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Current burden and future projections of glaucoma in the United Kingdom

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ABSTRACT

Background/aims Up-to-date, stratified estimates of the number of individuals affected by glaucoma in the UK are lacking. This study aimed to estimate the current and future glaucoma burden in the UK population.

Methods The most recent UK census data were used to obtain population counts stratified by age, sex and ethnicity. Age and sex-specific glaucoma prevalence estimates for individuals of European ancestry were sourced from a recent individual participant data meta-analysis of the European Eye Epidemiology Consortium. For non-European ethnic groups, prevalence was estimated by applying relative risks from a Bayesian global meta-analysis to the European baseline. Population projections from the UK's Office for National Statistics were used to estimate future disease burden.

Results Among 34 million UK adults aged ≥40 years, an estimated 1 019 629 individuals (95% CI 691 042 to 1 428 594) are currently living with glaucoma. Estimated age-specific case numbers increase from approximately 10 000 at ages 40–44 to nearly 173 000 in those ≥85 years. Although non-European groups represent only 5.8% of the UK population aged ≥65, they account for an estimated 8.1% of current glaucoma cases. By 2060, the number of affected individuals is projected to rise to 1.61 million (95% CI 1.11 million to 2.22 million), corresponding to a 60% rise in cases despite only a 28% population increase, driven by demographic ageing and the growth of higher-risk ethnic populations.

Conclusion The UK glaucoma burden is substantially higher than previously estimated and is expected to rise further by 2060, underscoring the need for targeted resource allocation and strategic healthcare planning.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Previous UK estimates rely on outdated census data and lack stratification by age, sex and ethnicity, reducing their utility for clinical and policy decision-making. Updated, stratified projections are needed to guide early detection strategies and healthcare planning amid a growing and increasingly diverse population.

WHAT THIS STUDY ADDS

⇒ This study provides the first UK-wide glaucoma estimates stratified by age, sex and ethnicity using the most recent census data. It also projects a substantial increase in glaucoma burden through 2060.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ These findings highlight the need to expand ophthalmology services, including optometric 'case-finding' initiatives, to meet the anticipated rise in glaucoma burden and ensure equitable access for under-served populations, particularly those living in remote or poorly connected areas, and those with limited access to specialist eye care.

INTRODUCTION

Glaucoma is a chronic, progressive eye disease and a significant public health concern, representing the leading cause of irreversible blindness worldwide.[1] In the UK, previous estimates suggested that approximately 700 000 individuals are living with glaucoma; however, this figure may not reflect the current population structure. With the availability of more recent census data and updated prevalence estimates, there is now an opportunity to generate revised projections that better capture the UK's evolving demographic landscape.[2 3]

Previous estimates have been limited by a lack of stratification by age, sex and ethnicity, reducing their accuracy and applicability. This limitation is particularly relevant in the UK, where demographic shifts, particularly the growth of ethnic minority populations with differing risks for glaucoma, demand updated models that account for this diversity.[3 4]

Late diagnosis remains a major risk factor for glaucoma-related vision loss, with over 40% of patients in the UK experiencing preventable vision impairment due to delays in treatment.[5] Given that glaucoma remains asymptomatic until its later stages, early detection and timely intervention may help slow disease progression and preserve vision.[6] Accurate up-to-date estimates and long-term projections of disease burden are therefore essential for the development and implementation of viable preventive strategies, including public awareness campaigns aimed at reducing delays in diagnosis and treatment, as well as to inform effective healthcare planning and guide resource allocation.[7 8]

As the UK's population continues to age, the burden of glaucoma is projected to rise, placing increasing pressure on an already stretched national healthcare system.[9 10] Anticipating this trend is

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critical to ensure that the healthcare system can meet the needs of the ageing and increasingly diverse UK population.[9]

Our study aimed to estimate the current and future burden of glaucoma in the UK, providing detailed stratification by age, sex and ethnicity. We used the most recent census population data and recently published European glaucoma prevalence estimates, applying established relative risks to estimate glaucoma burden across other ethnic groups.[11]

METHODS

We combined existing demographic data with published clinical prevalence estimates to project UK glaucoma burden.[11]

Population and inclusion criteria

The analysis focused on adults aged 40 years and older, given the low prevalence of glaucoma among individuals below this age threshold.[10 12] Data were stratified by 5-year age bands, sex and four broad ethnic categories (European, African, Asian and mixed/other).

