Reviewer’s report

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

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Reviewer: Jessica Cicchino

Reviewer's report:

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.

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.

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.
Other specific comments follow:

Abstract

--Add space between "9435" and "fatalities"

--"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."

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.

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?

-- "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.

--"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"

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

"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.

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.

"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.

--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.

--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 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.

Tables and figures

--Both tables: "Percent" can appear in the title of the table or in the column titles rather than as a footnote.
Table 2: The total column does not add up to the "elderly" and "other ages" columns. In some places it is greater, and in 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?

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?

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.

Figures 2 and 3: Some of the words in the legends for these figures are misspelled ("ambulance," "agricultural vehicles")

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

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