

# Diabetic eye screening in the UK - evaluate the effectiveness, progress, challenges and future directions.

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## Introduction

- Diabetes affects over 5.8 million people in the UK; diabetic retinopathy (DR) is a leading cause of preventable blindness [1].
- Early detection through screening is essential; timely interventions (laser, anti-VEGF)
- NHS Diabetic Eye Screening Programme (NDESP) established in 2003: population-based, annual screening for all patients  $\geq 12$  years with diabetes.

## Effectiveness

- ~4 million individuals registered; 3.3 million screened annually (~83% uptake) [2].
- Structured referral pathways integrated with primary care records enable early detection of sight-threatening DR and diabetic macular oedema.
- By 2014, DR was no longer the leading cause of certified blindness in England and Wales [3].

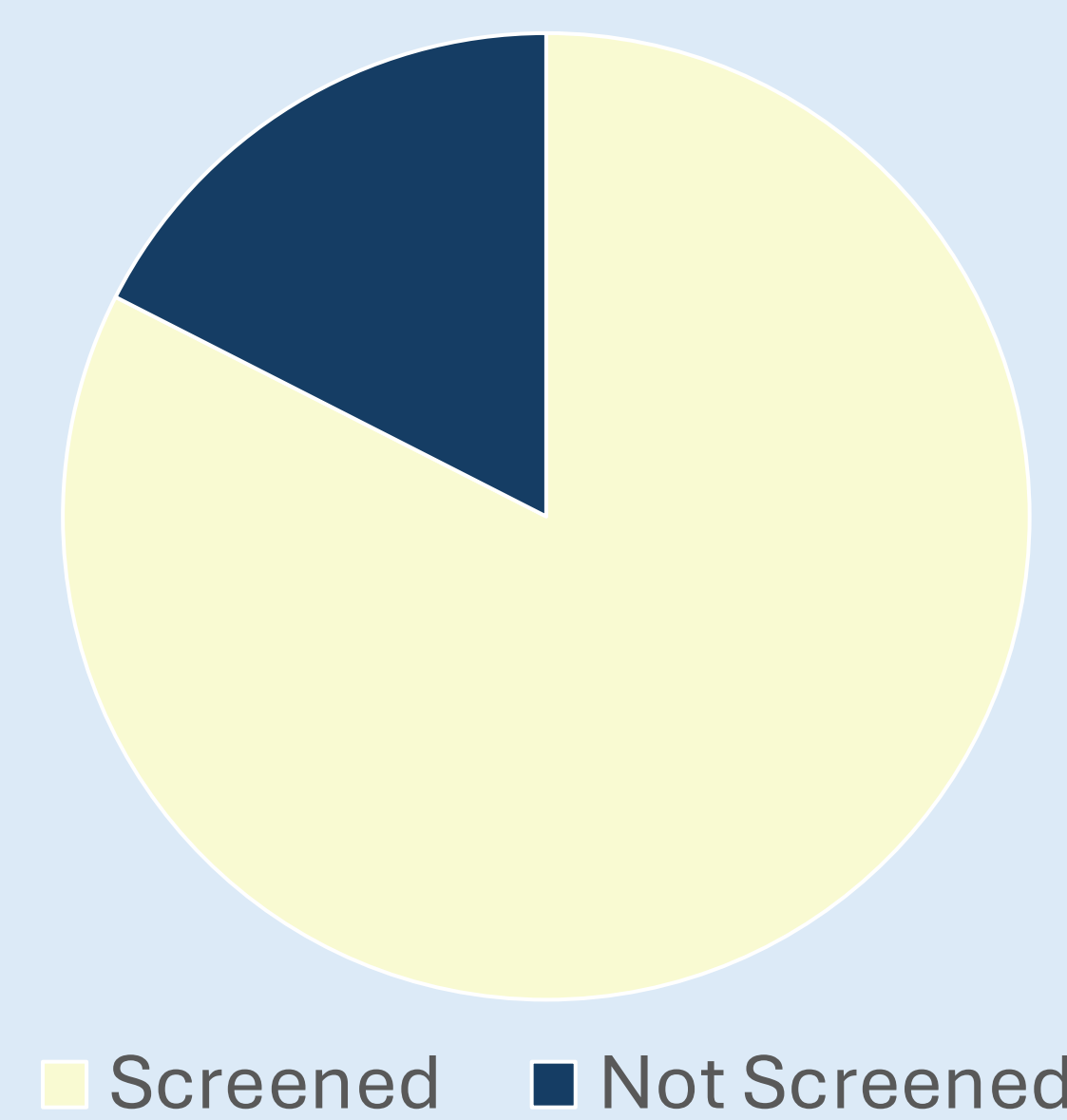
## Progress and Innovations

- Biennial screening for low-risk individuals (two consecutive negative screens) reduces unnecessary appointments.
- Optical Coherence Tomography (OCT) in community settings reduces referrals by ~40% [4].
- AI-assisted grading and risk-stratified intervals show promise for personalised, efficient screening.
- Integration with community-based care (pharmacies, GP practices, opticians) improves accessibility.

## Future directions

- Expand community-based OCT and AI integration
- Link retinal screening data with systemic risk factors (eg HbA1c, blood pressure, lipid profile) to identify and prioritise individuals at highest risk of progression.
- Behavioural interventions: flexible appointments, culturally sensitive communication, non-mydriatic imaging.
- Consider de-prioritising very low-risk elderly populations to refocus resources towards high-risk groups, particularly younger individuals and those from South Asians and Black backgrounds, who have a 54% and 121% higher risk of sight threatening DR [7].

## Annual Uptake of NHS Diabetic Eye Screening Programme



**Figure 1:** Pie chart showing that 3.3 million people were screened out of the 4 million that had registered.

## Challenges

- Lower uptake in:
  - Socioeconomically deprived populations [5, 6]
  - Minority ethnic groups
  - Young adults (<35 years)
- Non-attendance leads to preventable vision loss and financial burden (~£25 per missed appointment) [5].
- Psychosocial barriers include
