Author's response to reviews

Title: What is the global burden of visual impairment?

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Version: 4 Date: 14 December 2005

Author's response to reviews: see over
14 December 2005

The Editors
BMC Public Health

Sub: MS 1142010533876472

Dear Editors,

Thank you for your communication of 6 December 2005 suggesting revision of our manuscript to meet the MOOSE guidelines for meta-analysis. In the revised version submitted today, we have now given more detailed description of our meta-analysis. Each item in the MOOSE guidelines is addressed as described below:

**Reporting of background should include**

- **Problem definition**
  
  Problem defined in the background section on page 4 of the manuscript.

- **Hypothesis statement**
  
  A separate hypothesis statement does not seem necessary since the problem of exclusion of uncorrected refractive error as a cause of visual impairment with the best-corrected visual acuity definitions is already defined.

- **Description of study outcome(s)**
  
  Described in the background section on page 4 as visual impairment estimate including that caused by uncorrected refractive error.

- **Type of exposure or intervention used**
  
  Not applicable for this analysis.

- **Type of study designs used**
  
  Mentioned in the methods section as population-based studies that included presenting visual acuity to define visual impairment, which would allow ascertainment of the contribution of uncorrected refractive error to visual impairment in one or both of the visual impairment categories used by WHO for reporting.

- **Study population**
  
  Population-based samples, as mentioned in the methods section.

**Reporting of search strategy should include**

- **Qualifications of searchers (eg, librarians and investigators)**
  
  Mentioned in the Authors’ contribution section on page 16 that the first author did the literature search.

- **Search strategy, including time period included in the synthesis and keywords**
Mentioned in the methods section.

- **Effort to include all available studies, including contact with authors**
  
  As mentioned in the methods section, this analysis included all published studies that we could locate through literature search using PubMed followed by searching cross-references of the located publications.

- **Databases and registries searched**
  
  PubMed, as mentioned in the methods section.

- **Search software used, name and version, including special features used (eg, explosion)**
  
  No special software used.

- **Use of hand searching (eg, reference lists of obtained articles)**
  
  Cross-references searched, as mentioned in the methods section.

- **List of citations located and those excluded, including justification**
  
  Complete list of citations located shown in Annex 1, indicating which were included and which excluded along with the reasons.

- **Method of addressing articles published in languages other than English**
  
  As mentioned in the methods section, a few articles in languages other than English were located with PubMed search (listed in Annex 1), which were assessed using the information given in their English abstracts.

- **Method of handling abstracts and unpublished studies**
  
  Unpublished studies and abstracts were not considered for our analysis, as we wanted to include only peer-reviewed publications.

- **Description of any contact with authors**
  
  Authors were requested by email and regular mail to send their papers if we could not get those papers in the journals accessible to us.

**Reporting of methods should include**

- **Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested**
  
  As mentioned in the methods section, those population-based surveys that included presenting visual acuity to define visual impairment, which would allow ascertainment of the contribution of uncorrected refractive error to visual impairment in one or both of the visual impairment categories used by WHO for reporting, were included.

- **Rationale for the selection and coding of data (eg, sound clinical principles or convenience)**
As mentioned in the methods section, data from those studies were included that allowed a clear ascertainment of the contribution of uncorrected refractive error to population-based assessment of visual impairment.

- **Documentation of how data were classified and coded (eg, multiple raters, blinding, and interrater reliability)**

  Data were classified by the first author, who is experienced in population-based assessments of visual impairment as indicated by his several previous publications related to this topic.

- **Assessment of confounding (eg, comparability of cases and controls in studies where appropriate)**

  As mentioned in the discussion on page 13, the limited data available in the literature were often not refined enough to allow ascertainment of confounders such as index myopia, which points to the need for developing a standardised system of assessing the contribution of uncorrected refractive error to visual impairment in population-based studies.

- **Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results**

  A list of exclusion criteria were used, as mentioned in the methods section. Only those studies meeting the inclusion criteria were included, as assessed by the first author who is experienced in population-based assessments of visual impairment; stratification or regression not applicable to this analysis.

- **Assessment of heterogeneity**

  As mentioned in the discussion on page 13, clear description of the method of attributing visual impairment to uncorrected refractive error and the types of refractive error leading to visual impairment was often missing in the limited number of studies that met the inclusion criteria; this implies that there was heterogeneity in these studies that could have led to under- or over-estimation of the contribution of uncorrected refractive error to visual impairment, as discussed on page 13.

- **Description of statistical methods (eg, complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated**

  Statistical calculations for our analysis were relatively straight-forward; the formula used to calculate the total number of persons in a GDB sub-region with visual impairment including that due to uncorrected refractive error is given in the footnote for Table 3.

- **Provision of appropriate tables and graphics**

  In our understanding, the three tables included in this paper would sufficiently explain the data and calculations presented.

**Reporting of results should include**
- **Graphic summarizing individual study estimates and overall estimate**
  Graphic for this analysis would not add to the data already presented for each eligible study in Table 2.

- **Table giving descriptive information for each study included**
  Table 2 gives the relevant information for each study.

- **Results of sensitivity testing (eg, subgroup analysis)**
  Sensitivity analysis done and reported in the results section on pages 9-10.

- **Indication of statistical uncertainty of findings**
  Uncertainty of the estimate of the contribution of uncorrected refractive error to visual impairment covered in sensitivity analysis.

**Reporting of discussion should include**

- **Quantitative assessment of bias (eg, publication bias)**
  Not applicable to this analysis, as it is not a meta-analysis of the effect of an intervention for which negative results may have been under-reported.

- **Justification for exclusion (eg, exclusion of non–English-language citations)**
  Reason for excluding each located citation mentioned in Annex 1; non–English-language databases not searched by us; some non–English-language citations located in PubMed, which were assessed using their abstracts; possibly missing some non–English-language citations mentioned as a limitation of our report in the discussion on page 11 (first paragraph).

- **Assessment of quality of included studies**
  Discussion on page 13 mentions that for the countries for which data on the contribution of refractive error to visual impairment were available in this assessment, clear description of the method of attributing visual impairment to uncorrected refractive error and the types of refractive error leading to visual impairment was often missing, which points to the need for developing a standardised system of assessing the contribution of uncorrected refractive error to visual impairment in different populations.

**Reporting of conclusions should include**

- **Consideration of alternative explanations for observed results**
  This is not a meta-analysis of the effect of an intervention, for which alternative explanations for observed results may be more relevant. However, there could have been reasons for under- or over-estimating the contribution of uncorrected refractive error to visual impairment in the studies included in this analysis, which are discussed briefly on page 13.

- **Generalization of the conclusions (ie, appropriate for the data presented and within the domain of the literature review)**
The generalization made by us is based on the data available in the literature and the assumptions that we thought were most reasonable with the current state of knowledge.

- **Guidelines for future research**
  We mention on pages 13-14 that there is a need to develop a standardised system of assessing the contribution of uncorrected refractive error to visual impairment in population-based studies, that all population-based studies of visual impairment be based on presenting visual acuity so that uncorrected refractive error as a cause is not missed, and that it would be useful if standardised requirements for reporting of visual impairment and its causes from population-based surveys were developed and implemented through a combined effort of journal editors.

- **Disclosure of funding source**
  There was no separate funding source for the work related to this report, as mentioned on page 16.

We thank BMC Public Health for considering our manuscript, and we would be pleased to respond if any further clarifications were needed regarding this manuscript.

Kind regards,
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