Author’s response to reviews

Title: A Decade of Road Traffic Fatalities among the Elderly in North-West Iran

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Author’s response to reviews:

Dear Editor,

Thanks to the valuable comments we revised the manuscript according to the review report. I hope the manuscript now fits to the standards of publication in BMC Public Health.

Best Regards,

Moslemi

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Reviewer reports:

Reviewer 1: This paper describes factors pertaining to fatalities of older road users in the East Azerbaijan province of Iran. The study describes mechanisms of traffic deaths among a high-risk group, older road users, in Iran, a lower-middle income country (LIMC) with a large road traffic fatality problem. Research into factors underlying fatalities in this group is needed. This paper provides some useful information, but placement of the results within the larger literature and clarification of why some assertions are made in the discussion would strengthen the paper. The study could be better placed within the literature of factors leading to fatalities among older drivers in other countries, and already-published research on factors leading to fatalities in general in Iran. The authors say that there isn't much other work looking at details of fatal injury mechanisms along with injury outcomes for older road users, especially in LIMCs. To my knowledge this is true for LIMCs, but has been examined for higher income countries like the
US, and the results of the current study can be compared with what's been found in other countries. Previously published research has also already noted that older road users are disproportionately involved in fatalities as pedestrians in Iran (Bhalla, Naghavi, Shahraz, Bartels, & Murray, 2009, in Injury Prevention), but this was not cited in the current paper.

Thanks for the recommendation. We included several new recent references to improve the placement of this study within the related literature. We also included the nice paper by Bahalla et al.

It is unclear why the text of the paper pulls out comparisons between the older and younger ages that were very similar, while not discussing other comparisons that did not differ between groups. For example, it is pointed out that 78% of the elderly versus 80% of the other age groups were male, along with a p-value for the comparison; those numbers are practically identical, but it seems as if the authors are trying to make a point that one is bigger than the other by using language like "versus." Similarly, the paper discusses the causes of death of the older and younger age groups as if they differed substantially, but really, they were very similar.

Corrected. Seems the term “versus” was not appropriately used in our manuscript. We just meant to show that the distribution of gender, which is a major risk factor of traffic mortalities, was similar between the two age groups both statistically and practically.

It is similarly not clear if some of the explanations given for the study's findings are backed by data. For example, the authors offer that older road users may die at the hospital more often than other road users because they are more often injured in the inner city, but they do not cite or offer data that older victims are in fact injured in the city more often than other road users. The authors also argue that older traffic victims are more often pedestrians because older people are less willing and able to drive. While this seems logical, again, it would be helpful to cite statistics to back this up. Older people also drive less than the rest of the population in westernized countries like the United States, but are not as likely to be pedestrians when fatally injured as in Iran.

In the revised manuscript we added the new analysis based on our own data showing that about half of the elderly victims (51.1%) died due to an inner city crash, while, about a quarter of the non-elderly victims (26.3%) died after inner city crashes.

Other specific comments follow:

Abstract
Introduction:

You mention that hearing loss, weakened vision, and musculoskeletal problems made the elderly prone to traffic accidents. This is true, but a large and unmentioned factor is decline in cognitive function.

Thanks for reminding. It was also added in revised manuscript.

Materials and methods:

What is the definition of a traffic crash in Iran? The methods say that the victim had to have died within 30 days, but I wondered if a motor vehicle had to be involved or if any deaths on roadways were included. I noticed from Figure 3 that some deaths were due to falls. Do pedestrian deaths include falls that occurred on/next to roadways, even if a motor vehicle was not involved?

We added the legislative definition to the revised manuscript. Here also we meant fall of a vehicle leading to an injury not fall injury for the subjects. We clarified it in figure 3 changing the word “fall” to “Vehicle fall”.