Population data and projections

Population estimates were obtained from the UK's Office for National Statistics (ONS), drawing on the most recent census data: Census 2021 for Northern Ireland, England and Wales, and Census 2022 for Scotland.[13–15] These datasets provide population counts stratified by age (in 5-year bands), sex and ethnicity. For the purposes of this analysis, the granular ethnic classifications from the ONS census data were aggregated into four broader demographic groups (European, African, Asian and mixed/other) to align with the structure of published glaucoma prevalence estimates and to ensure consistency across the UK nations. Future population estimates up to 2060 were also sourced from the ONS 2021-based principal projections, reflecting demographic trends up to mid-2021 and aggregated into 5-year age bands. These projections assume stable fertility (1.59 children per woman), increasing life expectancy (82.2 years for men, 85.4 for women by 2045), and long-term net migration of 315 000 people per year from mid-2028 onwards.[16]

Glaucoma prevalence estimates

Prevalence estimates for individuals of European descent were derived from a recent pan-European pooled analysis conducted across 14 population-based eye studies from the European Eye Epidemiology Consortium, which provides prevalence estimates stratified by age and sex.[11 17] Glaucoma classification was based on study-specific criteria, with individuals considered cases if at least one eye was classified as having 'probable' or 'definite' glaucoma. In most contributing studies, diagnosis was made either by a glaucoma specialist or according to the International Society of Geographical and Epidemiological Ophthalmology (ISGEO) criteria, ensuring reasonable alignment with international epidemiological standards.[11 18] For individuals of African and Asian ancestry, relative risks (RRs) were calculated based on the global meta-analysis by Tham and colleagues.[10] Ethnicity-specific prevalence estimates were obtained by multiplying European prevalence estimates by the corresponding RR. For the mixed/other ethnic group, prevalence was calculated as the average of the European, African and Asian prevalence estimates. For each age and sex stratum, lower and upper bounds of prevalence were defined using the corresponding 95% CIs. These were propagated through the calculations to estimate uncertainty in the number of individuals affected. Further details and formulae are provided in the online supplemental methods.

Current and future glaucoma burden estimates

Prevalence estimates and CIs were calculated for each combination of age group, sex and ethnicity. Population data from England, Wales, Scotland and Northern Ireland were used to calculate the number of affected individuals in each country by applying prevalence estimates to the stratified populations. These stratified datasets were then combined to produce a UK-wide population distribution by age, sex and ethnicity. Age, sex and ethnicity-specific prevalence estimates were then applied to these aggregated population strata to calculate the number of individuals affected by glaucoma at the national level. Lower and upper bounds were computed using the CIs of the prevalence estimates, combined with census data, to provide ranges of estimated disease burden.[13–15] To project future burden, age-specific UK prevalence estimates were applied to ONS population projections from 2025 to 2060, with CIs calculated for each projected value.[16] A complete description of the computational approach is provided in the online supplemental methods.

Statistical methods and software

Analyses were conducted in Microsoft Excel (Version 16.95.1).[19] Figures were generated using RStudio (Version 2024.12.0+467). Visualisation and data reshaping were performed using the tidyverse, ggplot2, dplyr, readxl, tidyr and scales packages.[20]

RESULTS

Study population and demographic characteristics

Our analysis identified adults aged 40 years and older, corresponding to a total population of 34 084 403 individuals across the UK. Of these, 30 215 460 (88.65%) were resident in England and Wales, 2 925 340 in Scotland (8.58%) and 943 603 (2.77%) in Northern Ireland. The age distribution was typical of an ageing population of an industrialised nation, with individuals aged 65 and older comprising over one-third (36.7%) of UK adults aged ≥40 years. Overall, women accounted for 52.12% of the population. Ethnic composition was predominantly European (88.52%), followed by Asian (6.20%), African (2.85%) and mixed/other ethnicities (2.43%).[13–15]

Current estimated glaucoma burden

A total of 1.02 million UK adults aged ≥40 years (95% CI 691 000 to 1.43 million) are estimated to be currently affected by glaucoma, corresponding to an overall prevalence of 2.99% (95% CI 2.03% to 4.19%). By country, this translated to around 908 000 (95% CI 615 000 to 1.27 million) affected individuals in England and Wales, 86 000 (95% CI 59 000 to 120 000) in Scotland and 26 000 (95% CI 17 700 to 37 000) in Northern Ireland. Stratified estimates of the number of affected individuals by age, sex and country are presented in online supplemental table S1.

