environmental risk factors to the morbidity and mortality of neurological disorders especially in low resource settings.

OBJECTIVE 4: TO FOSTER RESEARCH AND INNOVATION AND STRENGTHEN INFORMATION SYSTEMS FOR NEUROLOGICAL DISORDERS

185. Information, evidence and the generation of new knowledge are needed to inform policy, planning and programming for neurological disorders. Together, they provide insight into effective health services, care models, and disease-modifying treatment options, and foster innovation such as health technologies in prevention, risk reduction, early diagnosis, treatment, potential for cure and care for neurological disorders.

186. The elevated cost and complexity surrounding brain research requires improved coordination within the research environment with multi-stakeholder involvement and public and private partnerships. In this context, cultivating an environment that fosters cross-regional research collaborations, data sharing and coordinating multicenter research studies is vital to reduce redundancies, fast-track research innovation and build capacity in low income settings.

187. Implementation research needs to be prioritized and combined with appropriate health systems evaluation to harness and scale prevention and treatment strategies for neurological disorders. Such an approach will facilitate the monitoring of interventions and allow for the replication and adaptation of successful interventions in similar settings.

188. Better representation of LMICs in the neurology research environment must be achieved through the development of cost-effective strategies to respond to neurological disorders, acknowledging country-specific needs and tailored to local resource settings.

189. It is paramount to encourage involvement and engagement of people with neurological disorders, their families and carers to better support and guide research and development of innovative solutions for neurological disorders in order to have genuine and meaningful impact on the research output.

190. Significant data gaps regarding neurological disorders in both HICs and LMICs hinder the strengthening of health information systems. Robust, standardized and easily accessible data is vital to create a complete understanding of the situation relating to neurological disorders in countries and serve as the basis for effective planning and the establishment of targeted interventions.

4.1 Investment in research

110 WHO Preventing disease through healthy environments: <https://apps.who.int/iris/handle/10665/204585>

111 Watts.Net al (2018) The 2018 report of the Lancet Countdown on health and climate change: shaping the health of nations for centuries to come, The Lancet

112 UN Sustainable Development agenda. <https://www.un.org/sustainabledevelopment/development-agenda/>

191. If the incidence of neurological disorders is to be reduced and the lives of people with neurological disorders are to be improved, sustained investment in biomedical, clinical, implementation and translational research are crucial to inform prevention, diagnosis, treatment and care as well as the potential to cure more neurological disorders.
192. All research and development activities for neurological disorders must be rooted in equity, diversity, and inclusiveness with increased engagement of people with neurological disorders to ensure that technologies and innovation are prioritized according to real demand and added value.
193. Investments in neurological research should promote the collaboration between Member States and relevant stakeholders, with a particular focus on strengthening North–South, South–South and triangular cooperation. Facilitating a global research agenda for neurology, will increase the likelihood of effective progress towards better prevention, diagnosis, treatment and care for people with neurological disorders while reducing redundancies, duplication of research and costs.
194. Concerted action to build research infrastructure, strengthen human resource in research and development, and increase collaboration among the research community, manufacturers, health professionals and programme managers, is needed to catalyze neurological research and development, particularly in LMICs.

Actions for Member States

195. Increase investment in research and improve research governance as an integral component of the national response to the burden of neurological disorders. Facilitate the development of new diagnostics, treatments and innovations that respond to the needs of people with neurological disorders, their families and carers and people at risk of developing neurological disorders. These innovations include but are not limited to use of big data, artificial intelligence, diagnostics, precision medicine, disease monitoring and assessment tools, assistive technologies, pharmaceuticals and new models of care.
196. Support national, regional and international research collaborations for neurological disorders to enhance sharing of, and open access to, research data, generate new knowledge on neurological disorders promotion, prevention, diagnosis, treatment and care, and translate existing evidence about neurological disorders into action.
197. Build knowledge and capacities of decision-makers on need for innovation within brain health and highlight the importance of prioritizing funding for neurological disorders research in the country and national research councils.
198. Strengthen national institutional capacity for research and development in neurological disorders through strategic alliances including enhanced research infrastructure, equipment and supplies in research institutions, harnessing the use of big data and artificial intelligence.
199. Involve and support people with neurological disorders and their carers to actively participate in the research development process to ensure the highest impact of research.

