Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment: a systematic review and meta-analysis

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Summary

Background Global and regional prevalence estimates for blindness and vision impairment are important for the development of public health policies. We aimed to provide global estimates, trends, and projections of global blindness and vision impairment.

Methods We did a systematic review and meta-analysis of population-based datasets relevant to global vision impairment and blindness that were published between 1980 and 2015. We fitted hierarchical models to estimate the prevalence (by age, country, and sex), in 2015, of mild visual impairment (presenting visual acuity worse than 6/12 to 6/18 inclusive), moderate to severe visual impairment (presenting visual acuity worse than 6/18 to 3/60 inclusive), blindness (presenting visual acuity worse than 3/60), and functional presbyopia (defined as presenting near vision worse than N6 or N8 at 40 cm when best-corrected distance visual acuity was better than 6/12).

Findings Globally, of the 7·33 billion people alive in 2015, an estimated 36·0 million (80% uncertainty interval [UI] 12·9–65·4) were blind (crude prevalence 0·48%; 80% UI 0·17–0·87; 56% female), 216·6 million (80% UI 98·5–359·1) people had moderate to severe visual impairment (2·95%, 80% UI 1·34–4·89; 55% female), and 188·5 million (80% UI 64·5–350·2) had mild visual impairment (2·57%, 80% UI 0·88–4·77; 54% female). Functional presbyopia affected an estimated 1094·7 million (80% UI 581·1–1686·5) people aged 35 years and older, with 666·7 million (80% UI 364·9–997·6) being aged 50 years or older. The estimated number of blind people increased by 17·6%, from 30·6 million (80% UI 9·9–57·3) in 1990 to 36·0 million (80% UI 12·9–65·4) in 2015. This change was attributable to three factors, namely an increase because of population growth (38·4%), population ageing after accounting for population growth (34·6%), and reduction in age-specific prevalence (–36·7%). The number of people with moderate and severe visual impairment also increased, from 159·9 million (80% UI 68·3–270·0) in 1990 to 216·6 million (80% UI 98·5–359·1) in 2015.

Interpretation There is an ongoing reduction in the age-standardised prevalence of blindness and visual impairment, yet the growth and ageing of the world's population is causing a substantial increase in number of people affected. These observations, plus a very large contribution from uncorrected presbyopia, highlight the need to scale up vision impairment alleviation efforts at all levels.

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Introduction

Universal Eye Health: a Global Action Plan 2014–2019 was adopted by WHO member states at the World Health Assembly in 2013.[1] Its goals are to reduce vision impairment as a global public health problem and to secure access to rehabilitation for people with vision impairment. The initiative has the global target of reducing the prevalence of avoidable vision impairment by 25% from 2010 to 2019. One of the key objectives of the Global Action Plan is to generate evidence on the magnitude of vision impairment, which is required to evaluate the success of this and similar initiatives.

Previously, we reported the results of a systematic review of published literature and some unpublished data from population-based studies that reported the prevalence of blindness and vision impairment from 1980, using a continuously updated database of population-based studies (the Global Vision Database). Globally, we estimated that 32·4 million people were blind in 2010, and that 191 million people had moderate and severe vision impairment. Additionally, the age-standardised prevalence of blindness and moderate and severe vision impairment decreased between 1990 and 2010.[2] Country-specific data were made available online, searchable by level of vision impairment, age, and sex.

Vision impairment and age-related eye diseases affect economic and educational opportunities,[3] reduce

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