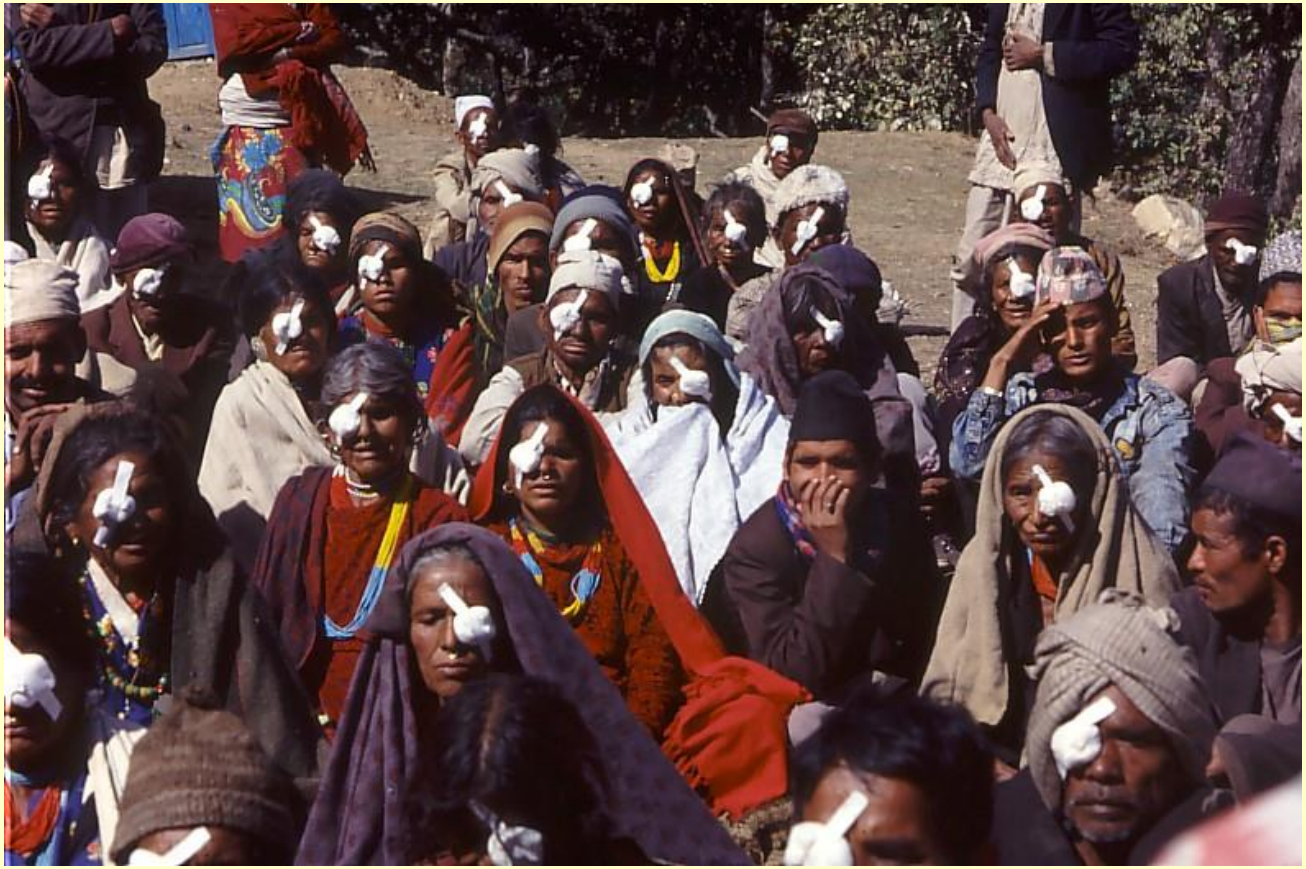
Na VISION 2020, hoe nu verder…



Hans Limburg MD PhD

Consultant Public Eye Health

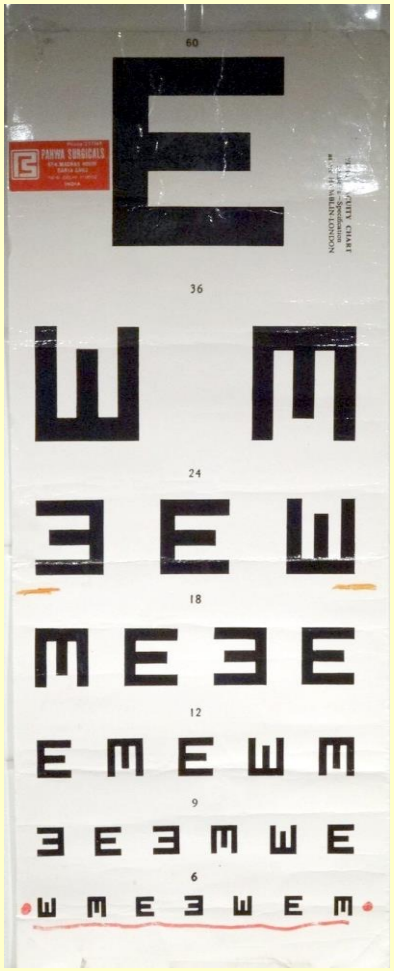
What is blindness / visual impairment (WHO definitions)?



WHO Categories of visual impairment
(ICD-9 version 1972)

Decimal	Snellen (ft)	Snellen (m)	
1	20/20	6/6	Normal vision
0.5	20/40	6/12	
0.3	20/60	6/18	
0.1	20/200	6/60	Low Vision
0.05	20/400	3/60	
0.017	20/1200	1/60	Blind
PL+	PL+	PL+	
PL-	PL-	PL-	

*with **best** correction in better eye*



WHO Categories of visual impairment
(advice 1998)

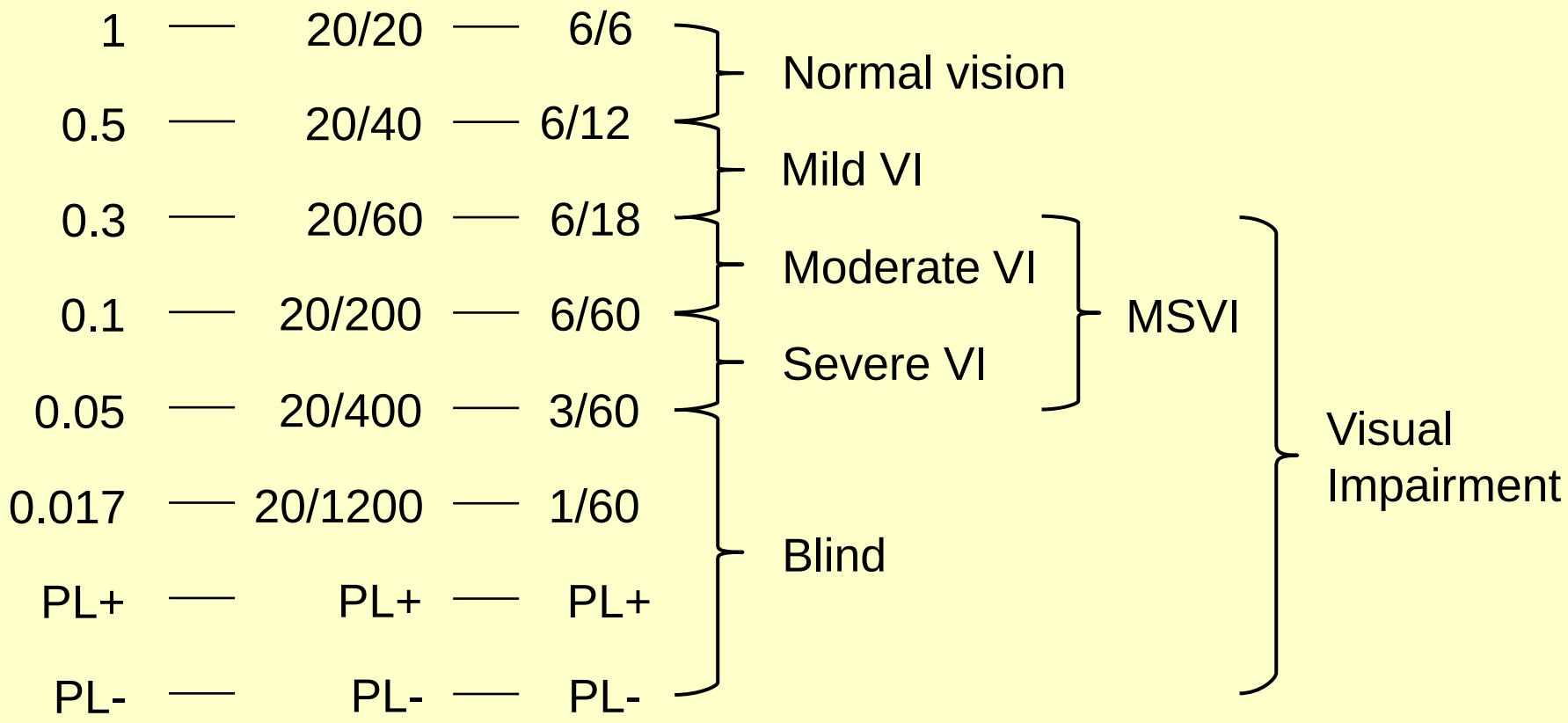
*with **best** correction in better eye (measure also with **available** correction)*

Decimal	Snellen (ft)	Snellen (m)	
1	20/20	6/6	Normal vision
0.5	20/40	6/12	
0.3	20/60	6/18	Moderate VI
0.1	20/200	6/60	Severe VI
0.05	20/400	3/60	
0.017	20/1200	1/60	Blind
PL+	PL+	PL+	
PL-	PL-	PL-	

Low Vision

WHO Categories of visual impairment
(ICD-10 version 2016)

*with **available** correction in better eye*
*(measure also **without** correction)*



WHO Categories of visual impairment
(ICD-10 version 2016)

*with **available** correction in better eye*
*(measure also **without** correction)*

Decimal	Snellen (ft)	Snellen (m)		
1	20/20	6/6	Normal vision	
0.5	20/40	6/12	Mild VI	**258 million**
0.3	20/60	6/18	Moderate VI	
0.1	20/200	6/60	Severe VI (MSVI)	**295 million**
0.05	20/400	3/60		
0.017	20/1200	1/60	Blind	**43 million**
PL+	PL+	PL+		
PL-	PL-	PL-		

2020: distant vision impaired **596 million**

near vision impaired **510 million**

WHO International policy

1997–2020: VISION 2020: The Right to Sight

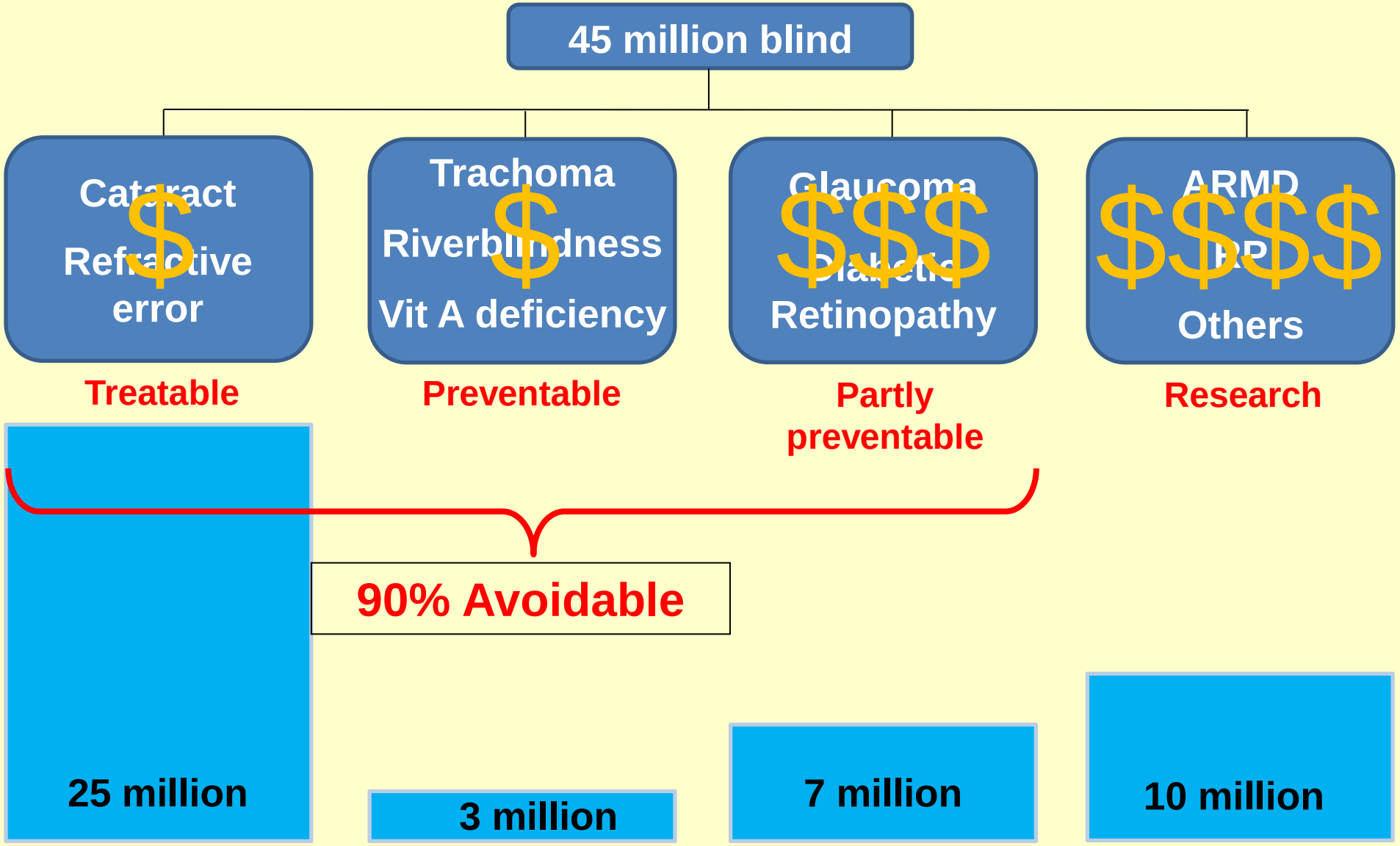
Focus on priority eye diseases

Cataract
Uncorrected Refractive Error (URE)
Trachoma
Rivierblindness
Childhood blindness
(Glaucoma and diabetic retinopathy)