Glaucoma prevalence in the overall UK population increased with age, from 0.24% (95% CI 0.01% to 0.72%) in the 40–44 age group to 10.64% (95% CI 7.78% to 13.85%) in those aged 85 and older. The burden was slightly higher in men (3.14%, 95% CI 2.06% to 4.51%) compared with women (2.86%, 95% CI 2.00% to 3.90%), with this sex difference becoming more pronounced in older age groups. Ethnicity-specific prevalence estimates revealed that African populations had the highest overall prevalence (3.93%, 95% CI 2.28% to 5.99%), followed by Europeans (3.14%, 95% CI 2.06% to 4.51%), mixed/other (2.50%, 95% CI 1.48% to 3.83%) and Asian groups (2.27%, 95% CI 1.39% to 3.41%). However, when examining age-specific prevalence values, African individuals consistently exhibited the highest prevalence across all age groups, followed

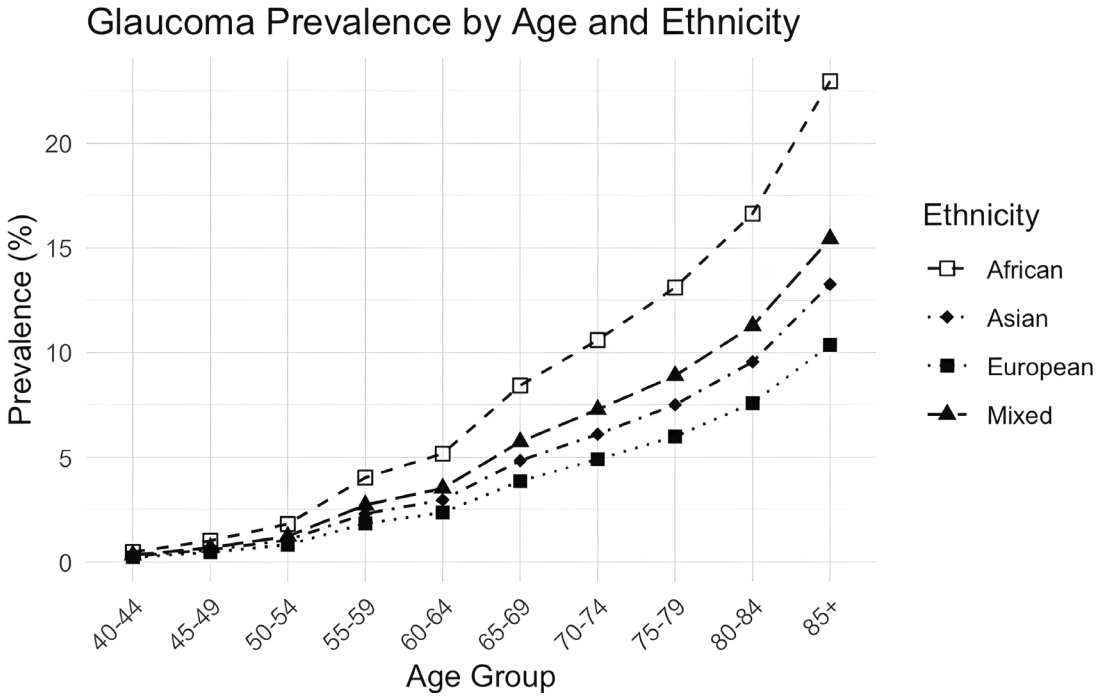

Figure 1 Estimated glaucoma prevalence by age group and ethnicity in the UK population aged ≥40 years. Age-specific prevalence estimates are shown for African, Asian, European and mixed/other ethnic groups. Prevalence increases with age in all groups, with African individuals showing the highest prevalence across all age ranges.

