




At least 1 billion people in the world in need of assistive technology (AT) and expected to double by 2030.

- Very limited data on need AT globally.
- Lack of reliable data on AT need in different settings.

WHO estimates of need, unmet need and low coverage in LMIC

DOMAIN	ASSISTIVE PRODUCT	NEED	UNMET NEED
VISION	 Glasses	970 million people	Over 200 million people do not have access to spectacles or other low-vision devices.
HEARING	 Hearing aids	466* million people	Products productions meets only 10% of global need and 3% of the need in low-income countries.
MOBILITY	 Wheelchair	75 million people	Only 5–15% of the population has access to one.

AT assessment is complex

Different approaches


- Partly depends how impairments, functioning and AT are defined, conceptualised, screened and measured.
- Survey tools
 - Participants' self-report.
 - Detailed clinical assessment.
 - Combination of two approaches.





Population-based AT measurement approaches



 METHOD	DESCRIPTION
Single question	'Do you think that services/APs, like hearing aids or walking sticks, would be helpful for you?'
Self-reported	Participants self-report of i) functional limitations and ii) associated need for AT amongst people who report functional difficulties.
Clinical impairment assessment	Standardised population-based methods for measuring clinical impairment and AT need.
Functional assessment	Combination of self-reported and clinical based data incorporating ICF components. <i>To be developed for all six domains.</i>
Indirect source	Uses data from the prevalence or incidence of related pathologies or conditions that were most strongly correlated with use of AP.

Tools available to measure AT need, unmet need & coverage

Self-reported WHO tools








Model Disability Survey (MDS)



GATE Assistive technology assessment needs (ATA-N)
(adapted WGSS as initial screening)

7. Which of the following assistive products do you think you need that you do not already have?










These are products that help with seeing:

Name of product	Image	Yes	No	Name of product	Image	Yes	No
1 Spectacles		<input type="radio"/>	<input type="radio"/>	4 White cane		<input type="radio"/>	<input type="radio"/>
2 Talking or touching watch		<input type="radio"/>	<input type="radio"/>	5 Braille equipment		<input type="radio"/>	<input type="radio"/>
3 Magnifier or telescope		<input type="radio"/>	<input type="radio"/>				

These are products that help with hearing:

SN	Name of product	Image	Yes	No	SN	Name of product	Image	Yes	No
6	Alarm signaler with light or vibration		<input type="radio"/>	<input type="radio"/>	8	Personal sound amplifier		<input type="radio"/>	<input type="radio"/>
7	Hearing aid		<input type="radio"/>	<input type="radio"/>					

These are products that help with moving from place to place:

SN	Name of product	Image	Yes	No	SN	Name of product	Image	Yes	No
9	Crutches, axillary or elbow		<input type="radio"/>	<input type="radio"/>	15	Portable ramp		<input type="radio"/>	<input type="radio"/>
10	Stick or cane		<input type="radio"/>	<input type="radio"/>	16	Grab bar		<input type="radio"/>	<input type="radio"/>
11	Walking frame or rollator		<input type="radio"/>	<input type="radio"/>	17	Therapeutic footwear		<input type="radio"/>	<input type="radio"/>
12	Orthosis or brace (for the foot, leg, hand, arm or spine)		<input type="radio"/>	<input type="radio"/>	18	Wheelchair		<input type="radio"/>	<input type="radio"/>
13	Prosthesis (artificial leg)		<input type="radio"/>	<input type="radio"/>					

Clinical impairment assessment

- ICED India and Cameroon research (*Mactaggart et al*)

Functional assessment

- To be developed at population-level.

Indirect source

- WHO regional office Tajikistan study

Example: Cameroon and India survey



Two population-based district level disability surveys in India and Cameroon (2013-14) investigated relationship between self-reported functional limitations & objectively-screened clinical impairments.



Objectives: To conduct secondary analysis of district level disability surveys in India and Cameroon:

1. To estimate the population use, unmet need, total need and coverage for 3 ATScale priority APs (distance glasses, hearing aids and wheelchairs) in each setting.
2. To explore relationship between data on AP need captured through self-report and clinical impairment assessment.

Methods

- Survey data collected: Self-reported functional limitations, clinical impairment assessment, and self-reported AT need.
- Data analysis: STATA 15.


Calculated for each AP (distance glasses, hearing aid and wheelchair):

- **Use:** use of AP/total study population.
- **Unmet need:** need AP (but not using)/total study population.
- **Total need:** using or needing AP/total study population.
- **Coverage:** use of AP/total need.

Stratified 'total need' estimates for distance glasses and hearing aids by age and sex.

Explored relationship between self-report and clinical impairment assessment for estimating AP need.

