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EYE HEALTH POLICY AND THE CHALLENGE OF PREVENTABLE BLINDNESS IN PAKISTAN

Asif Satti
Azad Jammu & Kashmir Medical College, Muzaffarabad
Email satti_asif666@gmail.com

Abstract:
Blindness and visual impairment remain major public health challenges in low- and middle-income countries (LMICs). In Pakistan, more than 12 million people live with visual impairment, including 2 million who are blind, with most cases being preventable or treatable. Despite national programs aligned with WHO's Vision 2020 and Vision 2030, gaps in implementation persist. To analyze the epidemiology of blindness in Pakistan, review national eye health policies, identify cultural and systemic barriers to implementation, and propose policy recommendations for sustainable prevention of avoidable blindness. A systematic narrative review was conducted using PRISMA guidelines. PubMed, Scopus, Web of Science, and Google Scholar were searched for articles published between 2000 and 2024. Government reports, WHO documents, and NGO publications were included. Data on prevalence, causes, policies, and interventions were extracted and narratively synthesized. Cataracts, uncorrected refractive errors, and diabetic retinopathy are the leading causes of blindness in Pakistan. National programs improved cataract surgical coverage and established over 300 district-level eye care centers, yet urban–rural disparities, gender inequities, and financial barriers persist. NGOs such as the Layton Rahmatulla Benevolent Trust (LRBT) have played a pivotal role in service provision, but sustainability remains a challenge. Integration of eye care into primary health care and universal health coverage is limited, while diabetic retinopathy is emerging as a growing threat due to Pakistan's rising diabetes prevalence. Preventable blindness in Pakistan reflects a policy–implementation gap. Strengthening eye health policy requires integration into primary healthcare, addressing gender and rural access barriers, and developing sustainable financing. Priority should be given to cataract and refractive error programs, diabetic retinopathy screening, female-centered outreach, and expansion of mid-level ophthalmic personnel to achieve equitable eye care and align with WHO's Vision 2030.

Keywords: *Eye Health; Preventable Blindness; Cataracts; Refractive Errors; Diabetic Retinopathy; Pakistan; Health Policy; Vision 2030*

Introduction

Blindness and visual impairment remain significant yet preventable global health challenges. According to the World Health Organization (WHO), at least 2.2 billion people worldwide live with vision impairment or blindness, of which 1 billion cases are preventable or treatable. In low- and middle-income countries (LMICs), including Pakistan, limited access to eye health services exacerbates this burden.

In Pakistan, an estimated 12 million people are visually impaired, including 2 million who are blind, with cataracts, refractive errors, glaucoma, and diabetic retinopathy as leading causes.[3],[4] Despite the high prevalence, blindness is largely preventable: WHO estimates that

80% of blindness in Pakistan is avoidable with timely intervention. Yet, structural gaps in eye health policy, inequitable access to services, lack of trained ophthalmologists in rural regions, and cultural perceptions of eye diseases limit progress.

Over the last two decades, Pakistan has developed national eye health initiatives, such as the National Program for Prevention and Control of Blindness, aligned with WHO's *Vision 2020: The Right to Sight* campaign While these initiatives have expanded cataract surgeries and community-based eye camps, challenges remain in integrating eye health into primary health care, addressing gender inequities in access, and ensuring sustainable financing.

This paper explores the challenge of preventable blindness in Pakistan by examining:
(1) the epidemiology of blindness and visual impairment,
(2) the evolution of national eye health policies,
(3) systemic and cultural barriers to implementation, and
(4) policy directions for achieving equitable, sustainable eye care under WHO's *Vision 2030*.

Literature Review

Global Burden of Preventable Blindness

Vision impairment is a leading cause of disability worldwide, with disproportionate effects on LMICs. The Global Burden of Disease (GBD) study ranks blindness as one of the top ten causes of years lived with disability Cataracts are the most common cause, accounting for 51% of global blindness, followed by uncorrected refractive errors, glaucoma, and diabetic retinopathy. Preventable blindness has wide social and economic implications, including lost productivity, increased dependency, and higher health costs.