Actions for the Secretariat

200. Advocate for increased investment in research for neurological disorders, through research prioritization, and agenda setting in the fields of biomedical, clinical, implementation and translational research at global, regional and national level.
201. Engage WHO collaborating centres, academic institutions, research organizations and alliances to strengthen capacity for research on neurological disorders at the country level.
202. Support international coordination mechanisms to facilitate harmonized global research efforts in neurology and foster regular communication and information exchange between stakeholders to build a globally connected research community.
203. Promote intercountry exchange of expertise to enhance regional and international research collaborations, especially in LMICs, including through the systematic mapping of national investments in research and outputs of research for neurological disorders.
204. Offer guidance and technical support to Member States in developing new diagnostics, treatments and innovative technologies for neurological disorders and mechanisms to ensure equitable access to and the implementation of these, particularly in low-resource settings.

Actions for international and national partners

205. Promote and mobilize financial support for research in neurological disorders, participate in priority-setting exercises and contribute to the dissemination of research findings in user-friendly language to policy-makers, the public, people with neurological disorders, their families and their carers.

206. Engage the research community, manufacturers, health professionals, programme managers, national health advisory groups, and development partners to promote innovation and pursue the research and development agenda for developing new tools and treatments for neurological disorders and ensuring equitable and affordable access of these products in LMICs.
207. Support national efforts to strengthen capacity for research, development and innovation and knowledge exchange, including institutional capacity building, research collaborations and the creation of research fellowships and scholarships, for all aspects related to the prevention, diagnosis, treatment and care of neurological disorders.
208. Support implementation research to generate new knowledge about barriers to uptake of the treatments for neurological disorders into widespread clinical care, and strategies that are effective in overcoming those barriers and in addressing health disparities. This will enable Member States to harness and scale proven treatment and prevention strategies for neurological disorders including in LMIC.

4.2 Data and information systems

209. Information systems for neurological disorders in most LMICs are rudimentary or absent, making it difficult to understand the availability and utilization of neurological services and the needs of people with neurological disorders and their carers.
210. Systematic integration, collection and monitoring of neurological disorders into population-level and routine health information systems data based on a core set of equity measures, across all levels of care and across the life course provides the basis to guide evidence-based actions to improve services and measure progress towards implementing national programmes for neurological disorders and brain health.
211. Availability of health and social care data can support the identification of gaps in service delivery, improve accessibility to, and coordination of, care for people with neurological disorders and promote a better understanding and detection of population level changes and trends.

Actions for Member States

212. Integrate monitoring of neurological disorders into routine information systems and across all levels of care and identify, collate, routinely report and use core data, disaggregated by sex, age and other equity measures in order to improve neurological care service delivery, promotion and prevention strategies and provide an understanding of the social determinants of neurological disorders.
213. Analyze and publish data collected on the availability and evaluation of utilization and coverage of services and effective treatments for neurological disorders to improve care and delivery of programmes.

Actions for the Secretariat

214. Offer technical support to Member States to
 - i. develop and/or reform national data collection systems, in order to strengthen multisectoral data collection for neurological disorders.
 - ii. build national capacity and resources for systematic collection, analysis and facilitate the use of data related to neurological disorders.
 - iii. develop a core set of indicators and targets in line with this action plan, other global action plans, WHO monitoring frameworks and national circumstances to monitor outcomes.
215. Support efforts for building new data-sharing programmes and initiatives that drive better disease understanding and promote research capacity building in low-resource settings.

Actions for international and national partners

216. Provide support to Member States to establish surveillance/ information systems that capture core indicators on neurological disorders, enable an assessment of change over time, and provide an understanding of the social determinants of neurological disorders.
217. Advocate for the involvement of people with neurological disorders, their families and carers in the collection, analysis and use of data on neurological disorders.
218. Provide support to Member States on better measurement techniques, instruments and methodology to improve capacity for collection, analysis and evaluation of neurological services.

