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Assistive Technology for NCDs and Mental Health: Experience from South Asia



Introduction :

Burden of NCDs and Mental Health in South Asia

61.8%

contribution of noncommunicable diseases (NCDs), including mental health conditions, to the overall disease burden in South Asia*

* Measured using the disability-adjusted life year (DALYs)

\$47trillion

the global cost of lost productivity from the four major NCDs** plus mental health conditions, between 2011 and 2030

** Cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases

NCDs and MH accounts for :

14.4%

of population is affected by Mental health disorders in South Asia contributing to disability and reduced quality of life .

22.9%

of adults are at risk of premature death from major NCDs including CVD, cancer, diabetes or CRD, 2021 , highlighting the substantial burden of NCDs in South Asia.

632.3

deaths per 100,000 people in South Asia due to NCDs, including mental health conditions in 2023, making them a leading cause of mortality in the region.

Growing Burden of NCDs and Mental Health Conditions, and associated Disability



Globally, 2.5 Billion (2022) people need at least one assistive product



3.5 billion people will need assistive technology by 2050, globally (+40% from 2022).

in addition to congenital factors, aging, or injury the rise in disability burden is significantly contributed by increase in NCDs and MH conditions specially in LMICs.

10–15% of the South Asian population lives with a disability	 NCDs are major drivers of disability	 Mental Health Burden in South Asia
• NCDs, including mental health conditions a significant cause of disability. • They can affect mobility, communication, cognition, self-care, and participation in daily life.	• 23,819.5 DALYs per 100,000 population in South Asia • NCDs such as diabetes, CVDs, CRDs & cancer can cause long-term disability and functional limitations.	• 40.7 million people affected across South Asia, 2023. • Depression, anxiety, schizophrenia, bipolar disorder, and dementia contribute to disability and functional limitations, reducing cognition, communication, independence, and social participation.

Disability burden related to NCDs in South Asia

3.05 Billion

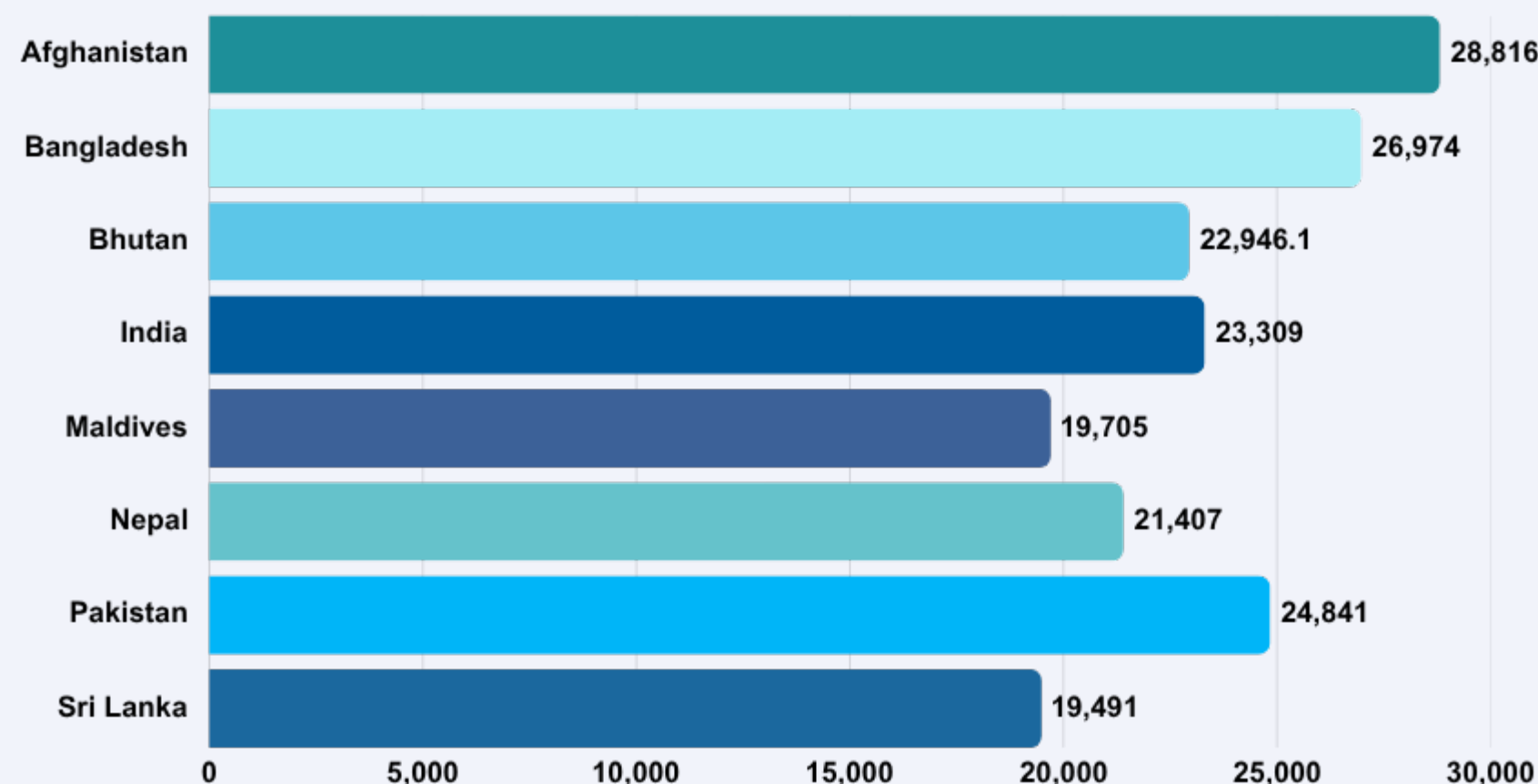
NCD incidence cases in South Asia in 2021