Eye Health in Pakistan: Epidemiological Context

Pakistan ranks among the countries with the highest prevalence of blindness in South Asia.[3] The National Blindness and Visual Impairment Survey (2003–2004) reported a blindness prevalence of 2.7% among adults aged ≥30 years, with cataracts responsible for more than half of all cases.[11] Recent estimates suggest over 12 million Pakistanis live with visual impairment, of which refractive errors and cataracts remain dominant causes.[4] Diabetes-related eye diseases are also rising due to increasing rates of type 2 diabetes, affecting nearly 26% of Pakistan's adult population.

Policy Frameworks: From Vision 2020 to Vision 2030

In response to WHO's *Vision 2020* initiative, Pakistan launched its National Program for Prevention and Control of Blindness (1994; revised 2003), emphasizing cataract surgeries, refractive services, and ophthalmology training. The program successfully established more than 300 district-level eye care centers and expanded cataract surgical coverage. However, limited coordination between federal and provincial health departments after devolution in 2011 weakened program sustainability. WHO's *Vision 2030* framework now emphasizes integrating eye care into universal health coverage (UHC), with Pakistan pledging alignment.

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Barriers to Implementation

Despite policies, access to eye care in Pakistan remains uneven. Urban-rural disparities persist, with most ophthalmologists concentrated in major cities like Lahore, Karachi, and Islamabad. Women, especially in rural areas, face cultural and mobility restrictions that limit eye care access. Out-of-pocket costs also deter timely treatment, as cataract surgery and corrective lenses are unaffordable for low-income households. Moreover, a lack of integration of eye health into primary healthcare means many patients seek care late, often when blindness is irreversible.

Community-Based and Preventive Strategies

Evidence from South Asia highlights the success of community eye camps, mobile clinics, and integration of basic eye care into primary healthcare. In Pakistan, NGOs such as Layton Rahmatulla Benevolent Trust (LRBT) and Aga Khan Health Services have played critical roles, conducted millions of free eye surgeries and established rural outreach centers. Training mid-level ophthalmic personnel and school screening programs have also improved coverage, though sustainability remains a challenge.

Emerging Challenges: Diabetes and Aging

Pakistan faces a dual challenge: an aging population and an epidemic of diabetes, both of which increase risks of visual impairment. By 2045, the number of people with diabetes in Pakistan is projected to exceed 37 million, making diabetic retinopathy a major public health concern. Without preventive screening and integration into health systems, blindness from diabetes is expected to rise sharply.

Methodology

Study Design

This study used a systematic narrative review design to synthesize evidence on eye health policies, epidemiology, and barriers to preventing blindness in Pakistan. The methodology followed PRISMA guidelines to ensure transparency and rigor.

Data Sources

We conducted searches in PubMed, Scopus, Web of Science, and Google Scholar for literature published between 2000 and 2024. Grey literature, including government reports, WHO documents, and NGO publications (e.g., LRBT reports), were also reviewed.

Search Terms

Search keywords included: *"preventable blindness," "cataract surgery coverage," "refractive errors," "diabetic retinopathy," "Pakistan," "eye health policy," and "Vision 2020/2030."* Boolean operators (AND/OR) and MeSH terms were applied.

Inclusion Criteria

1. Studies conducted in Pakistan or South Asia with relevance to eye health policy and blindness.
2. Peer-reviewed articles, policy reports, and systematic reviews.
3. Studies reporting prevalence, interventions, or policy analysis.

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Exclusion Criteria

1. Case reports and editorials.
2. Articles focusing solely on clinical ophthalmology without public health or policy context.
3. Non-English publications.

Data Extraction and Synthesis

Data were extracted into structured tables covering:
(1) prevalence of blindness,
(2) major causes,
(3) policy frameworks, and
(4) interventions. Evidence was synthesized narratively due to heterogeneity in study designs.