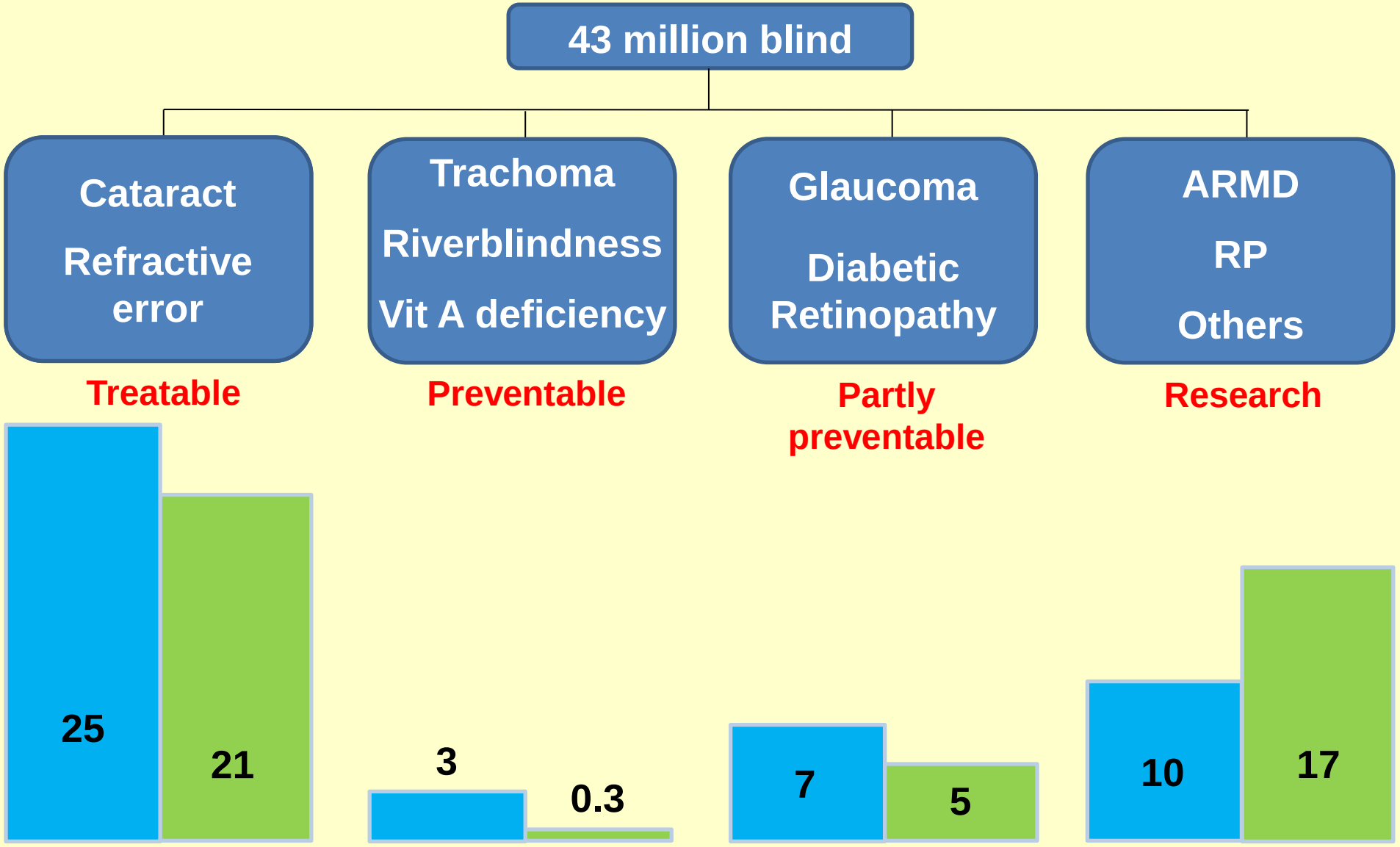
Develop national eye care plans

Ophthalmic staff: training and CME
Infrastructure: equipment, instruments, transport, etc.
Health education and promotion of eye care

Causes of blindness 1997

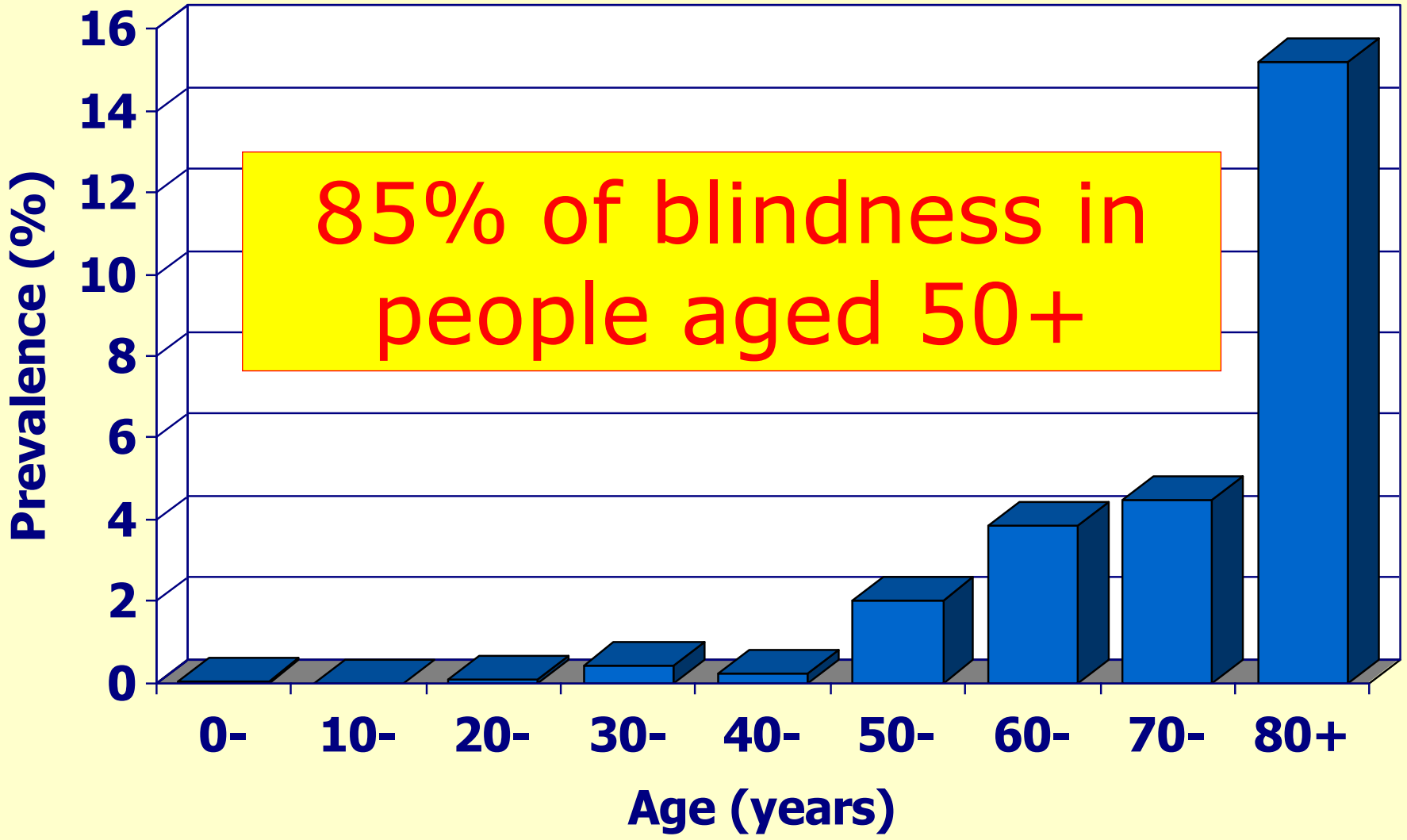


Causes Blindness 2020 (GBD)

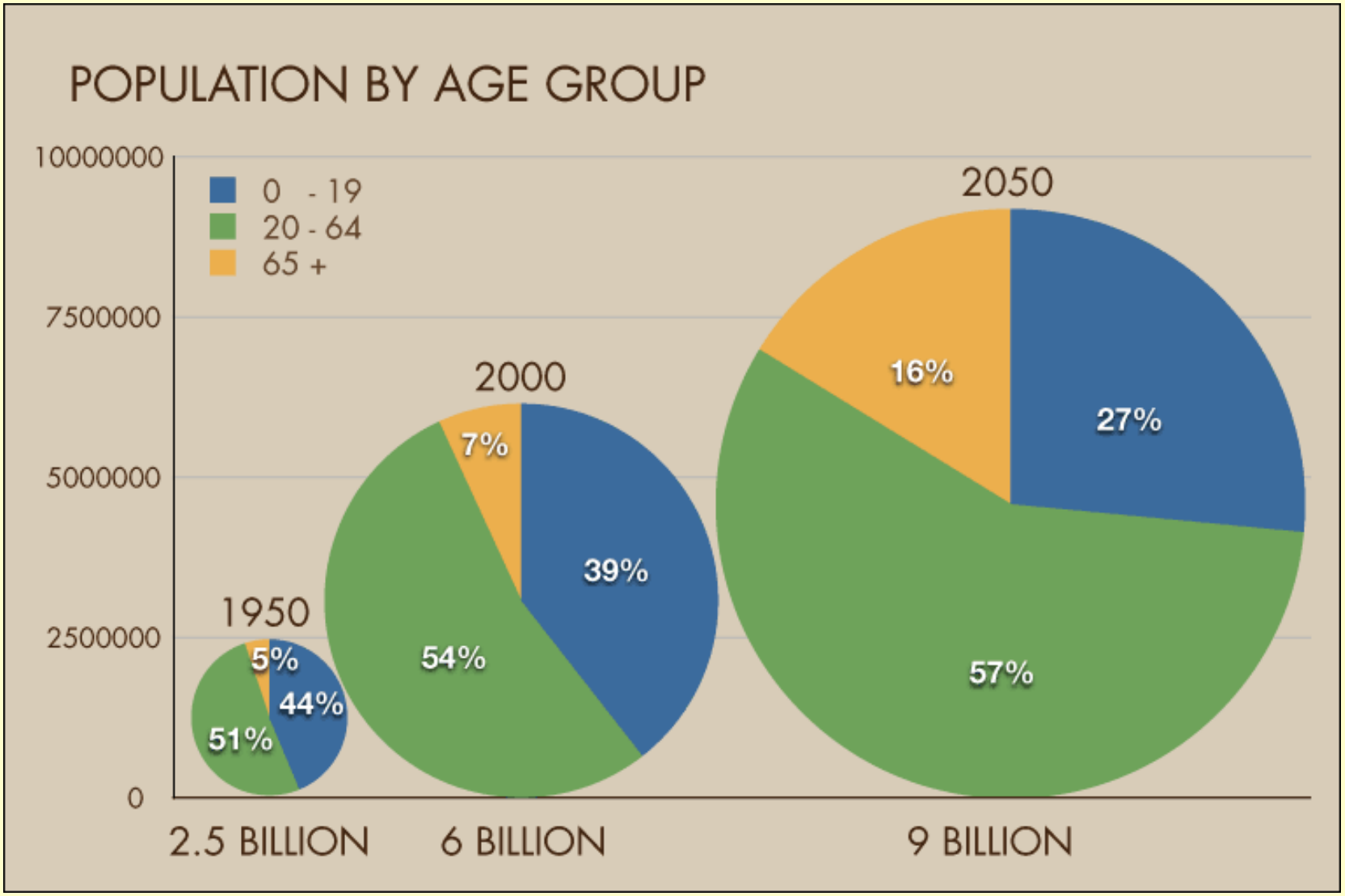


The Gambia: Blindness by age

(Faal H, Minassian DC, Dolin PJ, et al. Evaluation of a national eye care programme: re-survey after 10 years. *Br J Ophthalmol*. 2000;84:948–951)



Demographic changes – ageing trend



Changing epidemiology of eye diseases

Number of people blind and VI worldwide

Cataract 

Uncorrected refractive errors 

Trachoma 

Onchocerciasis 

Childhood blindness 

Glaucoma 

Diabetic Retinopathy 

Macula Degeneration 

New insights 1997 - 2020

Ageing, also in LMIC

- More people 50+
- Life expectancy increasing
- Prevalence age related eye diseases increasing

At start, focus on blindness only

- VA<6/18: loss of work
- Include Moderate and Severe Visual Impairment

Better cataract surgery techniques

- Better results
- Demand increasing
- VA criteria for cataract surgery lower

Lot of research

RAAB: Rapid Assessment of Avoidable Blindness (People ≥ 50 years)

Population based survey on blindness and VI

- Standardized protocol, software and data analysis
- Population-based cluster sampling
- Prevalence of blindness & visual impairment
- Causes of blindness & visual impairment
- e-Cataract surgical coverage and e-spectacles coverage
- Outcome of cataract surgery & % IOL implantation
- Barriers to cataract surgery
- Optional: Diabetic retinopathy module