by those of mixed/other ethnicity, Asian populations, and lastly European groups, as shown in figure 1. The greater glaucoma burden observed among individuals of European ancestry stems from their older demographic structure, which raises the weighted prevalence in this population. Conversely, the younger age distribution in Asian and mixed/other groups contributes to a lower aggregate proportion affected, despite higher age-specific estimates. In fact, among individuals of European ancestry, the largest number of cases occurred in the oldest age group (≥85 years), reflecting a relatively older population distribution, with approximately 39% of Europeans aged ≥40 being 65 or older. In contrast, the African population showed a peak number of affected individuals in the 55–59 age group, reflecting a younger demographic distribution, with only about 16% aged ≥65. Asian and mixed/other groups also had younger age structures, with 20.3% and 17.1%, respectively, aged ≥65, and the largest number of glaucoma cases occurring in the 60–69 age range. These differences are visually represented in the population pyramids shown in figure 2, which displays the age-specific and sex-specific distribution of glaucoma cases alongside the total population. Stratified estimates of the number of affected individuals stratified by age, sex and ethnicity are presented in table 1.

Future projections

Projections of glaucoma prevalence up to 2060, based on ONS population forecasts, estimate the number of affected UK individuals to increase from 1.18 million (95% CI 0.81 million to 1.65 million) in 2030 to 1.61 million (95% CI 1.11 million to 2.22 million) by 2060. This 60% increase in the absolute number of cases far outpaces the projected 28% growth in the population aged ≥40, reflecting a shift not only in population size but in its age and ethnic composition. The steepest increases were observed among individuals aged 75 and above, driven by both the ageing of the large cohort currently in midlife and the gradual ageing of younger, higher-risk ethnic groups. A breakdown of these projections by age group and year is provided in table 2, while figure 3 illustrates the overall upward trend in the number of individuals affected by glaucoma over time.

DISCUSSION

Summary of findings and public health implications

In this study, we provide updated estimates of the current and future burden of glaucoma in the UK. Using the most recent census data combined with prevalence figures stratified by age, sex and ethnicity from robust epidemiological studies, we estimate that 1.02 million individuals in the UK aged 40 years and older are currently affected by glaucoma, a figure substantially higher than previous reports.

Additionally, our projections indicate that the number of individuals living with glaucoma in the UK will continue to rise considerably in the coming decades, increasing from 1.02 million in 2025 to over 1.61 million by 2060. This anticipated 60% rise in cases, despite only a 28% increase in the population aged ≥40 years, reflects the UK's changing demographic structure. This is driven by two key trends: the ageing of the population, with the steepest increase in cases occurring in those aged ≥75 and the growing proportion of individuals from ethnic groups with higher glaucoma risk.[16] Although non-European ethnic groups currently comprise just 5.8% of the population aged ≥65, they already account for 8.1% of glaucoma cases. As these high-risk populations age, their contribution to the national glaucoma burden is expected to grow significantly. This evolving demographic landscape, not captured by prevalence estimates alone, highlights the importance of monitoring absolute case numbers over time. These demographic shifts are anticipated to amplify the burden of glaucoma on the healthcare system over the forthcoming decades, underscoring the need for targeted public