"All the elderly fatalities due to traffic injuries registered through the time period from March 2006 to March 2016 were…” Add a space between "2016" and "were"
"Several variables were measured for all the participants including: 1) crash-related data consisting of crash mechanisms, crash counterparts, inner/outer city crash and crash time. 2) Victim-related data including demographic data, main cause of death, injured organs, place of death, and mode of transfer to hospital." Point 2 is not a complete sentence. Consider adding a comma and the word "and" between points 1 and 2 rather than turning them into complete sentences.

Corrected.

"In this study, the data for mode of transporting the accident victim to hospital was only for the last seven years of study." This sentence appears to be missing a word, perhaps "available"

Added as recommended.

Results

"About 14.4%..."—It's not true that "about" 14.4% of fatalities were elderly; exactly 14.4% were. Please reword so that the sentence does not use "about."

Corrected.

"secondary incremental wave"—It's unclear what exactly this statement means. Consider rewording.

Reworded.

"The likelihood of a pedestrian aged above 65 to die after a motorcycle crash was nearly 1.7 times more than similar casualties in other ages"—I'm unclear what the comparison is here. Are pedestrians 65+ who were killed by motorcycles being compared to all other fatalities among other age groups, or just pedestrians? And if so, how was the decision made to break the data into such a specific grouping? Also, for some readers the "likelihood of dying in a crash" refers to the likelihood that a person will die when they are involved in such a crash; please make it clear that is not what you mean here.

Clarified. We added an introductory sentence providing the percentages in addition to odds ratio to clarify it in revised manuscript. Considering the high percentage of pedestrians among elderly
traffic mortalities, an exclusive analysis was conducted only for pedestrians and it was found that elderly pedestrians are more likely to be killed by motorcyclists than pedestrians in other age groups.

Discussion

- The discussion section needs to be broken up into more paragraphs. As it stands, the discussion section has two paragraphs, with the second paragraph spanning nearly three pages.

Done as recommended.

--"Older pedestrians are shown to represent 13% of the population while accounting for 36% of the mortalities"—where? The prior sentence talks about lower and higher income countries, and so it is not clear which area this sentence refers to.

Location name added and also the percentage for our study area was provided in revised manuscript.

--It is mentioned that older people are at high risk of being involved in a crash as a pedestrian because of their physical vulnerabilities. While this is true (e.g., slower crossing speed), their cognitive capabilities play a role as well. Older people may have cognitive limitations that make it more difficult for them to pick appropriate gaps in traffic to cross the street, for example. This could be especially exacerbated in a complicated environment.

This explanation of the respected reviewer now added to the manuscript.

--It is mentioned that fatally injured older people more frequently have higher limb fractures because they are primarily colliding with bumpers. While that might be true, injury patterns also differ between fatally injured older people and traffic fatalities of other ages in other countries, where the

The explanation added.
The authors discuss that elderly people using anti-coagulants may be at higher risk of bleeding and brain hemorrhage. Are these used widely among older people in Iran? If not, this seems like a non sequitur.

We removed this sentence in revised manuscript due to unavailability of robust evidence for Iran.

Tables and figures

-- Both tables: "Percent" can appear in the title of the table or in the column titles rather than as a footnote.

Done as recommended and the footnote on percentage was removed.

-- Table 2: The total column does not add up to the "elderly" and "other ages" columns. In some places it is greater, and it some places it is less. Also, what does the p<0.01 in the final column refer to? Does it mean that each individual comparison differed significantly by age, or that the pattern of causes of death differed by age?

Corrections and clarifications added to the manuscript. It was due to missing values which were in turn was negligible(<0.4%) but we added a clarification in this regard. A footnote for clarifying the p-values was also added to each table. Table 2 is now labeled table 3 in revised manuscript.

--Figure 1: It's confusing that the text of the paper discusses Christian years, but the graph includes Iranian years. Consider converting both to Christian years. --Figure 1: How were the points for 2006 and 2016 plotted, since only partial years of data were available?

We added the conversion details for month and year to the revised manuscript.

--Figure 1: It's not clear at first glance which side of the graph plots data for the elderly and which for other age groups. I suggest plotting both on the same scale. The difference in magnitude between the groups isn't so great that you won't be able to tell the pattern over time for the elderly if the scale was the same.

