

Global and national epidemiology of glaucoma: prevalence, burden, and public health implications

Epidemiologia nacional e global do glaucoma: prevalência, sobrecarga e implicações à saúde pública

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According to the World Health Organization (WHO), the three leading causes of visual impairment are refractive errors (42%), cataracts (33%), and glaucoma (2%), with glaucoma being the leading cause of irreversible blindness worldwide (8%), followed by age-related macular degeneration (5%).⁽¹⁾ Glaucoma, a chronic and degenerative disease, has long been a concern for public health authorities. It was estimated to affect over 67 million people worldwide, a number that grew to 76 million in 2020 and is projected to reach 111.8 million by 2040.⁽²⁻⁴⁾ In 2020, glaucoma caused bilateral blindness in approximately 3.61 million people and moderate-to-severe visual impairment in 4.14 million, accounting for 8.4% of all blindness and 1.4% of all moderate-to-severe visual impairment worldwide.⁽⁵⁾

Glaucoma is characterized by progressive optic neuropathy and is often asymptomatic until advanced stages. With aging populations, a higher burden of chronic diseases, and the rising prevalence of different glaucoma types, understanding the current epidemiological status and future projections is essential to guide public policies for blindness prevention and burden reduction.⁽⁶⁾ Schoff et al. demonstrated the influence of age on glaucoma incidence: individuals aged 40 accounted for approximately 1.6 new glaucoma cases per 100,000 inhabitants per year, whereas 80-year-old people accounted for 94.3 cases per 100,000 inhabitants.⁽⁷⁾ The World Glaucoma Association (WGA) estimates that one in 200 individuals aged 40 has glaucoma, with its prevalence increasing to one in eight by age 80.⁽⁸⁾

Geographic and ethnic disparities further underscore the disease's uneven impact. The global prevalence of primary open-angle glaucoma (POAG) has remained at approximately 2.4% over the last two decades, yet this masks significant regional variations.⁽⁸⁾ With a prevalence of 4.0%, Africa faces the highest burden, while Oceania reports the lowest at 1.8%.⁽⁹⁾ These differences highlight the need to investigate underlying genetic, environmental, and healthcare access factors.

In Brazil, data on glaucoma prevalence are scarce. Most studies are limited and outdated, reporting a prevalence of 2 to 3% in populations over 40 years old, with prevalence increasing with age and reaching 6 to 7% after 70 years of age, which represents about 1.5 million people.^(10,11) In one of the few population-based studies, Projeto Glaucoma, conducted in southern Brazil, Sakata et al. (2007) evaluated 1,636 individuals aged 40 years or older and found a glaucoma prevalence of 3.4%.⁽¹²⁾ Among these, 87% had POAG and 13% had primary angle-closure glaucoma (PACG).⁽¹²⁾ Notably, over 90% of affected individuals were unaware of their diagnosis, revealing a substantial

diagnostic gap in the community.⁽¹²⁾ These findings provided the first regionally specific estimate of the disease burden in Brazil, highlighting the critical need for early detection and public health planning.

Other studies evaluating the epidemiological profile of patients at glaucoma centers found that POAG was the most common type, accounting for nearly half of all confirmed diagnoses (47.6%).⁽¹³⁾ Cases of normal-tension glaucoma (NTG) and PACG were less frequent, comprising 2.0% and 3.7% of cases, respectively.⁽¹³⁾ Secondary glaucoma was rare (1.9%), with neovascular glaucoma accounting for 0.9% of cases.⁽¹³⁾

Between 2013 and 2023, Brazil recorded 59,573 hospital admissions due to glaucoma, with a significant concentration in the Southeast region (47.1%), followed by the Northeast (23.14%), South (18.61%), Center-West (9.13%), and North (1.99%).⁽¹⁴⁾ These figures reveal marked regional disparities in glaucoma management, reflecting structural differences in healthcare access, particularly regarding early diagnosis and outpatient treatment. While the Southeast leads in hospitalizations and expenditures, the low rates in the North may reflect limited access to specialized care.

According to estimates, the number of people of all ages living with sight loss will increase to over 1.7 billion by 2050.⁽¹⁵⁾ This is compounded by significant productivity loss due to low vision and blindness, with an estimated annual loss of \$410.7 billion, of which \$43.6 billion is from blindness and \$367.1 billion from moderate-to-severe vision impairment.⁽¹⁶⁾ Because glaucoma is an irreversible cause of blindness, its impact on productivity is a major concern. Some studies report that as many as 35% of people in low- and middle-income countries, such as Brazil, are blind at diagnosis. This alarming statistic highlights a significant impact on productivity and should be a primary concern for policymakers, as it represents a failure of public health systems to implement effective diagnosis and early treatment programs.

Given its high prevalence, lasting functional impact, and growing economic burden, glaucoma should be recognized as a public health priority. As a progressive and irreversible disease, it gradually erodes autonomy and quality of life – often unnoticed until advanced stages – especially among aging populations and in regions with limited access to care. Expanding early detection, ensuring equitable access to effective treatments, and fostering public awareness are essential steps. Addressing glaucoma is not only a medical challenge but also a social and economic imperative.