Training of local survey teams

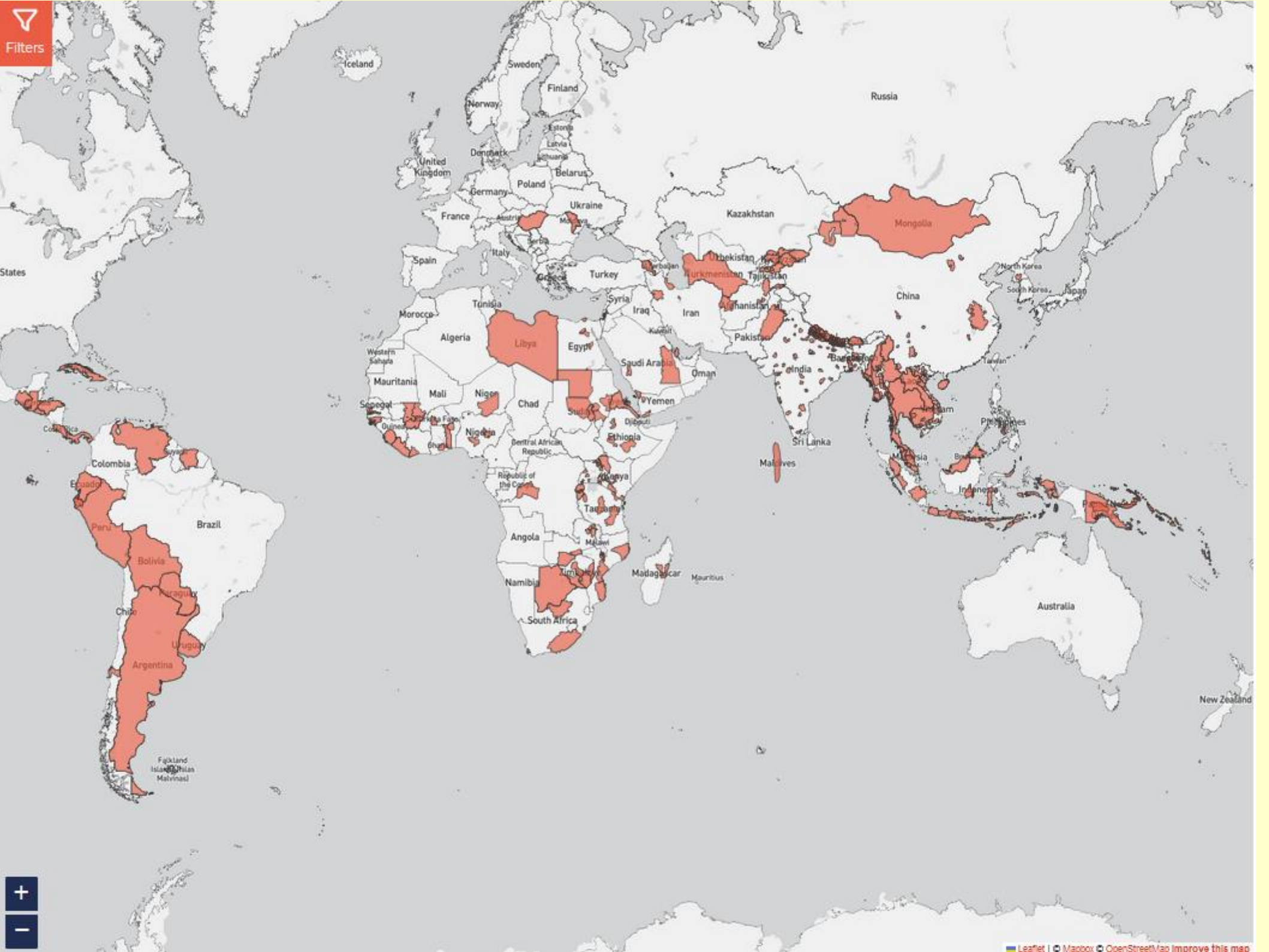


Fieldwork in selected clusters

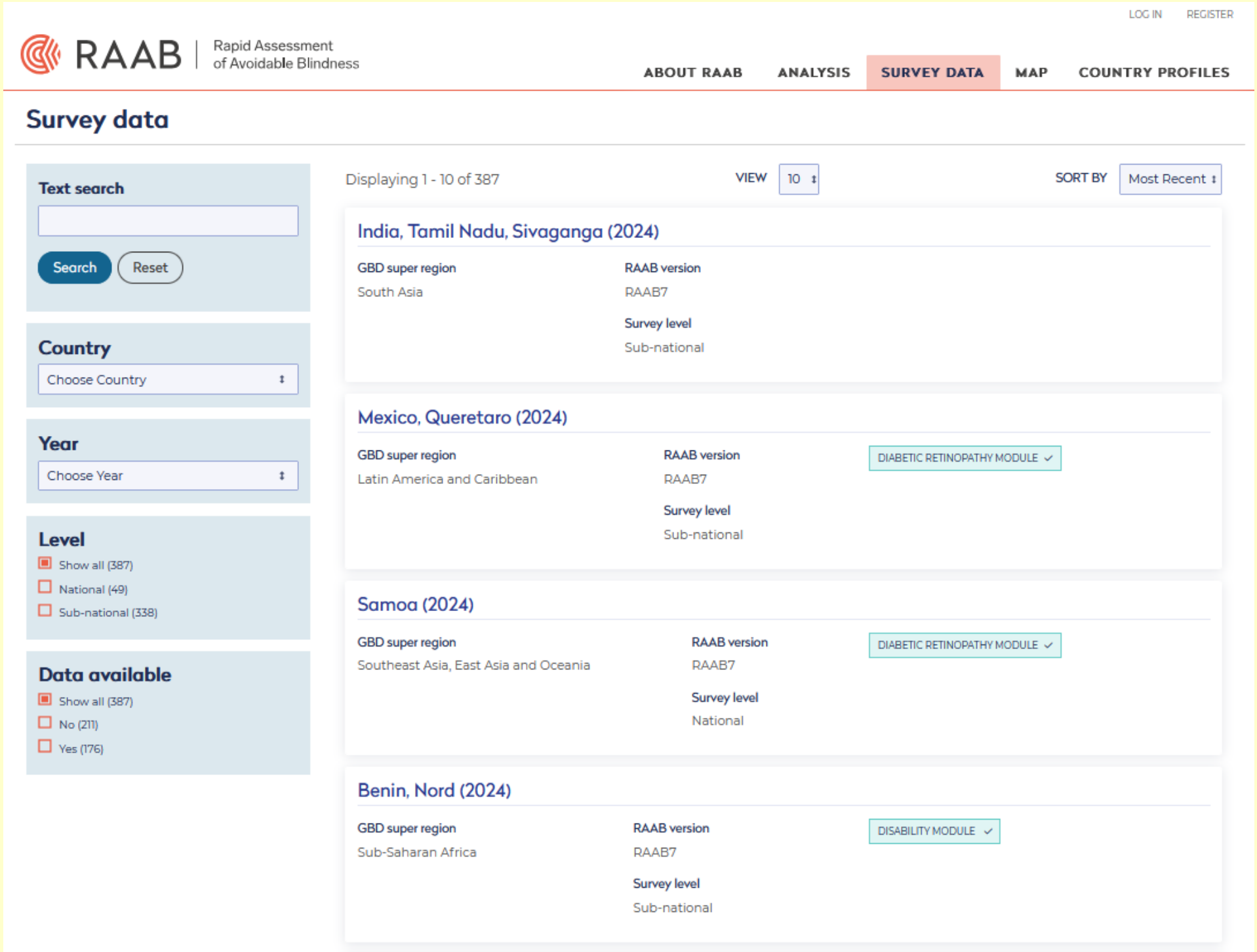


Examination of people with PVA<6/12

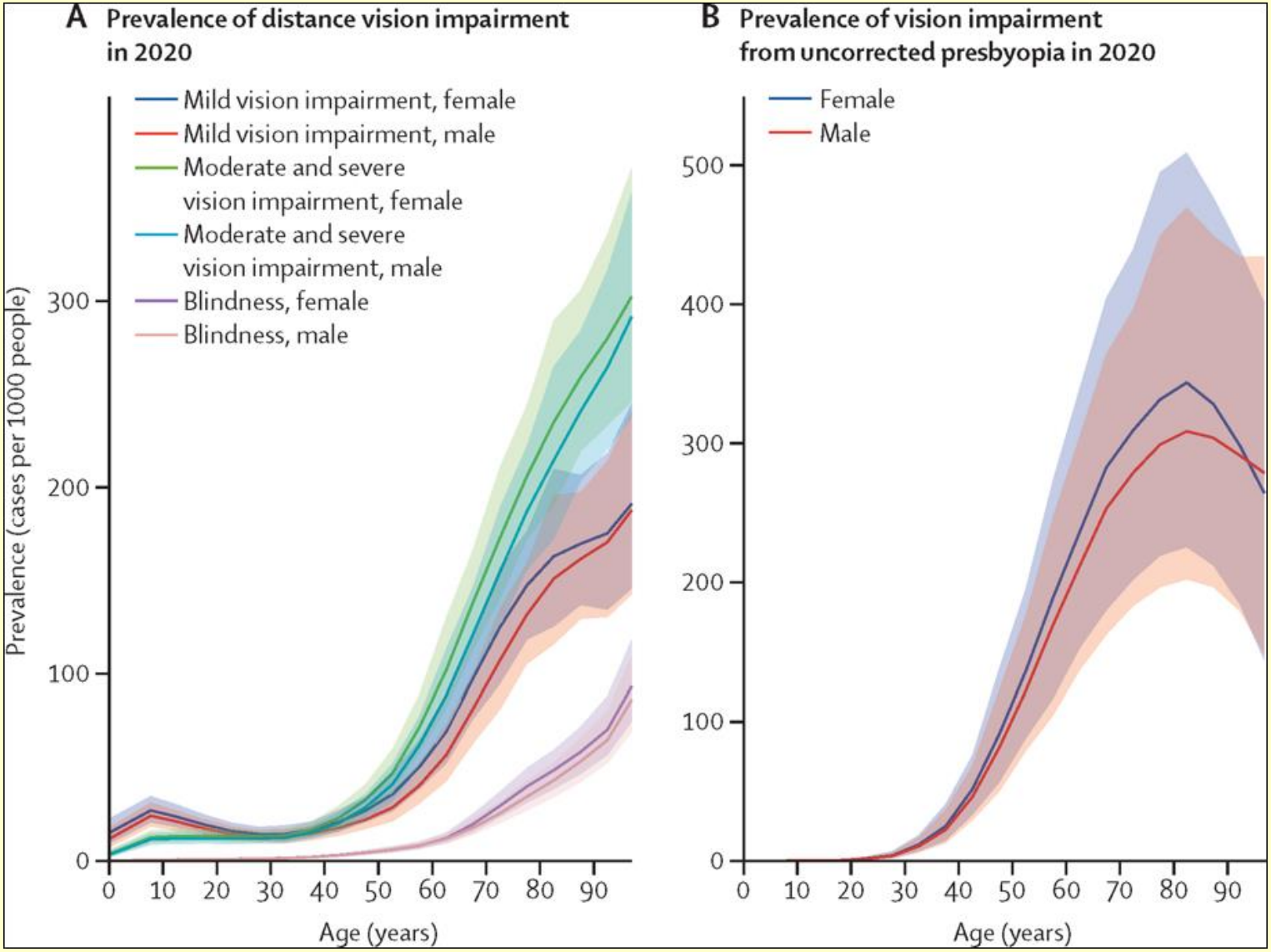



Filters
Iceland
Sweden
Finland
Norway
Russia
Estonia
Latvia
Lithuania
Denmark
United Kingdom
Belarus
Poland
Germany
Ukraine
France
Kazakhstan
Mongolia
Spain
Italy
Uzbekistan
Turkmenistan
Tajikistan
Turkey
Azerbaijan
Georgia
North Korea
South Korea
Japan
China
Syria
Iraq
Iran
Afghanistan
Pakistan
Kuwait
Tunisia
Morocco
Algeria
Libya
Egypt
Western Sahara
Saudi Arabia
Oman
India
Taiwan
Mauritania
Mali
Niger
Chad
Yemen
Sudan
Djibouti
Senegal
Guinea
Nigeria
Ethiopia
Sri Lanka
Maldives
Central African Republic
Republic of the Congo
Kenya
Tanzania
Angola
Malawi
Zimbabwe
Namibia
Madagascar
Mauritius
South Africa
Australia
New Zealand
Colombia
Ecuador
Peru
Brazil
Bolivia
Paraguay
Chile
Uruguay
Argentina
Falkland Islands (Islas Malvinas)
Leaflet | © Mapbox © OpenStreetMap Improve this map

RAAB Repository (www.raab.world/survey-data/)

