A serial cross-sectional analysis of the prevalence, risk factors and geographic variations of reduced visual acuity in primary and secondary students from 2000 to 2017 in Hong Kong.

Reviewer Comments to Author

General Comments

1. This study covers an important topic, trends in reduced visual acuity (VA) in students in Hong Kong. By combining several data sources, and carefully standardising the main dataset over time, it provides useful data on reduced VA prevalence in Hong Kong across 16 years.

2. It is a clearly written paper, which is mostly easy to follow, logical, well-structured

and appropriately referenced. However, more work, especially in presenting and

interpreting the results, is needed to prepare the paper for publication and ultimately ensure that it is a valuable addition to the literature.

Introduction

3. The introduction would benefit from a bit more focus on existing Hong Kong data, and how this compares to data from mainland China/Taiwan. The introduction

mentions the limitations of existing Hong Kong data, but not what is currently known(while acknowledging those limitations). Given that results are compared with mainland China/Taiwan in the abstract/conclusion, it might be useful to introduce some ideas about why differences in Hong Kong might be expected. Furthermore,given that trends were investigated (and found) in the data, the fact that existing data from China (and elsewhere) was collected at different time points should be acknowledged. Authors could also mention the importance of standardisation in the introduction, given that your results show the need to standardise carefully.

4. The second paragraph on testing VA and refractive errors initially seemed fairly clear, but actually ultimately I found it quite confusing. I wonder what is the purpose of this section (to make the case for the measure of VA?) and what does this add to the I am not an expert on visual health.) Methods and Results

5. One very important piece of information is missing from the methods/results: how many students are covered by the annual health check, and what is this as a

percentage of Hong Kong students? The results are based on prevalence, but raw

descriptive statistics are missing. (Or perhaps I have missed this, but if so, they should be much more prominent.)

6. Before explaining the use of multiple imputation to handle missing data the researchers should say something about how much data (and which data) is actually missing.

7. I understand that for the purpose of presenting the results, choosing 4 time intervals and 5 age/grade intervals may be helpful, but it would be reassuring to know that these choices do not substantially affect the results.

8. The results for grade seem to be basically the same as for age (which is hardly surprising, I assume they correlate very highly). Unless I am missing a good reason to keep both, I think the paper would be easier to read if the authors just state once that results for age and grade were very similar and then subsequently only write about age, with all further references/results regarding grade only included in supplementary files.

9. On a related note, I generally find it useful to report/read correlations between predictors and would encourage the authors to add a table with this information.

10. It took me some time to understand the first paragraph of the results (in particular what the correlation shows, and why it is so strong). I assume what you are trying to say here is that reduced VA prevalence has a very strong negative correlation with SHS attendance/enrolled students because age is a strong predictor of VA? This result might be easier for the reader to understand and interpret if you also explain the crude and age-sex adjusted prevalence rates, and note the differences with the standardized prevalence rate. (Good standardization practice could also be further discussed in the discussion.) Furthermore, it may be useful to provide readers with some explanation of why the proportion of primary to secondary students attending SHS (and enrolled) has changed so much over time.

11. The tables are difficult to read with the present formatting (so I hope authors/editors will ensure that numbers appear on one line wherever possible, e.g., by setting the

12. Table 2 moves back and forth between prevalence data (a/c) and odds ratios (b/d) which is difficult to read. If the researchers accept my suggestion to remove grade data, then c/d are not needed, but if they reject the suggestion, then I think this table should be reordered (e.g., acbd).

13. Prevalence changes over time are one of the main results of the paper, yet I cannot see any statistical testing of whether these changes are significant. Perhaps it is implied by non-overlapping confidence intervals, but the results would be more robust if changes over time were explicitly tested and reported on.

14.To make the odds ratio, Author should add per year(describe this in text).

15.The statement "implying that the interaction effect between age and sex was statistically significant"seems very odd, should not authors just actually test with the interaction effect was significant? (This interaction is also mentioned in the discussion, but I did not see the test result anywhere.)

16. The results regarding geographical variations (Type of housing, School district, Home district and Student Health Service Centres) are inadequately presented and

interpreted. Either significant revision is needed to make these results interpretable to people who do not have much knowledge of Hong Kong geography, or these results should be removed (and potentially made the subject of a separate paper). I suggest removal, because these geographical variations are barely mentioned in the introduction, and in the discussion section the explanations are very speculative and completely unreferenced. (Authors even acknowledge this for one of the predictors conduct in- ve that the paper is still sufficient without these results, there is still important data on time trends, age and gender.

Discussion

17. The discussion needs a lot of work, both on structure and content. Authors should start by clearly laying out their general findings, and only then explaining what these findings add to the existing literature, and how they compare with mainland

China/Taiwan etc.

18. Authors should include a section on strengths and limitations.

19. New terms such as myopia are added to the discussion readability.

20. There is insufficient explanation and interpretation of the interesting findings

regarding changes in the effects of gender and age on VA (and the interaction).

Possible explanations should be referenced and compared with existing literature.

21.explaining are these results not just age effects (see also comment 8)? Or are they really about educational attainment?

22. Authors should be very wary of introducing new results (on cross-boundary students) in the discussion. I can see why they may be relevant to the overall trends found in the paper, but I think this idea should be included in the introduction (and thus justifying the including of relevant results in the results section and subsequent discussion).