Reviewer’s report

Title: The protective effect of helmet use in motorcycle and bicycle accidents: a propensity score-matched study based on a trauma registry system

Version: 1 Date: 23 Dec 2016

Reviewer: Safa Abdalla

Reviewer’s report:

Thank you for responding to my comments. It is much clearer now what has been done. I do have further comments about the methodology and the display of the results:

-the authors clarified that the propensity score calculation used mortality as a dependent variable - why was that? Propensity scores are calculated by regressing the key independent variable of interest in the study (helmet use) and not the outcome of interest on the potential confounders. The whole concept of propensity scores is predicated on estimating the probability of being in one or the other intervention group given the potential confounders not the probability of the outcome. re-calculate the propensity score correctly.

-Accordingly one would expect supplementary table 2 to compare the standardized difference (categorical variables) and covariance ratios (continuous variables) between helmet users and non-helmet users in each group of road users to check that they are balanced across those groups. Comparing mortality is not informative and is based on incorrect propensity score estimation method. The tables with the potential confounders should use the standardized difference or measures for continuous variables and not the OR or p-value.

- I understand how it would be difficult to use one comorbidity as a referent category (because they are not mutually exclusive) and it is reasonable to have separate yes/no variables for each comorbidity but for the other variables with mutually exclusive categories (e.g. gender), the information is redundant and in effect, you are presenting data from different models with different intercepts and probably also running into multiple testing problem. It would be great if you could share examples of publications where this was done (where variables have mutually exclusive categories like the gender variable).

-regarding the definition of the cases as primary trauma-related injury: Someone can still be discharged and get re-admitted into hospital and die from a complication directly related to the trauma. Those might not be frequent but they are still suffering the primary consequences of the trauma. Their exclusion is still a limitation albeit hard to assess how important.

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

No
Does the work include the necessary controls?
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Unable to assess

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Yes

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