Author’s response to reviews

Title: Prevalence and Causes of Visual Impairment and Spectacle-Wearing Rate in Migrant Workers’ Children School in Shanghai, China

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Author’s response to reviews: see over
Dear Editor,

Thank you for giving us the opportunity to address the reviewer’s concerns. The primary issue as raised by the reviewer is lack of the detailed description of clinical examination procedures and comparison of refractive errors with other studies. In the revised manuscript, we added details on examination procedures and estimated myopia data to compare with other studies. We also sought a native English speaker in this research area to edit the manuscript and hope that all the grammatical errors have been corrected and the current version met the standard of publication. We prepared an itemized response below to address each point raised by the review.

Thank you again for your time and we look forward to hearing from you soon!

Sincerely

Jianfeng Zhu
Reviewer's report

Title: Prevalence and Causes of Visual Impairment and Spectacle-Wearing Rate in Migrant Workers' Children School in Shanghai, China

Version: 2  Date: 29 June 2014

Reviewer: Ian G Morgan

Reviewer's report:

This is an interesting and potentially important paper. Little is known about the prevalence of myopia in the children of migrant workers in China, and similarly little is known about the levels of visual impairment and the prevalence of myopia.

China has an unusual system, the hukou, where children are only entitled to education and other social services in the place in which they are registered. Many problems have therefore been generated given that a significant percentage of the population has moved from rural places of residence to cities in search of work. For example, the authors quote a figure of nearly 40% of the population of Shanghai as consisting of migrant workers. There appears to be some variation in the treatment of the children of these workers in relation to access to public services, with some cities moving to complete access, and others maintaining a strict “hukou” rule. It is not clear to me what the situation is in Shanghai. The authors quote a figure of 150,000 for the number of migrant children enrolled in migrant schools in Shanghai, which seems remarkably low for a city with a population of over 23 million, with 40% of the population consisting of internal migrants. This means of the order to 4 million migrant, assuming 3 person family units, and hence 4 million children. Where are the other children? Is the common situation that families are separated? Are they enrolled in the mainstream education system, are they not receiving any schooling, or are they at home as defined by their hukou? Probably this goes beyond the scope of the present study, but the questions are important.

Reply:

For migrant population in Shanghai, Shanghai have a residence permit system. The residence permit is divided into A, B and C three types: A type is for domestic talented people who enjoy the treatment of shanghai resident and whose children can
study in Shanghai and participate in the college entrance examination; B type is for returned overseas people, who enjoy the treatment of shanghai resident and whose children can study in Shanghai and participate in the college entrance examination; C type is for general migrant workers who can’t enjoy the treatment of shanghai resident and whose children can study in Shanghai, but can’t participate in the college entrance examination. The A and B type is a long-term residence which is equivalent to PR, C type is equivalent to short-term residency. According to the data from the Shanghai Education Commission, there were 400,000 migrant children in Shanghai whose parents had C type of residence permit, among which 250,000 enrolled in mainstream education system, and 150,000 enrolled in special migrant children’s school.

What is more under the control of the authors is their perspective in relation to the appearance of UCVA in children. In most situations, the appearance of myopia is the major cause of reduction in VA in children. It increases from the age of 5-6 and normally reaches significant proportions in urban areas of China by the age of 11-12 in children in mainstream schools. This has been clearly documented in studies from Guangzhou on both refractive error and visual acuity. The detailed paper on VA from Guangzhou has not been cited, but provides important comparative data.

Reply:
We have estimated the prevalence of myopia in this study and done comparison with the data in Guangzhou study in revised manuscript (lines 321-332).

The authors describe the appearance of visual impairment as an inevitable result of the move from rural to urban areas, but this is almost certainly not the case. There are certainly consistent urban-rural differences and differences associated with economic development between cities, but there appear to be two major factors involved. One is study intensity which promotes the development of myopia. The other is time outdoors, which prevents the development of myopia. If migrant children have a lower level of educational pressure, perhaps, in part, because they are given inferior schooling, the expectation would be that migrant children would have less myopia
and hence less visual impairment than children in main-stream schools. It is probably not too late to survey these children using a standard questionnaire on children’s activities, of the kind developed with WHO funding in Guangzhou.

Reply:
The main purpose of this study is to require the prevalence and causes of visual impairment and spectacle-wearing rate, so we don’t survey children’s study intensity and activities in this study. Between October in 2013 and June in 2014, we had done another study focusing on spectacle wear, refractive error, study intensity, and outdoors activities times in others migrant worker’s children schools.

