

THE IMPACT OF GLAUCOMA ON UZBEKISTAN'S ECONOMY

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Abstract

This article examines the economic implications of glaucoma in Uzbekistan, focusing on how this chronic eye disease contributes to healthcare costs, lost productivity, and broader socioeconomic burdens. Glaucoma, a leading cause of irreversible blindness, poses significant challenges in developing countries like Uzbekistan, where access to early detection and treatment is limited. Drawing on national and international data, the analysis covers direct medical expenses, indirect costs from disability, and the strain on the country's GDP. Findings indicate that glaucoma could impose an annual economic burden of hundreds of millions of dollars, exacerbated by an aging population and rural-urban disparities. Preventive measures, such as expanded screening programs, could mitigate these costs. The article is structured in IMRAD format and references 15 sources from global health organizations and local studies.

Keywords: glaucoma, economic burden, healthcare expenditure, Uzbekistan, GDP, blindness.

GLAUKOMA KASALLIGINING O'ZBEKISTON IQTISODIYOTIGA BO'LGAN TA'SIRLARI

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Annotatsiya

Ushbu maqolada O'zbekistonda glaukomaning iqtisodiyotga ta'siri tahlil qilinadi. Unda ushbu surunkali ko'z kasalligi sog'liqni saqlash xarajatlari, mehnat unumdorligi yo'qotilishi hamda kengroq ijtimoiy-iqtisodiy muammolarga qanday

hissa qo'shayotgani yoritilgan. Glaukoma – dunyo miqyosida qaytarilmas ko'rlikning yetakchi sababi bo'lib, erta tashxis va muntazam davolanish imkoniyatlari cheklangan rivojlanayotgan mamlakatlar, jumladan O'zbekiston uchun ham jiddiy muammo hisoblanadi. Milliy sog'liqni saqlash statistikasi va xalqaro ma'lumotlarga asoslanib, ushbu tadqiqot to'g'ridan-to'g'ri tibbiy xarajatlar, nogironlik bilan bog'liq bilvosita iqtisodiy yo'qotishlar hamda mamlakat yalpi ichki mahsulotiga (YaIM) tushayotgan yukni baholaydi. Natijalar shuni ko'rsatadiki, glaukoma mamlakat iqtisodiyotiga yiliga yuzlab million dollar miqdorida zarar yetkazmoqda. Bu holat aholining qarib borayotganligi va qishloq hamda shahar o'rtasidagi tibbiy xizmatlar nomutanosibligi bilan yanada kuchaymoqda. Profilaktik choralarni kengaytirish – xususan, aholi orasida skrining dasturlarini yo'lga qo'yish, xabardorlikni oshirish va erta davolashni yo'lga qo'yish – uzoq muddatli iqtisodiy yukni sezilarli darajada kamaytirishi mumkin. Maqola IMRAD tuzilmasida yozilgan bo'lib, unda xalqaro sog'liqni saqlash tashkilotlari va mahalliy tadqiqotlarning 15 manbasi keltirilgan.

Kalit so'zlar: glaukoma, iqtisodiy yuk, sog'liqni saqlash xarajatlari, O'zbekiston, YaIM, ko'rlik.

ВЛИЯНИЕ ГЛАУКОМЫ НА ЭКОНОМИКУ УЗБЕКИСТАНА

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Аннотация

В данной статье рассматривается экономическое воздействие глаукомы в Узбекистане, акцентируя внимание на том, как это хроническое заболевание глаз влияет на расходы системы здравоохранения, снижение производительности труда и более широкие социально-экономические последствия. Глаукома является одной из ведущих причин необратимой

слепоты во всём мире и представляет серьёзную проблему для развивающихся стран, включая Узбекистан, где возможности ранней диагностики и длительного лечения ограничены. На основе национальной статистики здравоохранения и международных данных в исследовании оцениваются прямые медицинские расходы и косвенные экономические потери, связанные с инвалидностью и снижением трудовой активности населения. Результаты показывают, что глаукома наносит экономический ущерб, оцениваемый в сотни миллионов долларов ежегодно, что усугубляется старением населения и неравенством между городскими и сельскими регионами в доступе к медицинской помощи. Усиление профилактических мер — таких как расширение программ скрининга, повышение осведомлённости населения и раннее лечение — может существенно снизить долгосрочное экономическое бремя. Статья структурирована в формате IMRAD и содержит 15 источников из данных международных организаций здравоохранения и местных исследований.

Ключевые слова: глаукома, экономическое бремя, расходы на здравоохранение, Узбекистан, ВВП, слепота.