OBJECTIVE 5: TO STRENGTHEN THE PUBLIC HEALTH APPROACH TO EPILEPSY AND PROMOTE SYNERGIES WITH OTHER NEUROLOGICAL DISORDERS

219. Epilepsy affects people of all ages, genders, races, and income levels. Poor populations and those living in LMICs bear a disproportionate burden, which poses a threat to public health and economic and social development.
220. In many parts of the world, people with epilepsy and their families suffer from stigma and discrimination due to ignorance, misconceptions, and negative attitudes surrounding the disease. They often face serious difficulties in education, employment, marriage, and reproduction.
221. The risk of premature death in people with epilepsy is up to three times higher than the general population. Important causes include Sudden Unexpected Death in Epilepsy (SUDEP), status epilepticus, unintentional injuries and suicide. In LMICs, the excess mortality is associated with lack of access to health facilities and potentially preventable causes of epilepsy.
222. Epilepsy often co-exists and can be compounded by other comorbid health conditions, including other neurological disorders, necessitating a synergistic approach to addressing co-existing conditions.

5.1 Access to services for epilepsy

223. Epilepsy is a highly treatable condition and over 70% of people with epilepsy could live seizure free if they had access to appropriate anti-seizure treatment, the most cost-effective of which are included in the WHO Model List of Essential Medicines. Despite this, the current treatment gap for epilepsy is estimated at 75% in low-income countries and is substantially higher in rural than in urban areas¹¹³.
224. Wide treatment gaps may result from a combination of lack of capacity in health care systems, inequitable distribution of resources and low priority accorded to epilepsy care. Factors that widen this gap include staff shortage, limited access to antiseizure medicines, lack of knowledge, misperceptions and stigma.
225. Primary health care provides a platform where the health needs of people with epilepsy can be effectively addressed through a people-centered approach. With political will and a combination of innovative strategies, epilepsy prevention, diagnosis and treatment can be integrated into primary health services in cost-effective ways, even in low-resource settings.
226. There is an urgent need to strengthen the public health approach to epilepsy and place the needs of affected people within the centre as well as emphasize the critical role of primary health care, health system strengthening and sustainable access to affordable essential medicines and diagnostics.

Actions for Member States

227. Develop and strengthen models of care for epilepsy that promote high-quality people-centred primary care as the core of integrated health services throughout the life course. Strong and functional referral systems with specialist services as well as care for refractory epilepsy should be made available.
228. Enhance training and support in epilepsy diagnosis and management of the primary health care workforce including facility-, outreach- and community-based health workers. Develop strategies to ensure prioritization of epilepsy in workforce planning, adequate incorporation of epilepsy-related competencies and leadership skills in training curricula, and meaningful engagement of the community and general workforce to increase demand for epilepsy services.
229. Implement strategies to make antiseizure medicines more available, accessible and affordable. Strategic options are: to include essential antiseizure medicines in national formularies; to strengthen supply chains and systems of selection, procurement and distribution; and to improve access to controlled medicines (such as phenobarbital).
230. Improve care to prevent the common causes of epilepsy such as perinatal injury including hypoxic ischemic brain injury, central nervous system infections, stroke and traumatic brain injuries by promotion of safe pregnancies

¹¹³ World Health Organization. (2019). Epilepsy: a public health imperative. World Health Organization. <https://apps.who.int/iris/handle/10665/325293>

and births, prevention of head trauma and control of neuroinfectious diseases such as cysticercosis, meningitis, encephalitis and malaria.

231. Strengthen monitoring and evaluation of epilepsy services through well-functioning health information systems that generate reliable data and support the use of information for improved decision-making and learning by local, national and global actors. Data should be collected from multiple sources including registries and disease-specific reporting systems, surveys and administrative and clinical data sets.

Actions for the Secretariat

232. Develop and disseminate technical guidance to address key gaps and strengthen actions for epilepsy at global and national level by addressing key policy, implementation and research considerations.
233. Provide guidance on strengthening the implementation of the epilepsy component of WHO's Mental Health Gap Action Programme (mhGAP) including updated recommendations, to provide quality care and evidence-based interventions through primary health care.
234. Offer support to Member States for documenting and sharing best practices of evidence-based epilepsy service delivery and care coordination.

Actions for international and national partners

235. Establish community teams to support people with epilepsy and their families/carers in the community and strengthen mechanisms to engage with complementary and alternate medicine providers such as traditional healers.
236. Support people with epilepsy and their families and carers to access services, for example, by developing evidence-based, user-friendly information and training tools for epilepsy and available services and/or by setting up websites with information and advice at local levels.
237. Conduct implementation research including dissemination of lessons learned to accelerate the scale-up of successful strategies to strengthen epilepsy services.