1.69 Billion

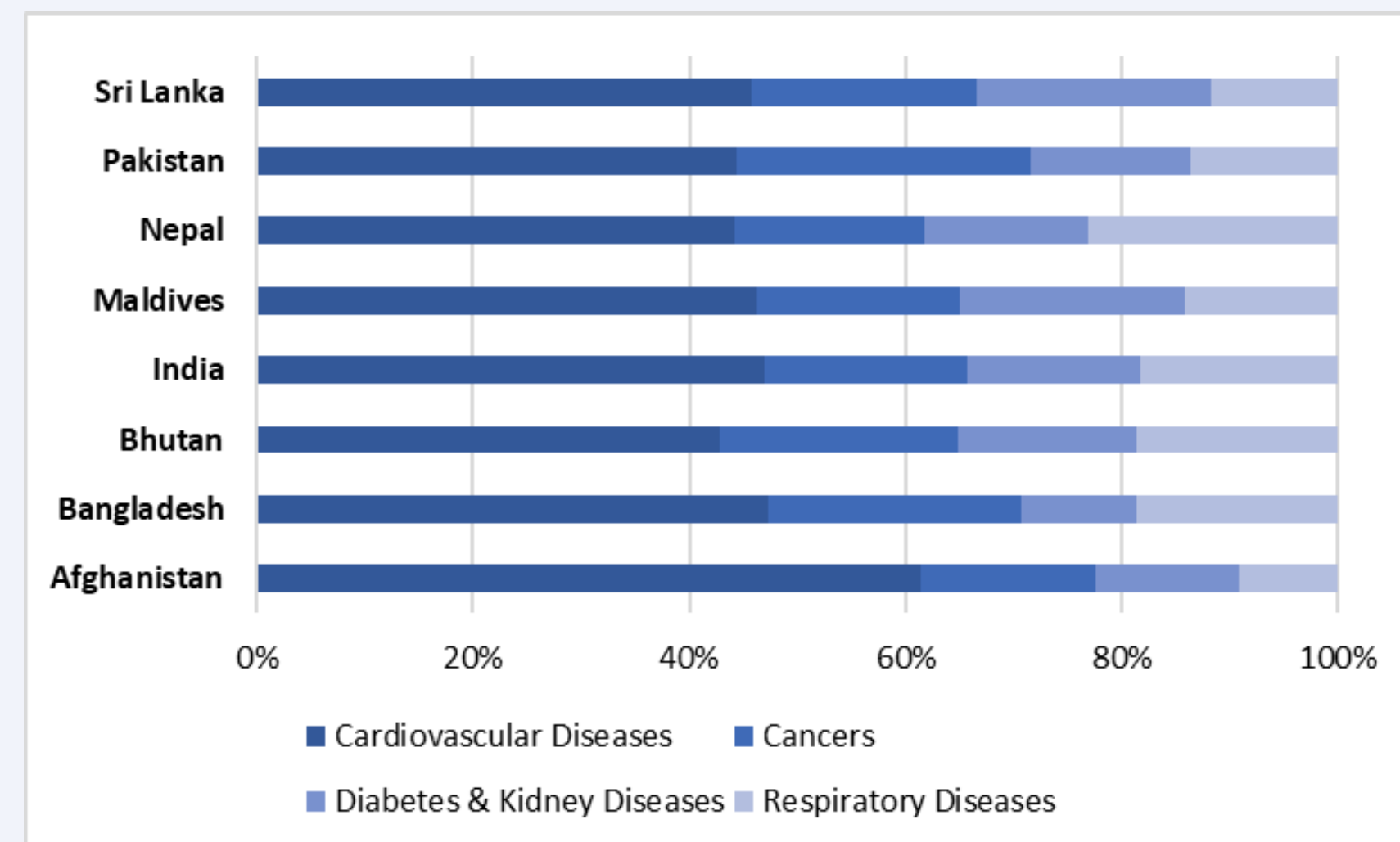
NCD prevalence in South Asia in 2021

23,819 DALYs

Age-standardized DALYs per 100,000 population were lost to NCDs indicating a high burden of disability and premature mortality , 2023



NCD burden across South Asia: DALYs lost per 100,000 population, 2023



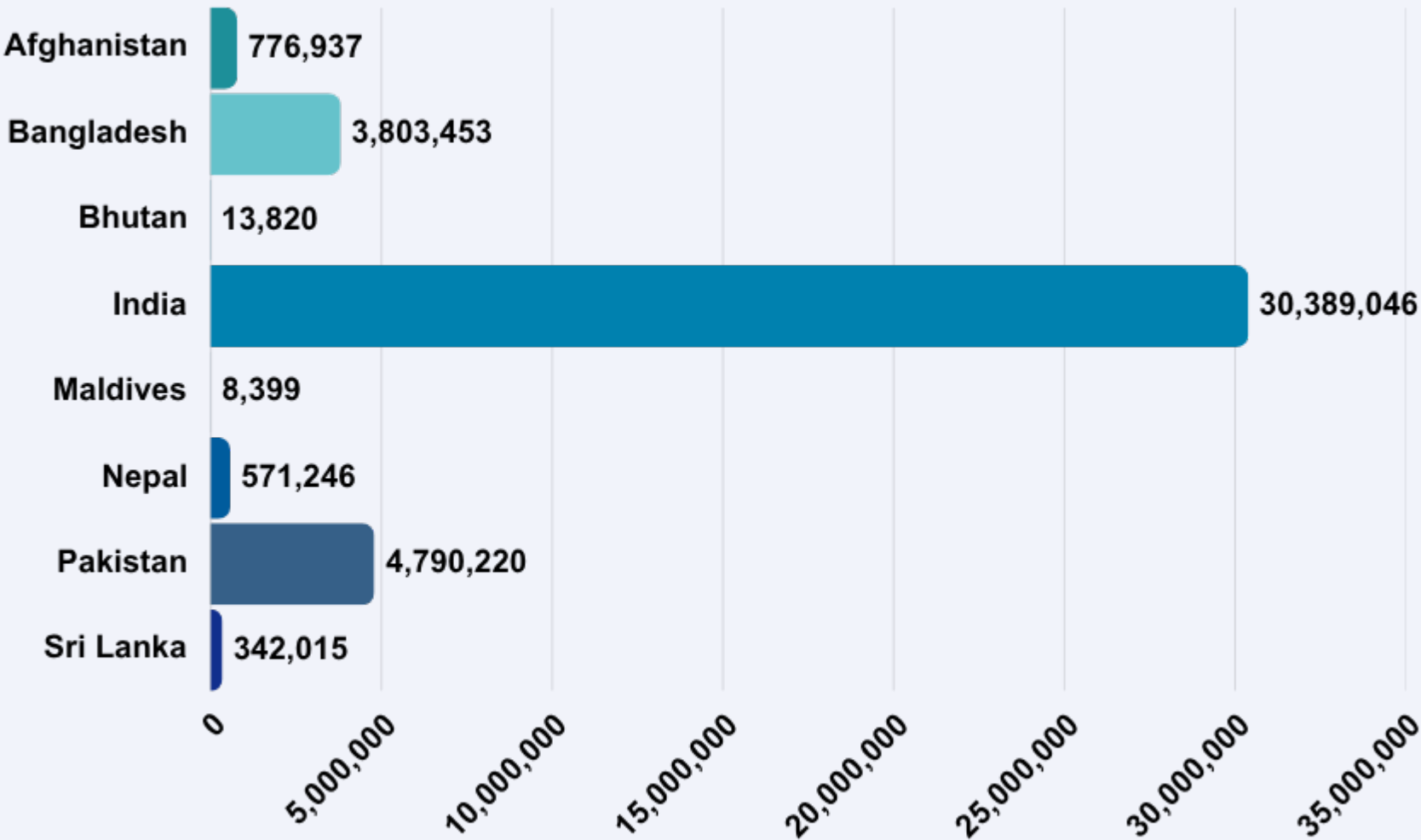
Disease-wise burden (in percentage contribution) of major noncommunicable diseases (NCDs) in South Asian countries to Disability -Adjusted Life Years (DALYs) -2023 data.

