

Prevalence and Causes of Childhood Visual Impairment and Blindness

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INTRODUCTION

Definition of visual impairment and blindness

Importance of early detection and intervention

Global relevance and impact on child development

IMPACT ON CHILDREN

Delayed cognitive and motor development



Educational challenges



Social isolation and reduced quality of life

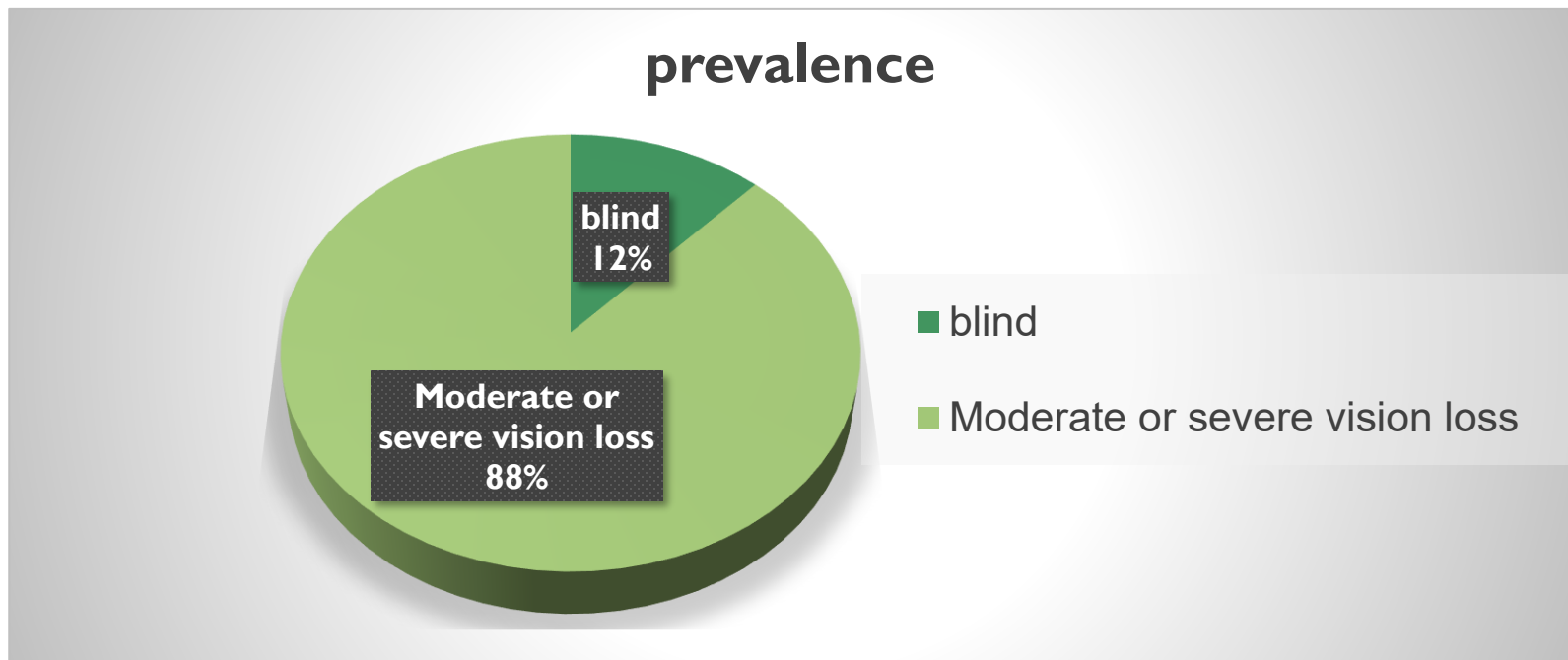


Definition

ICD-9-CM Range		US (20/x)	Metric
(Near-) Normal Vision	Range of Normal Vision	20/12.5 – 20/25	6/3.8-6/7.5
	Mild Vision Loss	20/32 – 20/63	6/9.5-6/19
Low Vision	Moderate Vision Loss	20/80 – 20/160	6/24-6/48
	Severe Vision Loss	20/200 – 20/400	6/60-6/120
	Profound Vision Loss	20/500 – 20/1000	6/150-6/300
(Near-) Blindness	Near-Blindness	20/1250 - 20/2000	6/380-6/600
	Blindness	NLP	

GLOBAL PREVALENCE OF VISUAL IMPAIRMENT AND BLINDNESS

In 2019, the WHO estimated that 2.2 billion people worldwide were visually impaired, of whom 12 % were blind (visual acuity less than 3/ 60) and 88 % had moderate or severe vision loss (visual acuity between $<6/18$ and $\geq 3/60$).