This prediction appears to fit with the data, although comparisons are not straight-forward. In relation to visual impairment, the definitions used differ from those used in the Guangzhou study. For comparability, it is important that the authors present data using the same cut-offs as used in Guangzhou. At first glance, there does appear to be less visual impairment in the migrant children in Shanghai than in mainstream children in Guangzhou, but this conclusion needs to be made more definitive. This would be a unique and important observation. It is not an issue of which definition is better, but rather an approach to presenting the results which ensures comparability.

Reply:
In our study, Children with unaided visual acuity of 20/40 or less in either eye were regarded as having visual impairment. The thresholds of 20/40 or less, less than 20/63, and 20/200 or less were used in defining visual acuity categories (line 155-156). The definition is the same as those used in Guangzhou.

For refractive errors, the definitions appear to correspond to those used in the RESC studies, and the prevalence of myopia also appears to be lower in the migrant children. However, comparison is difficult because of the protocol adopted and the low acceptance of cycloplegia. The protocol only carried out cycloplegic refraction for children with VA equal to or below 20/40. This does not allow estimation of the population prevalence of myopia, and it is important in
studies of this kind to obtain cycloplegic refractions for those with normal visual acuity, or at least a sub-sample of these children. This enables calculation of a real population prevalence. I would recommend this for future studies.

Reply:
We had done another study focusing on spectacle wear, refractive error, study intensity, and outdoors activities times in grade 5 in others migrant worker’s children schools between October in 2013 and June in 2014.

In addition, low acceptance rates compromise the validity of the data. Cycloplegia is essential in children for accurate refractions, and the authors should note that large sample sizes do not compensate for the errors associated with lack of cycloplegia. It is possible to obtain high acceptance rates, as the RESC studies indicate, and a smaller sample size with more attention paid to higher rates of acceptance would be better.

Reply:
This study is a charity research project jointly supported by Shanghai Charity Foundation and Shanghai Eye Disease Prevention and Treatment Center. This study is a pilot investigation on myopia, amblyopia, and low vision in all schools for migrant workers' children in Shanghai, with the purpose of acquiring the prevalence and causes of visual impairment among the migrant children in Shanghai. This survey is a public health intervention project, so scientific research is just one part of goal. During the subsequent two years, we will do different intervention for all myopia, amblyopia, low vision students from 140,000 migrant children in others 144 migrant worker’s schools. Time is tight on the project, and the workload is huge too. So the cycloplegic rate (59.62%) of children with visual impairment was relatively lower in this study due to the weak eye care consciousness of migrant children’s parents and deficiency of cycloplegic mobilization. In future project, we will pay more attention to the health education work of cycloplegic.

In summary, the authors have some interesting and potentially important data, but they do not take full advantage of the potential for comparing their data to that on children in main-stream schooling in Guangzhou. It should be possible to
completely align their data with the VA/VI data from Guangzhou. Comparison of the prevalence data is more difficult because of the defects in the protocol adopted for this study, but some alignment should be possible. This will add significantly to the value of this paper.

Reply:
We have estimated the prevalence of myopia in this study and done comparison with the data in Guangzhou study in revised manuscript (lines 321-332).

**Major compulsory revisions:**

The authors need to compare their data on VA/VI and refractive error with other data in the literature – in particular with the data on both issues published from Guangzhou. It should be possible to give some comparison of refractive errors as well, despite the defect in the protocol.

Reply:
We have compared our data on VI with Guangzhou data (line 288-295), and have estimated the prevalence of myopia in this study to compare with the myopia data in Guangzhou study in discussion (line 321-332).

The authors need to specify what sort of chart was used for VA determination. The authors need to note that younger children, up to at least the age of 6-7, do not achieve normal visual acuity with these charts, and that some of what they are calling VI may not in fact be VI, but age-normal VA.

Reply:
Visual acuity was measured at 5m by an ophthalmic technologist who used a retroilluminated standard logarithmic visual acuity chart with tumbling-E optotypes (line 121-122).

Children with unaided visual acuity of 20/40 or less in either eye were regarded as having visual impairment. The thresholds of 20/40 or less, less than 20/63, and 20/200 or less were used in defining visual acuity categories (line 155-156).
In revising the paper, the authors should pay particularly attention to correcting some problems. For example, in the Introduction, the sentence beginning “In addition, the resistance from parents ……..” does not make sense. Something is presumably missing. In the same paragraph, the authors then state that “current refractive error studies in children do not focus on assessing the prevalence of refractive error, but on visual impairment with refractive error.” I do not believe that this statement is correct, and it is based only on one paper. There are many other examples that need to be dealt with.

Reply:
Thanks for the advice put forward by the reviewer, and the mistakes and inappropriate expressions were corrected in this paper.

**Discretionary revisions:**
The authors need to carefully consider which are the important comparisons to make within their data, and present the data in terms of percentages to facilitate these comparisons.

