



LETTER TO THE EDITOR

## Understanding visual impairment in UK Biobank

Dear Editor,

In their recent article,<sup>1</sup> Dawes *et al.* report prevalence estimates for visual impairment and dual sensory problems in middle age and associations between visual impairment and demographic factors, using data from UK Biobank.<sup>2</sup> UK Biobank recruited half a million individuals with a subsample of 122 000 having an enhanced ophthalmic examination which included distance visual acuity and autorefractometry. As the group within the UK Biobank Eyes and Vision Consortium undertaking investigation of vision function and refractive error, we have two areas of concern in relation to this paper.

Firstly, as UK Biobank is not a population sample, it is inappropriate to cite an estimate of frequency as true population prevalence. There are few population based studies with which to compare these findings but in our study of a UK population sample (birth cohort) of subjects aged 44 years,<sup>3</sup> the prevalence of habitual and best corrected distance visual acuity in those with low vision were 1.23% and 0.75% respectively, notably higher than equivalent estimates in this study (Supplemental table 1).

Secondly, the statistical approaches used in the paper to obtain standardised frequency estimates used 2001 census data rather than the more appropriate 2011 census data. In addition, the comparative statistics in Table 2 should have compared the UK population and the subsample of the UK Biobank with ophthalmic data, rather than the entire UK Biobank population. More importantly, these approaches *cannot* address the issues of bias which have led to the low prevalence estimates of visual impairment in the study population. For example, there are a significant number of subjects excluded who were invited but did not have an acuity test as they were visually-impaired (self-reported reason for no test). Equally, there are a large number of individuals who were recorded as having reduced visual acuity who were known to have been tested without their habitual optical correction.

Finally, the authors have assumed that the most common cause of visual impairment was uncorrected refractive error without confirming this using the refraction data available on subjects.

We agree with the authors that the size and coverage of UK Biobank allow estimates of association between health outcomes and demographic and socio-economic factors to be generalizable to the wider population, but this requires the methodological issues we have outlined to be taken into account when interpreting or applying the findings of this paper.

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### References

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3. Rahi JS, Cumberland PM & Peckham CS. Visual impairment and vision-related quality of life in working-age adults: findings in the 1958 British birth cohort. *Ophthalmology* 2009; 116: 270–274.