GLOBAL PREVALENCE OF CHILDREN VISUALLY IMPAIRED

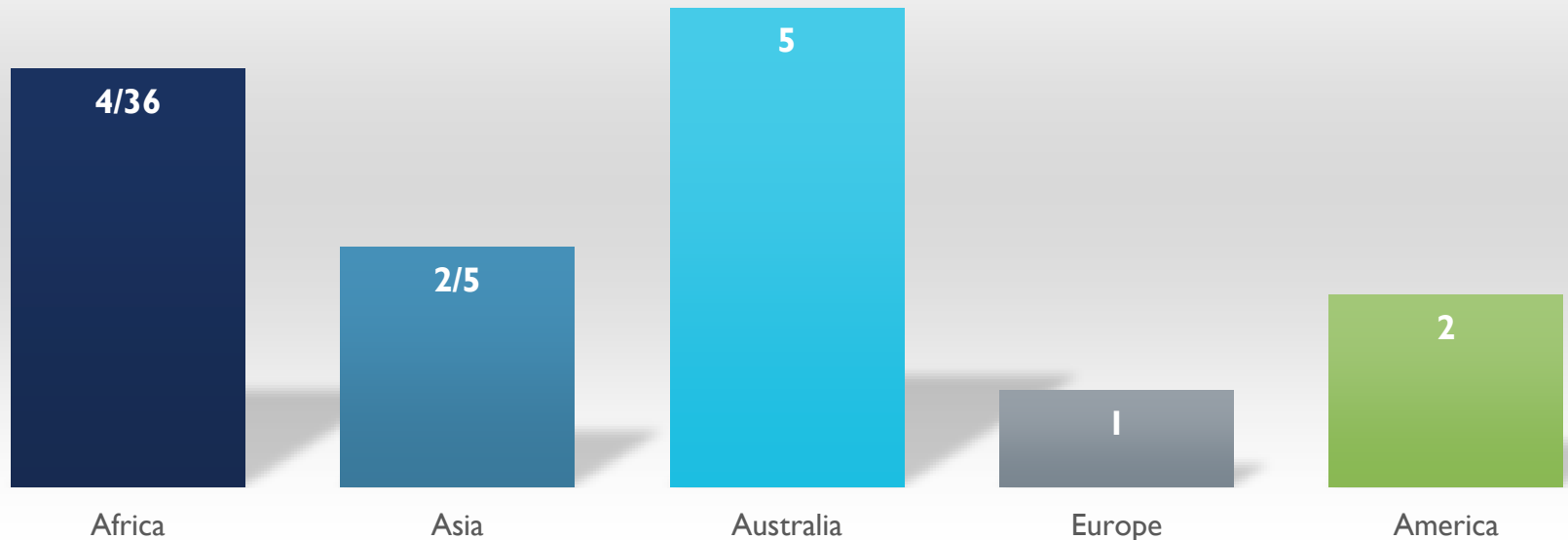
- ❖ ~19 million children visually impaired worldwide
- ❖ ~1.4 million children are blind
- ❖ Higher prevalence in low-income countries (up to 1.5 per 1,000)
- ❖ Lower prevalence in high-income countries (around 0.3 per 1,000)

REGIONAL DIFFERENCES

- ❖ **Low-income countries:** preventable causes dominate (e.g., vitamin A deficiency, measles)
- ❖ **High-income countries:** genetic disorders and Retinopathy of Prematurity (ROP) more common

PREVALENCE OF VISUAL IMPAIRMENT IN CHILDREN BY REGION

Prevalence (%)



Loulidi S, Loukid M, Boussaa S. Visual impairment and blindness among children: A literature review. Clinical Epidemiology and Global Health. 2025 Jul 1;34:102094.

MAJOR CAUSES OF VISUAL IMPAIRMENT

- Refractive errors
- Congenital cataracts
- Retinopathy of Prematurity (ROP)
- Vitamin A deficiency
- Genetic and hereditary disorders
- Congenital infections (rubella, toxoplasmosis)



MAIN CAUSES OF VISUAL IMPAIRMENT AND BLINDNESS

- Cataract – 22%
- Retinopathy of prematurity (ROP) – 14%
- Refractive error – 12%
- Corneal opacity/scar – 13% (in low-income countries)
- Major anatomical sites affected: Retina (26%), Lens (22%), Cornea (13%).