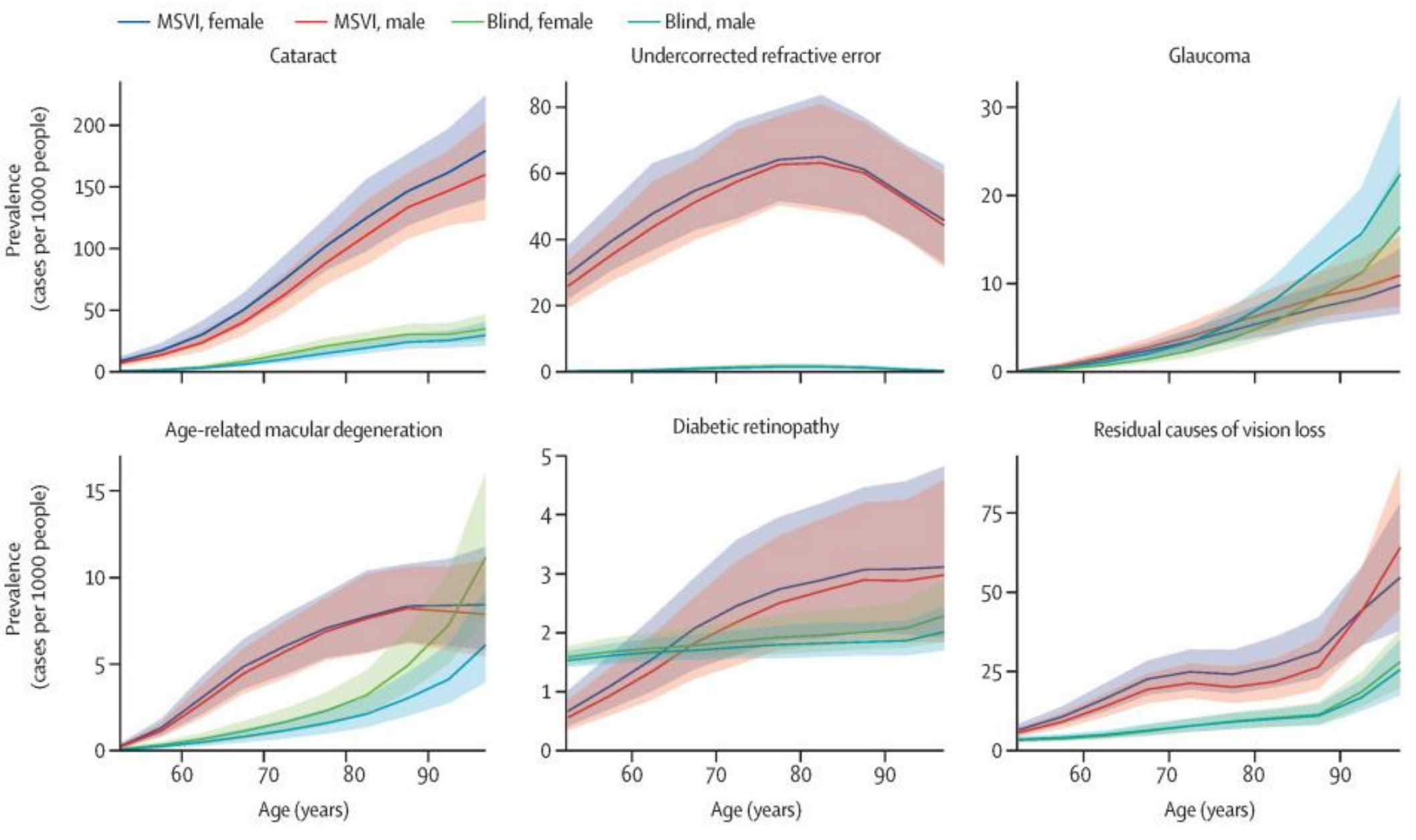


Estimated age specific blindness and VI in 2020



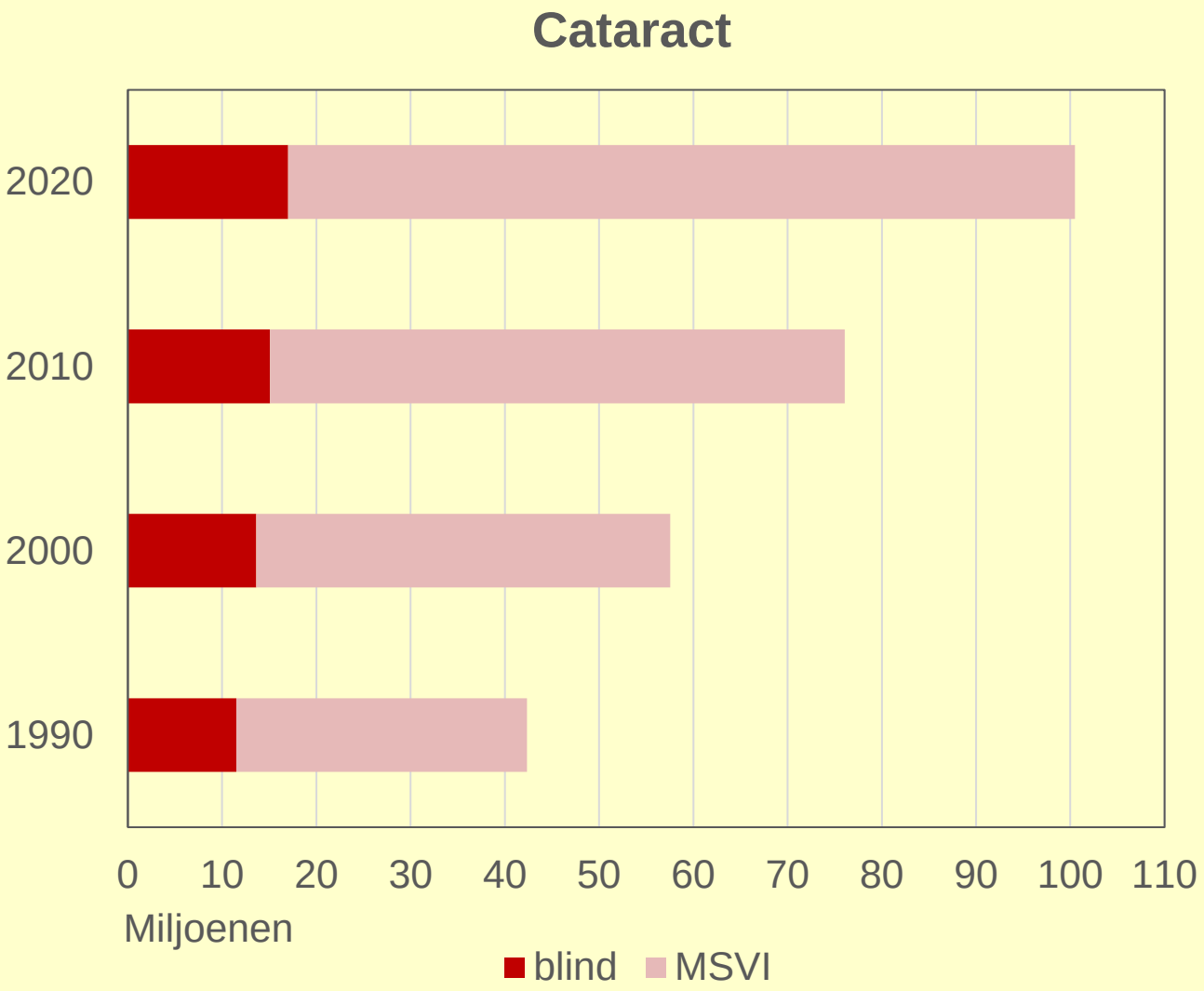
Trends in prevalence of blindness and distance and near vision impairment over 30 years: an analysis for the Global Burden of Disease Study. VLEG. The Lancet Global Health, Vol 9, Feb 2021

Age-specific prevalence rates of distance blindness and MSVI by cause and by sex in adults aged 50 years and older in 2020



Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: the Right to Sight: an analysis for the Global Burden of Disease Study

Cataract

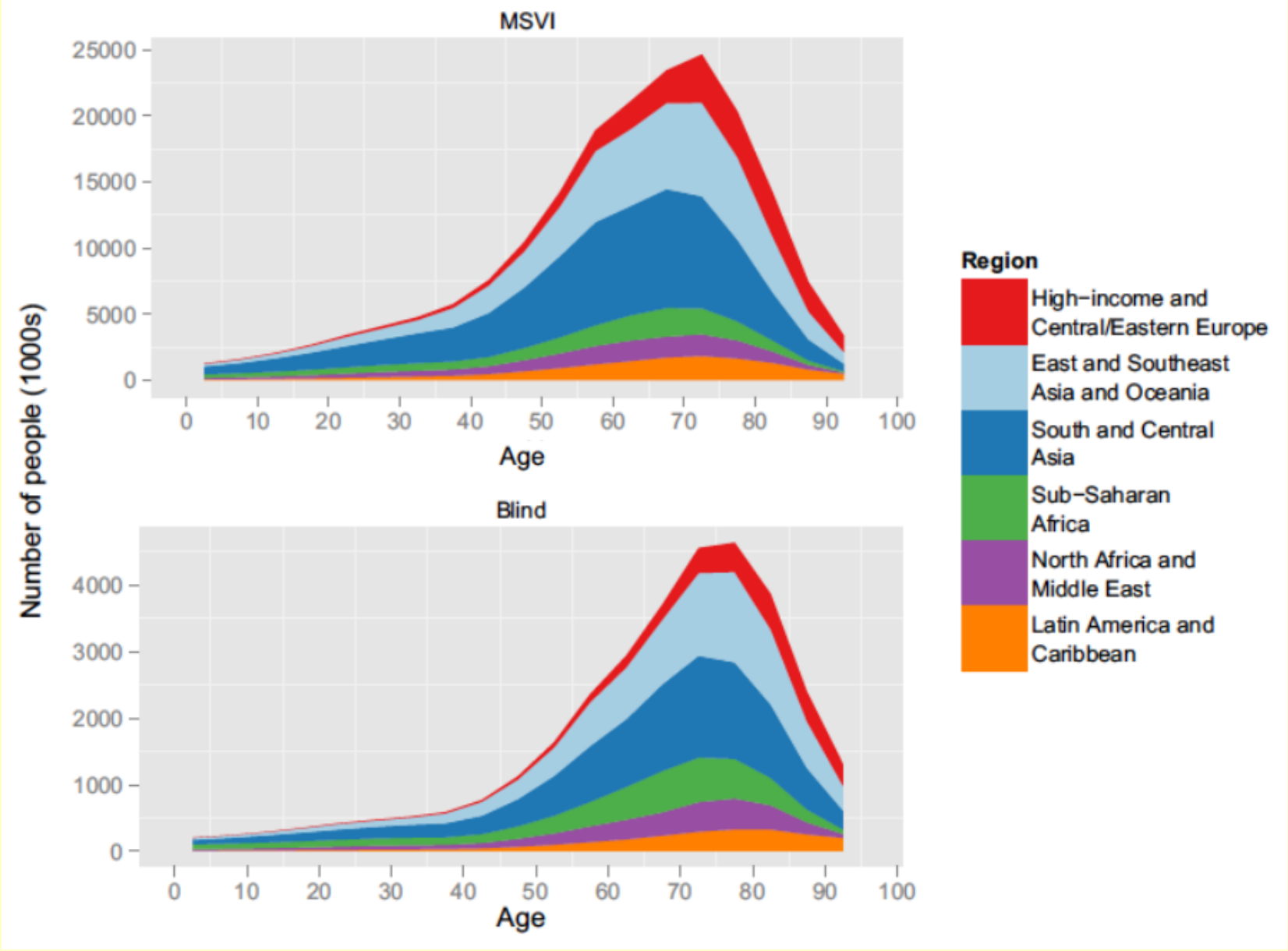




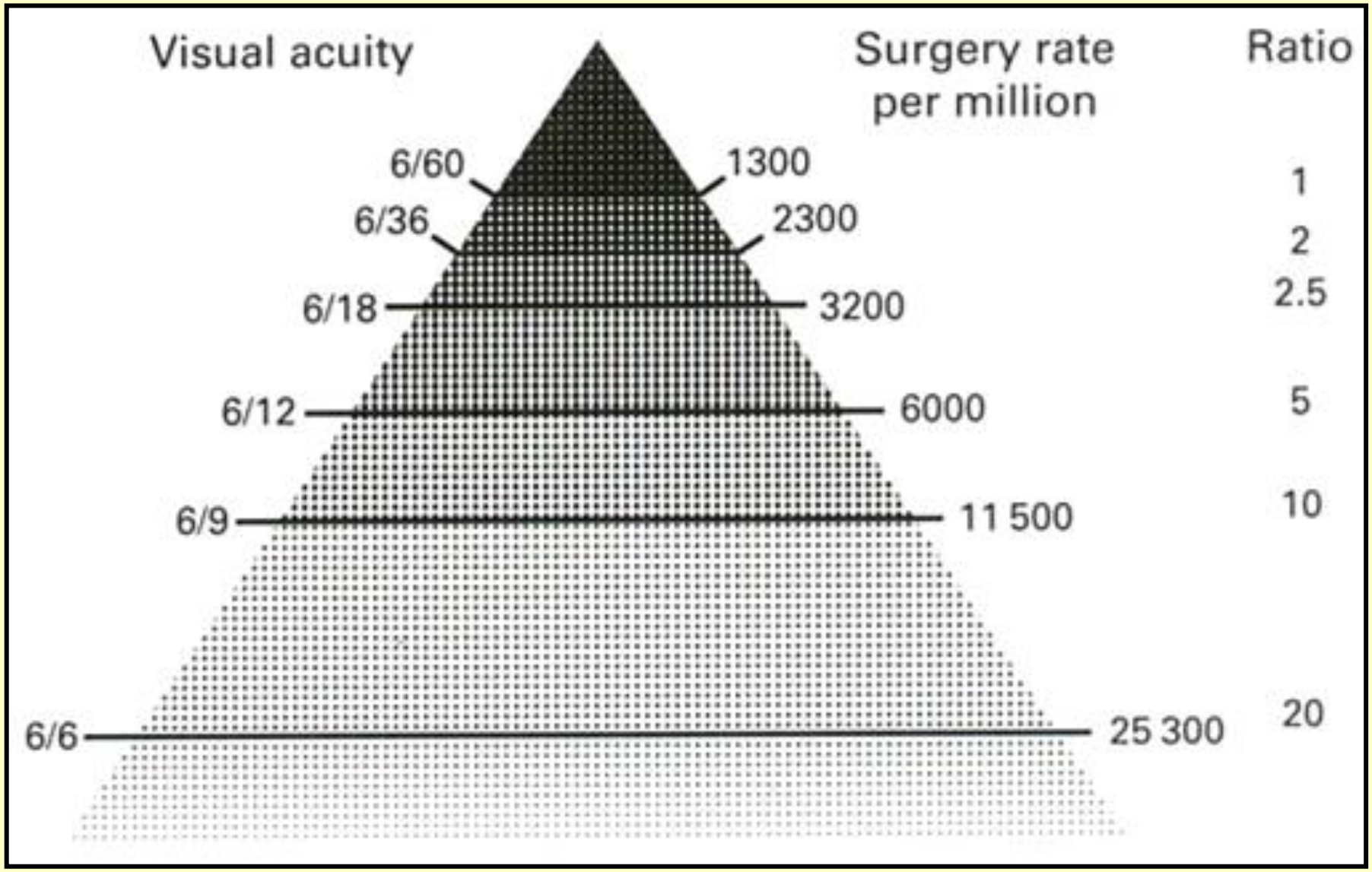


Data from Vision Atlas

Most blindness and MSVI in people aged 50+ in 2017



Visual Acuity criteria for surgery and cataract surgical rate

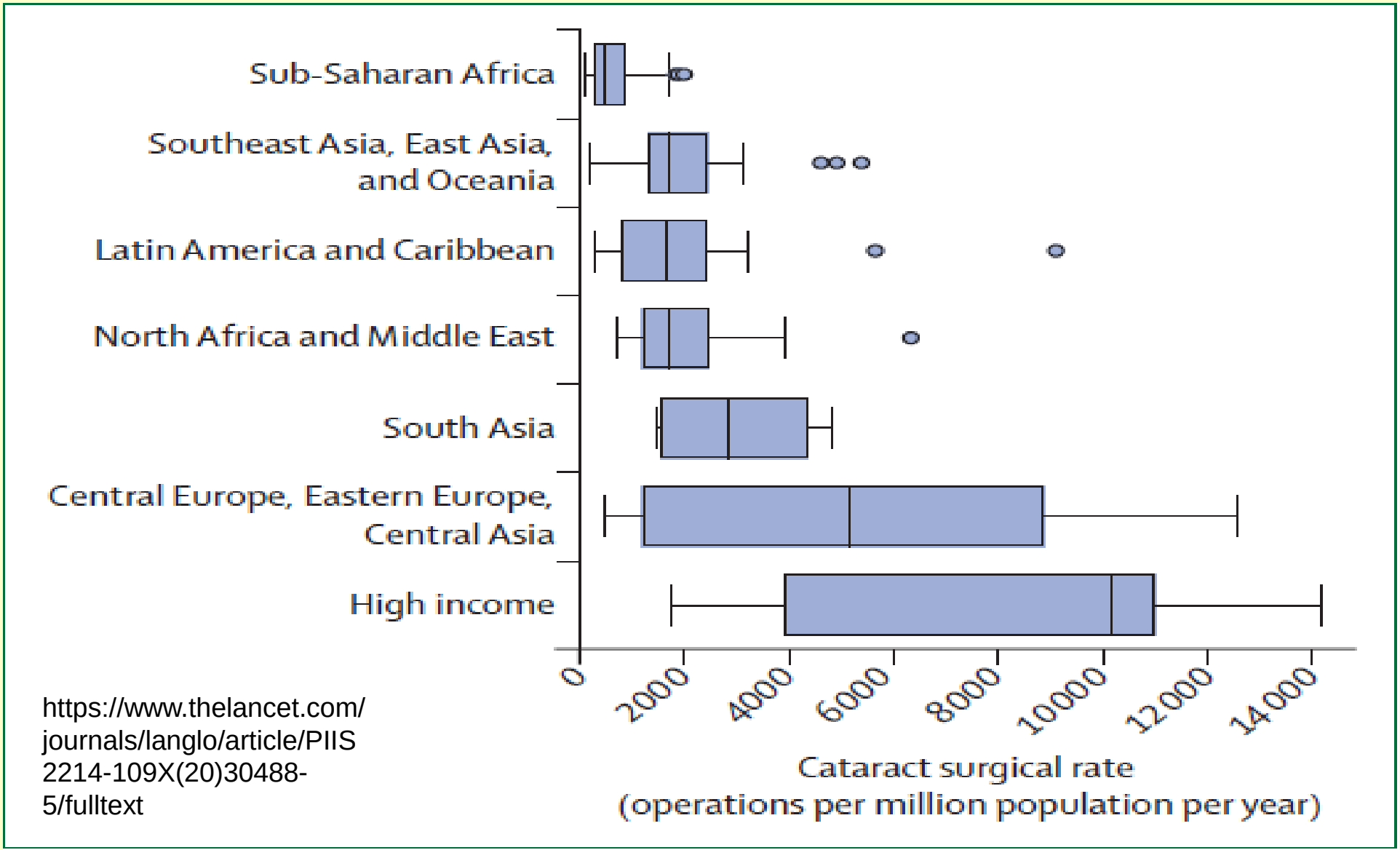


Taylor H. Cataract: how much surgery do we have to do? Br J Ophthalmol 2000;84:1-2

Cataract Surgical Rate:

No. of cataract operations / million people / year

WHO Target: Africa > 2000; Asia > 3000



https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(20)30488-5/fulltext

Cataract Surgical Rate:

No. cataract operations / million people / year

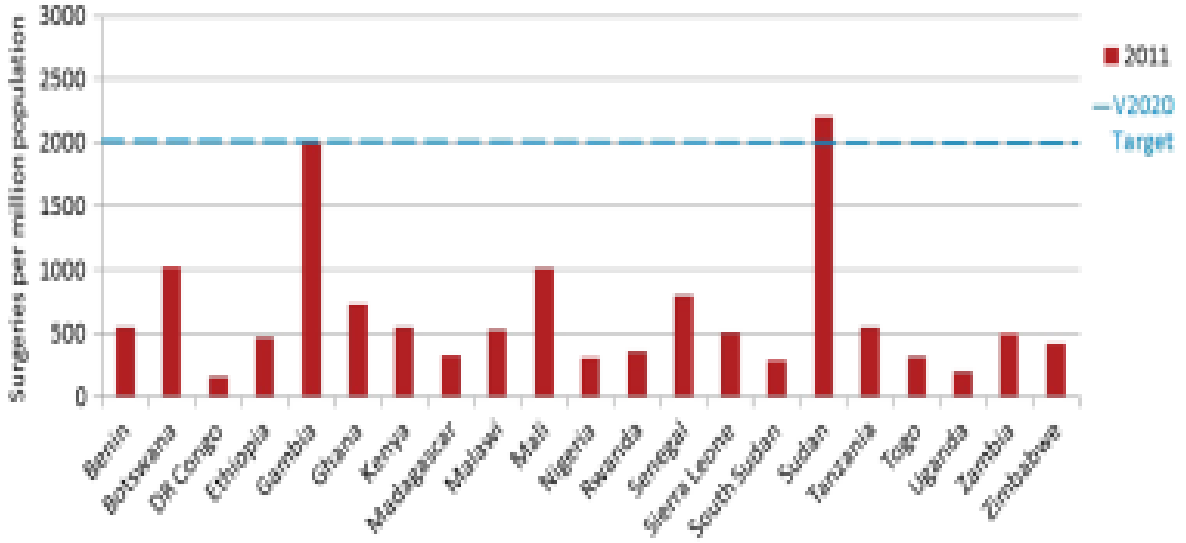


Figure 6 Cataract surgeries per million population in 2011. Estimates of surgeries for '2011' come from 2008 for Malawi, from 2010 for Benin, Botswana, Democratic Republic (DR) of Congo, Ethiopia, Gambia, Ghana, Kenya, Madagascar, Rwanda, Senegal, Sierra Leone, Sudan, Uganda and Zimbabwe and from 2012 for South Sudan.