AUTHORS' CONTRIBUTION

Substantial contribution to conception and design: Emílio Rintaro Suzuki Junior, Ana Flávia Lacerda Belfort; Acquisition of data: Ana Flavia Belfort, Emilio Rintaro Suzuki Junior, Victória Chiodi Pereira; Drafting of the manuscript: Ana Flavia Belfort, Emilio Rintaro Suzuki Junior, Victória Chiodi Pereira; Critical revision of the manuscript for important intellectual content: Ana Flavia Lacerda Emilio Rintaro Suzuki Junio; Final approval of the submitted manuscript: Ana Flavia Lacerda Belfort, Emilio Rintaro Suzuki Junior, Victória Chiodi Pereira; Research group leadership: Emilio Rintaro Suzuki Junior.

REFERENCES

1. World Health Organization (WHO) Global data on visual impairments 2010; WHO/NMH/PBD/12.01. Geneva: WHO; 2012 [cited 2025 Oct 3]. Available from: <https://www.iapb.org/wp-content/uploads/GLOBALDATAFINALforweb.pdf>
2. Thylefors B, Négrel AD. The global impact of glaucoma. *Bull World Health Organ.* 1994;72(3):323-6.
3. Quigley HA. Number of people with glaucoma worldwide. *Br J Ophthalmol.* 1996;80(5):389-93.
4. Tham YC, Li X, Wong TY, Quigley HA, Aung T, Cheng CY. Global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. *Ophthalmology.* 2014;121:2081-90.
5. Vision Loss Expert Group of the Global Burden of Disease Study; GBD 2019 Blindness and Vision Impairment Collaborators. Global estimates on the number of people blind or visually impaired by glaucoma: A meta-analysis from 2000 to 2020. *Eye (Lond).* 2024;38(11):2036-46.
6. World Health Organization (WHO). Package of eye care interventions. Geneva: WHO; 2022 [cited 2025 Oct 3]. Available from: <https://www.who.int/publications/i/item/9789240048959>
7. Schoff EO, Hattenhauer MG, Ing HH, Hodge DO, Kennedy RH, Herman DC, et al. Estimated incidence of open-angle glaucoma in Olmsted County, Minnesota. *Ophthalmology.* 2001;108(5):882-6.
8. World Glaucoma Association. What is glaucoma? World Glaucoma Association; 2025 [cited 2025 Oct 3]. Available from: <https://www.worldglaucomaweek.org/what-is-glaucoma/>
9. Zhang N, Wang J, Li Y, Jiang B. Prevalence of primary open angle glaucoma in the last 20 years: a meta-analysis and systematic review. *Sci Rep.* 2021;11(1):13762.
10. Brasil. Ministério da Saúde. Secretaria de Atenção Especializada à Saúde; Secretaria de Ciência, Tecnologia, Inovação e Complexo da Saúde. Portaria Conjunta SAES/SECTICS nº 28, de 6 de dezembro de 2023. Aprova o Protocolo Clínico e Diretrizes Terapêuticas do Glaucoma. Brasília (DF): Ministério da Saúde; 2023 [citado 2025 Out 3]. Disponível em: <https://www.gov.br/conitec/pt-br/midias/protocolos/portaria-conjunta-no-28-pcdt-do-glaucoma.pdf>
11. Conselho Brasileiro de Oftalmologia (CBO). Condições de saúde ocular no Brasil. São Paulo: CBO; 2023 [citado 2025 Out 3]. Available from: https://www.cbo.net.br/admin/docs_upload/Condicoesdesaudeocularnobrasil.pdf
12. Sakata K, Sakata LM, Sakata VM, Santini C, Hopker LM, Bernardes R, et al. Prevalence of glaucoma in a South Brazilian population: Projeto Glaucoma. *Invest Ophthalmol Vis Sci.* 2007;48(11):4974-9.

13. Diniz ER, Ferreira GF, Cotta BS, Chiodi VL, Assumpção PV, Magalhães LL, et al. Perfil clínico epidemiológico de pacientes com glaucoma atendidos em um serviço de referência em oftalmologia do estado de Minas Gerais. *Rev Med Minas Gerais*. 2021;31:e31103.
14. Alves de Oliveira JV, Mendonça CQ, Macedo Paradis RJ, Silva RS, Abud ACF, Leite MDP, et al. Panorama epidemiológico hospitalar de pacientes com glaucoma no Brasil. *Braz J Implantol Health Sci*. 2025;7(3):2090-103.
15. International Agency for the Prevention of Blindness (IAPB). *Vision Atlas: Global Data*; 2025 [cited 2025 Oct 3]. Available from: <https://visionatlas.iapb.org/global-data/>
16. Burton MJ, Ramke J, Marques AP, Bourne RR, Congdon N, Jones I, et al. The Lancet Global Health Commission on Global Eye Health: vision beyond 2020. *Lancet Glob Health*. 2021;9(4):e489-e551.