Reviewer's report

Title: Choice of relative or cause-specific approach to cancer survival analysis impacts estimates differentially by cancer type, population, and application: evidence from a Canadian population based cohort study

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Reviewer: Angela Mariotto

Reviewer's report:

This is a nice and well written paper addressing an important problem of comparisons of relative versus cause-specific survival in estimating net cancer survival. This paper extends previous studies evaluating difference between relative versus cause-specific survival by including disparities comparisons among 2 different populations, First Nations and non-Aboriginal Canadian populations. The paper compares 4 methods: relative survival with ethnicity life tables (RS-ELT), relative survival with general life tables (RS-GLT), cause-specific survival using a narrow definition of cause of death (CS-N), and cause-specific survival using a broader definition of cause of death (CS-B).

1. Although the authors do a good job in describing the most notable differences in the text and mentioning that different biases may affect each of the measure, cancer site and population differentially, I feel that the paper would greatly benefit for more tight conclusions that could provide better guidance on the use of one measure versus another in different situations. For example, the results show that CS-N yields higher survival estimates in general and especially for oral, stomach and colorectal cancers. Would the authors suggest that the CS-N should be used instead of CS-N? Would the authors recommend the use of RS-ELT instead of RS-GLT?

2. Stage impacts survival and is an indicator of the amount of screening. Comparing breast or prostate cancer survival by stage could have provided more insight into the differences of RS and CS for these cancer sites. I would suggest providing comparisons by stage or at least including the lack of stage (if this is the cases) as a limitation of the study.
3. Figure 1 is difficult to read due to the black-gray scale. The y-scale in Figure 1 are variable to emphasize differences within cancer sites. However the results are presented over all cancer sites. Having a common scale would help in reading differences across cancer sites.

4. Page-7 second paragraph. I do not agree with the statement that "The age-standardized survival estimates using CS-Broad approach was higher compared to RS-ELT for most cancers". It seems to me that there were many exceptions so I am not sure this can be generalized.

5. Page 5 third paragraph. Can the authors explain how the excess mortality hazard were adjusted for sex and age? Stratified or using them as covariates?

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