CSR is proxy for output of cataract surgery programme

Barriers to cataract surgery

Why do patients not present spontaneously?

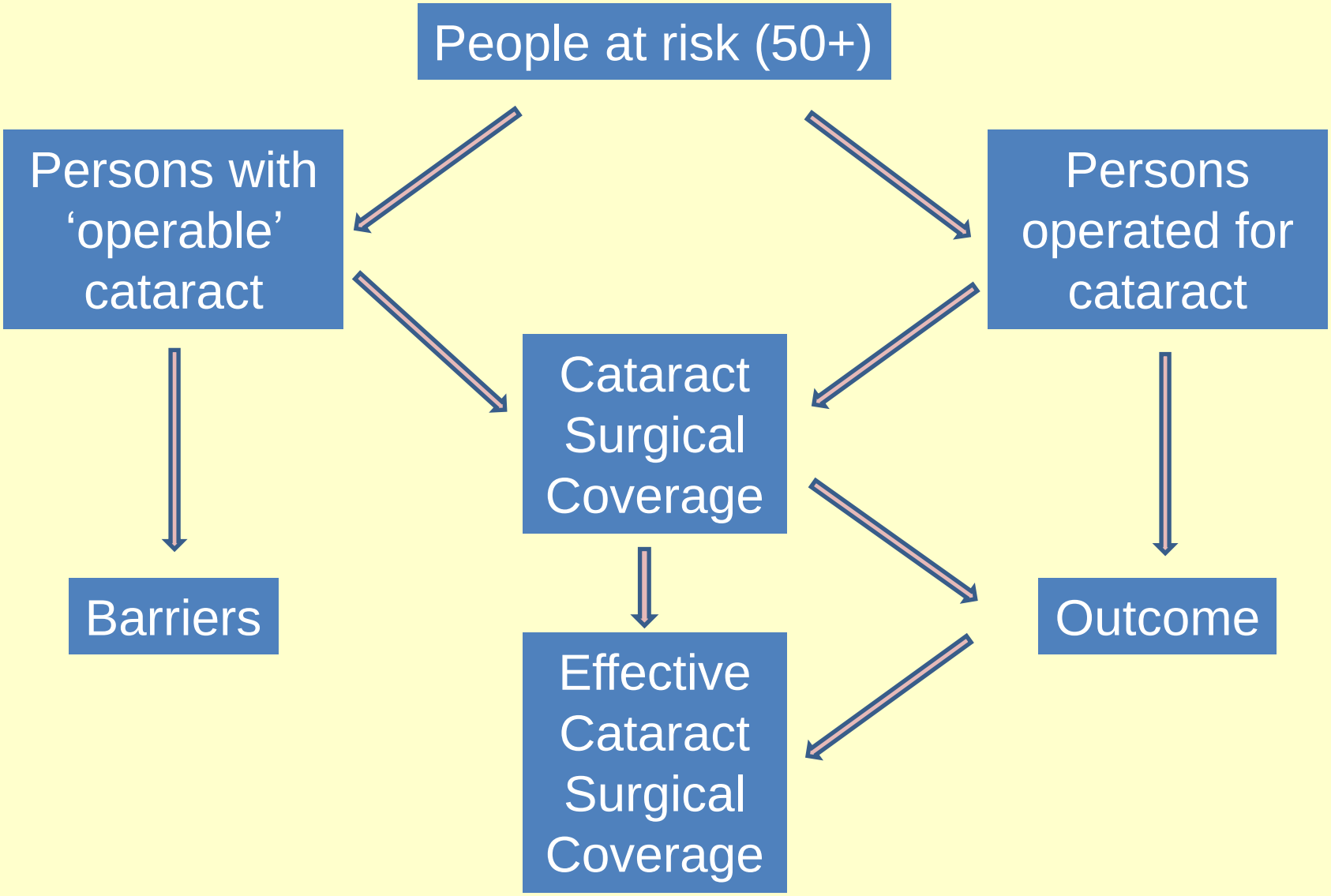


Barriers to cataract surgery

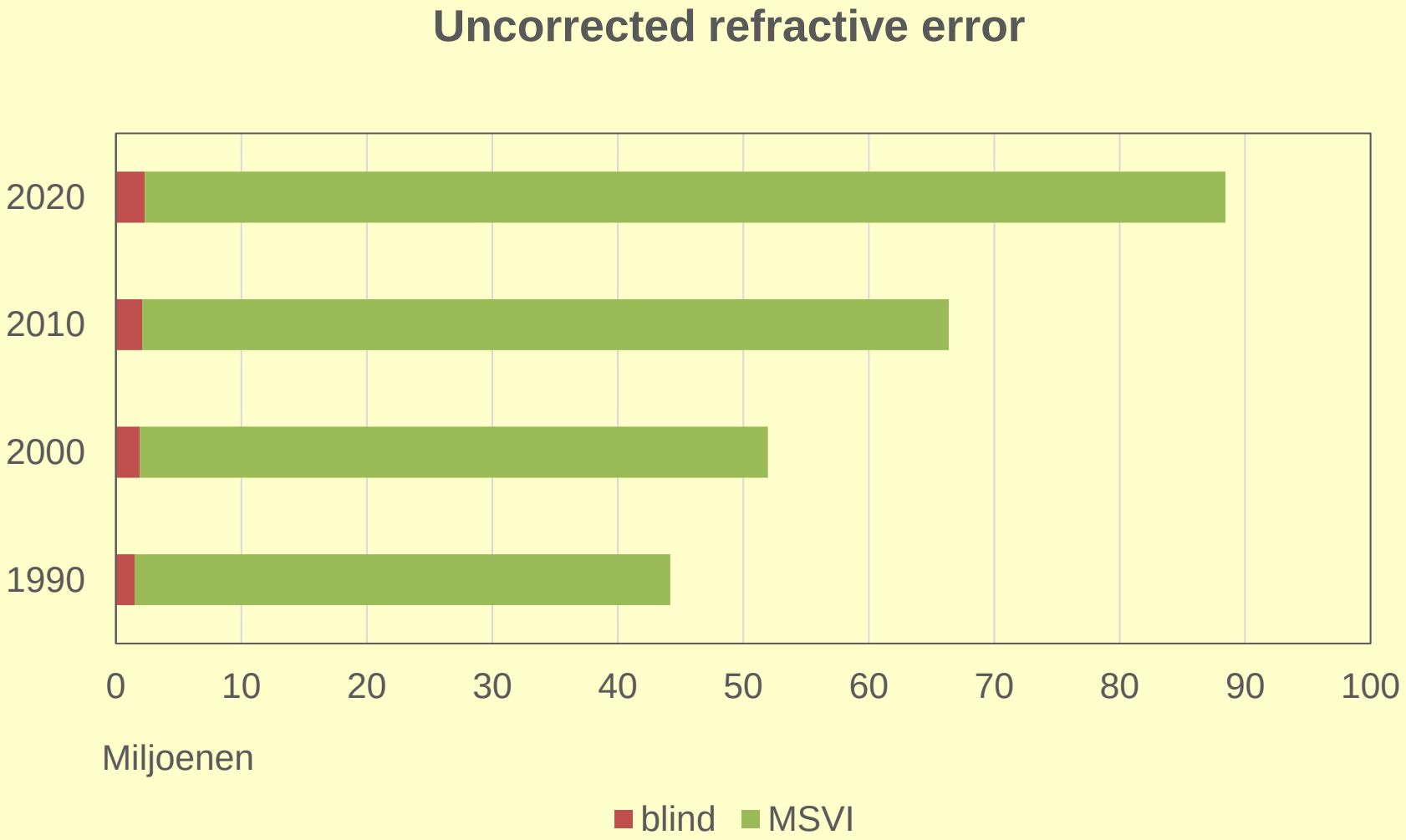
1. Need not felt
2. Fear of surgery or poor outcome
3. Costs
4. Treatment denied by provider
5. Unaware that treatment is possible
6. Cannot access treatment
7. Local reasons, like ‘on waiting list’

Patients often do not present spontaneously!

RAAB: Community Assessment of Cataract Services



Uncorrected Refractive Errors (URE)



Data from Vision Atlas

Epidemic of myopia in children

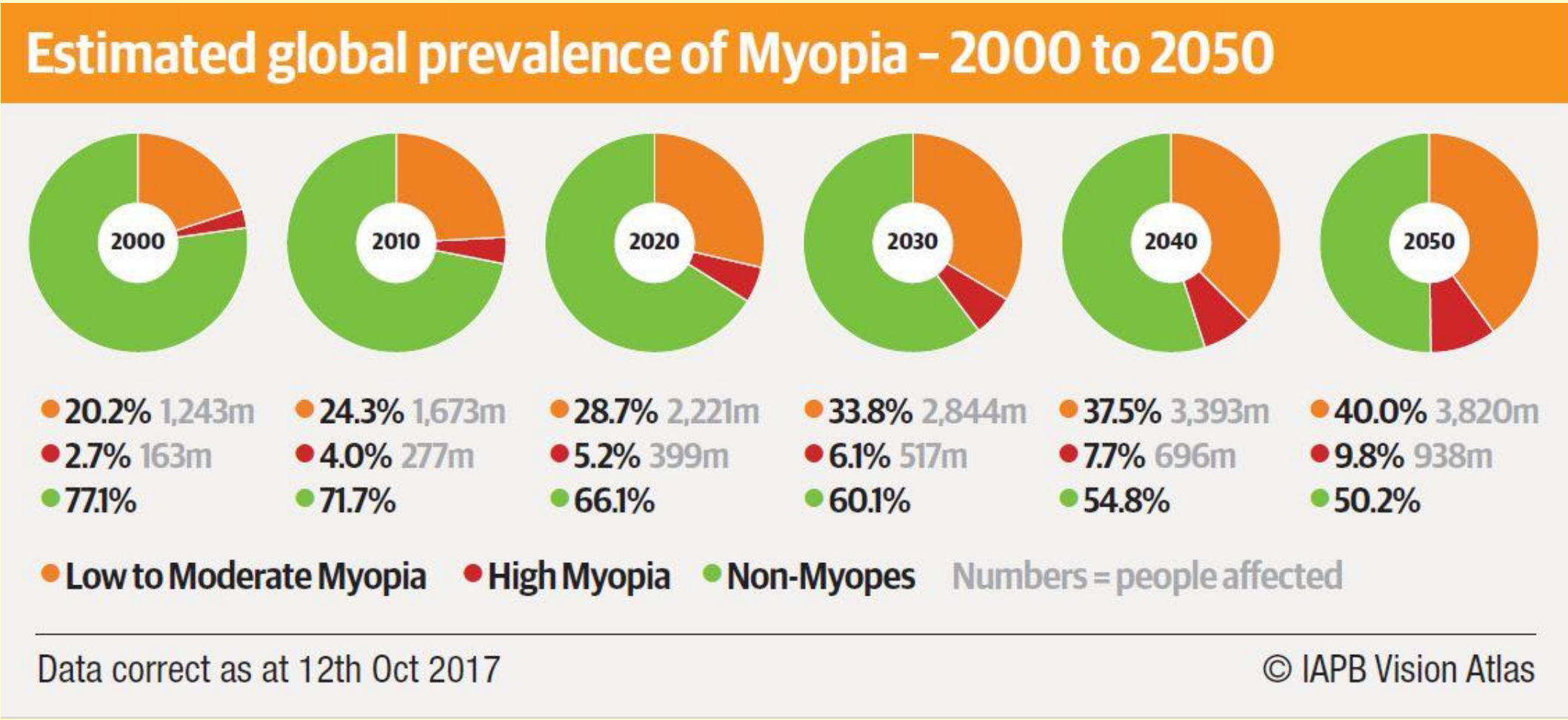
Prolonged accommodation in children

- competitive school systems
- smartphone, computer, games
- lack of day light & outdoor activities
- ethnic group
- S.E. Asia >> Africa
- urban > rural
- private > public schools



“40 to 80 minutes of additional outdoor time during the day in primary school children reduced Myopia incidence by 23% to 50%” (Taiwan & China)

Prognoses myopia 2000 - 2050



Guo YH, Lin HY, Lin LL et al. Self reported Myopia in Taiwan: 2005 National Health Interview Survey. Eye.2012. 26(5), 684-689

Lee YY, Lo CT, Sheu SJ et al. Risk factors for and progression of Myopia in young Taiwanese men. Ophthalmic Epidemiol. 2015. 22(1), 66-73

Holden BA, Fricke TR, Wilson DA, Jong M, Naidoo KS, Sankaridurg P, Wong TY, Naduvilath TJ, Resnikoff S. Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050. Ophthalmology. 2016 May;123(5):1036-42

