Reviewer’s report

Title: Alcohol-impaired driving in US counties, 2002-2012

Version: 0 Date: 06 Sep 2017

Reviewer: Wenjun Li

Reviewer’s report:

This article addresses an important public health issue on alcohol impaired driving (AID) and injury prevention. It produced county-level estimates that are useful to public health planning and/or evaluation. Overall, the article is promising, however, substantial revisions are needed prior to publication. Authors may consider the following reviewer critiques while revising their manuscript:

1) Please clearly define the main outcomes (alcohol-impaired driving episodes (self-report incidents) and prevalence of AID (% of persons in a defined time and space) in the methods section of the abstract and manuscript;

2) Introduction: the author argued that MVCs are the leading cause of death for age 16-24 and among all age groups, and MVC-related fatalities are rising, yet this analysis reported declining trends in AIDs. This appears counter-intuitive, would you elaborate?

3) Data source: please create one or new paragraphs to explain BRFSS data briefly, including critical attributes (sampling, data collection, processing, contents, etc.). A manuscript is not self-content without such critical elements.

4) Please provide sample sizes available for analysis, by year and overall;

5) Clarify what % of respondents excluded from analysis due to missing information, and justify if this practice would impact the analysis results and why (potential response/selection bias), and relevant method to mitigate the issue;

6) Gender is related to AIDs, and gender by age interactions are expected; please explain why gender is not considered in the analysis?

7) The state-level BRFSS response rate declined progressively over time. In addition to provision of a range, it would be helpful to presented response rates by year, and discuss its potential impact on analysis results;

8) Small area estimation models (equation): mixing "X" after the betas; explain why gender is not considered; not sure why year was modeled as a random effect;

9) Small area estimation models: would it be helpful to include the year variable to test for temporal trends?
10) Would income and employment status affect AID, and should be modeled in the SAE models?

11) I could not understand "The draws were post-stratified by education, race and marital status utilizing population counts from the US census and ACS. Would you clarify? Similarly, "Draws were age-standardized using the 2010 census population", what does it actually mean?

12) Please explain what (statistical) models were used to analyze binge drinking and AID episodes, and how the relative risks were quantified.

13) Results: need a typical Table 1 that describes the characteristics of the sample, and those included in the analysis.

14) Results: the results on AID episodes in two paragraphs could be summarized concisely in a table.

15) Discussions: did not read.

16) Conclusion: I am not sure the conclusion on positive progress on the annual number of self-reported AID episodes, - it is against the rising numbers of AID-related fatalities. Is it possible that the low response rates of more recent years causing problems?

**Level of interest**
Please indicate how interesting you found the manuscript:

An article of importance in its field

**Quality of written English**
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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