Disability burden related to Mental Health in South Asia

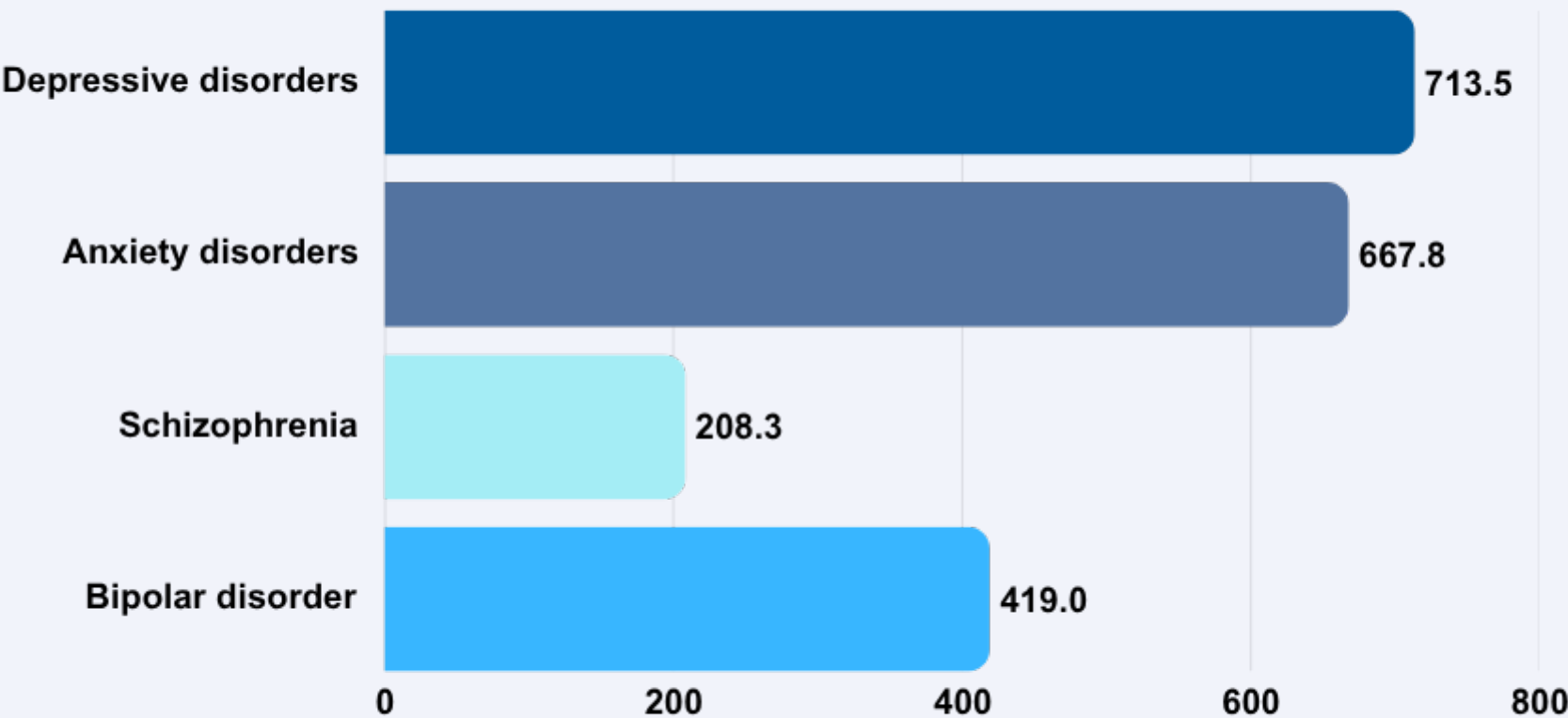
14.4% Share of population with mental health disorders
South Asia, 2023.

40.7 Million DALYs

were lost to mental health disorders, indicating a high burden of disability and premature mortality, 2023



Total disease burden from MH, measured in DALYs per year, in South Asia 2023



Estimated number of disability-adjusted life years (DALYs) per 100,000 people, broken down by category of mental illness in South Asia, 2023.

https://ourworldindata.org/grapher/share-with-mental-and-substance-disorders?tab=table&country=~WB_SA&mapSelect=~WB_SA&tableFilter=wb
https://ourworldindata.org/grapher/disease-burden-from-ncds?tab=table&country=~WB_SA&tableFilter=wb
https://ourworldindata.org/grapher/disease-burden-from-ncds?tab=table&country=~WB_SA&tableFilter=countries
<https://ourworldindata.org/grapher/mental-illnesses-prevalence>

Understanding the role of AT in addressing Disability associated with NCDs and MH conditions

Assistive technology (AT) is an overarching term covering products and their associated services, along with support systems, that are required to maintain or improve the functioning and promote inclusion of individuals dealing with one or more forms of disability.



The Role of Assistive Technology in NCDs

AT shifts the focus from strictly clinical "treatment" to practical "disability support". It provides tools for individuals to regain control of their daily lives and emotional regulation



Self-Management & Treatment Adherence

Medication reminders, smart pill dispensers, and health apps support treatment adherence and long-term disease management.



Health Monitoring & Early Detection

Glucose monitors, BP monitors, wearables, and remote monitoring devices enable continuous tracking and early detection of complications.



Mobility & Physical Function

Wheelchairs, walkers, prostheses, and orthoses improve mobility and independence for people with disabilities.



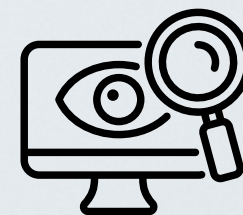
Rehabilitation

Telerehabilitation, robotic therapy, and rehabilitation devices support recovery after stroke and other NCD-related conditions.



Telehealth and RPM

Telemedicine and virtual care platforms improve access to specialist services and ongoing disease management.



Vision and hearing support

Magnifiers, screen readers, low-vision devices, hearing aids, and assistive listening systems help individuals manage sensory impairments.

Cardiovascular Diseases



Stroke

- BP Monitors
- EEG
- Carotid Doppler
- Neuro Assessment Tools
- FAST Screening App
- AI LVO detection

Assisitive Technology

- Wheelchairs
- Orthosis and Braces
- Canes
- Transfer Boards
- Gait Trainer Bars
- AAC Devices
- EMG Biofeedback Device

Peripheral Artery Disease

- ABI Device
- Doppler Ultrasound
- Angiography
- Ulcer Detection
- Thermal Perfusion Imaging/Sensors

- Walking Aids
- Prosthetics
- Pressure Offloading Devices
- Compression Stockings
- Smart Compression Systems

Chronic Heart Failure

- BP /HR/SpO (Wearable/Manual)
- ECG Devices /AI ECG Analysis
- Wearable AFib Detector
- Fluid Overload Sensors
- Gait Analyser

- Adjustable Beds/Seats
- Mobility Aids
- Oxygen Concentrators
- Remote Monitoring Systems
- Bicycle Ergometers

Chronic Respiratory Disease



COPD

Early Detection

- Spirometry
- Pulse Oximeter
- Peak Flow Meter
- Blood Gas Analyzer
- AI Lung Sound Analysis
- Plethysmography
- Wearable Respiratory Sensors

Assisitive Technology

- Smart Inhalers
- Nebulizers
- Digital Spirometers
- BiPAP/CPAP
- Remote Monitoring Systems

Asthma

- Peak Flow Meter
- Spirometry
- Air Quality Monitors
- FeNO Testing
- AI Trigger Detection & Symptoms Tracking

- Inhalers (spacers)
- Nebulizers
- Breathing Trainers
- ClipTone Systems
- Respiratory Masks

Bronchiectasis

- Spirometry
- Pulse Oximeter
- Respiratory Rate Monitors
- SAMD
- AI Chest Imaging
- Symptom Tracking & Cough Detection Apps

- Airway Clearance Devices
- Nebulizers
- Suction Devices
- HFCWO Vests
- Humidifiers

Diabetes



Retinopathy

- Fundus Camera
- AI Retinal Screening
- Visual Acuity Charts
- Retinal and Contrast Tests
- Smartphone Fundus Cameras

- Screen Readers
- Magnifiers
- Braille Displays
- White Cane
- Audio Apps
- Talking Devices

Neuropathy

- Monofilament Test
- Biothesiometer
- Nerve Conduction Studies
- Vibration Testing Device
- Sensory Kits

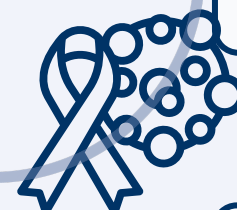
- Protective Footwear
- Orthotic Insoles
- Walking Aids
- Wobble Boards
- Neuro Stimulation
- Smart Insoles (pressure detection)
- Ulcer Prediction AI

Diabetic Foot (Ulcer/ Amputation)

- Foot Temperature Sensors
- Plantar Pressure Sensor
- Thermal Imaging
- ABI
- Doppler Ultrasound
- Infection Biomarkers

- Prosthetic Limbs
- Myoelectric Limbs
- Wheelchairs
- Crutches
- Microprocessor Controlled Prosthetics
- Simulation Training
- Pressure Cushion

Cancer



Lymphedema

- Bioimpedance Devices
- Limb Measurement Tools
- Perometry
- Ultrasound
- Smart Patches
- Clinical Scales

- Compression Garments
- Pneumatic Pumps
- Lymphatic Drainage Aid
- Arm Supports
- Pressure Cushions

Speech loss

- Laryngoscopy Tools
- Voice Analysis Apps detecting early vocal cord changes
- AI Voice Biomarkers

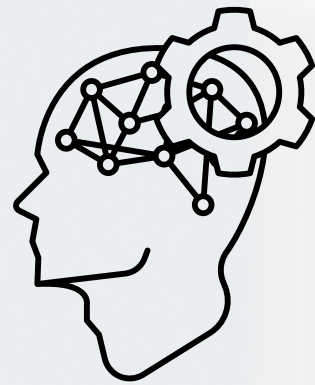
- Electrolarynx
- AAC Devices
- BCI Communication Boards
- Voice Amplifiers
- Speech Generating Devices

Treatment associated fatigue

- Activity Trackers
- Sleep Monitors
- HR Monitors
- AI Fatigue Prediction
- Fatigue Severity Index

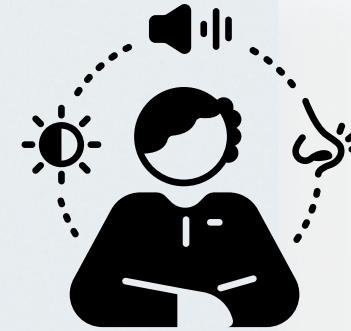
- Mobility Aids
- Assistive Seating
- Smart Home Devices
- Adjustable Beds
- Daily Activity Aids

The Role of Assistive Technology in MH



Cognitive & Task Management:

Electronic calendar apps, wearable reminders, and digital personal assistants help individuals manage medication routines, appointments, and daily tasks that can be disrupted by cognitive fog or severe anxiety.



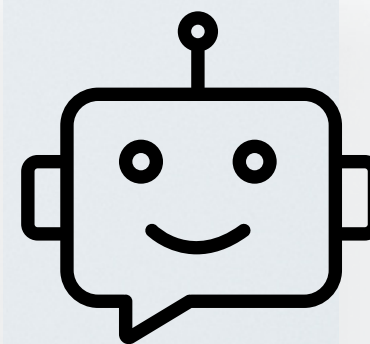
Sensory Regulation:

Low-cost, easily accessible tactile aids such as weighted or ball blankets can provide sensory grounding, minimizing distress and anxiety attacks.



Mood & Behavior Tracking:

Electronic calendar apps, wearable reminders, and digital personal assistants help individuals manage medication routines, appointments, and daily tasks that can be disrupted by cognitive fog or severe anxiety.

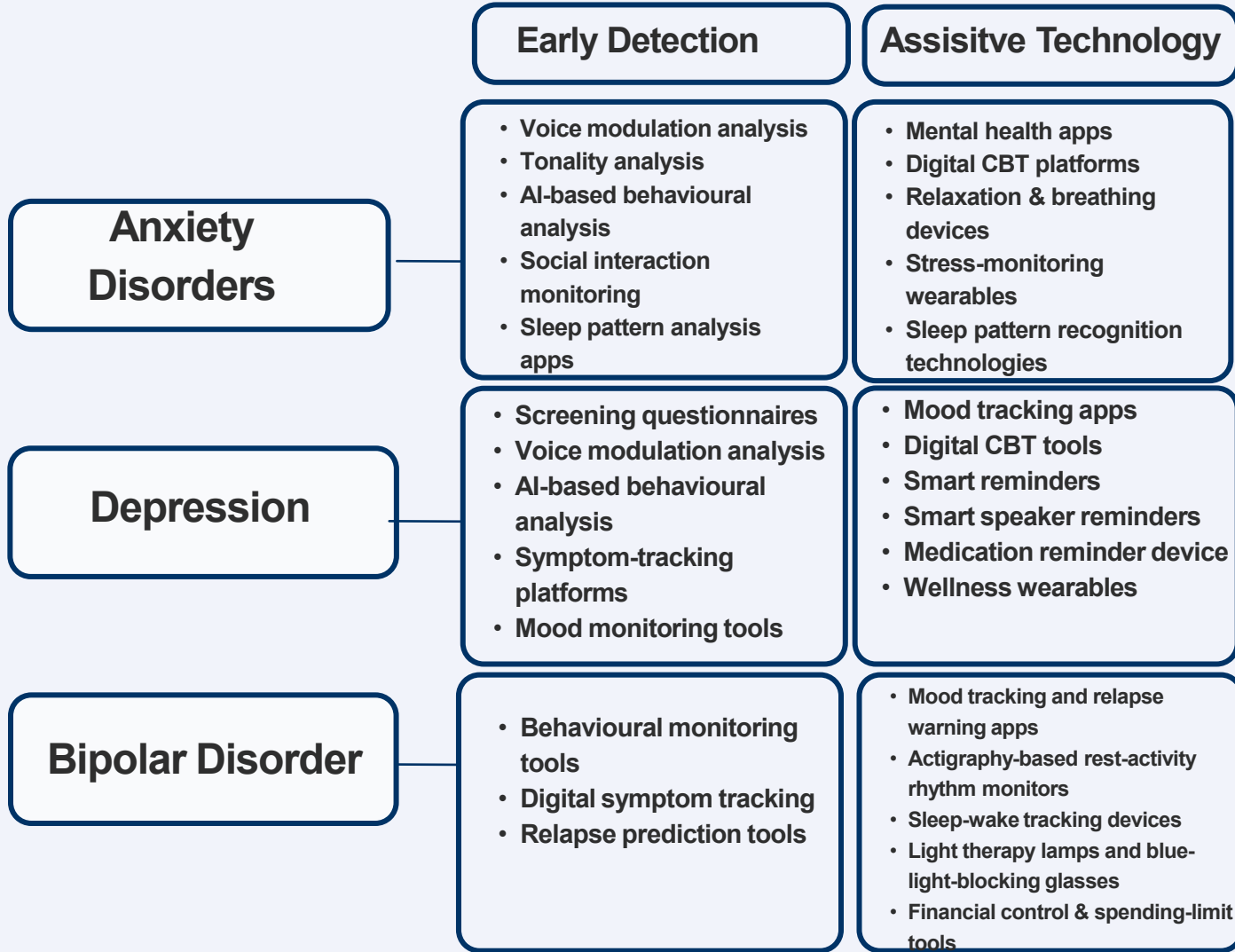


Telepsychiatry & Peer Support:

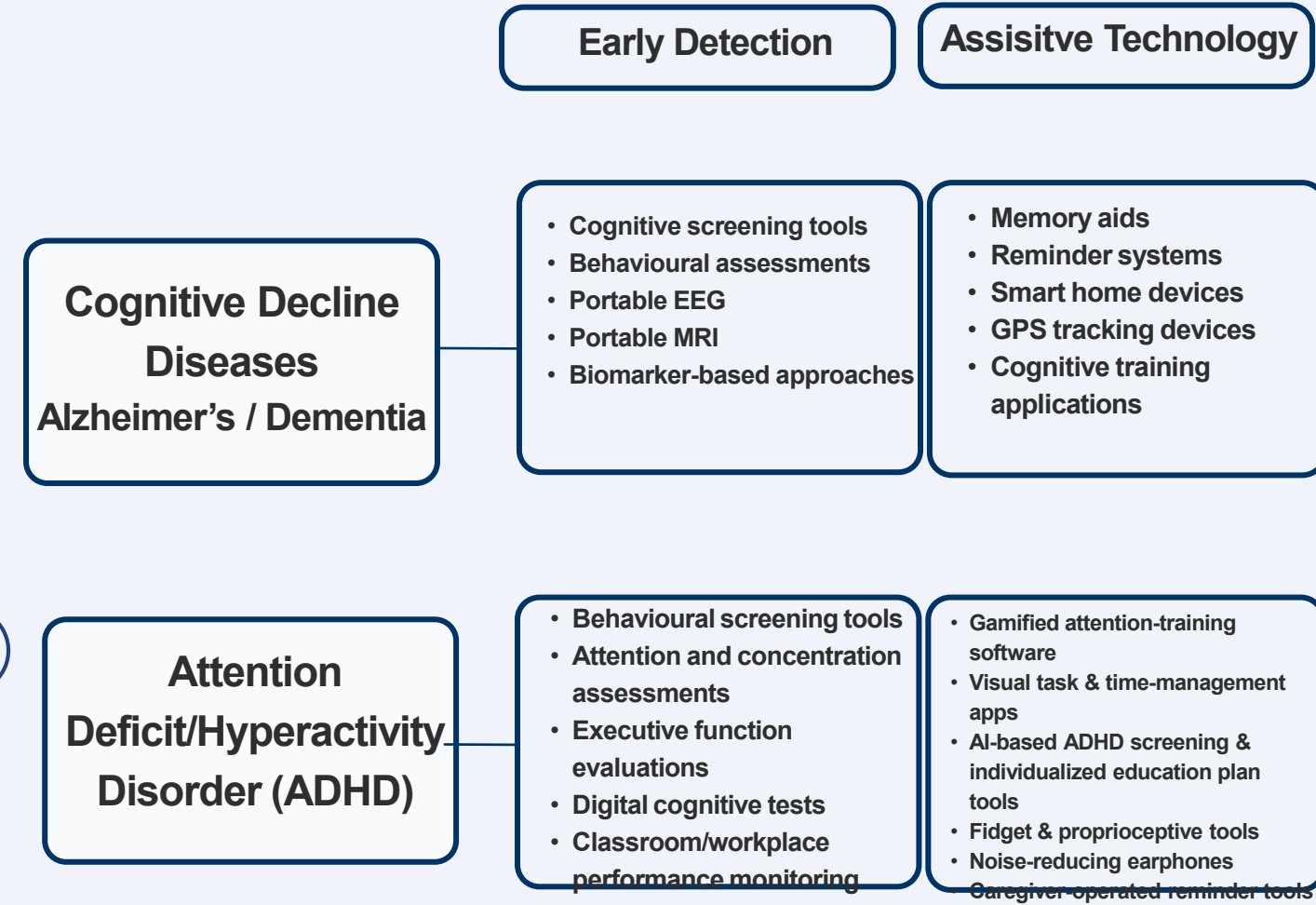
Platforms like tele-counseling (e.g., the hub-and-spoke model used by India's NIMHANS) and localized peer responder training programs ensure that vulnerable individuals in rural or underserved regions can still access continuous support.



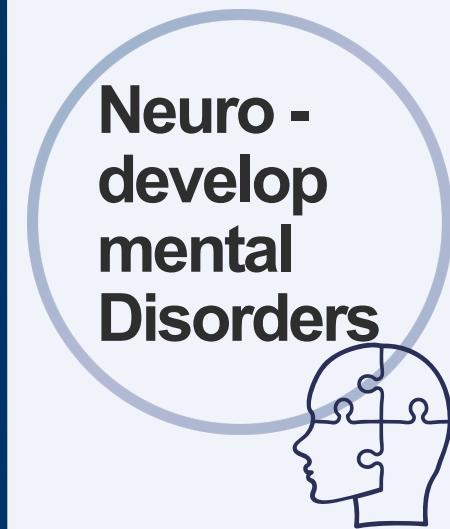
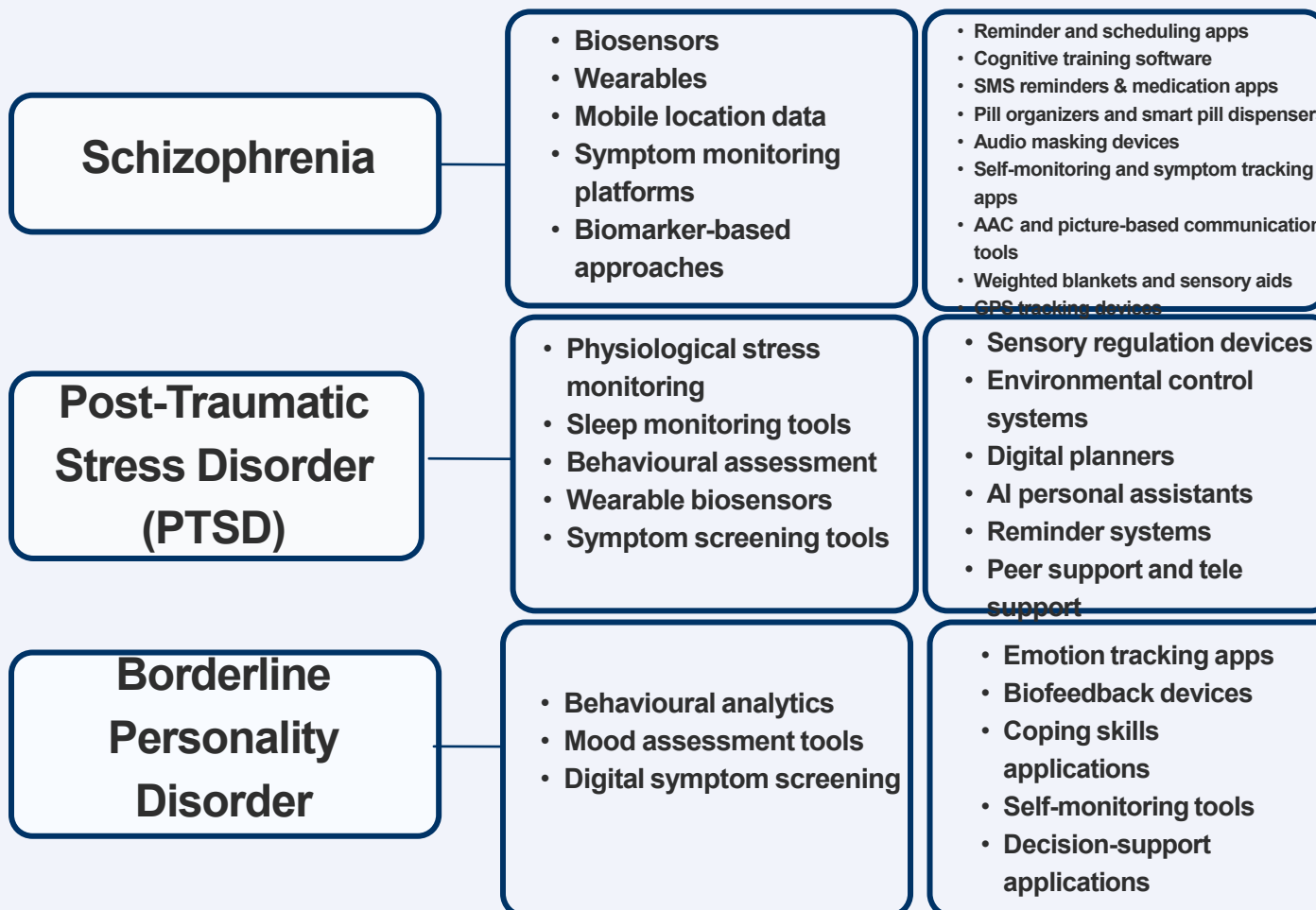
Common Mental Disorders



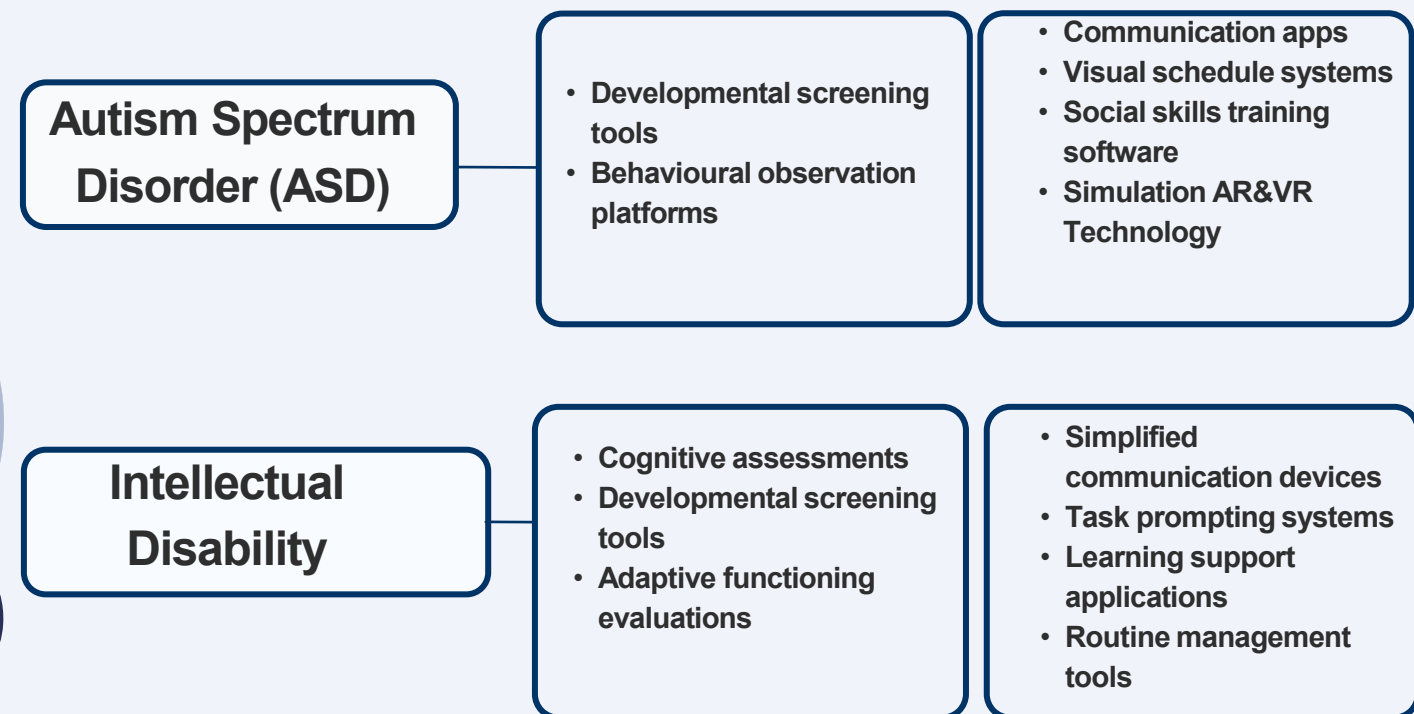
Cognitive & Neuro - degenerative Disorders



Severe Mental Disorders



Neuro - develop mental Disorders



Comment: Certain neurodegenerative disorders like Cerebral Palsy, Parkinson's Disease, and associated disabilities are not included in the scope of this discussion.

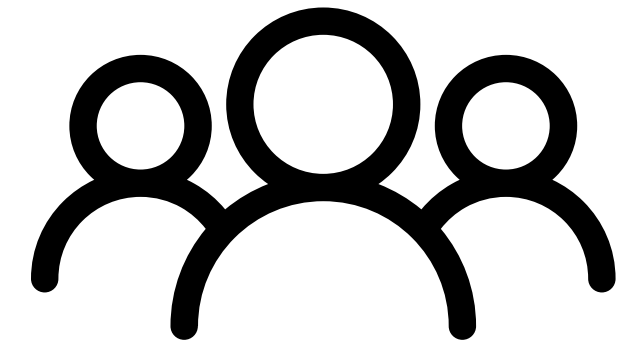
How Assistive Technology impacts Individuals, Communities, Economy and Society

Individuals



- Improves independence, mobility, communication, and daily functioning.
- Access to education, employment, and social participation.
- Promotes dignity, confidence, and quality of life.

Community



- Reduces caregiving burden.
- Fosters inclusive and accessible environments.
- Enables greater participation and contribution of community members.

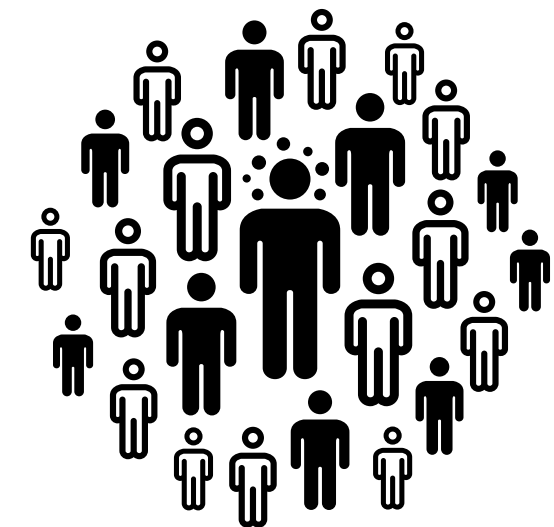


- AT access can generate USD 8.5 trillion in lifetime earnings gains across LMICs.
- Reduced caregiving needs can create USD 1.9 trillion in economic gains for families and caregivers.
- Meeting unmet AT needs could yield over USD 10 trillion in benefits, exceeding 1% of LMIC GDP.

Economy

- Increases workforce participation and productivity.
- Supports healthy ageing and independent living.
- Reduces healthcare, social care, and caregiving costs.

Society



Key Global Initiatives & Frameworks for Assistive Technology

Global Policy & Strategic Frameworks



WHO Resolution on Assistive Technology (WHA71.8, 2018)

Calls on countries to strengthen AT policies, financing, and service delivery systems.



UN Convention on the Rights of Persons with Disabilities (UNCRPD)

Recognizes access to assistive technology as a human right and promotes inclusion and independent living and to achieve **target 3.8; universal health coverage**



WHO 5P People-Centred Assistive Technology Model:

Framework that places **people** at the centre of the assistive technology system, highlighting how **Policy, Products, Provision, and Personnel** work together to determine equitable access to assistive technology.



Sustainable Development Goals (SDGs)



Key Global Initiatives & Frameworks for Assistive Technology *contd...*

WHO-Led Global Initiatives



Global Report on Assistive Technology (GReAT), 2022

Provides evidence on global AT needs, access gaps, and recommendations for strengthening national AT systems.



Priority Assistive Products List (APL)

Identifies 50 essential assistive products that should be universally available through health and social care systems.



Rehabilitation 2030 Initiative

Promotes integration of rehabilitation and assistive technology into Universal Health Coverage (UHC).