CAUSES BY INCOME LEVEL

Low-income countries:

- Cataract, corneal opacities, corneal scars

Middle/high-income countries:

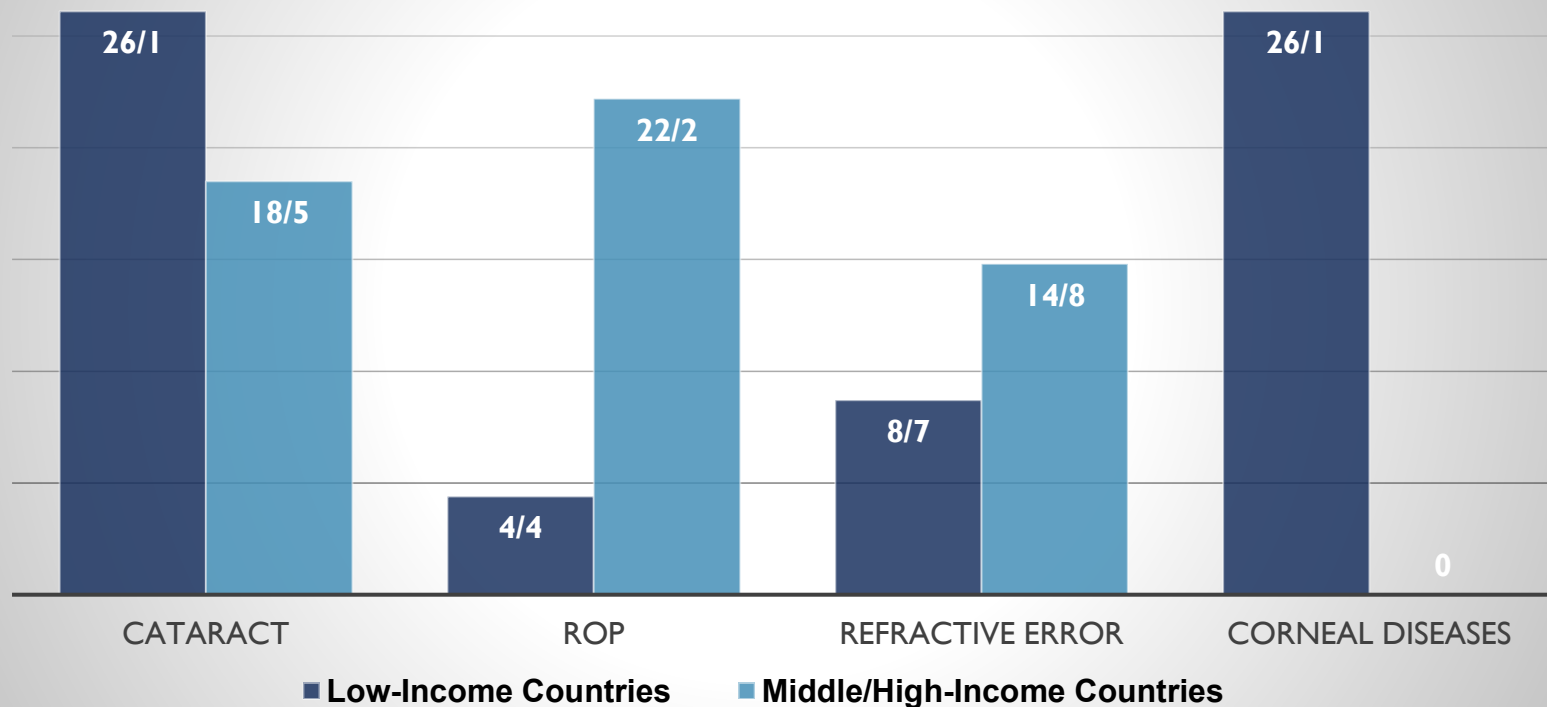
- Retinopathy of prematurity (ROP), cataract, refractive errors

Causes of Childhood Blindness or Visual Impairment

Site of Abnormality	Disease Type	% in Low-Income Countries	% in Moderate–High-Income Countries
Whole Globe	Glaucoma, Microphthalmos, Phthisis, Nystagmus	20.3%	14.8%
Cornea	Corneal Opacities	26.1%	0%
Lens	Cataract	8.7%	3.7%
Retina	Retinal Dystrophy, ROP, Choroideral Scar, LHON	10.1%	51.9%
Optic Nerve	Optic Atrophy	15.9%	14.8%
Normal Globe	Refractive Errors, Amblyopia	1.5%	7.4%
Cerebral/Visual Pathways	Hypoxic-Ischemic Encephalopathy, Unknown Disorders	7.3%	14.8%

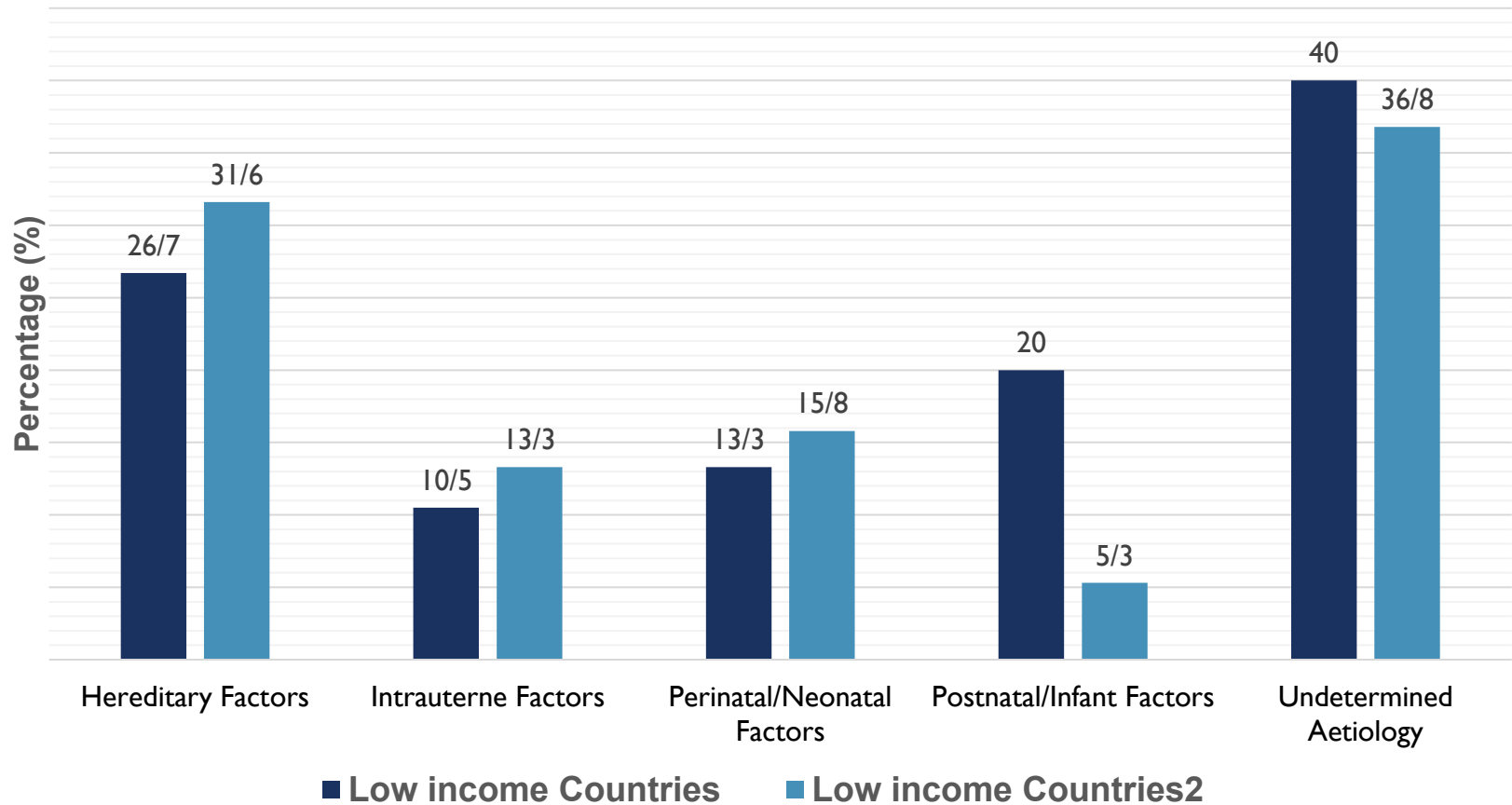
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CAUSES BY COUNTRY INCOME LEVEL

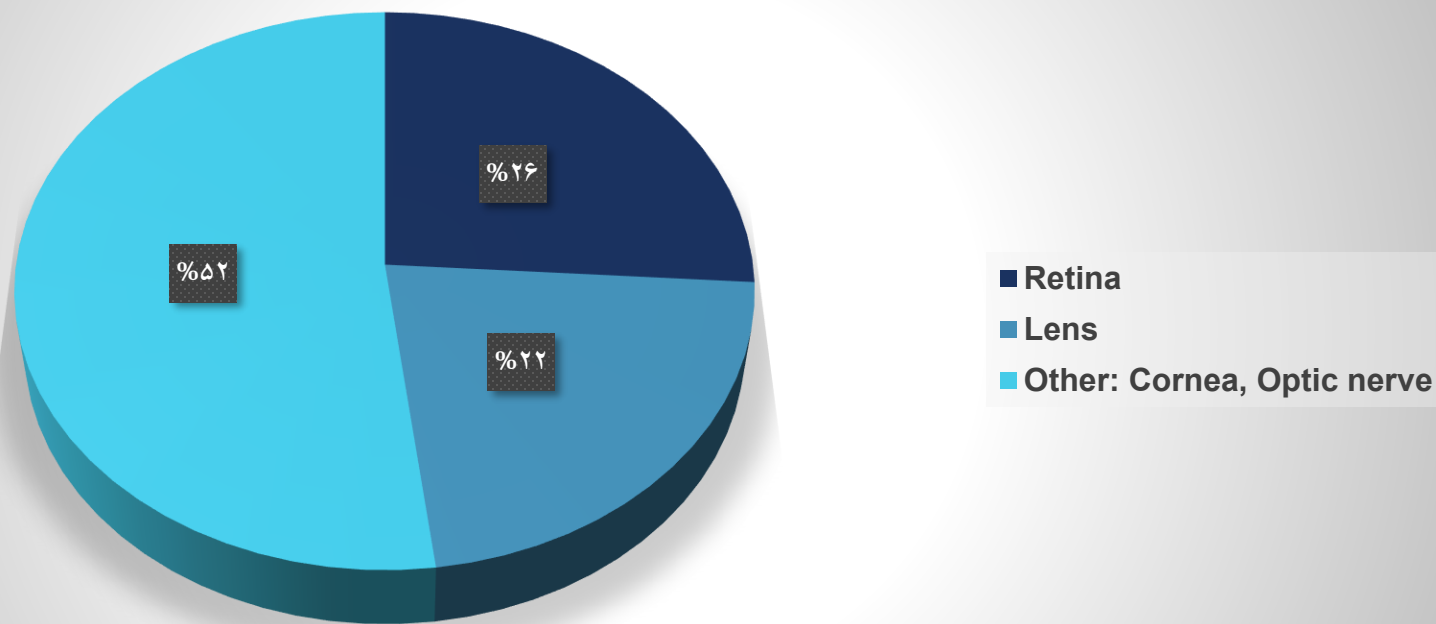


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Risk factors for blindness and visual impairment in the included studies by countries classification.



ANATOMICAL SITES AFFECTED



PREVENTABLE VS NON-PREVENTABLE CAUSES

Category	Examples	Notes
Preventable	Vitamin A deficiency, measles	Linked to nutrition and vaccines
Treatable	Cataracts, refractive errors	Requires early diagnosis
Non-preventable	Genetic disorders, ROP	May benefit from low vision aids

Avoidability Rate of Blindness and Visual Impairment by Region and Country

Continent	Average Avoidability Rate (%)	Countries and Rates
Africa	63.5	Burkina Faso (60%), Congo (100%), Eritrea (69.6%), Ethiopia (62.4%), Mali (61.6%), South Africa (68.1%), Sudan (89.5%), Tunisia (87.5%)
Asia	57.5	Bangladesh (82.3%), Cambodia (73.6%, 71.2%), Indonesia (28.0%), Iran (33.7%), Myanmar (53.6%), Nepal (45.7%), Pakistan (38.6%), Philippines (56.7%), Turkey (39.0%)
Europe	56.0	Greece (52.4%)
America	53.5	Brazil (66.4%), Guatemala (52.0%), Suriname (53.4%)
Australia & Oceania	19.0	Fiji (26.8%), New Zealand (13.6%)

PREVENTION & INTERVENTION

- ❖ Early screening programs
- ❖ Nutritional support (Vitamin A)
- ❖ Vaccination campaigns
- ❖ Access to pediatric ophthalmology
- ❖ Neonatal care improvements



CONCLUSION

- ❖ Visual impairment in children is a global health issue
- ❖ Majority of causes are preventable or treatable.
- ❖ Need for integrated screening and intervention programs
- ❖ Early intervention is key and can transform lives
- ❖ Strengthening pediatric Optometry & ophthalmology services is essential.



THANK YOU