Results: total need and coverage

	INDIA		CAMEROON	
	TOTAL NEED	COVERAGE	TOTAL NEED	COVERAGE
TOTAL 3 APs (moderate VI)	6.5%	51%	1.9%	19%
TOTAL 3 APs (mild VI)	9.3%	36%		
Glasses <6/18 (moderate VI)	3.7%	87%	0.8%	37%
Hearing aids	3%	4%	1.2%	7%
Wheelchairs	0.1%	3%	0.1%	0%

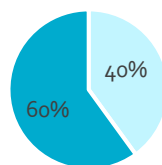
Prevalence of need increased significantly with age but not significantly by gender, i.e. in older adults 60+years distance glasses increased to 8.2% and 4.4% and hearing aids to 20.7% and 7.7% in India and Cameroon respectively.

Results: AP need relationship between self-report and clinical impairment

Amongst those who needed AP

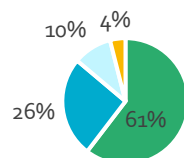
INDIA

Cases (moderate vision impairment) who need distance glasses (n=10)



- Reported needing glasses (n=4)
- Reported not needing glasses (n=6)

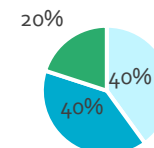
Cases with hearing impairment who need hearing aids (n=102)



- Reported needing a hearing aid (n=62)
- Reported not needing a hearing aid (n=26)
- Reported not knowing what a hearing aid is (n=10)
- Reported using a hearing aid (n=4)

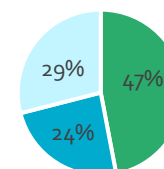
CAMEROON

Cases (moderate vision impairment) who need distance glasses (n=15)



- Reported needing glasses (n=6)
- Reported not needing glasses (n=6)
- Reported using glasses (n=3)

Cases with hearing impairment who need hearing aids (n=38)



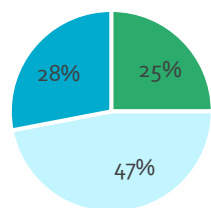
- Reported needing a hearing aid (n=18)
- Reported not needing a hearing aid (n=9)
- Reported not knowing what a hearing aid is (n=11)

Results: AP need relationship between self-report and clinical impairment

Amongst those who self-reported needing AP

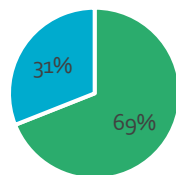
INDIA

Cases (moderate vision impairment) who reported needing distance glasses (n=60)



- Refractive error (n=15)
- Cataract surgery (n=28)
- No vision impairment (n=17)

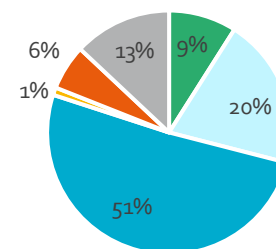
Cases who reported needing a hearing aid (n=90)



- Need a hearing aid (n=62)
- Do not need a hearing aid (n=28)

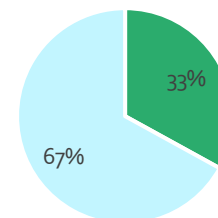
CAMEROON

Cases (moderate vision impairment) who reported needing distance glasses (n=69)



- Refractive error (n=6)
- Cataract surgery (n=14)
- No vision impairment (n=35)
- Surgical complications (n=1)
- Glaucoma (n=4)
- Other post segment/CNS (n=9)

Cases who reported needing a hearing aid (n=54)



- Need a hearing aid (n=18)
- Do not need a hearing aid (n=36)

Prevailing WHO framework for measuring health and disability at both individual and population levels

Health

Functional needs tool

Combination of tools measuring impairment and assessing function in line with the ICF to estimate service and assistive product needs for a wider population.