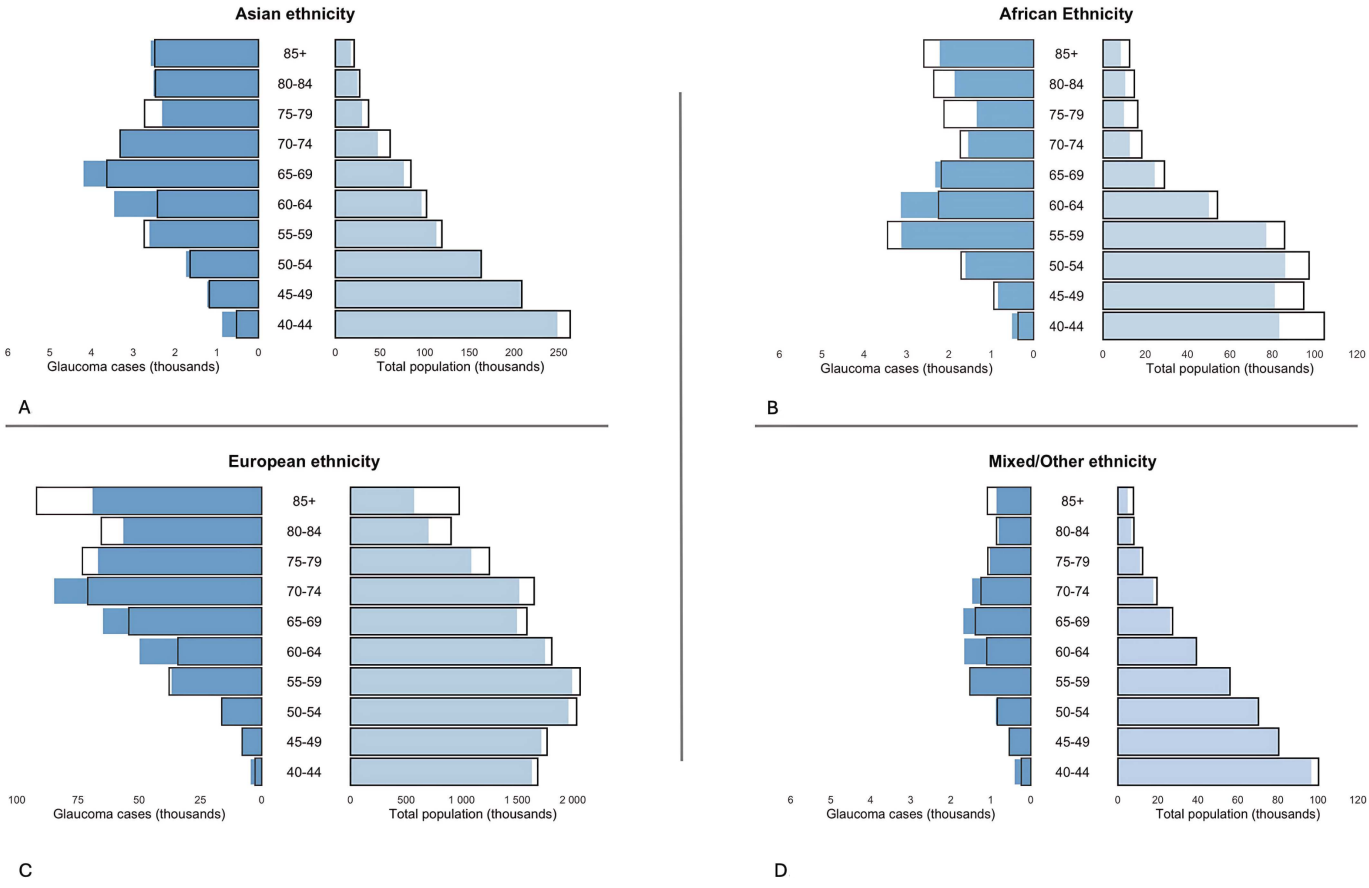

Figure 2 Population pyramids showing age-specific and sex-specific distributions of individuals affected by glaucoma (left) and the total population (right) in 2025, stratified by ethnicity. Estimates are based on 2021/2022 UK census data and age-specific and sex-specific glaucoma prevalence from Stuart *et al*[11] for individuals of European ancestry, with relative risks for other ethnic groups derived from Tham *et al*.[10] Filled bars represent men, while overlaid hollow bars represent corresponding values for women. Age increases from bottom to top in each panel. Panels show data for (A) Asian, (B) African, (C) European and (D) mixed/other ethnicity groups.

health strategies and long-term healthcare planning to address the growing demand.[10]

The burden of glaucoma is further compounded by the diversity of glaucoma subtypes encountered in both epidemiological studies and clinical practice. Population-based estimates indicate that primary open-angle glaucoma accounts for approximately 80% of all glaucoma cases, with primary angle-closure glaucoma and secondary glaucoma representing 9.1% and 11.0%, respectively.[11] However, the methodology employed in most population surveys is insufficient to reliably identify primary angle-closure glaucoma, particularly when gonioscopy is not routinely performed. As such, the burden of primary angle-closure glaucoma may be underestimated.[21] Similarly, secondary glaucoma is likely underreported despite accounting for a meaningful share of clinical caseloads. Real-world data from UK glaucoma clinics highlight the complexity of the clinical landscape, with significant proportions of patients presenting with ocular hypertension (19.0%), glaucoma suspect diagnoses (21.8%), and mixed or uncertain classifications (36.4%).[22]

Moreover, approximately 50% of glaucoma cases remain undiagnosed even in well-resourced healthcare systems, as suggested by previous UK-based studies.[23] This gap is even greater among ethnic minority groups, who are more likely to experience delays in diagnosis and to present with advanced disease. For instance, African Caribbean patients are estimated to be over four times more likely to present with advanced visual field loss than white patients of similar age, sex and intraocular pressure.[24 25] The prevalence data we used to derive our figures were obtained from physical examinations carried out in population and community-based survey studies, and will have identified disease when present among participants of the studies. There will have been some response bias among participants, probably disproportionately underestimating patients who are more severely affected by glaucoma and already under intensive medical management. However, it is important to recognise that those people under the care of medical services probably account for approximately half of our calculated totals. For this reason, it remains a priority to continue efforts to identify undiagnosed patients in a timely fashion, especially those in higher risk demographic groups, and among sectors of the population who engage less with healthcare services.

These discrepancies emphasise the challenges in detection, classification and long-term monitoring of glaucoma, and highlight the substantial burden posed by those at risk of developing this condition, not only those with confirmed disease.[6] Our estimates and projections of disease burden carry significant implications for clinical practice and public health. The projected increase in numbers of those affected by glaucoma will place considerable strain on ophthalmic services, necessitating expansion in specialist care, diagnostic capacity or innovative transformation of long-term management services. Furthermore, the higher prevalence among the growing non-European populations highlights the need to develop refined and targeted awareness campaigns and early detection strategies.[10 26]

Table 1 Estimated number of individuals affected by glaucoma in the UK with 95% CIs, stratified by age, sex and ethnicity.

Age group (years)	European/white		African		Asian		Mixed/other	
	Men	Women	Men	Women	Men	Women	Men	Women
40–44	4573 (163 to 12 902)	2693 (0 to 8752)	512 (17 to 1465)	367 (0 to 1211)	874 (30 to 2455)	528 (0 to 1708)	402 (14 to 1141)	238 (0 to 779)
45–49	8075 (0 to 28 865)	7954 (1237 to 19 442)	839 (0 to 3040)	938 (134 to 2324)	1233 (0 to 4390)	1178 (178 to 2868)	557 (0 to 2003)	537 (80 to 1320)
50–54	16 679 (8241 to 27 471)	16 274 (5659 to 30 921)	1608 (730 to 2685)	1712 (551 to 3298)	1733 (833 to 2844)	1639 (558 to 3101)	881 (414 to 1459)	834 (278 to 1593)
55–59	36 689 (22 133 to 54 634)	37 801 (25 614 to 52 054)	3121 (1730 to 4712)	3449 (2148 to 4816)	2615 (1534 to 3878)	2739 (1805 to 3757)	1529 (878 to 2290)	1523 (982 to 2109)
60–64	49 864 (34 467 to 67 709)	34 197 (22 075 to 49 034)	3130 (1989 to 4309)	2246 (1333 to 3266)	3458 (2325 to 4677)	2422 (1520 to 3459)	1666 (1097 to 2276)	1101 (677 to 1588)
65–69	64 896 (44 363 to 88 876)	54 255 (35 060 to 76 941)	2324 (1460 to 3227)	2180 (1295 to 3134)	4191 (2786 to 5716)	3633 (2283 to 5131)	1682 (1095 to 2317)	1387 (854 to 1978)
70–74	84 682 (58 883 to 114 427)	71 022 (55 331 to 88 529)	1548 (989 to 2120)	1730 (1239 to 2187)	3322 (2247 to 4471)	3315 (2512 to 4115)	1461 (968 to 1986)	1246 (925 to 1563)
75–79	66 818 (49 842 to 85 863)	73 224 (57 355 to 90 968)	1347 (924 to 1755)	2115 (1522 to 2664)	2315 (1679 to 2963)	2730 (2080 to 3378)	1018 (723 to 1316)	1074 (801 to 1342)
80–84	56 529 (39 775 to 75 677)	65 502 (48 764 to 84 139)	1869 (1209 to 2537)	2358 (1613 to 3070)	2517 (1723 to 3356)	2471 (1789 to 3162)	803 (538 to 1081)	857 (608 to 1108)
≥85	69 038 (46 006 to 95 803)	91 947 (72 188 to 113 564)	2219 (1359 to 3122)	2591 (1869 to 3244)	2577 (1670 to 3562)	2486 (1899 to 3058)	858 (545 to 1197)	1084 (811 to 1347)
Total	457 843 (303 873 to 652 228)	454 869 (323 319 to 614 345)	18 517 (10 407 to 28 972)	19 686 (11 704 to 29 213)	24 834 (14 827 to 38 310)	23 140 (14 624 to 33 736)	10 858 (6272 to 17 065)	9882 (6015 to 14 725)

Current UK guidelines for opportunistic glaucoma detection may require revision to incorporate ethnicity and age-stratified risk profiles more systematically.[26] Timely detection in high-risk ethnic groups and older adults may prevent late-stage disease, reducing the burden of preventable vision loss.[27] These projections also emphasise the pressing need for healthcare resource planning and investment in training, equipment and service delivery in ophthalmology to meet future demand.[9]

Burden of sight loss

While our projections describe the number of individuals affected by glaucoma, they do not fully capture the associated burden of visual disability. Loss of fitness to drive, visual impairment meeting WHO thresholds and bilateral blindness remain critical outcomes of major concern to both patients and healthcare systems.[1] Recent global estimates suggest that glaucoma is responsible for approximately 8% of blindness and 1.4% of moderate to severe vision impairment among individuals aged ≥50 years.[28] Nonetheless, population-level data quantifying the burden of glaucoma-related sight loss are limited in the UK, representing an important gap in knowledge that warrants further research.

Although population-based studies have reported a halving of the 20-year risk of glaucoma-related blindness over recent decades, up to 10–16% of patients with glaucoma may still experience bilateral blindness by the end of life.[29–31] Advanced disease at diagnosis, uncontrolled intraocular pressure and poor treatment adherence are key preventable risk factors.[32] Lifetime visual prognosis remains a major concern for patients and underscores the importance of accurately identifying those at highest risk of progression to sight loss, alongside implementing effective long-term management strategies.

Strengths and limitations

The main strength of our study lies in combining the most recent UK census data with robust glaucoma prevalence estimates from the largest and most up-to-date cross-sectional meta-analysis currently available for the European population, enabling

Table 2 Projected number of people with glaucoma in the UK from 2030 to 2060 by age group (in thousands), with 95% CIs

Age group	2030	2040	2050	2060
40–44	12 (0 to 36)	12 (0 to 36)	13 (0 to 38)	12 (0 to 37)
45–49	23 (2 to 70)	26 (2 to 77)	25 (2 to 77)	27 (2 to 80)
50–54	37 (16 to 66)	44 (18 to 78)	45 (19 to 79)	47 (20 to 83)
55–59	84 (53 to 120)	88 (56 to 126)	98 (62 to 141)	98 (62 to 140)
60–64	112 (74 to 155)	100 (67 to 139)	119 (79 to 165)	122 (81 to 169)
65–69	169 (112 to 236)	161 (107 to 225)	171 (113 to 238)	192 (127 to 267)
70–74	173 (126 to 225)	203 (149 to 265)	185 (135 to 241)	221 (162 to 288)
75–79	169 (129 to 213)	218 (166 to 275)	212 (161 to 267)	228 (174 to 288)
80–84	187 (135 to 245)	199 (144 to 261)	241 (174 to 316)	227 (164 to 297)
85+	219 (160 to 285)	288 (211 to 375)	379 (277 to 493)	441 (323 to 574)
Total	1184 (808 to 1650)	1340 (920 to 1858)	1487 (1024 to 2055)	1614 (1115–2224)

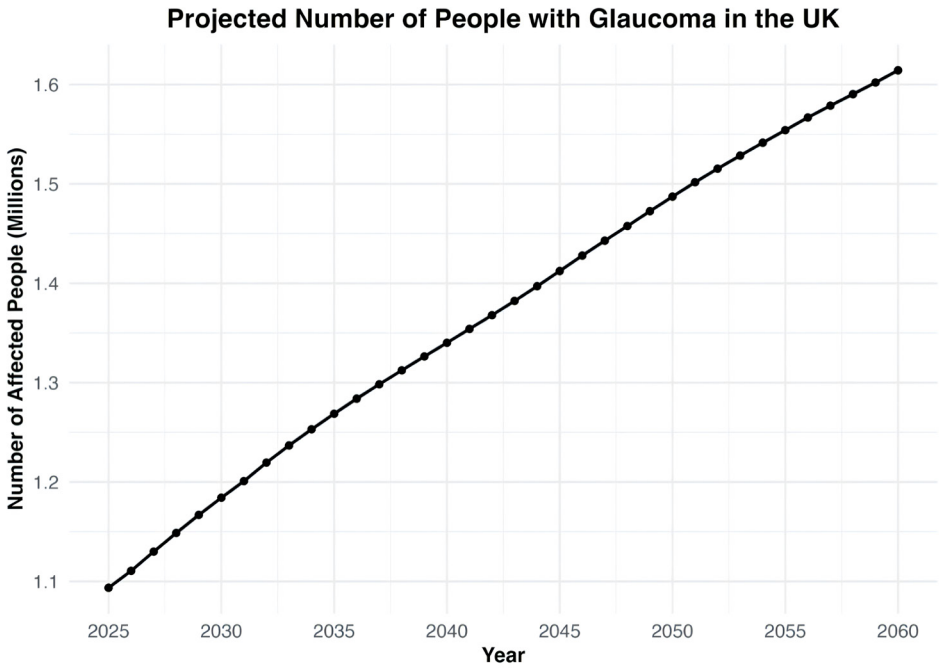

Figure 3 Projected number of people affected by glaucoma in the UK from 2025 to 2060. Line graph showing the projected number of individuals aged ≥40 years living with glaucoma in the UK between 2025 and 2060 based on current age-specific prevalence estimates and population projections from the UK Office for National Statistics.

precise stratification by age, sex and ethnicity.[11] For non-European ethnicities, relative risks were derived from the global meta-analysis by Tham and colleagues, which remains the most comprehensive and methodologically rigorous source currently available for estimating ethnicity-specific glaucoma risk.[10] While this approach allowed us to model prevalence across all major UK ethnic groups in the absence of detailed national data, it also introduces a potential limitation, as Tham and colleagues' prevalence estimates are restricted to primary open-angle glaucoma and primary angle-closure glaucoma, excluding secondary glaucoma.[10] In our analysis, we assumed that these relative differences by ethnicity would apply similarly to the overall glaucoma prevalence, an assumption that may not fully capture the complexity of glaucoma subtypes across populations.

These methodological choices introduce a degree of uncertainty, particularly in the CIs, which are wider at the extremes of the age distribution. In younger age groups, the very low prevalence amplifies relative uncertainty, while in older populations, small percentage changes can translate into large differences in the estimated number of affected individuals. Despite these limitations, we believe that this approach provides valuable, policy-relevant insights into the extent of the glaucoma burden in the UK.

Future research

Further efforts should focus on improving data sharing from UK glaucoma clinics and national ophthalmic registries. This approach could help validate projections and enhance real-world understanding of disease burden over time. In parallel, further efforts are needed to better quantify the burden of visual disability caused by glaucoma.

Although our analyses were limited to the UK, similar methods could be applied to other European countries using their census forecasts and available prevalence data, which would provide further insights into the future burden of glaucoma across Europe.

As the most up-to-date estimation of glaucoma prevalence in the UK, this study highlights an increasing burden that is projected to rise significantly by 2060, emphasising the urgency of early disease detection, risk-based preventive strategies and long-term healthcare planning to meet the needs of a growing and increasingly diverse population.

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Contributors LAM and KVS contributed equally to this work. LAM performed the analyses and drafted the initial manuscript, figures and tables. KVS contributed to the study design, refined the methods and provided critical revisions to the first draft. RNL and WPN provided input on study design and interpretation of results. PJF and AK contributed equally, with PJF developing the overall study concept. Both AK and PJF provided substantial revisions to the manuscript. All authors reviewed and approved the final manuscript. PJF is the guarantor of the work.

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Patient consent for publication Not applicable.

Ethics approval This study used only anonymised, aggregate population and prevalence data from publicly available sources, including UK census data and published glaucoma prevalence estimates. No new or individual-level data were used, and no direct participant involvement occurred; therefore, ethical approval was not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information. This study used aggregate, publicly available, and anonymised data sources, including UK Census 2021/2022 demographic data and published glaucoma prevalence estimates. All data relevant to the study are included in the article or uploaded as supplementary information.

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