  - Unstable housing, contact details and stigma
  - Language and health literacy limitations
  - Appointment inflexibility
  - Discomfort with dilating drops [6].

## Conclusion

- NDESP has significantly reduced DR-related blindness through systematic national coverage and structured referral systems.
- Persistent inequalities in uptake threaten gains; targeted interventions are essential.
- Emerging technologies and personalised approaches have the potential to improve efficiency, equity, and sustainability.

## References

- [1] Diabetes UK, How Many People in the UK Have Diabetes?, accessed August 29, 2025, <https://www.diabetes.org.uk/about-us/about-the-charity/our-strategy/statistics>
- [2] Lawrenson JG, Bourmpaki E, Bunce C, Stratton IM, Gardner P, Anderson J; EROS Study Group. Trends in diabetic retinopathy screening attendance and associations with vision impairment attributable to diabetes in a large nationwide cohort. *Diabet Med*. 2021 Apr;38(4):e14425. doi: 10.1111/dme.14425. Epub 2020 Nov 1. PMID: 33064854; PMCID: PMC8048647
- [3] Liew G, Michaelides M, Bunce C. A comparison of the causes of blindness certifications in England and Wales in working age adults (16–64 years), 1999–2000 with 2009–2010. *BMJ Open*. 2014;4(2):e004015. doi: 10.1136/bmjopen-2013-004015. PMID: 24525390; PMCID: PMC3927710
- [4] Meredith S, Mourtzoukos S, Rennie C, Harding-Trestrail C, Kirby P, Vodrey J, Clarke D, Hammond A. First year of implementing OCT into a diabetic eye screening service—quantification of the reduction in hospital eye service referrals. *Eye (Lond)*. 2022 Sep;36(9):1840–1. doi: 10.1038/s41433-022-01930-w. PMID: 35136205; PMCID: PMC9391348
- [5] Lawrenson JG, Graham-Rowe E, Lorencatto F, et al. What works to increase attendance for diabetic retinopathy screening? An evidence synthesis and economic analysis. *Health Technol Assess*. 2018 May;22(29):1–160. doi: 10.3310/hta22290
- [6] Banks J, Olvera-Barrios A, Pitt M, et al. Effect of ethnicity and other sociodemographic factors on attendance at ophthalmology appointments following referral from a Diabetic Eye Screening Programme: a retrospective cohort study. *BMJ Open Ophthalmol*. 2025;10(1):e001969. doi:10.1136/bmjophth-2024-001969.
- [7] Olvera-Barrios A, Yip JLY, Evans J, et al. Ethnic disparities in progression rates for sight-threatening diabetic retinopathy: a cohort study in a multi-ethnic population. *BMJ Open Diab Res Care*. 2023;11(6):e003683. doi: 10.1136/bmjdr-2023-003683.