

## COMMENT OPEN



# A commentary on the updated research priorities in ophthalmology: implications and future directions

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The recently published study that refreshed the James Lind Alliance Sight Loss and Vision Priority Setting Partnership research priorities [1] represents a significant effort in shaping the future of ophthalmic research by the UK Clinical Eye Research Strategy (UKCERS) [2]. While the study effectively re-evaluated the most pressing research needs in ophthalmology, this commentary highlights additional considerations and implications of these findings, particularly in light of emerging research and advancements in the field.

The study's methodology ensured diverse stakeholder engagement, providing valuable insights into the evolving landscape of ophthalmic research. The emphasis on patient and professional involvement enhances the credibility of the prioritisation process. However, there remain key areas that warrant further attention.

The study does not explicitly address the role of artificial intelligence (AI) and precision medicine in ophthalmology. Recent advances in AI-driven diagnostics, machine learning models for disease progression prediction and personalised treatment approaches could significantly impact areas such as early detection of visual disorders and improved treatments for glaucoma and age-related macular degeneration. Integrating these aspects into future research priorities is crucial for optimising patient outcomes [3].

The survey results highlight the importance of integrating ophthalmic primary and secondary care via community optometric pathways. However, disparities in access to ophthalmic care persist, particularly among underserved populations. Future research should focus on evaluating barriers to care, the impact of telemedicine in ophthalmology and the development of cost-effective screening and treatment programs for at-risk groups.

While the study effectively identifies current priorities, there is a need for robust longitudinal studies that track the long-term

effectiveness of interventions. Additionally, harnessing real-world data through national registries and electronic health records could provide valuable insights into disease progression and treatment efficacy across diverse populations.

Following the publication of the updated research priorities, the UKCERS team has developed Population, Intervention, Comparison and Outcome (PICO) frameworks to further refine and operationalise these priorities. The PICO model provides a structured approach to formulating precise and actionable research questions that align with the identified needs in ophthalmology.

By applying the PICO framework, we can:

- Clearly define the patient populations most affected by specific conditions, ensuring targeted research.
- Specify key interventions and compare them to existing or alternative treatment modalities.
- Establish measurable outcomes that can guide the development of clinical trials and observational studies.

*Example 1: Addressing the priority area of research into the treatment of age-related macular degeneration (AMD). A PICO-based approach might frame a research question as follows:*

- Population: Patients with intermediate AMD.
- Intervention: The Valeda Light Delivery System (photobiomodulation therapy) or oral medications (e.g. metformin, AREDS multivitamin formulation, sirolimus, L-dopa, tonabersat, SGLT2 inhibitors, fenofibrate, statins).
- Comparison: Standard care with no intervention or placebo.
- Outcome: Slowed progression to late-stage AMD (neovascular or geographic atrophy) and preservation of visual function.

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*Example 2: Addressing the priority area of research into Ophthalmic biomarkers of early Alzheimer's disease. A PICO-based approach might frame a research question as follows:*

- Population: Adults under assessment for *Alzheimer's disease*
- Intervention: A comprehensive visual assessment which might include; posterior segment OCT imaging, fundus photography, eye movement assessment +/- visual processing or other techniques combined into one visual assessment tool.
- Comparison: NHS standard Alzheimer's diagnostic criteria ('Revised Criteria for Diagnosis and Staging of Alzheimer's Disease' was published June 27, 2024 in Alzheimer's & Dementia)
- Outcome: Diagnostic accuracy. Sensitivity and specificity of the visual assessments to identify people with Alzheimer's disease.

By incorporating these and other specific PICO's into future research initiatives, we can ensure that research priorities are systematically developed into focused and actionable studies that can drive meaningful advances in eyecare. This is of particular importance given that eye research remains underfunded when compared to its societal impact.

Vision loss is estimated to affect two million people in the UK, costing the economy £25 billion annually [<https://www.google.com/url?q=https://www.sightresearchuk.org/eye-research/our-research/&source=gmail-imap&ust=1732711886000000&usq=AOvVaw1dSnCzMIYV6VLu-m5IJZR9m>]. Despite this, UK funding for eye research represents only 1.5% of medical research spending, a fraction of what is allocated to areas such as cancer or cardiovascular research [<https://www.openaccessgovernment.org/article/sight-loss-research-equitable-future/163563/>]. This disparity places the UK at risk of falling behind nations like the USA, where the National Eye Institute invests over \$800 million annually in vision research. In order to redress this imbalance, the Clinical Study Groups of UKCERS have prepared several PICO's across different subspecialty areas of Ophthalmology for submission to UK's National Institute for Health Research (NIHR). The intention is to lead to commissioned calls for research into these specific areas among the NIHR's nine research programmes that fund multi-disciplinary health and social care research in areas that include clinical evaluation and translation, health services and organisation, technology development, public health and social care.

The updated research priorities offer a valuable framework for advancing ophthalmology research. Integration of emerging

technologies, equitable access to care and long-term data-driven approaches need also to be emphasised in future iterations of priority setting. Additionally, applying the PICO framework ensures that research priorities are systematically developed into focused and actionable studies. By addressing these additional considerations, ophthalmology research can be further aligned with evolving clinical needs and technological advancements, ultimately improving patient care and outcomes.

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## COMPETING INTERESTS

The authors declare no competing interests.

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