Reply:
Thanks for the advice put forward by the reviewer, we have done comparison with refractive data in Guangzhou in this paper (line 321-332).
Reviewer's report

Title: Prevalence and Causes of Visual Impairment and Spectacle-Wearing Rate in Migrant Workers' Children School in Shanghai, China

Version: 2 Date: 11 July 2014

Reviewer: Padmaja R Sankaridurg

Reviewer's report:

Major compulsory revisions

1. The article suffers mainly from language issues. The sentences are not grammatically structured and the entire article requires heavy editing- it would be very difficult to point out all the issues with grammar and sentence formation and was not undertaken as part of this review. For example, page 1, para 1, line 6-infrastructures should be infrastructure. Example 2. Page 1, para 2, lines 5-7:The sentence beginning with “In addition, resistance from parents in giving consent…” does not make sense- how does this lead to prevalence of refractive error. Same paragraph, last sentence ending with”…studies do not focus on… but on visual impairment with refractive error”- again it is not clear as to what the authors intend to say

Reply:
The manuscript has been extensively edited by a native English speaker with experience in scientific communication.

2. There is also no page numbering and is difficult to track edits.

Reply:
We have added the number of lines marking in manuscript.

Minor essential revisions

3. Page 3, Visual acuity was measured at 5m but was converted to 20ft??

Reply:
Visual acuity was measured at 5m by an ophthalmic technologist who used a retroilluminated standard logarithmic visual acuity chart with tumbling-E optotypes (lines 121-122). The result of visual acuity was recorded as decimal. However, we want to show the results of this study to the readers in international who were used to
20ft. So we converted decimal record of visual acuity to 20 ft.

4. Page 3, cycloplegic procedure- was cycloplegia with 0.5% or 1% tropicamide isn’t 5 drops way too excessive?
   Reply:
   Cycloplegia was induced with 5 drops of 0.5% compound tropicamide and administered 5 minutes apart(lines 130-131). At present, this is the most common usage in child optometry clinic in shanghai.

5. Page 4, line 1- “Subjective refraction was assigned to children for cycloplegic…”- are the authors saying that all children underwent subjective refraction?
   Reply:
   After vision screening, children with unaided (uncorrected) visual acuity of 20/40 or worse in either eye received cycloplegic /non-cycloplegic refraction and subjective refraction.

6. Page 5, study population, line 4 says “1721 children aged 11-12”. Table 1 says 3032 children aged 11-12.
   Reply:
   There were 3032 children aged 11-12 selected in this study. This is an error caused by multiple revisions and have been corrected in revised manuscript (lines 170).

7. Table 2 says 328 were wearing glasses but Table 3 is about 311 students. Is this 328 minus the 17 participants?
   Reply:
   Table 2 shows 328 children were wearing glasses, among whom 17 children without visual impairment. However, table 3 shows Characteristics of 2006 participants wearing and not wearing glasses with visual impairment.

8. Table 4- I see no point to this information other than the mean SE between
cycloplegic and non cycloplegic eyes. But even with the mean SE, it is incorrect to compare mean SE between eyes cyclopleged (these were mostly myopic) versus those that were non cyclopleged (little or no refractive error). So surely the cyclopleged eyes would show more myopic refractive error?

Reply :
This study is a charity research project jointly supported by Shanghai Charity Foundation and Shanghai Eye Disease Prevention and Treatment Center. This survey is a public health intervention project, so scientific research is just one part of goal. During the subsequent two years, we will do different intervention for all myopia, amblyopia, low vision students from 140,000 migrant children in others 144 migrant worker’s schools. Time is tight on the project, and the workload is huge too. So the cycloplegic rate (59.62%) of children with visual impairment was relatively lower in this study due to the weak eye care consciousness of migrant children’s parents and deficiency of cycloplegic mobilization.

Compared to children with cycloplegia, the children without cycloplegia are not significant in terms of gender and grade, and are significant in the SE without non-cycloplegia mean with a difference of 0.53 D in table 4. Therefore, we used the difference of SE between small pupil and cycloplegic to estimate the SE of noncycloplegic population on the assumption that they received cycloplegic. After estimation, we require the prevalence of myopia to compare with data in other studies.

9. Discussion, Para 2- the discussion here needs to be prefaced with the finding that much of the visual impairment was due to refractive error and mostly myopia. If not-the discussion on more outdoor activity resulting in less visual impairment does not make sense.

Reply :
Thanks for the advice put forward by the reviewer, and the mistakes and inappropriate expressions were corrected in this paper.

10. Discussion, Para 4- what do the authors mean by “Screening was applied in this study…”. The section of “difference of 0.53D between cyclo and non cyclo values”
does not make sense as they are not comparative groups.

Reply:

Thanks for the advice put forward by the reviewer, and the mistakes and inappropriate expressions were corrected in this paper.