Global Cooperation on Assistive Technology (GATE)

Supports countries through standards, policy guidance, workforce development, and capacity building.

Innovation & Implementation Programmes

UNICEF Assistive Technology Programme

Strengthens AT ecosystems, particularly for children and adolescents with disabilities.

AT2030 Programme (UK-funded)

Advances AT access through innovation, research, market shaping, and evidence generation in LMICs

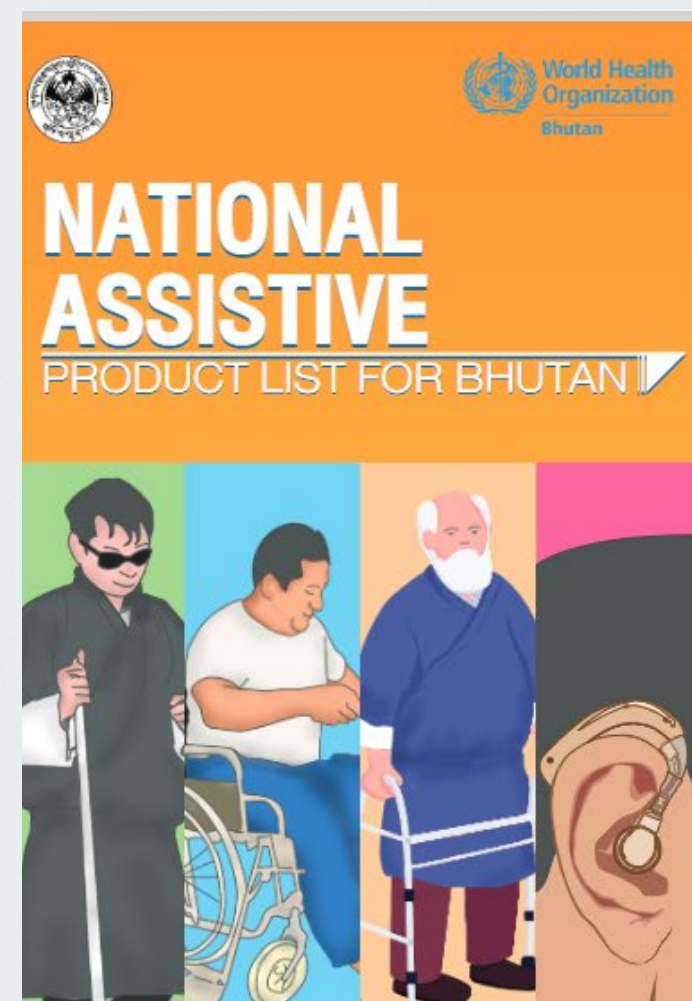
The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)

ESCAP advances disability-inclusive development in Asia-Pacific by promoting accessibility, assistive technology, and equal participation for persons with disabilities.

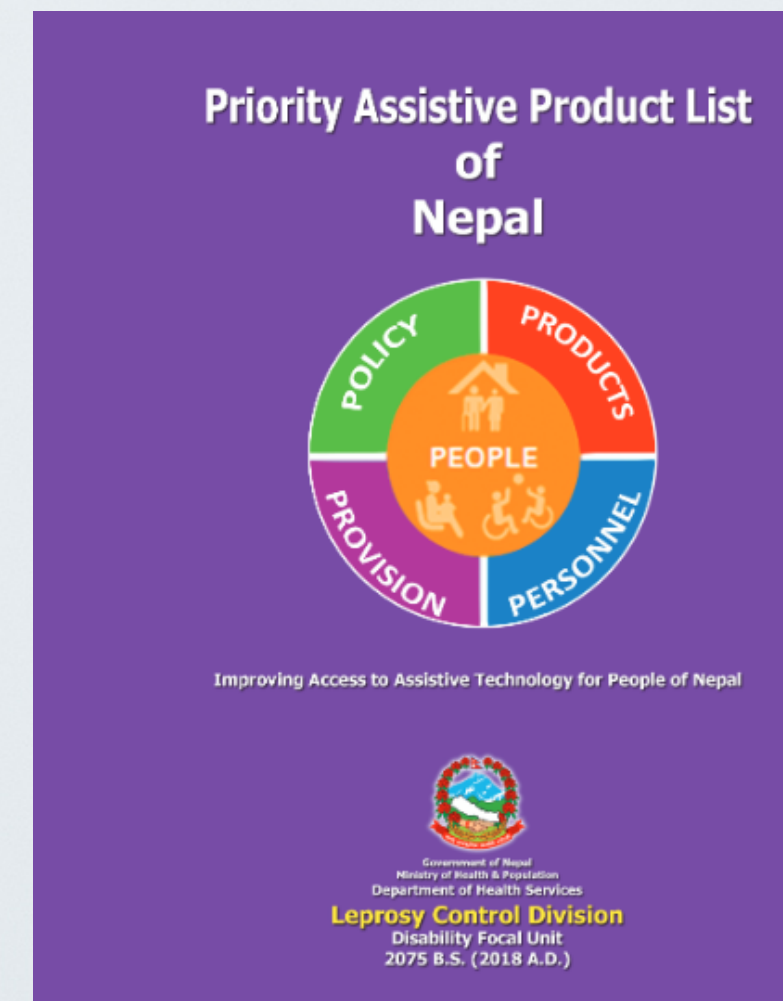
Country-specific initiatives in South Asia



**NATIONAL LIST OF
ESSENTIAL ASSISTIVE
PRODUCTS (NLEAP)
INDIA 2023**



**NATIONAL ASSISTIVE
PRODUCT LIST FOR
BHUTAN**



**PRIORITY ASSISTIVE
PRODUCT LIST OF
NEPAL, 2018**

Group Engagement



**How can AT connect with
service delivery for people with disability
in your country context ?**



Opportunities for AT in South Asia



Integrating AT into Universal Health Coverage (UHC)

- Incorporating AT into UHC can improve equitable access and financial protection for people requiring assistive products.



Expanding Digital and Smart Assistive Technologies

- Digital ATs improve chronic disease monitoring, medication adherence, and self-care.
- For MH scaling platforms like Telemanas to expand the reach for AT awareness and referral for Rehabilitation services



Addressing the Growing Burden of NCDs

- AT can reduce disability and improve quality of life by supporting rehabilitation, self-management, and independent living for people with NCDs.



Bridging the Access Gap in LMICs

- Despite growing demand, in many LMICs, only around 3% of people in need have access to affordable AT, highlighting a major opportunity for service expansion and innovation.



Supporting Healthy Ageing

- More than 2.5 billion people globally currently need at least one assistive product, and this number is projected to exceed 3.5 billion by 2050, creating substantial demand for age-friendly assistive solutions.



Economic and Market Growth Potential

- The global assistive technology market is projected to reach USD 26–31 billion, creating opportunities for local manufacturing, research, innovation, and public-private partnerships.

Assistive Technologies (NCD-associated)

Mobility Aid

Exobot GripX

An advanced upper-limb prosthetic hand featuring adaptive grip technology and precise control, designed to enhance functionality, independence, and user confidence in daily activities.



NeoBolt

An advanced upper-limb prosthetic hand featuring adaptive grip technology and precise control, designed to enhance functionality, independence, and user confidence in daily activities.



Sahayatha Wheelchair S100/S200

A powered wheelchair with an integrated commode and auto-cleaning system, supporting hygiene, comfort, and independent mobility.



Vision Aid

Smart Vision Glasses

AI-enabled smart glasses that assist with text reading, object recognition, and navigation, helping people with visual impairments navigate independently.