Childhood blindness



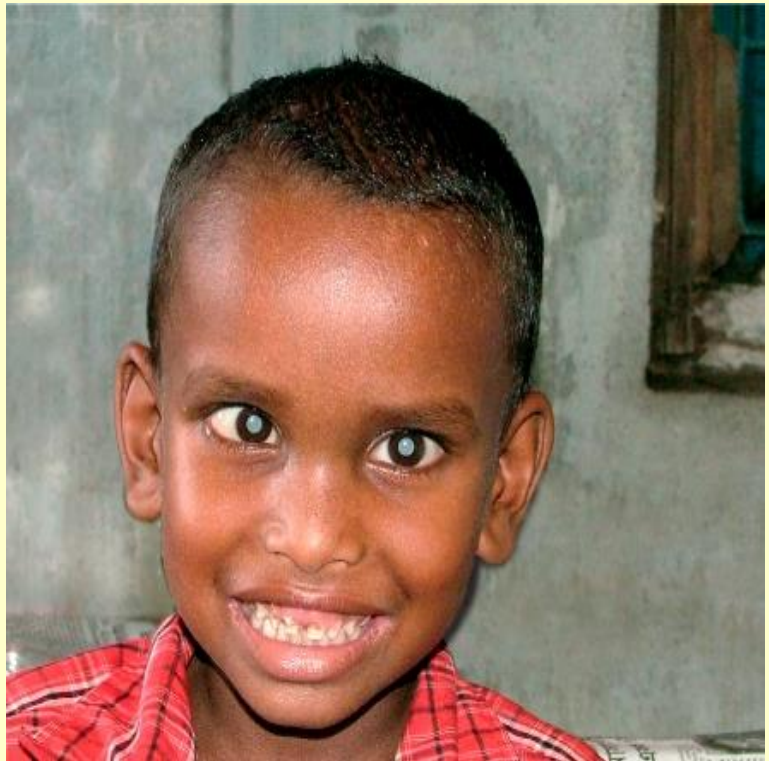
Blind school, Kenya

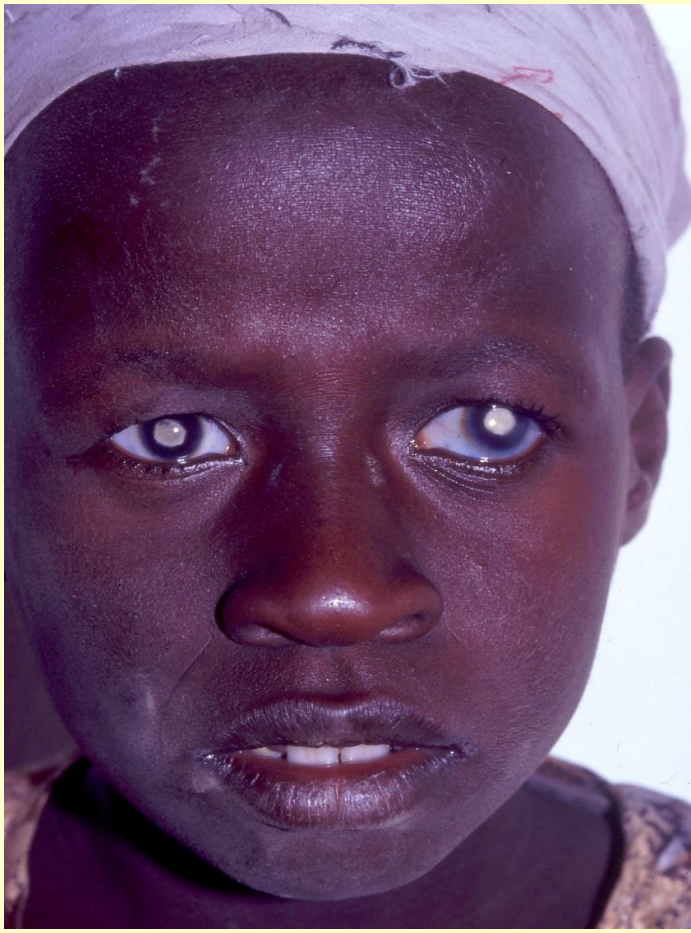
Note: most children are not blind but have low vision !

Childhood Blindness

Succes of measles vaccination and mass vit. A distribution,

1st and 2nd cause of childhood blindness in Africa: Congenital / developmental cataract (hereditary; rubella)
(dd ……)





Trachoma



Photophobia



Flies, spreading Chlamydia trachomatis, feeding on excreta from eyes, nose and mouth

Global Elimination of Trachoma

- 1998: SAFE strategy plus annual mass treatment with Azithromycin
- 2020: 31.1 million treatments of Azithromycine shipped to 12 countries
- People at risk of trachoma - 91% reduction
  - 2002: 1.500 million
  - 2021: 136 million
- People requiring trichiasis surgery - 76% reduction
  - 2002: 7.6 million
  - 2021: 1.8 million
- 1.9 million people blind or VI
- 11 countries validated for eliminating trachoma as a public health problem

Status of elimination of Trachoma as a public health problem, 2016

42 countries need SAFE interventions to eliminate Trachoma†

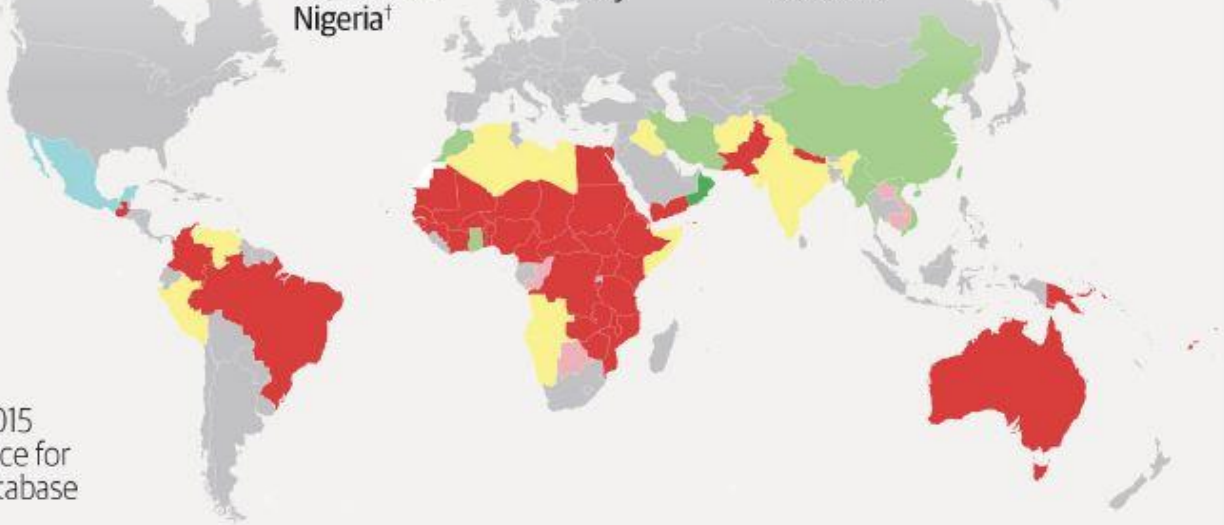
30 countries actively implementing SAFE strategy*

Nearly 50% of the people at risk of Trachoma live in Ethiopia, Malawi and Nigeria†

75 million people at risk in Ethiopia, the world's most affected country†

1 country Oman, validated as having eliminated Trachoma

6 countries claim to have eliminated Trachoma



*Source: ITI, 2015
†Source: Alliance for GET2020 Database

According to the Global Health Observatory, 2016

- Known to require interventions to eliminate Trachoma
- Claims to have eliminated Trachoma
- Thought to not require interventions
- Status uncertain
- Under surveillance
- Validated as having eliminated Trachoma

It is estimated that US$1 billion is needed to eliminate Trachoma

The target is to eliminate Trachoma by 2020

Data correct as at 25th Oct 2016

© IAPB Vision Atlas

Onchocerciasis





Onchocerca volvulus

Blackfly Stages

Human Stages

1. Blackfly (genus *Simulium*) takes a blood meal (L3 larvae enter bite wound)
2. Subcutaneous tissues
3. Adults in subcutaneous nodule
4. Adults produce unsheathed microfilariae that typically are found in skin and in lymphatics of connective tissues, but also occasionally in peripheral blood, urine, and sputum.
5. Blackfly takes a blood meal (ingests microfilariae)
6. Microfilariae pentrate blackfly's midgut and migrate to thoracic muscles
7. L1 larvae
8. L3 larvae
9. Migrate to head and blackfly's proboscis

Spraying with larvicides

Ivermectine

i = Infective Stage

d = Diagnostic Stage

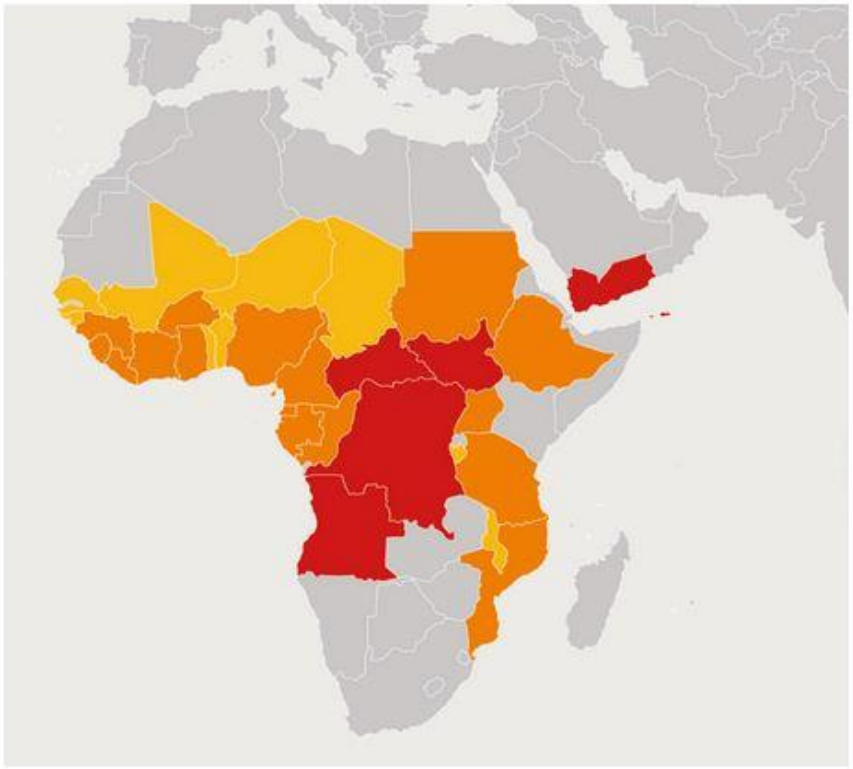
CDC
SAFER·HEALTHIER·PEOPLE™

Treatment Onchocerciasis

- OCP 1975: spraying larvicides
- 1987: Ivermectin kills microfilaria,
  - Provided for free by MSD
- APOC 1995: mass distribution through Community Directed Treatment with Ivermectin (CDTI)
- 2020: Mectizan Donation Program
  - Active in 45 countries
  - 417 million treatment doses provided (cumulative)
  - 4 countries eliminated river blindness



Distribution of Onchocerciasis in Africa and Middle East



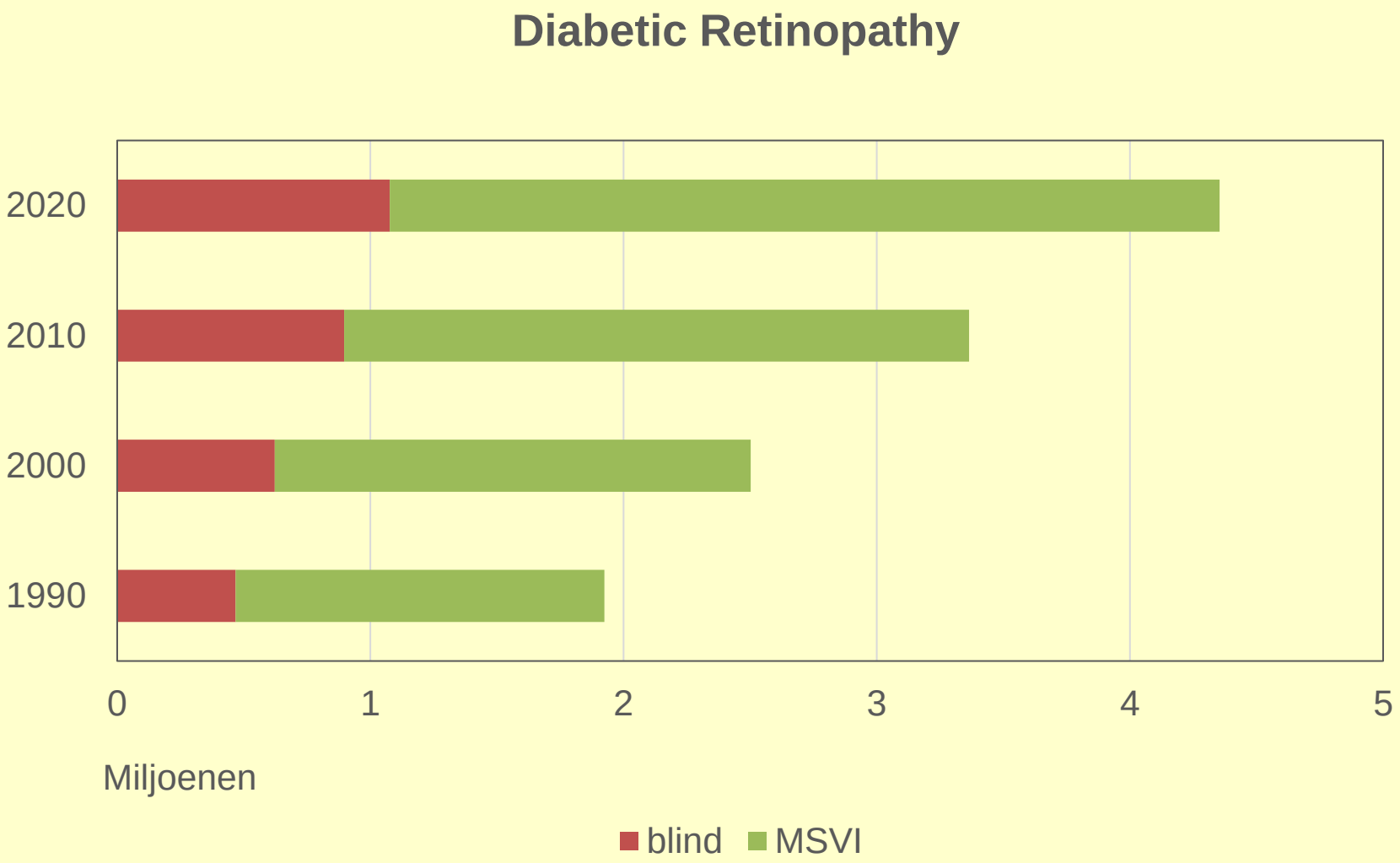
- Good progress, with treatment expected to stop in 2016 - 2017
- On target to be able to stop treatment between 2018 and 2020
- Likely to require treatment beyond 2020

Onchocerciasis in the Americas



- Verified as free of Onchocerciasis
- Expected to confirm free of Onchocerciasis in 2016
- Small pockets of active Onchocerciasis transmission remains