Our statistician believes due to a 6-time different magnitude it is good to keep the 2 y-axes,however, seems through pdf conversion of the manuscript axis titles have been displaced and caused ambiguity. So we corrected it in revised manuscript.

--Figures 2 and 3: Some of the words in the legends for these figures are misspelled ("ambulance," "agricultural vehicles")
Corrected. Figure 3 is labeled figure 2 in revised manuscript and figure 2 is replaced by a table.

Reviewer 2: This manuscript is looking at crash mechanisms and medical outcomes of traffic fatalities among the elderly in East Azerbaijan province of Iran between 2006 and 2016. It is a relevant topic, but a number of things need to be clarified in order to allow a more consistent presentation of the work done. The figures are very hard to interpret in black and white and tables would increase the understanding and transparency for the reader. Furthermore the language has to be edited throughout the whole manuscript.

Thanks for the comments. We did our best to revise the manuscript in a way to be acceptable by the respected editor and reviewers.

Abstract

* Clarify from what age elderly is defined.

>65 years

Definition added to revised manuscript.

* Statistical methods should be included in methods.

Added in abstract.

* The conclusion in the abstract should be based on the results in the current study not implications of the results.

Revised.

Introduction

The introduction does not include what is known before, even though the authors acknowledge that there are previous studies the results of these studies are not presented.
Revised

Methods

It is unclear how the statistical analyses are done. The authors write that they have done multivariate logistic regressions, but this is not evident from the tables. What is included in the multivariate regression models and why is the confidence intervals not presented in tables?

Thanks. A clarification added where the logistic regression was used. The logistic regression was used to assess whether the elderly were at higher risks of hospital mortality. To keep the manuscript simple we reported just the adjusted odds ratios and their 95% confidence intervals.

Results

* The results are hard to follow; it would have been easier to interpret the results based on tables instead of figures. The figures are very hard to interpret in black and white.

We removed figure 2 replacing it with a table(new table 1) and we also removed figure 5 replacing it by simple text as recommended in your later comment. Considering the number of slides and e-publishing of the journal we hope the current 3 figures will be appropriate.

* The text regarding Figure 3 does just explain the content of the figure not the results. Crash mechanisms are part of the aim and should be included in the results.

Done as recommended by adding main results as text.

* Figure 5 and mode of transportation seem to be a bit outside the research questions, maybe it can be mentioned in the text, but a figure is not needed

It was removed.

* Table 1 - It is not clear how the percentage for each column is calculated; can each person be represented in more than one cell? How is the p-value calculated? The n should be included at the to of every column. Table 2 - The numbers in the columns do not add up correctly to the total numbers and the percentages in the total column are not correct.

Clarifications and corrections were applied on tables. The total number for each column added to table 2 in revised manuscript, however, this couldn’t be done for table 1 because the rows are not mutually exclusive and a victim may be repeated in more than one row of the table. That was the reason also that we had one p-value for each row in table 1 but a single p-value for table 2. A footnote for each table was also added.
* Figures 1, 2, 3, 4 and 5 - Revise the patterns so it is possible to distinguish between them in black and white.

Considering the number of slices in the remaining 3 figures and e-publishing of the journal we hope the current 3 figures are appropriate, however, if the journal considers black & White publication of figures, we will replace the colors by patterns.

Discussion

* The limitations of the study should be highlighted and discussed in the discussion section.

A section was added for limitations of the study.

* Ageism is mentioned in the discussion, but the link of this concept with the current study needs to be clearer, do the authors believe that this is an explanation of the results?

Yes. It is mostly a hypothetic explanation to motivate future research. We made a small change in wording to clarify this.

* Bumper collisions are also mentioned in the discussion, but the mechanisms in Figure 3 do not include this term.

This was not part of the routine classification used by forensic medicine organization in Iran. So our statement is mostly an explanation. Stated also as a limitation.

* A conclusion should be included in the discussion.

Added as recommended.