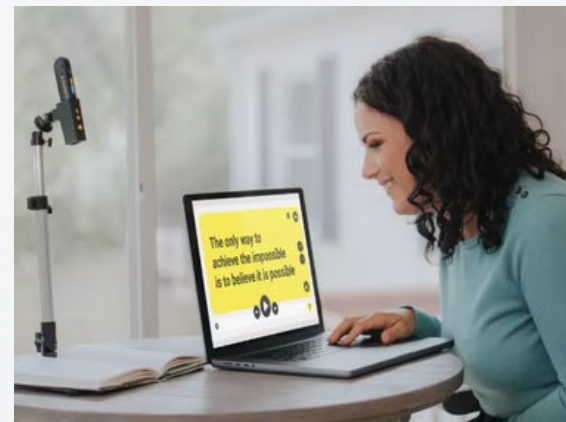
Jyoti by Torch It

AI-powered smart glasses that provide text reading, object and currency recognition, and navigation assistance, enabling greater independence for people with visual impairments.



OrCam Read 3

A portable AI-powered reading and magnification device that reads printed and digital text aloud, magnifies content, and provides interactive assistance for people with low vision and reading difficulties.



Selfcare

LokomatPro Gait Trainee

A robotic gait rehabilitation system that combines an exoskeleton, treadmill, and body-weight support to help individuals relearn walking and improve mobility.



ReWalk 7

A wearable robotic exoskeleton that enables individuals with lower-limb mobility impairments to stand, walk, and navigate independently, improving mobility, health, and participation in daily activities..

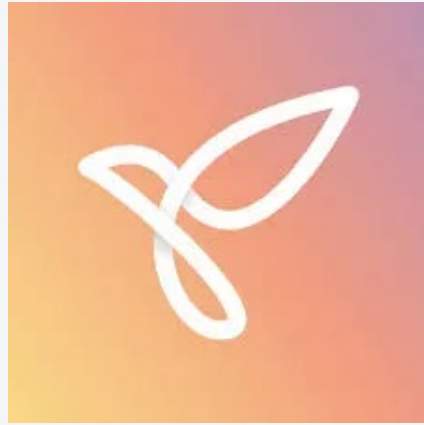


Dexcom G7 & G7 15-Day CGM Systems

CGM that provide real-time glucose readings and alerts, helping people with Type 1 and Type 2 diabetes manage blood sugar levels and make informed treatment decisions.



Assistive Technologies (MH-associated)



Youper

An AI-powered mental health app that uses CBT techniques to help users manage anxiety, challenge negative thought patterns, reduce overthinking, and build healthier coping strategies.

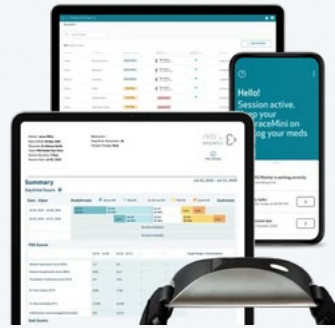
AngelSense GPS Tracker

A wearable GPS-based safety and monitoring device that provides real-time location tracking, geofence alerts, route monitoring, and communication features to support the safety, independence, and well-being.



AdagioVR

A virtual reality-based mental health platform that delivers immersive, evidence-based interventions to help individuals manage stress, anxiety, trauma, and burnout while improving emotional well-being and resilience.



Empatica Health Monitoring Platform for Parkinson's

AI-enabled wearable monitoring platform that continuously tracks motor symptoms such as tremor, bradykinesia, dyskinesia, gait, sleep, and medication response in people with Parkinson's disease.

Jiobit Smart Tag

Real-time location tracking wearable for children and vulnerable individuals requiring supervision.



Neuphony EEG Headband

EEG neurofeedback wearable that measures brain activity in real time and provides personalized neurofeedback therapy to improve focus, calmness, mood regulation, stress management, and cognitive performance.



Wysa

An AI-powered mental health chatbot that delivers CBT-based emotional support, self-care exercises, and mood management through conversational coaching.

Mave

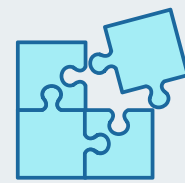
Wearable transcranial Direct Current Stimulation (tDCS) headset designed to improve stress regulation, focus, mood, attention, and cognitive resilience through low-intensity electrical stimulation of the prefrontal cortex. Paired with a mobile app for session management and progress tracking.



MindPeers

Mental wellness platform integrating psychological assessments, therapy services, and wearable-linked sleep and behavioral analytics for personalized mental health insights.





Challenges related to AT access in South Asia

01

Low Awareness of AT and Available Services

- Demand side gap- mainly for NCDs due to lack of awareness. In MH it is compounded by active avoidance.
- In Bangladesh, reports only 6–7% disability identification, Nepal reports 2–4 year delays before users learn of prosthetic services, while Sri Lanka highlights major information gaps in rural and estate communities.

02

Shortage of Skilled Workforce

- Afghanistan, Pakistan, Nepal, Bangladesh, Bhutan, and Maldives report shortages of trained rehabilitation and AT professionals, affecting assessment, fitting, and follow-up.
- Availability of skilled workforce for MH-related disability is even more skewed than NCDs.

03

Urban-Centric Service Delivery

- Bangladesh, Nepal, Pakistan, and Sri Lanka report concentration of services in urban areas, while rural and estate populations face significant access barriers and travel costs.
- Nepal and Bangladesh largely rely on camp-based service delivery; users reported repeated referrals across facilities, increasing travel costs and delays in accessing services.

04

High OOPE

- Overall, OOP health expenditure is around 60 %, there is low private insurance coverage and limited government mechanisms of pre-payment and subsidy.
- Hearing aids cost 5,000–7,000 BDT in Bangladesh and 100,000–200,000 LKR in Sri Lanka; Nepal and Pakistan similarly report affordability as a major barrier.
- For MH, there is no dedicated budget line for ATs for people with psychosocial disabilities.

05

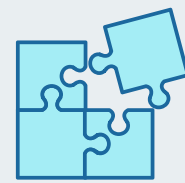
Limited National Assistive Product Lists (APLs)

- Only Bhutan, India, and Nepal have established national priority assistive product lists, resulting in fragmented procurement and inconsistent access to essential assistive products across the region.

06

High Unmet Need for AT

- Maldives reports unmet need of 36% for communication and 34% for hearing impairments; Sri Lanka reports 20% unmet need; Pakistan reports only 22% of AT needs met.



Challenges related to AT access in South Asia

07

Fragmented Governance and Coordination

- Sri Lanka, India, Nepal, and Pakistan report fragmented responsibilities across health, social welfare, and education sectors, leading to inefficient service delivery.
- The AT policy is typically split across health, social welfare and disability ministries with no single accountability and a comprehensive nationally aligned planning/ guideline for AT access.

08

Product supply mismatch

- The product design is poorly informed by the end user need
- AT often are not designed to fit the environment in low-resource settings, including the skillset of healthcare workers.
- The product material is often not suitable for the hot and humid climate commonly found in South Asian countries.

09

Disability and AT Data Systems

- Countries use different disability definitions and assessment methods.
- For example, Blindness prevalence in Nepal varies from 1.2% to 17.4%, illustrating major data inconsistencies across the region.

10

Stigma and Social Exclusion

- Bangladesh, Nepal, Sri Lanka, Pakistan, and Afghanistan report stigma, under-reporting of disability, delayed help-seeking, and reduced AT uptake, particularly among women and persons with invisible disabilities.
- Specially for MH, AT as a category is barely recognised.

Key Recommendations for Strengthening AT access in South Asia



Key Recommendations for Strengthening AT access in South Asia



Thank You

For more information – pbajaj@path.org