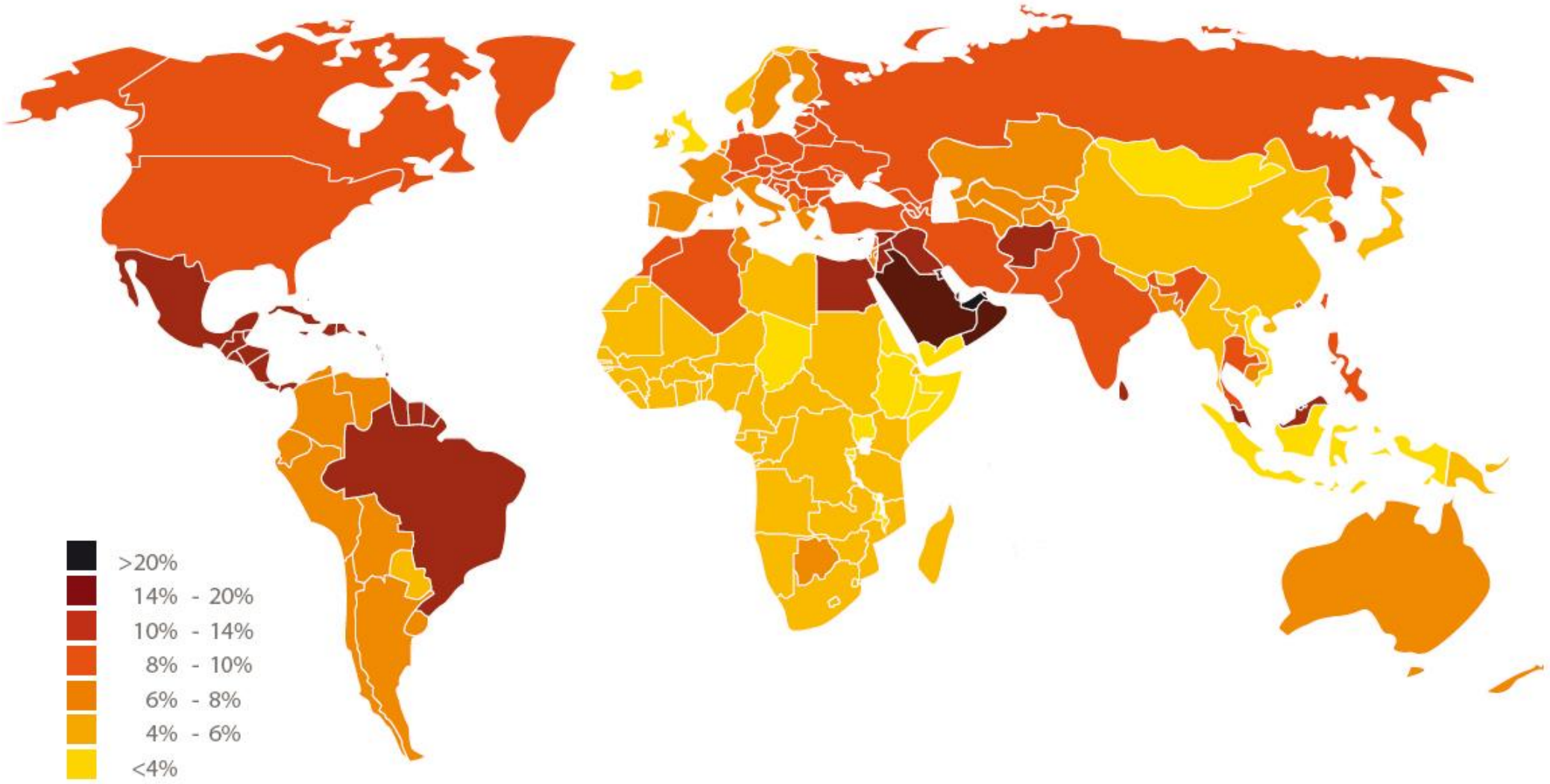
Diabetic Retinopathy



Data from Vision Atlas

Diabetes by country, 2025 estimates

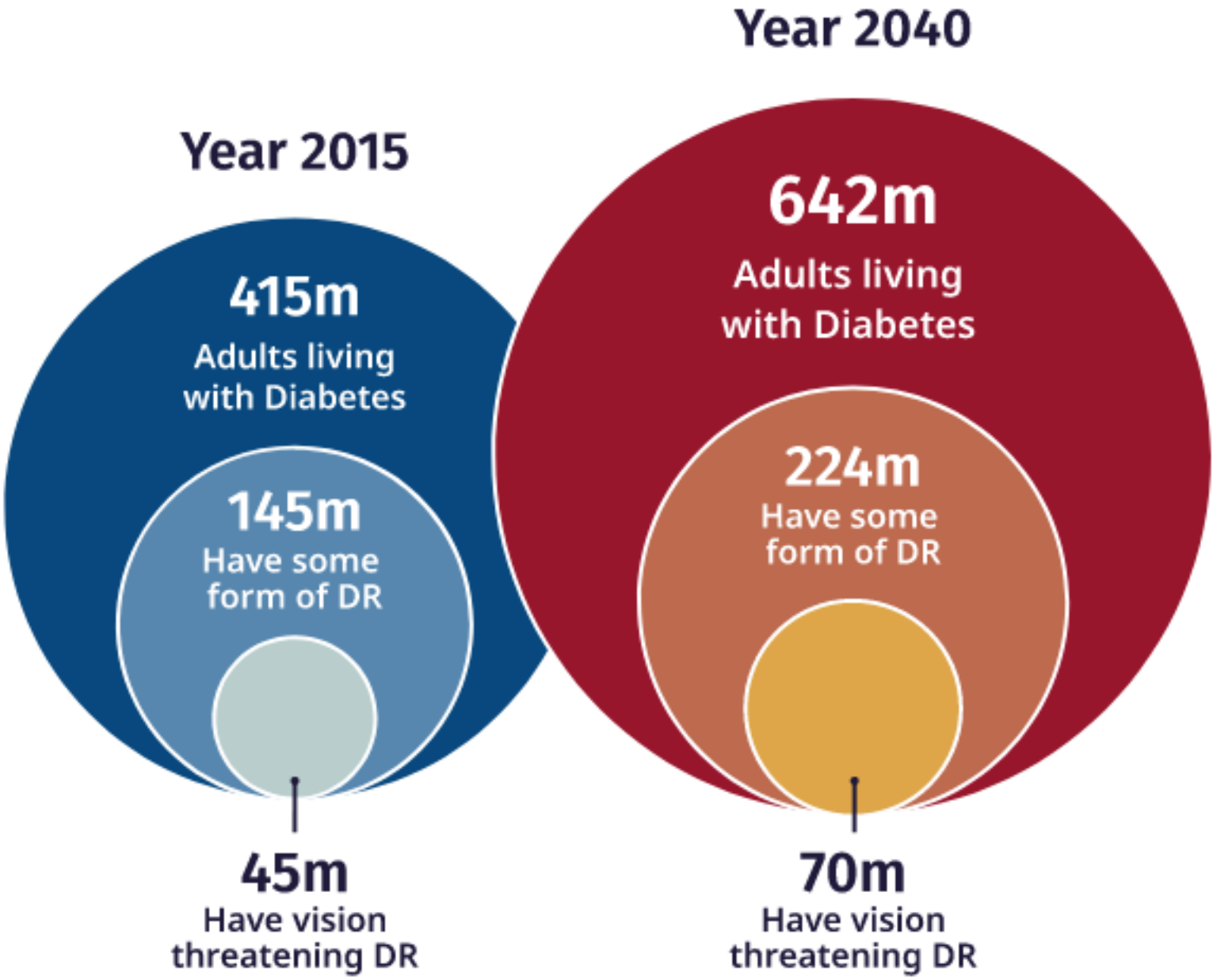
Prevalence estimates of diabetes, 2025



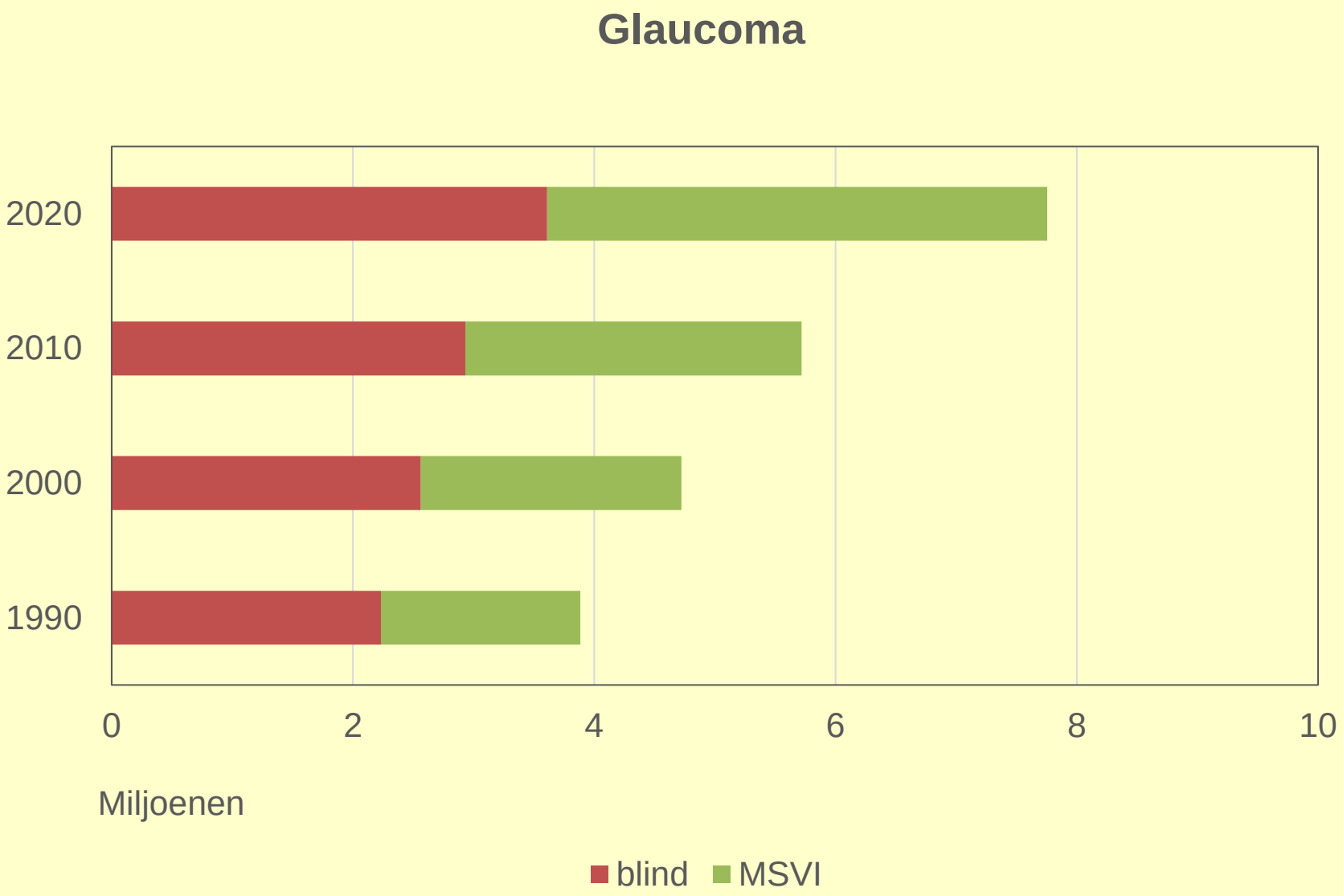
SOURCE: *DIABETES ATLAS THIRD EDITION*, © INTERNATIONAL DIABETES FEDERATION, 2006

Diabetes and diabetic retinopathy, 2015 to 2040

(Global, number of people in millions)



Glaucoma

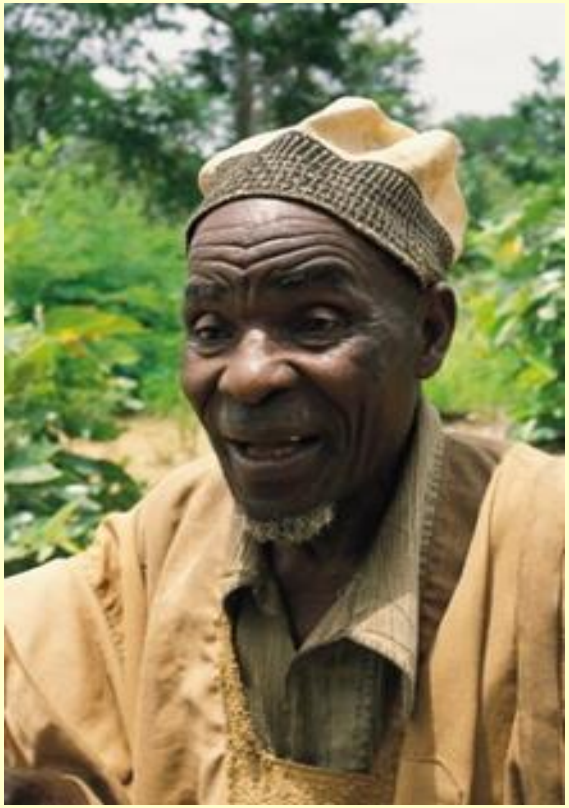


Data from Vision Atlas

Prevalence of glaucoma >40 years by region

	POAG		ACG
Africa	**4.16%**	**China**	**1.26%**
Japan	3.31%	SE Asia	1.20%
Latin America	3.16%	India	0.80%
Europe	1.97%	Japan	0.39%
India	1.75%	Europe	0.25%
China	1.40%	Latin America	0.19%
Middle East	1.31%	Africa	0.16%
SE Asia	1.18%	Middle East	0.16%
World	**1.96%**	**World**	**0.69%**

USA:
Caucasians:
POAG: 1.86%,
ACG: 0.1%



Magnitude and distribution of glaucoma

Under-estimated in population-based surgeys

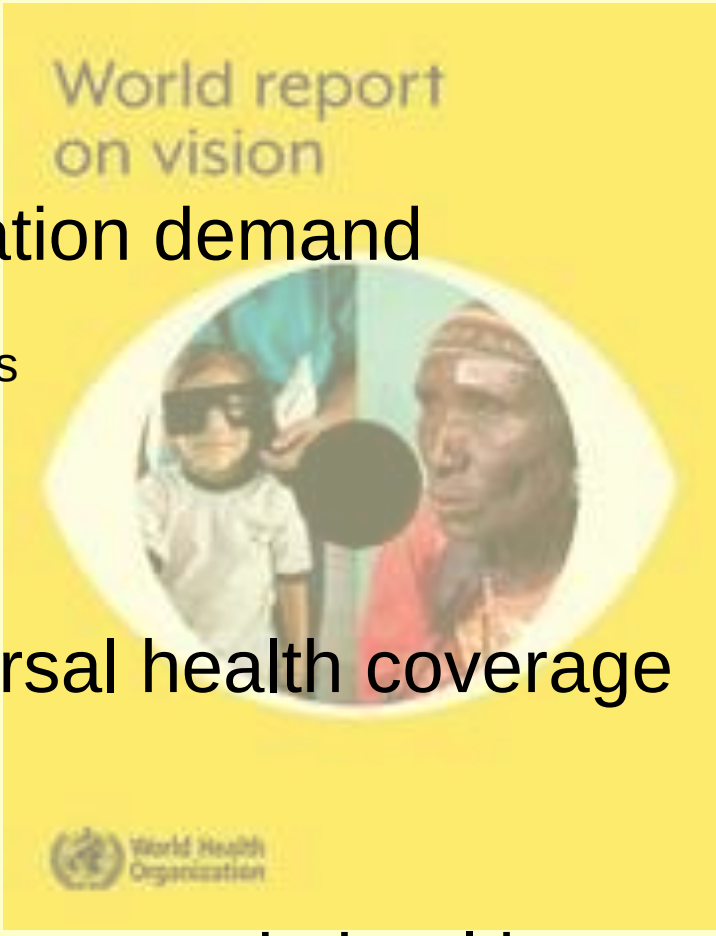
- Central vision remains intact until late
- Visual fields often not assessed in surveys
- Diagnosis can be difficult under field conditions