**Environmental
Factors**

Personal Factors

Functioning assessment

Provide a holistic picture of individuals' abilities and daily living skills

3 HEALTH INDICATORS

1. Mortality

2. Morbidity

3. Functioning!!

Approx. 2.4 billion*

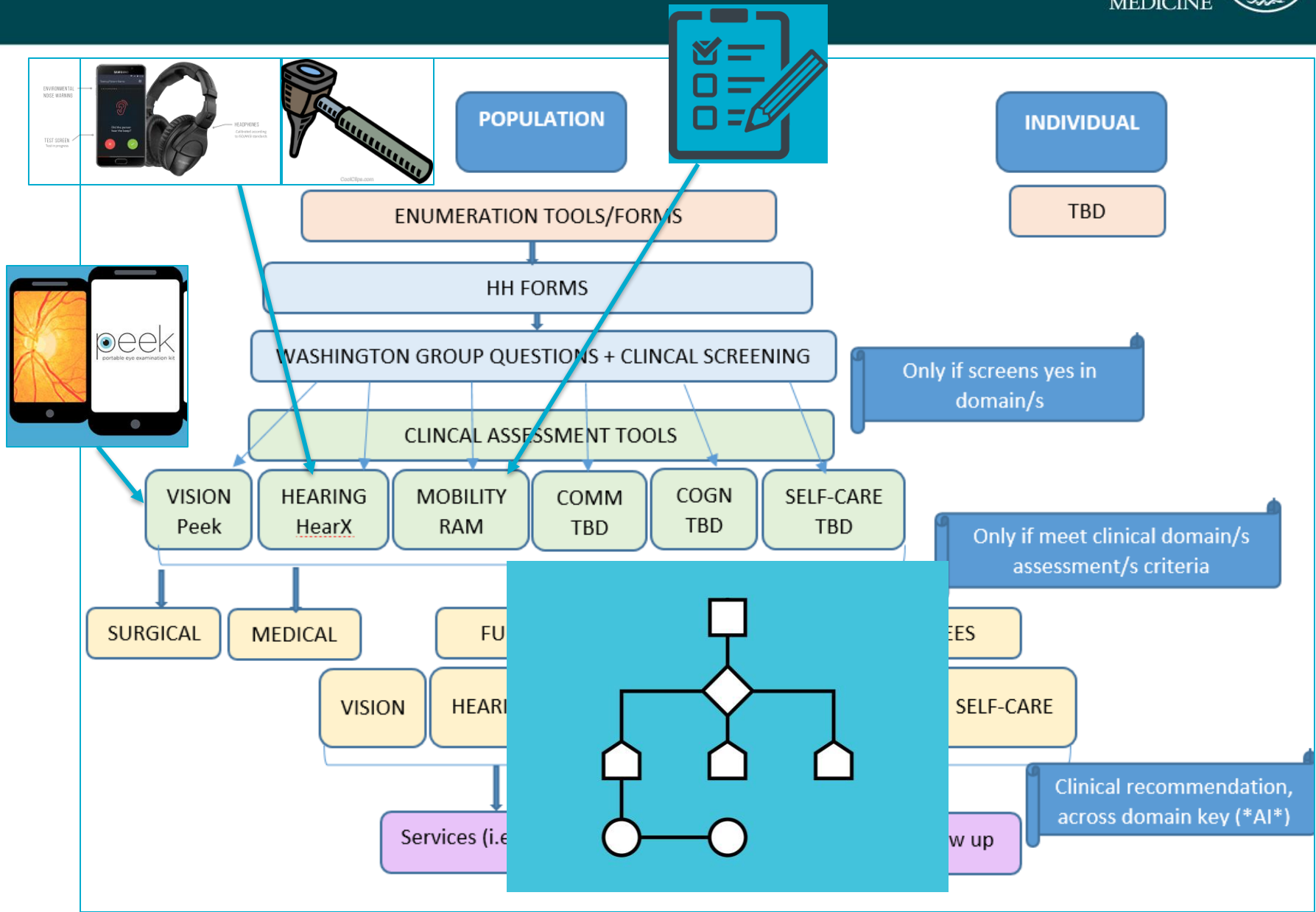
* gross estimates from GBD data



(Image credit: WHO DAR)

Quinn et al, 2011; Desrochers and Fallon, 2013; WHO, 2011; WHO DAS

Proposed all-age survey tool

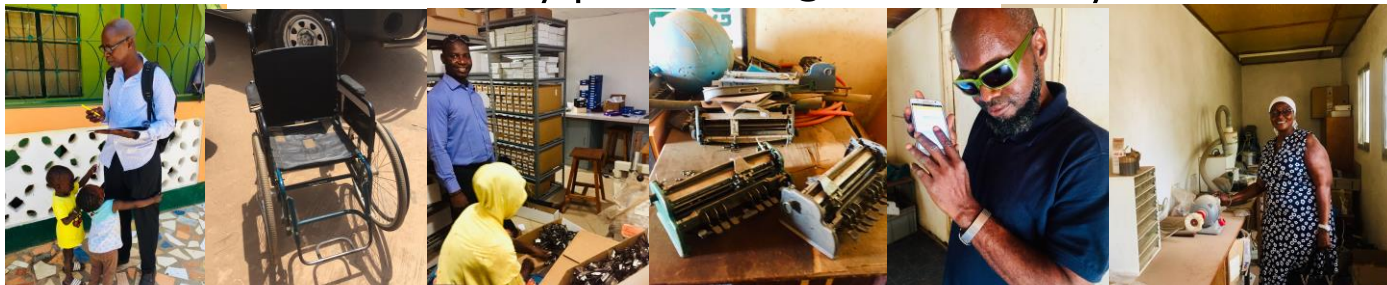


Need to close the AT data gap by building up the evidence base.

- Requires the development of hybrid tools compatible with the ICF.
- All-age population-level AT estimates of need, unmet need and coverage.
- Systematic use to enhance comparability between settings and over time.

LSHTM AT2030 research

- Complete data analysis from The Gambia and Turkey surveys
- Further develop clinical impairment measurement methodology and pilot functional assessment questionnaires in The Philippines and The Gambia follow up surveys in Q1 2020.
- With AT2030 partners, develop AP decision trees (WHO & GDI) and bespoke mobile survey app (GDI).
- Full six functional domain survey planned Q3 2020 in Kenya.



THANK YOU!

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HYGIENE
& TROPICAL
MEDICINE



International
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in Disability