5.2 Engagement and support for people with epilepsy

238. In many parts of the world, people with epilepsy and their families are subjected to stigmatization and discrimination as a result of the misconceptions and negative attitudes that surround epilepsy, including the belief that epilepsy is the result of possession by evil spirits or that it is contagious.
239. Stigmatization leads to human rights violations and social exclusion. In some settings, children with epilepsy may not be allowed to attend school, while adults with the condition may not be able to find suitable employment or to marry.
240. Innovative strategies are needed to strengthen international efforts and national leadership to support policies and laws for persons living with epilepsy, improve public attitudes, reduce stigma while fully respecting their human rights.
241. People with epilepsy, their carers and organizations that represent them should be empowered and involved in advocacy, policy, planning, legislation, service provision, monitoring and research in epilepsy.

Actions for Member States

242. Ensure the views and needs of people with epilepsy and their families are reflected in health policies which affect them. Include people with epilepsy, their carers and families in all aspects of developing and strengthening services that support their autonomy. Strong attention to gender and diversity equality needs to be ensured to empower the most vulnerable.
243. Develop or strengthen legislation to promote and protect the rights of people with epilepsy and prohibit discrimination against them in respect of, for example, education, employment, marriage and family planning, obtaining a driving license, and recreation. Improve accountability by setting up mechanisms, using existing independent bodies where possible, to monitor and evaluate the implementation of policies and legislation relevant to epilepsy to ensure compliance with the Convention on the Rights of Persons with Disabilities.
244. Facilitate joint community initiatives with strong community provider leadership and civil society engagement as part of scaling up community owned and led initiatives on epilepsy.

245. Enhance access to a range of person-centred, culturally-appropriate and responsive services including liaison with local nongovernmental organizations and other stakeholders in order to provide information that empowers people with epilepsy to make informed choices and decisions about their care.

Actions for the Secretariat

246. Support the active participation of people with epilepsy and their families in development of all technical products, norms and standards that are relevant to them.
247. Support Member States to develop key capacities needed to engage effectively in participatory processes that involve people with epilepsy and their families and to leverage these results for decision-making.

Actions for international and national partners

248. Ensure that people with epilepsy are included in activities of the wider community and foster cultural, social and civic participation by enhancing their autonomy.
249. Support advocacy efforts and public education activities related to epilepsy for community leaders, grassroots public health workers, and people with epilepsy and their families to correct misconceptions and counter negative attitudes towards people with epilepsy and influence more people with epilepsy to seek treatment.

5.3 Epilepsy as an entry point for other neurological disorders

250. Epilepsy can be idiopathic but can also be a sequelae of other neurological conditions. For example, epilepsy can be secondary to stroke, infections, brain tumors or traumatic brain injury. Epilepsy is also comorbid with other neurological conditions. Migraine occurs in about 19% of people with epilepsy. Intellectual disability is seen in approximately 26% of adults and 30–40% of children with epilepsy¹¹⁴.
251. A seizure can also be a manifestation of other conditions such as infections, metabolic imbalance, brain tumors and neurodegenerative diseases.
252. A well-functioning epilepsy care service can present a good opportunity to strengthen the management of other neurological disorders.

Actions for Member States

253. Orient health systems to expand existing epilepsy prevention, diagnosis, treatment and care to the management of co-morbidities as an essential component at all levels of care.
254. Strengthen the capacity of non-specialist healthcare providers working in primary care to develop competencies that extend beyond epilepsy care to cut across other neurological disorders including the treatment of co-morbidities.
255. Leverage epilepsy diagnostics such as electroencephalogram (EEG), neuroimaging technology (including Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and specialized referral services (e.g., surgery) to include facilities for diagnosis and management of other neurological disorders.
256. Expand procurement systems developed for antiseizure medicines to improve access to effective and quality medicines for other neurological disorders.

Actions for the Secretariat

257. Support Member States to incorporate care for other neurological conditions in routine epilepsy services at primary care level by providing strategies, processes and tools that countries can apply to strengthen the health workforce.
258. Promote and facilitate the exchange of best practices at international, regional and national levels to inform the implementation of integrated care models for epilepsy and other neurological disorders.

¹¹⁴ World Health Organization. (2019). Epilepsy: a public health imperative. World Health Organization. <https://apps.who.int/iris/handle/10665/325293>

Actions for international and national partners

259. Activate national networks and lobby administrators, policy-makers and other stakeholders to integrate care for co-morbidities (i.e. physical and mental health conditions) as an integral part of epilepsy treatment and care services.

Annex: Global targets and indicators

Strategic objective	Global target(s)	Key indicator(s)	Comments
SO1. To raise the prioritization and strengthen governance for neurological disorders	<u>Global target 1.1:</u> 75% of countries will have adapted or updated existing national policies, strategies, plans or frameworks to include neurological disorders by 2031	Existence of an operational national policy, strategy, plan or framework that has been adapted or updated to include neurological disorders (for instance, on noncommunicable diseases, mental health, maternal, children and adolescent health, ageing and disability).	For countries with a federated system, the indicator will refer to policies/plans of the majority of states/provinces within the country.
	<u>Global target 1.2:</u> 100% of countries will have at least one functioning awareness campaign or advocacy programme for neurological disorders by 2031	Existence of at least one functioning awareness campaign or advocacy programme for neurological disorders	Campaigns and programmes should be national and preferably cover both universal, population-level awareness strategies as well as those aimed at locally identified vulnerable groups.
SO2. To provide effective, timely and responsive diagnosis, treatment and care for neurological disorders	<u>Global target 2.1:</u> 75% of countries will have neurological disorders within universal health coverage benefits package by 2031	Existence of a set of evidence-informed, prioritized, essential, quality health services and supports for neurological disorders within the universal health coverage benefits package.	Services and supports include financial risk protection and promotive, preventive, treatment, rehabilitative, and palliative care across the life-course.
	<u>Global target 2.2:</u> 80% of countries will provide essential medicines and basic technologies required to treat neurological disorders in primary care by 2031	Countries report availability of essential medicines and affordable basic technologies to treat neurological disorders in primary care.	This is part of the health system for integration of care for neurological disorders into primary health care and includes description of availability of medicines and basic technologies at primary health care level.
SO3. To implement strategies to promote brain health and development and prevent neurological disorders.	<u>Global target 3.1:</u> 80% of countries will have at least one functioning multisectoral programme for brain health promotion, or the prevention of neurological disorders, across the lifecourse by 2031	Existence of at least one functioning multisectoral programme for brain health promotion, or the prevention of neurological disorders, across the lifecourse	Programmes should be national and should preferably cover both universal, population-level strategies as well as those aimed at locally identified vulnerable groups.
	<u>Global target 3.2:</u> The global targets relevant for prevention of neurological disorders are achieved as defined in: - the Global action plan for prevention and control of noncommunicable diseases 2013-2020	Relevant indicators as defined in: - the Global action plan for prevention and control of noncommunicable diseases 2013-2020 - Defeating meningitis by 2030: a global road map, - Every newborn: an action plan to end preventable deaths.	Reporting to WHO's governing bodies as provided for in the aforementioned action plans.

Strategic objective	Global target(s)	Key indicator(s)	Comments
	- Defeating meningitis by 2030: a global road map, - Every newborn: an action plan to end preventable deaths		
SO4. To foster research and innovation and strengthen information systems for neurological disorders	<u>Global target 4.1:</u> 50% of countries routinely collect and report on a core set of indicators for neurological disorders through their national health data and information systems every two years by 2031	Countries have functioning health data and information systems to routinely collect and report on a core set of indicators for neurological disorders	Reporting and submission of core neurological disorder indicator set to WHO every two years Core neurological disorder indicators include those relating to specified targets of this action plan, together with other essential indicators of health system actions (e.g., training and human resource capacity, availability of essential medicines for neurological disorders, out-patient and in-patient visits).
	<u>Global target 4.2:</u> 70% of countries have integrated neurological disorders into existing research plans or programmes by 2031	Existence of a current research plan or programme in which neurological disorders are integrated	For countries with a federated system, the indicator will refer to plans or programmes of the majority of states/provinces within the country.
SO5. To strengthen the public health approach to epilepsy and promote synergies with other neurological disorders	<u>Global target 5:</u> By 2031, countries will have increased service coverage for epilepsy by 20%	Proportion of persons with epilepsy who are using services	Data may be derived from administrative sources, electronic records and registries. This will be a relative, globally combined measure. Numerator: cases of epilepsy receiving services, derived from routine information systems or, if unavailable, a baseline and follow-up survey of health facilities in one or more defined geographical areas of a country. Denominator: total cases of epilepsy in the sampled population, derived from national surveys or, if unavailable, subregional global prevalence estimates.