Introduction

Glaucoma is a progressive optic neuropathy characterized by increased intraocular pressure, leading to irreversible vision loss if untreated. It is often asymptomatic in early stages, earning it the moniker "silent thief of sight." Globally, glaucoma affects over 80 million people, with projections reaching 111 million by 2040. In developing countries, where healthcare infrastructure is strained, the disease disproportionately impacts vulnerable populations, resulting in higher rates of blindness and disability.

Uzbekistan, a Central Asian nation with a population exceeding 35 million, faces unique challenges in managing glaucoma. The country's economy, transitioning from Soviet-era structures to market-oriented reforms, achieved a GDP of

approximately \$80 billion in 2023, with forecasts for 5.9% growth in 2025, potentially reaching \$100 billion. Healthcare spending stands at around 7.36% of GDP, with per capita expenditure at \$169 in 2022, reflecting modest investments compared to global averages. Plans to increase education and healthcare budgets by 20% in 2025 signal progress, but glaucoma remains under-addressed.

Epidemiological data on glaucoma in Uzbekistan are limited, but studies indicate a rising incidence. Longitudinal analysis shows primary disability from glaucoma doubled between 2015 and 2020, with open-angle and closed-angle forms dominating 97.9% of cases. In neighboring Kazakhstan, annual incidence rose from 59.1 to 135.5 per 100,000 between 2000 and 2022, suggesting similar trends in Uzbekistan due to shared environmental factors like UV exposure in arid regions. Childhood glaucoma contributes to 5% of avoidable blindness, highlighting intergenerational impacts.

The economic burden of glaucoma extends beyond medical costs to include lost wages, caregiver expenses, and reduced quality of life. In developing countries, undiagnosed cases reach 95%, amplifying indirect costs. This article aims to quantify glaucoma's economic toll on Uzbekistan, hypothesizing that it could reduce GDP by 0.5-1%, akin to patterns in low-income nations. By integrating epidemiological insights with economic modeling, we explore pathways for mitigation.

Methods

This study employs a mixed-methods approach, combining secondary data analysis from international databases (WHO, World Bank) and local publications with economic modeling. Data sources include PubMed for prevalence studies, World Bank indicators for GDP and healthcare spending, and IMF reports for fiscal projections.

Quantitative assessment: Burden estimates use cost-of-illness models, incorporating direct (treatment) and indirect (productivity loss) costs. Prevalence is extrapolated from regional data: assuming 1-2% adult prevalence (similar to

Central Asia), affecting 350,000-700,000 Uzbekistanis. Disability-adjusted life years (DALYs) are calculated using WHO formulas, with costs per DALY at \$1,000-3,000 in developing contexts.

Qualitative insights: Review of psychosocial impacts from studies on patient burdens in low-income settings. Limitations: Sparse Uzbekistan-specific data; estimates rely on proxies from Kazakhstan and global averages. Future research needs national surveys.

Results

Glaucoma prevalence in Uzbekistan is underreported, but proxies suggest 1-2% of adults are affected, with incidence rising due to aging (15% over 60 by 2030). Disability cases increased from 2015-2020, with 57,338 primary open/closed-angle diagnoses. Economic modeling reveals substantial costs.

Direct costs: Treatment (medications, surgery) averages \$200-500 per patient annually in developing countries; for Uzbekistan, this totals \$70-350 million for 350,000 cases. Healthcare spending, at 7% of GDP, absorbs 5-10% more from glaucoma.

Indirect costs: Blindness reduces productivity; global estimates show \$6,000-27,000 annual loss per case. With Uzbekistan's \$3,000 average income, 50,000 blindness cases could cost \$150-300 million in lost wages.

Overall GDP impact: 0.5-1% reduction, or \$400-800 million annually, aligning with US burdens scaled down (\$2.86 billion globally).

Table 1: Estimated Economic Burden of Glaucoma in Uzbekistan.

Component	Annual Cost (millions USD)	Notes
Direct Medical	100-200	Drugs, surgery
Indirect (Productivity)	200-400	Lost work, disability
Family/Social	50-100	Caregiving
GDP Loss	300-500	Aggregate impact

Results highlight rural disparities, where access lags, increasing late-stage costs.

Discussion

The findings underscore glaucoma's role in perpetuating poverty cycles in Uzbekistan. High patient burdens (61.5% of income for low earners) mirror developing country patterns. Compared to the US (\$2.5 billion direct costs), Uzbekistan's scaled burden is proportionate given GDP differences. Aging demographics will amplify this; by 2040, cases may double.

Policy implications: The 2025 budget increases offer opportunities for screening, reducing undiagnosed rates from 95%. Mobile clinics and teleophthalmology could cut costs by 30%, as in Brazil. Limitations include data gaps; recommendations: National glaucoma registry and cost-effectiveness studies.

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