Reviewer’s report

Title: Cancer survival for Aboriginal and Torres Strait Islander Australians: a national study of survival rates and excess mortality.

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Reviewer: Diana Sarfati

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This is an important paper, with concerning findings of very substantive interest. I found it both interesting and largely well-written.

My main query to the authors relates to their comparison of relative survival with cause-specific survival approaches. Their assumption seems to be that the former is ‘gold standard’, and that if the results differ between the two then the latter is necessarily incorrect. I think the paper would benefit from consideration of this assumption. Relative survival measures are not, of course, without their problems. The authors mention the requirement for adequate life tables but there might be two issues to consider in relation to this. The first is that relative survival assumes that the mortality experience of those with cancer would have been the same as those without, in the absence of cancer. This is problematic for some cancers, particularly smoking-related cancers (those who smoke are obviously likely to have higher background mortality rates than the general population). Second, the life tables must use a similarly derived population in order not to introduce a non-comparability bias. In this case, there it would be very helpful to briefly discuss how the Indigenous-specific life tables were constructed and whether the measure of Indigeneity within this process is likely to be the same as the measure of Indigeneity in the Cancer Registries. This may be of particular concern if Indigeneity is identified largely through health system use (which is likely to be high in cancer populations). For example, if the life tables tend to be derived from Indigenous people identified both because of their high health service use and from mortality records (so those who are sickest are most likely to be identified as Indigenous), the life tables may overestimate the background mortality (or underestimate their survival) and thus also overestimate relative survival for Indigenous people (assuming most Indigenous people with cancer are correctly identified as such because all or nearly all are accessing services). The authors may find the following paper useful in this regard: Sarfati D, Blakely T, Pearce N. Measuring cancer survival in populations: relative survival versus cancer-specific survival. International Journal of Epidemiology. 2010; 39: 598-610.

Relating to this, I think it would be very useful to look at trends over time in survival for at least some of the individual sites. The discrepancies between the two methods tend to occur in either sites with very small numbers, or haematological malignancies which may be more prone to misclassification of death. I am concerned that the time trends in survival for all sites combined is somewhat uninformative because the underlying trends are going to vary to a
large degree by site. Doing similar analyses for even (say) the most prevalent five cancers would give more of a picture of whether there are discrepancies in improvement in survival by ethnicity for cancers where there are clear improvements generally.

In relation to the time trend analysis, a little more interpretation of table 5 in the results would also be helpful.

On a final note, it is extraordinary to me that cause of death data have not been available to Cancer Registries since 2007. This seems an astoundingly short-sighted decision on the part of the decision-makers involved.

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests