ANNALS OF HUMAN BIOLOGY
2026, VOL. 53, NO. 1, 2607717
https://doi.org/10.1080/03014460.2025.2607717

Taylor & Francis
Taylor & Francis Group

RESEARCH PAPER

OPEN ACCESS Check for updates

Prevalence of visual conditions among orphaned children in Togo

Cécile Schat-Savy[a] and Paula van Dommelen[b]

[a]Stichting Kinderhulp Togo, Zoetermeer, The Netherlands; [b]Department of Child Health, The Netherlands Organization for Applied Scientific Research TNO, Leiden, The Netherlands

ABSTRACT

Background: Visual impairments in children can significantly impact their development.
Aim: To assess the prevalence of visual conditions among Togolese orphaned children.
Subjects and methods: A total of 673 orphans of Sub-Saharan African descent, aged 1 month to 23 years, from 17 orphanages in Lomé and surrounding areas were examined between October 2021 and April 2025. Eye assessments included the use of an otoscope, ophthalmoscope, LEA symbol chart (for children aged 3), and E-hook chart (for children >3). Diagnosed conditions were confirmed through specialist referrals when necessary.
Results: Visual conditions were identified in 109 children (16.2%), of whom 61 (56.0%) were referred to ophthalmology for further evaluation. Fifty were diagnosed with a single ocular condition, while 11 had multiple conditions. These were most commonly combinations of ametropia with conjunctival disorders or glaucoma. In total, 73 ocular conditions were identified within this group, with ametropia being the most prevalent ($n = 40$, 54.8%), particularly astigmatism.
Conclusion: Visual conditions were common among Togolese orphaned children. Although not formally studied, the findings support the integration of routine visual screening into early childhood health programs and school entry assessments to prevent or treat visual conditions with appropriate care.

ARTICLE HISTORY
Received 25 September 2025
Revised 18 November 2025
Accepted 17 December 2025

KEYWORDS
Ametropia; tropical endemic limbo-conjunctivitis; glaucoma; cataract; children

Introduction

Visual impairment in children refers to any condition that significantly reduces vision and affects daily functioning, learning, and development. This includes refractive errors, conjunctival problems, as well as more severe conditions like glaucoma, cataract, or blindness (Burton et al. 2021; GBD 2019 Blindness and Vision Impairment Collaborators and Vision Loss Expert Group of the Global Burden of Disease Study 2021). Visual impairments in children can significantly impact their developmental milestones, educational achievements, social interaction, and overall quality of life (Frick et al. 2007; Ophir-Cohen et al. 2009; Loh et al. 2015; Rakatoarisoa et al. 2020). These impairments are often accompanied by symptoms such as vision disturbances, headaches, and eye fatigue (Paluku et al. 2022). Globally, an estimated 19 million children are visually impaired, with 13 million cases attributed to refractive errors, which are conditions that are easily diagnosed and treatable (Resnikoff et al. 2008; Solebo and Rahi 2014; Loulidi et al. 2025). However, in low- and middle-income countries, access to eye care services remains limited, resulting in a disproportionate burden of preventable and untreated visual conditions (Cardona et al. 2025). Children with visual impairment require not only access to general healthcare, but also to specialised educational support. According to the United Nations Convention on the Rights of the Child and various child rights charters, every child has the right to health and education, including special needs education for those with disabilities (United Nations 2025). Ensuring these rights is important for promoting equity and inclusion, particularly for children with visual conditions.

Sub-Saharan Africa exemplifies this disparity, with approximately 4.3 million individuals blind, 17.4 million experiencing moderate to severe visual impairment, and 101 million affected by near vision impairment (Naidoo et al. 2020). Despite the availability of low-cost interventions, the region continues

CONTACT Cécile Schat-Savy camcsavy@gmail.com Stichting Kinderhulp Togo, Zoetermeer, The Netherlands

to face conditions due to a shortage of qualified eye care professionals and broader health system limitations (World Health Organization (WHO) 2024).According to the World Health Organization's first World Report on Vision, unmet needs for distance vision correction in low- and middle-income regions are estimated to be four times higher than in high-income countries (World Health Organization 2019). Furthermore, 89% of people with visual impairment live in these regions, with women representing 55% of moderate to severe cases (Ackland et al. 2017). In nine out of ten instances, vision loss is preventable or treatable, underscoring the urgent need for accessible and equitable eye care services (Haileamlak 2022).

In Togo, a West African country with a population of approximately 8.5 million, an estimated 808,000 people in Togo were living with visual impairment (Bourne et al. 2020).The situation is particularly concerning for vulnerable populations such as orphaned children. Although the prevalence of visual impairments in orphaned children is not well-documented, it is evident that access to eye care services is severely limited. They do not receive routine screenings or timely treatment, increasing the risk of undiagnosed and untreated conditions. Orphaned children are especially at risk due to their marginalised status and the limited resources available in orphanages, which often lack the capacity to provide regular health check-ups, including eye assessments. Nutritional deficiencies, particularly vitamin A deficiency, continue to pose serious health risks for children in low-resource settings. Vitamin A is essential for maintaining healthy vision, and a lack of it can lead to night blindness and, if untreated, progress to permanent vision loss (Song et al. 2023). In Togo, the government provides vitamin A supplementation at 6, 10, 16, and 20 months of age through national child health programs, including in orphanages (Supplément en vitamine A chez les enfants de 0 à 11 mois au cours de la vaccination de routine par région sanitaire - Portail de données du Togo 2025). These initiatives aim to prevent deficiency-related complications such as impaired vision and increased vulnerability to infections. Nevertheless, vitamin A deficiency remains a leading cause of preventable childhood blindness in many parts of the developing world (World Health Organization 2014), especially among vulnerable groups such as children in institutional care. This highlights the gap in routine healthcare coverage and the importance of targeted medical interventions to address preventable health risks. Vaccination status is another important factor in child health, as measles infections can result in severe ocular complications, including conjunctivitis, keratitis, and corneal lesions.

Despite the known importance of early detection and treatment, there is a lack of comprehensive data on the prevalence of visual conditions among Togolese orphans. This gap in knowledge hinders the development of targeted health policies and effective interventions aimed at improving eye health in this vulnerable population. Addressing this issue requires effort to integrate visual screenings into routine healthcare practices for children, particularly those in institutional care, and to uphold their fundamental rights to health and education.

Our study is therefore aimed to analyse the prevalence of visual conditions among Togolese orphan children.

Materials and methods

Population

From April 2021 to April 2025, a team led by a chief physician conducted thorough medical examinations of 673 orphans aged between 1 month and 23 years. These examinations were carried out at the request of 17 orphanages in Lomé and its surrounding areas, marking the first time these children received such detailed medical examinations, with eye assessments included as part of the overall physical evaluation. All transportation, consultation, and appropriate treatment costs for referred children were covered.

Anamnesis

The orphanages had little to no knowledge of the children's family and personal ocular history, including conditions such as strabismus, glaucoma, amblyopia, or the use of glasses. Discussions with each

orphanage's management also addressed dietary practices and the presence of vegetable gardens, with attention to the availability of yellow and red fruits and green leafy vegetables that are rich in vitamin A. Only five orphanages had vegetable gardens, made possible by the availability of sufficient land. In contrast, the remaining 12 orphanages, located in urban areas, faced space constraints that limited such initiatives.

Due to unknown vaccination histories, the team administered the Measles Mumps Rubella vaccine to all children aged 20 months to 10 years across 17 orphanages.

Reference criteria

The Dutch Youth Healthcare guideline for vision screening was used as a working basis, which systematically detects eye and vision abnormalities early to prevent visual impairment and achieve health gains (Nederlands Jeugdinstituut 2019).This guideline outlines the following actions:

- Actions for eye examination at each implementation moment.
- Components of developmental examination from the Dutch Development Instrument, known in Dutch as the van Wiechenondezoek (Laurent de Angulo et al. 2008). The Dutch Developmental Instrument consists of 75 developmental milestones between 0–4 years covering five fields of development: gross motor activity, fine motor activity, adaptation, communication and personality/social behaviour.
- Alarm symptoms during anamnesis.
- Actions (referral or control) based on abnormal findings during eye inspection.
- Actions (referral or control) for insufficient or abnormal findings in children under 36 months.
- Referral control criteria for visual acuity measurement after 36 months.

Examinations

Eye assessments were conducted outdoors in the morning by the same well-trained staff member to ensure optimal lighting conditions. For children aged 3 years, or for older children with a comparable cognitive level, visual acuity was tested using the LEA symbol chart placed at 4–5 m, in combination with occlusion glasses and a matching LEA pointer card for symbol recognition. For children older than 3 years, the E-hook chart was used at the same distance, with occlusion glasses and an E-hook on a stick. Following these eye assessments, a medical eye examination was performed by a physician:

- An ophthalmoscope was used in children up to 3 months of age specifically to detect retinoblastoma by assessing the retina. In cases of notably poor visual acuity at any age, the ophthalmoscope was also used to investigate potential causes such as cataracts.
- Using an otoscope, the physician examined all children, regardless of age, for eyelid structure, pupil response, corneal clarity, iris appearance, and scleral condition, as well as signs of nystagmus and strabismus.
- For children up to 3 years of age, visual responses and atypical behaviours were assessed using coloured blocks, guided by age-specific milestones from the Dutch Development Instrument that involve block-based tasks.

Conditions were identified based on the results of these examinations and further confirmed through specialist referrals when necessary. In addition, the overall physical health condition was examined. Blood tests were performed, including blood grouping, Rhesus factor, HIV, and hepatitis B screening. Vaccinations were also reviewed and administered as needed, covering measles, yellow fever, typhoid, tetanus, and hepatitis B.

To protect children's confidentiality, cell countsless than 5 or totals across multiple categories that could reveal exact numbers were not reported precisely but were presented as "<5."

Results

A total of 673 orphans of Sub-Saharan African descent were available, including 85 children under the age of four who were not yet attending school, 270 children aged 4 to 10, and 318 children aged 11 and older from 17 orphanages.

Out of 673 orphans examined, 109 children (16.2%) were identified with visual conditions. Of these, 61 children (56.0%) were referred to ophthalmology for further evaluation (see Table 1), while the remaining 48 remained under observation, as their conditions did not yet require specialist care. Visual conditions were almost equally distributed between boys and girls. Most of the children referred for further examination were aged 11 years or older. Among the referred group, girls accounted for two-thirds of the cases, whereas boys made up two-thirds of those under observation.

Among the 61 referred children, 50 children were diagnosed with a single ocular condition, 10 had two, and one child presented with three distinct ocular conditions. The most frequent combinations involved ametropia with conjunctival disorders, and ametropia with glaucoma. Table 2 presents the characteristics of all ocular conditions ($n = 73$) identified in this group. Ametropia was the most common condition, accounting for 54.8% (40/73) of cases, with astigmatism being the predominant subtype (23/40, 57.5%). All children diagnosed with ametropia were provided with corrective lenses. Conjunctival disorders were also frequent (13/73, 17.8%), followed by glaucoma (9/73, 12.3%), which was more commonly observed in older children, although cases were generally rare. Cataracts were also noted, linked to trauma or associated with HIV. Less than five children met the criteria for low vision (ICD-11 classification code 9D90.3) (Vaishali and Vijayalakshmi 2020).

Of the 61 children referred to ophthalmology, 22 (36.1%) had no other medical issues. A total of 28 children (45.9%) had one additional medical condition, such as dental problems, ear problems, sickle cell anaemia, umbilical hernia, or anaemia. The remaining 11 children (18.0%) had two or more medical conditions, including gynaecological issues, high blood pressure, HIV, anaemia, sickle cell anaemia, and ear problems.

Table 1. Characteristics of the 109 children with visual conditions among the 673 Togolese orphans from 17 orphanages.

Characteristics	Category	Visual condition ($N = 109$)	Referred visual condition ($N = 61$)	Non-referred but remained under observation ($N = 48$)
Sex	Boys	55 (50.5 %)	25 (41.0 %)	31 (64.6%)
	Girls	54 (49.5%)	36 (59.0%)	17 (35.4%)
Age	< 4 years	12 (11.0 %)	6 (9.8 %)	6 (12.5 %)
	4– 10 years	27 (24.8 %)	7 (11.5%)	20 (41.7 %)
	≥11 years	70 (64.2%)	48 (78.7%)	22 (45.8 %)

Table 2. The characteristics of the ocular conditions of the 61 referred children.

Ocular conditions	Number	Boys	Girls	<4 years	4–10 years	≥11 years
Ametropia	40	15	25	<5	≥5	26
Myopia	12	<5	≥5	<5	<5	7
Hypermetropia	5	<5	<5	<5	<5	<5
Astigmatism	19	8	11	<5	≥5	14
Astigmatism and hypermetropia	<5	<5	<5	<5	<5	<5
Astigmatism and myopia	<5	<5	<5	<5	<5	<5
Conjunctival problems	13	≥5	<5	<5	<5	8
Tropical limbo conjunctivitis (LCET)	5	5	<5	<5	<5	<5
Allergic conjunctivitis	8	<5	<5	<5	<5	<5
Eyelid problems	<5	<5	<5	<5	<5	<5
Blepharitis	<5	<5	<5	<5	<5	<5
Ptosis	<5	<5	<5	<5	<5	<5
Glaucoma	9	<5	≥5	<5	<5	≥5
Ocular hypertension	<5	<5	<5	<5	<5	<5
Papillary excavation	<5	<5	<5	<5	<5	<5
Cataract	<5	<5	<5	<5	<5	<5
Uveal metaplasia	<5	<5	<5	<5	<5	<5
Total	73	32	41	9	16	48

Discussion

Our study provides the prevalence of visual conditions among orphaned children of Sub-Saharan African descent in Togo. Of the 673 children examined, 16.2% were found to have a visual condition, with ametropia (particularly astigmatism) being the most common condition. Girls and children aged 11 years and older were more likely to be referred to specialist care.

Demographics

Our study population consisted entirely of children of Sub-Saharan African origin. People of Sub-Saharan African origin are disproportionately affected by several ocular conditions (Burton et al. 2021; GBD 2019 Blindness and Vision Impairment Collaborators and Vision Loss Expert Group of the Global Burden of Disease Study 2021). Studies conducted in Sub-Saharan African countries, specifically Madagascar and the Democratic Republic of Congo, have reported that ametropia is common among school-aged children (Rakatoarisoa et al. 2020; Paluku et al. 2022). Large global analyses show that Sub-Saharan Africa has one of the highest burdens of avoidable vision impairment worldwide, largely driven by limited access to eye-care services, shortages of trained professionals, delayed diagnosis and treatment, and socioeconomic determinants that restrict the use of available eye-care interventions (Burton et al. 2021; GBD 2019 Blindness and Vision Impairment Collaborators and Vision Loss Expert Group of the Global Burden of Disease Study 2021). Despite these challenges, there is a potential advantage. Global analyses showed that childhood myopia is rising rapidly in middle- and high-income countries (Liang et al. 2025), with increased use of digital devices and reduced outdoor activity often implicated in this trend (Németh et al. 2021). In contrast, Togolese orphaned children have no access to digital devices and spend more time outdoors, which may help protect against this trend.

Common diagnoses

Our study found a relatively high prevalence of glaucoma in the study population. This is consistent with the literature, which shows that glaucoma is the second leading cause of blindness in Sub-Saharan Africa, with a higher prevalence, earlier onset, and more rapid progression than in Caucasian populations (Kyari et al. 2013). Cataract was also observed, including cases associated with HIV infection. Sub-Saharan Africa has a high HIV prevalence, and HIV infection has been associated with an increased risk of cataract development, but this has been mostly documented in adults (Amaral et al. 2024). This highlights the need for integrated care approaches that address both infectious diseases and their ophthalmic complications. No cases of strabismus (squint) were detected in our study population, which is in line with the low prevalence reported in African populations. A recent systematic review and meta-analysis estimated the overall prevalence of strabismus in Africa at 0.8% (Akowuah et al. 2023). The absence of amblyopia in our study population likely reflects its low prevalence.

Public health implications

Our study contributes to the limited literature on orphaned children in West Africa, a population often excluded from regular health services. As shown in previous research from Ghana, Gambia, and Togo, sociodemographic vulnerability is strongly associated with vision difficulties (Seidu et al. 2021). Our findings reinforce the need for targeted public health strategies and policy reforms to ensure equitable access to eye care for marginalised groups.

Recommendations

Medical staff, especially public health specialists and ophthalmologists, should be informed about the importance of early screening. For example, this can be achieved through targeted training programs and the inclusion of early visual screening protocols in national paediatric and public health guidelines. It is also essential to raise awareness among the general population. For example, through community

outreach, educational campaigns, distribution of informational materials in clinics, orphanages, and schools, and collaboration with local media and community leaders. These efforts should emphasise that early screening, starting from birth and the first weeks of life, is important to prevent lifelong visual impairment and to support healthy child development.

Visual screening should begin at a young age and be conducted regularly. These screenings should be integrated with routine vaccinations and vitamin A supplementation and carried out by trained professionals. Visual acuity should be checked systematically at the start of each school year, including in kindergarten, primary, and secondary schools. Ophthalmology students could assist in monitoring the children and maintaining contact with schools to ensure follow-up care. Screening should start in the first months of life, not only when the child enters school. Delaying screening may lead to health problems that affect daily functioning in orphanages, schools, and later in the workplace. Young children should receive vitamin A supplements as part of their nutritional care. All children must be vaccinated against measles, as the infection can cause serious eye complications. Environmental factors such as allergens (including dust mites and peanuts), as well as exposure to dust and sunlight, can worsen eye conditions and should be addressed through preventive measures (Solebo et al. 2015). It is also important to detect sickle cell disease early. Severe forms such as sickle cell anaemia often lead to retinopathy, which can result in blindness if not treated in time (Hall and Shilio 2006).

Strengths and limitations

A strength of our study is its comprehensive approach, involving detailed eye examinations with standardised screening tools of a large group of orphaned children in Togo. A limitation is that our study did not capture the psychosocial, educational, or developmental impacts of visual impairment, which are important for understanding the broader consequences for affected children.

Conclusions

Sixteen percent of Togolese orphans examined had visual conditions, mostly refractive errors such as astigmatism. This high prevalence underscores the importance of regular eye screening in orphanages.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The author(s) reported there is no funding associated with the work featured in this article.

References

Ackland P, Resnikoff S, Bourne R. 2017. World blindness and visual impairment: despite many successes, the problem is growing. Community Eye Health. 30(100):71–73.

Akowuah PK et al. 2023. Strabismus and amblyopia in Africa – a systematic review and meta-analysis. Strabismus. 31(1):31–44. https://doi.org/10.1080/09273972.2022.2157023

Amaral DC et al. 2024. Cataract in HIV patients: a systematic review and meta-analysis. Cureus. 16(10):e72370. https://doi.org/10.7759/cureus.72370

Bourne R et al. 2020. Trends in prevalence of blindness and distance and near vision impairment over 30 years: an analysis for the Global Burden of Disease Study. Lancet Glob Health. https://visionatlas.iapb.org/country-data/togo/. Accessed 17 November.

Burton MJ et al. 2021. The Lancet Global Health commission on Global Eye Health: vision beyond 2020. Lancet Glob Health. 9(4):e489–e551. https://doi.org/10.1016/S2214-109X(20)30488-5

Cardona M et al. 2025. Eye care interventions that reduce access inequities for women, rural residents and older people in low-middle-income countries: a scoping review. Front Public Health. 13:1578848. https://doi.org/10.3389/fpubh.2025.1578848

Frick KD, Gower EW, Kempen JH, Wolff JL. 2007. Economic impact of visual impairment and blindness in the United States. Arch Ophthalmol. 125(4):544–550. https://doi.org/10.1001/archopht.125.4.544

GBD 2019 Blindness and Vision Impairment Collaborators, Vision Loss Expert Group of the Global Burden of Disease Study. 2021. 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. Lancet Glob Health. 9(2):e144–e160.

Haileamlak A. 2022. The burden of visual impairment and efforts to curve it down. Ethiop J Health Sci. 32(5):874. https://doi.org/10.4314/ejhs.v32i5.1

Hall A, Shilio B. 2006. Limbo-conjonctivite endémique des tropiques (LCET). Rev Santé 43 44 279 Ocul Communautaire. 3(1):8–10. https://archive.cehjournal.org/article/limbo-conjonctivite-endemique-des-tropiques-lcet/. Accessed 17 November 2025.

Kyari F, Abdull MM, Bastawrous A, Gilbert CE, Faal H. 2013. Epidemiology of glaucoma in Sub-Saharan Africa: prevalence, incidence and risk factors. Middle East Afr J Ophthalmol. 20(2):111–125. https://doi.org/10.4103/0974-9233.110605

Laurent de Angulo MS, Brouwers-de Jong JEA, Bijlsma-Schlösser JFM et al. 2008. Ontwikkelingsonderzoek in de Jeugdgezondheidszorg. Het Van Wiechenonderzoek. De Baecke-Fassaert Motoriektest. Van Gorcum.

Liang J et al. 2025. Global prevalence, trend and projection of myopia in children and adolescents from 1990 to 2050: a comprehensive systematic review and meta-analysis. Br J Ophthalmol. 109(3):362–371. https://doi.org/10.1136/bjo-2024-325427

Loh A, Wong C, Lamoureux EL. 2015. Impact of visual impairment on functioning and quality of life in children: a systematic review. Surv Ophthalmol. 60(3):309–324.

Loulidi S, Loukid M, Boussaa S. 2025. Visual impairment and blindness among children: a literature review. Clin Epidemiol Glob Health. 34:102094. https://doi.org/10.1016/j.cegh.2025.102094

Naidoo K et al. 2020. Prevalence and causes of vision loss in sub-Saharan Africa in 2015: magnitude, temporal trends and projections. Br J Ophthalmol. 104(12):1658–1668. https://doi.org/10.1136/bjophthalmol-2019-315217

Nederlands Jeugdinstituut. 2019.Databank Richtlijnen: Jeugdgezondheidszorg – Oogscreening. https://www.jgzrichtlijnen.nl/richtlijn/jgz-richtlijn-opsporen-oogafwijkingen/. Accessed 17 November

Németh J et al. 2021. Update and guidance on management of myopia. European Society of Ophthalmology in cooperation with International Myopia Institute. Eur J Ophthalmol. 31(3):853–883. https://doi.org/10.1177/1120672121998960

Ophir-Cohen M, Ashkenazi T, Maeir A. 2009. Developmental attainments and emotional status of young children with visual impairments and emotional or behavioral deficits. Res Dev Disabil. 30(3):341–352.

Paluku KJ, Kahindo KA, Kanyere MC, Mumbere MT. 2022. Fréquence des amétropies aux cliniques universitaires du Graben en République Démocratique du Congo. Kisangani Médical. 12(2):556–563.

Rakatoarisoa RTR et al. 2020. Conséquences des troubles de réfraction non corrigés sur la performance scolaire, étude sur 414 enfants. Revue Malgache De Pédiarie. 3(2):29–37.

Resnikoff S, Pascolini D, Mariotti SP, Pokharel GP. 2008. Global magnitude of visual impairment caused by uncorrected refractive errors in 2004. Bull World Health Organ. 86(1):63–70. https://doi.org/10.2471/blt.07.041210

Seidu A-A et al. 2021. Prevalence and sociodemographic factors associated with vision difficulties in Ghana, Gambia, and Togo: a multi-country analysis. BMC Public Health. 21(1):2148. https://doi.org/10.1186/s12889-021-12193-7

Solebo AL, Cumberland PM, Rahi JS. 2015. Whole-population vision screening in children aged 4–5 years to detect amblyopia. Lancet. 385(9984):2308–2319. https://doi.org/10.1016/S0140-6736(14)60522-5

Solebo AL, Rahi JS. 2014. Epidemiology, aetiology and management of visual impairment in children. Arch Dis Child. 99(4):375–379. https://doi.org/10.1136/archdischild-2012-303002

Song P, Global Health Epidemiology Research Group (GHERG). et al. 2023. The prevalence of vitamin A deficiency and its public health significance in children in low- and middle-income countries: a systematic review and modelling analysis. J Glob Health. 13:04084. https://doi.org/10.7189/jogh.13.04084

Supplément en vitamine A chez les enfants de 0 à 11 mois au cours de la vaccination de routine par région sanitaire - Portail de données du Togo. 2025. https://togo.opendataforafrica.org/cicibjb/suppl%C3%A9ment-en-vitamine-a-chez-les-enfants-de-0-%C3%A0-11-mois-au-cours-de-la-vaccination-de-routine-par-r. Accessed 17 November

United Nations. 2025. Convention on the Rights of the Child. Adopted by General Assembly resolution 44/25 of 20 November 1989, entry into force 2 September 1990. https://www.unicef.org/child-rights-convention/convention-text. Accessed 17 November

Vaishali KV, Vijayalakshmi P. 2020. Understanding definitions of visual impairment and functional vision. Community Eye Health. 33(110):S16–S17.

World Health Organization (WHO). 2024. Promising progress on eye health in African region, but conditions remain. WHO Regional Office for Africa. https://www.afro.who.int/news/promising-progress-eye-health-african-region-challenges-remain. Accessed 17 November 2025.

World Health Organization. 2014. Xerophthalmia and night blindness for the assessment of clinical vitamin A deficiency in individuals and populations. Vitamin and Mineral Nutrition Information System. https://iris.who.int/bitstream/handle/10665/133705/WHO_NMH_NHD_EPG_14.4_eng.pdf. Accessed 17 November 2025.

World Health Organization. 2019. World report on vision. Licence: CC BY-NC-SA 3.0 IGO https://iris.who.int/bitstream/handle/10665/328717/9789241516570-eng.pdf. Accessed 17 November 2025.