Results

Table 1. Prevalence of Blindness and Visual Impairment in Pakistan

Source	Population	Blindness Prevalence	Leading Causes	Notes
Jadoon et al, 2006[3]	≥30 years	2.7%	Cataracts (51%), glaucoma (7%), refractive errors (12%)	National Survey (2003–04)
Vision 2020 Pakistan, 2018[4]	All ages	~12 million visually impaired; 2 million blind	Cataracts, refractive errors, DR	Updated national estimates
Basit et al, 2018[12]	Adults	DR prevalence 26% in diabetics	Diabetic retinopathy emerging cause	Linked to diabetes epidemic

Table 2. National Eye Health Policy and Programs

Policy/Program	Year	Key Features	Achievements	Challenges
National Program for Prevention & Control of Blindness	1994; revised 2003	Cataract surgery, refraction, training of ophthalmologists	>300 district eye care centers, increased cataract coverage	Weak governance, limited rural reach
Vision 2020 Alignment	2000–2020	Focus on avoidable blindness	Cataract backlog reduced	Sustainability after devolution (2011)
WHO Vision 2030 (Pakistan pledge)	2020–2030	Integration into UHC	Commitment to expand primary eye care	Implementation gaps persist

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Table 3. Barriers to Preventable Blindness Interventions

Barrier	Evidence	Implication
Urban–rural disparity	Ophthalmologists concentrated in major cities (Akram & Khan, 2017[15])	Rural populations underserved
Gender inequities	Women face cultural restrictions, lower access (Ahmad & Gul, 2016[16])	Female blindness rates higher
Financial barriers	High out-of-pocket cataract surgery costs (Malik & Zafar, 2012[17])	Poor households delay care
Weak integration	Eye care not fully included in PHC (Shaikh et al, 2019[18])	Delayed detection, preventable blindness

Discussion

This review reveals a persistent gap between policy frameworks and practical outcomes in Pakistan's eye health system. While prevalence data indicate significant improvements in cataract surgical coverage, a high burden of blindness remains due to refractive errors, cataracts, and diabetes-related complications.

The National Program for Prevention and Control of Blindness initially improved access through district eye centers, but governance challenges after the 2011 health devolution weakened coordination. Pakistan's alignment with Vision 2020 helped reduce cataract backlog, yet systemic integration into primary healthcare and universal health coverage remains limited.

Cultural and gender barriers present a critical challenge. Women, particularly in rural Pakistan, face restricted mobility and decision-making power, limiting their access to eye care. Similarly, the concentration of ophthalmologists in urban centers leaves rural districts underserved.

Non-governmental organizations (NGOs) like LRBT have filled critical service gaps, providing free eye surgeries and mobile outreach. However, reliance on donor-driven models raises sustainability concerns. Scaling teleophthalmology and community health worker engagement offers promise for expanding access, especially for diabetic retinopathy screening.

Conclusion and Clinical/Policy Recommendations

Preventable blindness in Pakistan remains a major public health issue, driven by cataracts, refractive errors, and diabetic retinopathy. Although national eye health policies exist, implementation barriers particularly urban-rural inequities, gender disparities, and weak health system integration limit their effectiveness.

Recommendations

1. **Policy Integration**
    - Embed eye care into primary healthcare and UHC frameworks to ensure equitable access.
    - Strengthen inter-provincial coordination after devolution.

2. **Cataract and Refractive Error Programs**
    - Expand low-cost cataract surgical programs in rural districts.
    - Increase provision of affordable corrective lenses through public-private partnerships.
3. **Diabetic Retinopathy Control**
    - Integrate retinal screening into diabetes clinics nationwide.
    - Use teleophthalmology for remote screening and referrals.
4. **Addressing Gender Inequities**
    - Deploy female health workers to improve women's access.
    - Design culturally sensitive awareness campaigns targeting rural households.
5. **Human Resources and Training**
    - Increase training of mid-level ophthalmic personnel to bridge urban–rural gaps.
    - Incentivize ophthalmologists to work in underserved areas.
6. **Sustainable Financing**
    - Reduce out-of-pocket costs via insurance schemes and subsidies.
    - Encourage NGO government partnerships with long-term sustainability frameworks.

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