Refractive error occurs when the shape or length of the eye prevents light from focusing directly on the retina, resulting in blurred vision. This makes it difficult for the eyes to focus on images clearly, and vision can become blurred and impaired. Refractive errors include eye problems such as myopia (short-sightedness), hyperopia (long-sightedness), astigmatism (caused by an irregularly curved cornea) and presbyopia (age-related near-vision impairment). Correcting a refractive error with an eye examination and spectacles is a simple, cost-effective and high impact intervention. But despite this, the unmet need for refractive error correction remains significant, particularly in resource-poor settings. Evidence shows that 49 per cent of all visual impairment is caused by unaddressed refractive error, 800 million people across the world have unaddressed refractive error, and 1.8 billion people have an age-related near-vision impairment.¹

At Sightsavers, our research into eye health includes exploring what opportunities there are for the scale-up of quality refractive error services, as well as identifying innovative approaches to strengthen eye care services in the context of broader health systems.

¹ https://www.sightsavers.org/protecting-sight/what-is-refractive-error/
Evidence gap maps bring together systematic or literature reviews that combine the evidence available on a specific topic and presents them in a user-friendly format. These reviews are useful because they identify gaps in knowledge and can help to inform best practice guidance in a specific area. Gap maps provide easy access to these reviews, their methodological quality and the strength of their conclusions.

This brief presents the findings of our refractive error evidence gap map as of June 2020.

What is included in the refractive error gap map (EGM)

- Sightsavers’ refractive error EGM is divided into five sections: burden of disease, biomedical research, service delivery, health systems, and impact and economic evaluation. It includes 91 reviews of research on these topics.

- To reflect the breadth of synthesis work on refractive error, the EGM includes reviews focusing on different conditions, including presbyopia, myopia, astigmatism, low vision and amblyopia, with the understanding that these conditions often have different causes and treatment solutions.

- 71% of refractive error reviews include a mix of countries from different regions, 23% of the reviews do not report the geographical region of included studies and 5% are country specific. In reading these reviews, it is important to consider if there are factors that make the results only applicable to a specific geographic setting or if they are generalisable.

- The largest proportion of reviews (23%) on refractive error relate to a mix of income levels (high and middle income countries). 20% of the reviews include studies conducted in high and low and middle income countries and 14% of the reviews include studies from high income countries only. The remainder of the reviews are global (9%), 4% focus on middle income countries only, and another 4% are from low and middle income countries. Very few reviews are from low income countries (2%) and 1% are from high and low income countries. 23% of the reviews do not report the geographic location of included studies.
Key messages

- No reviews about health systems were identified, which is an important gap in evidence synthesis as we work towards the goals of universal health coverage and health systems strengthening.

- Future research should focus on responding to identified gaps. Out of 91 reviews, 58 reach a conclusive answer to the research question. However, findings should be analysed with caution as the quality of the reviews are either medium (29) or poor (22) quality.

- The quality of the methodological approach in the available reviews is inconsistent. Out of 91 reviews included in the EGM, only 19 are deemed to be of a high methodological standard. Given the importance of synthesis work for policy influencing and decision-making, this is an important point to consider. For example:
  - The bulk of the reviews are on biomedical research (treatment), with 43 studies, but only 11 of these are considered of high quality methodologically.
  - Most of the reviews on the burden of disease (epidemiology) draw strong conclusions (16/17). However, only two are graded as high quality.
  - There are five reviews exploring the impact of refractive error services, three of which reported strong evidence in response to their question. However, none of the five are high quality methodologically.

- A greater focus on equity is needed. Further research to determine the prevalence of refractive error and access to services in different population groups is needed. None of the reviews focus on gender equity.

- High-quality evidence is needed on the unaddressed refractive error’s impact on academic achievements and learning outcomes as we promote collaboration between health and education systems and work towards the SDG 4, inclusive and equitable quality education for all.

Reflections on the update of refractive error EGM

- A total of 66 reviews were added to the EGM in the 2020 update, an increase of 72%.

- Between 2015 and 2020, there was a 30% increase of reviews reporting strong evidence in response to their research question.

- 12% of reviews are attributed medium confidence based on the methodology used.

- There is an 18% increase of reviews that include findings from studies conducted in high and middle income settings from 2015 and 2020.

- An increase of 8% was observed in reviews that include findings from studies conducted across all income settings (high, medium, and low income countries) from 2015 and 2020.
How to read the refractive error gap map

Research evidence from systematic or literature reviews is displayed in a matrix. The columns show the thematic areas that are relevant to the theme of refractive error, labelled as sectors and sub-sectors. The rows show the strength of the evidence in each review: strong, inconclusive or weak. If the authors of a particular review were able to reach a conclusive answer to their research question using the evidence available, the evidence is classed as strong. If they were unable to reach a conclusive answer due to insufficient evidence, the evidence is classed as weak. If the outcome was somewhere in between, the evidence is classed as inconclusive.

The numbers displayed in each box indicate the number of systematic or literature reviews. The reviews are split by confidence level, which is an indicator of the methodological quality of the reviews themselves. We have rated the methodological confidence in each review as strong (green hexagon), medium (yellow square) or low (red circle).

On the research centre, by clicking on one of the hyperlinks, you will be taken to a separate webpage to read a summary of that individual review.

About this brief

The refractive error gap map and this brief were produced by Bhavisha Virendrakumar, research associate for evidence synthesis at Sightsavers.

Suggested reference for the gap map:


Please address questions/comments about this brief to RUL@sightavers.org.