Reviewer's report

Title: A Comparison of Methods to Estimate the Survivor Average Causal Effect in the Presence of Missing Data: a Simulation Study

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Reviewer: Ming-Wen An

Reviewer's report:

The authors consider the problem of estimating the survivor average causal effect (SACE) in the presence of attrition due both to death and loss to follow-up. Specifically they describe and evaluate, via a simulation study, two methods - a marginal structural model approach and a sensitivity approach - for estimating the SACE. They also motivate the problem by, and apply the methods to, an illustrative example studying age-related macular degeneration (AMD). Overall the paper is written clearly. The following comments might help to enhance the readability of the paper.

__MAJOR COMMENTS__

1. Simulation Study Parameter Values.
   a. How was the value of 0.6 chosen for the true SACE? Were other value considered, and if so, how did the results compare?

   b. From Tables 1-2, it seems that the true value for the sensitivity parameter tau is approximately 1 (ranging from 0.78 to 1.144) across the different scenarios. Again, were other values considered, and if so, how did the results compare?

   c. In the conclusion, the authors state that the MSM's produced biased estimates of the SACE in the presence of an unmeasured survival-outcome confounder. It might help, as comparison, to also include a simulation scenario where there are no unmeasured confounders.

2. The authors emphasize the need for content experts and data analysts to work together to prepare causal diagrams (from Conclusion, p.26) and to decide which values of the sensitivity parameter tau are plausible (from page 12). This can often be challenging. It might be helpful to briefly provide some practical guidance (or suggest references) on doing this.

__MINOR COMMENTS__

1. Tables 1 and 2 (Results) - it seems that when monotonicity is violated, not only does bias "not increase" (authors' words in the text), but rather the bias actually "decreases" relative to when monotonicity holds. If in fact correct, the authors may want to discuss this observation.

2. Tables 1 and 2 (Results) - add in the footnote that the "estimate" columns is the average from 2000 datasets, if indeed correct.
3. For clarity in the text on the simulation study, it might help to explicitly state / summarize what the simulation parameters are and their values, i.e. $OR_{uz} = (0.25, 0.50, 2.0)$, $OR_{uy} = (0.5, 2.0)$, and monotonicity assumption (violated vs. not violated), whose combinations define the 12 scenarios.

**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.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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