WHO - World Report on Vision (2019)

Main issues from previous period:

Eye care expansion lags behind population demand

- Changes in demography and life style
- Poor planning due to limited data and weak health systems
- Eye care poorly integrated in health systems



Recommendations:

Make eye care an integral part of universal health coverage

- Effective Cataract Surgical Coverage
- Effective Spectacle Coverage
- Cataract Surgical Rate

Implement integrated people-centred eye care in health systems

Raise awareness and engage and empower people and communities

Reports on eye health

World Report on Vision, WHO 2019

https://www.who.int/publications/i/item/9789241516570

The *Lancet Global Health* Commission on Global Eye Health: vision beyond 2020

https://doi.org/10.1016/S2214-109X(20)30488-5

Trends in prevalence of blindness and distance and near vision impairment over 30 years: an analysis for the Global Burden of Disease Study

https://doi.org/10.1016/S2214-109X(20)30425-3

IAPB Vision Atlas

Eye Health: Why it matters



Eye health is essential for achieving the Sustainable Development Goals

Good vision and eye health unlocks people's potential to:



Get an education



Earn a living



Maintain Well-being

Image credits: 1. Neil Oakshott (Operation Eyesight); 2. Mansour Mohsen; 3. Ellen Crystal (Seva Canada)

IAPB Vision Atlas

Eye Health: Why it matters



1.1 billion people
are living with vision loss
because they
do not have access
to basic
eye care services



55% of people with vision loss **are women and girls**

91 million children
have vision loss as they **don't have access to eye care services**



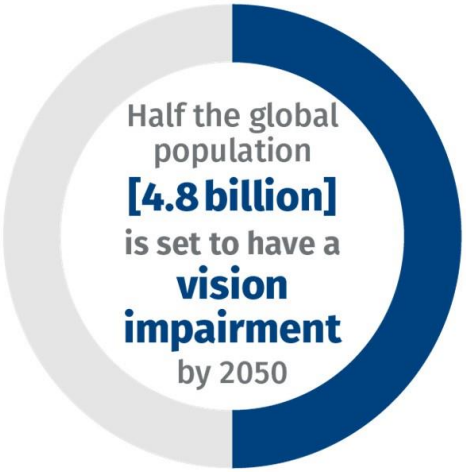
Vision loss
costs the global economy
$411 billion
per annum in productivity losses

IAPB Vision Atlas

Eye Health: Why it matters



Did you know?



Almost **everyone will need access to eyecare services** during their lifetime

90%
of all vision loss is preventable or treatable



Unless there is a significant investment, eye care services are **unlikely to cope with future needs.**

Eye health is essential for achieving the **Sustainable Development Goals**



1 NO POVERTY

Poverty is both a cause and a consequence of poor eye health

90% **of vision loss is in low- and middle-income countries**

with the poor and extreme poor among the furthest left behind

2 ZERO HUNGER

Improved eye health can increase household income which in turn reduces hunger

Free high quality cataract surgery can increase household income:

46% **of household incomes moved up an income bracket**

3 GOOD HEALTH AND WELL-BEING

Eye health is key to ensuring good health, mental health and wellbeing.

Poor eye health increases the risk of mortality up to 2.6 times

4 QUALITY EDUCATION

Eye health has positive impact on school enrolment, educational attainment and learning

Glasses can reduce the odds of failing a class **by 44%**

Children with vision loss are 2-5 times less likely to be in formal education in low- and middle-income countries

5 GENDER EQUALITY

Women and girls more likely to have vision loss and experience additional barriers to eye care services

Overall, women are **12% more likely** to have vision loss than men

8 DECENT WORK AND ECONOMIC GROWTH

Good eye health and vision promotes inclusive economic growth, employment and improved living standards

Providing glasses can increase workplace productivity by **22%**

Cataract surgery can increase household per capita expenditure by **88%**

10 REDUCED INEQUALITIES

Poor eye health is driven by inequality

Women, older people, persons with disabilities, indigenous peoples, refugees and internally displaced persons and migrants **are among those most affected**

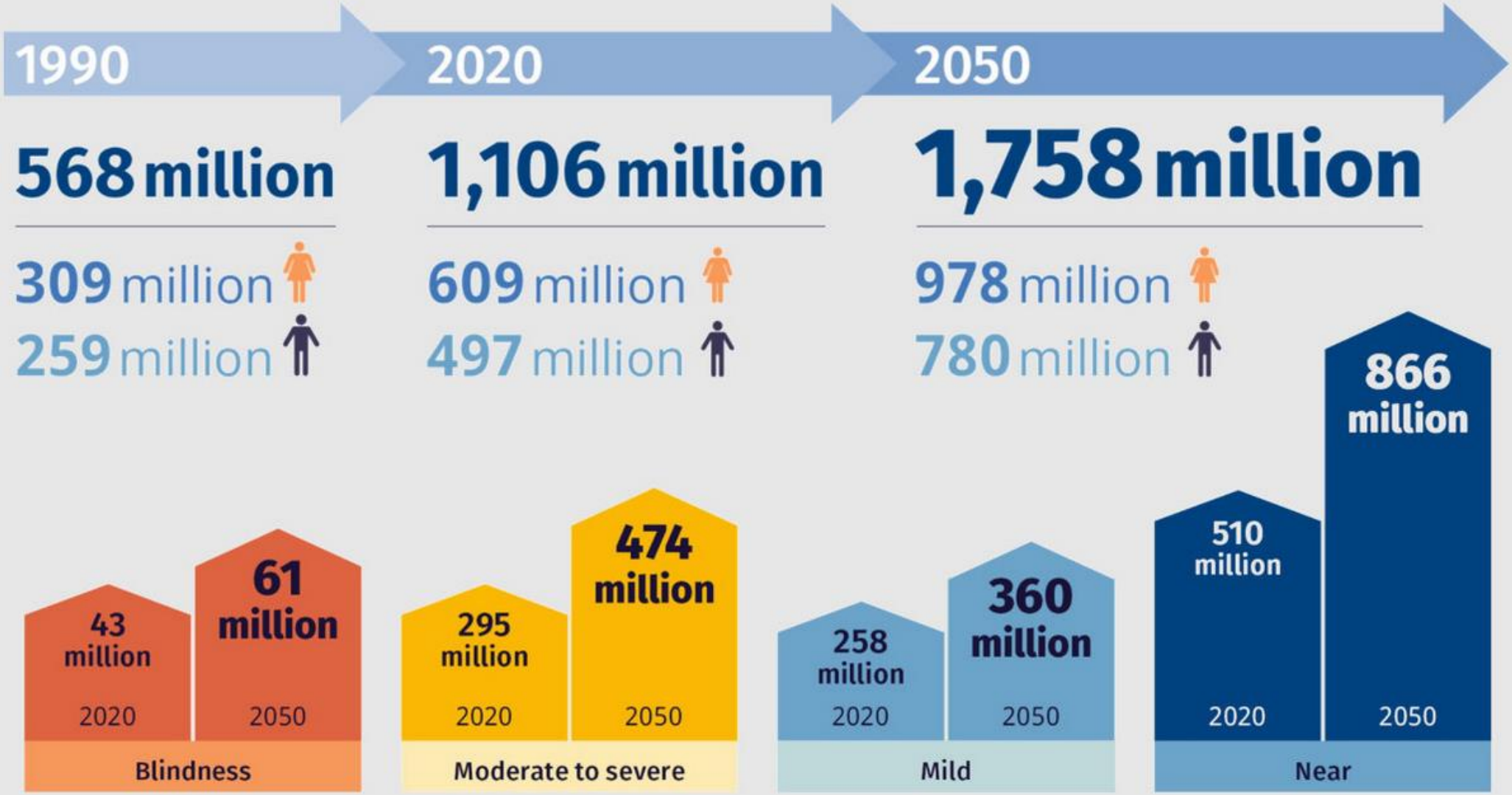
73% of people with vision loss **are over the age of 50**

11 SUSTAINABLE CITIES AND COMMUNITIES

Eye health is critical to reducing road traffic deaths and injuries

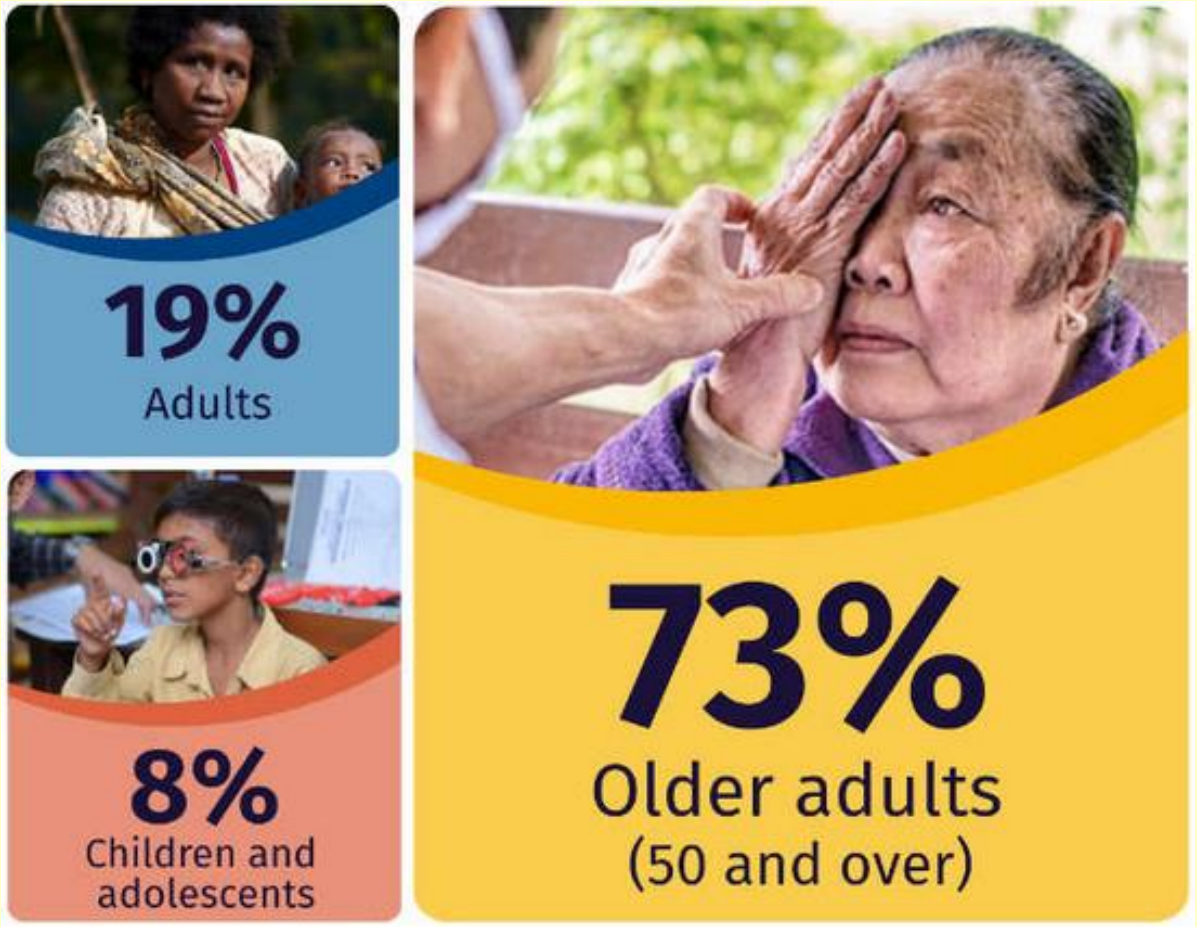
Unoperated cataract can increase the chance of a motor vehicle accident by **2.5 times**

Increase of people with vision loss

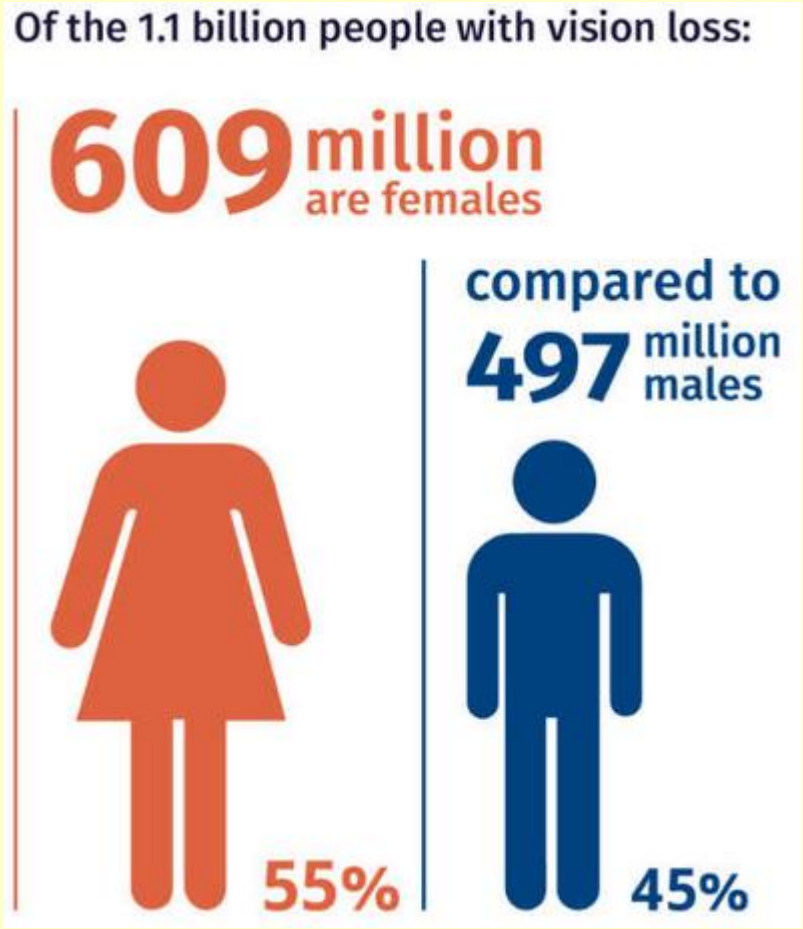


Inequality

by age



by gender



Eye care info…

- IAPB Vision Atlas
  - https://www.iapb.org/learn/vision-atlas/
- RAAB repository
  - http://www.raab.world
- Trachoma Atlas
  - http://www.trachomaatlas.org
- Other useful links
  - www.tropischeoogheelkunde.nl

