Author’s response to reviews

Title: Cancer survival disparities worsening by socio-economic disadvantage over the last 3 decades in New South Wales, Australia

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Professor Natalie Pafitis
Editor
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Dear Professor Pafitis,

Thank you for forwarding the reviewer’s comments for our manuscript. We have incorporated the recommended changes. Please find below our itemized point-by-point response.
Reviewer reports

Amy Downing (Reviewer 1):

This study uses competing risk regression models to examine the variation and trends in cancer survival by socioeconomic disadvantage, remoteness and country of birth. Whilst much of the study is well explained and clear, I found it difficult to understand how the cause of death information had been used to inform the models. Cause of death within cancer registration (and other routinely collected) data is notoriously poor, at least in the UK. I would like to see more information about this and for the authors to be clear about the quality of such information. If these data are poor then the models will not be reliable - this is not mentioned anywhere in the discussion as it stands. It would also be interesting to see how the results compare to standard regression.

Response: We thank the reviewer for raising this important issue. In this study, we used the death from the incident cancer as an outcome of interest and deaths from other causes were regarded as competing events. The NSW Cancer Registry receives cause of death information from the Australian Bureau of Statistics (ABS). The ABS obtains the cause of death information from the Medical Certificates of Cause of Death, a general format recommended by the WHO and used by all Australian states. The ABS ensures and maintains the quality of the cause of death data by using trained coders, detailed documentation and coding instructions, and thorough data quality checks. More information about the quality of Causes of Death registration in Australia can be found here: ABS, Causes of Death, Australia, 2014, Cat. No. 3303.0, ABS, Canberra, 2016 (the document is available online in http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3303.0Main+Features22014?OpenDocument).

In the NSW Cancer Registry, trained medical coders use the ABS Cause of Death data as baseline information. The Registry has detailed information about patients’ history of cancer (hospital admission records and all other notifications) and, therefore, coders may revise the ABS cause of death based on all the information available in the Registry. For example, the Registry may consider the primary cancer to be the cause of death when a secondary cancer consequent to the primary cancer is recorded on the death certificate as the underlying cause of death. Subsequently causes of deaths are coded into cancer deaths and other deaths. According to the ‘Cancer in NSW: Incidence and Mortality 2008’ report, death processing is very complete,
quality of death notification system is high, and causes of deaths are well ascertained in the NSW Cancer Registry. We have now provided more information about the quality of cause of death data in the manuscript.

“Death processing is very complete in NSW and cause of death information is well ascertained in the NSW CR (25).” (lines 106-107)

In this study, we wanted to examine cancer deaths in the presence of other potential causes of deaths and, therefore, we performed competing risk regression analyses. However, we performed standard Cox proportional hazard regression analyses as a supplementary sensitivity analysis and the results remained largely similar (not reported in the manuscript). In the Discussion, we have referred to other previous studies examining cause-specific survival and discussed potential reasons for similarity of findings (lines 285-291).

Do the authors have any explanation why the results for Unknown country of birth are so favourable? There seems to be something very different about this group and perhaps they should be excluded altogether.

Response: Results for unknown country of birth are likely to be explained by under-notification of country of birth information for cancers with good prognosis, such as melanoma and prostate cancer. The NSW Cancer Registry receives country of birth information mostly through death and hospital admission notifications. Therefore, if the Cancer Registry only receives a pathology notification, country of birth information will be missing. This has been clarified in the manuscript. We also conducted sensitivity analyses by excluding those with unknown country of birth and results remained unchanged (data not shown). This has now been stated in the manuscript.

“We also conducted sensitivity analyses excluding cases with unknown summary stage and cases with unknown country of birth.” (lines 186-188)

“Results remained unchanged when excluding those with unknown country of birth (not shown).” (lines 262-263)
“Under-notification of country of birth for cancers with a good prognosis (such as melanoma) is likely to at least partly explain the relatively low risk of death among people with unknown country of birth. The NSW CR receives country of birth information mostly through death registrations and hospital admission notifications. If the registry only receives a pathology notification, country of birth will be missing. Excluding those with unknown country of birth in a sensitivity analysis had no impact on results.” (lines 317-323)

I think the conclusions could be stronger (this also applies to the abstract) - how do these data help inform policy? How can they be communicated to policy makers, governments, health providers, etc?

Response: We agree with the Reviewer that these findings need to be discussed with policy makers, health care providers and other stakeholders, such as government, in order to help inform policies. We also think that it is important to better understand the reasons behind these disparities in order to plan targeted actions. Including different stakeholders into planning and discussions is important because reasons behind the disparities are likely to be complex and include several different contributing factors. We have now revised the conclusions in the abstract and in the text.

“There is a widening gap in comparative risk of cancer death by level of socio-economic disadvantage that warrants a policy response and further examination of reasons behind these disparities.” (lines 47-49)

“Active attention is needed to address cancer survival disparities by socio-economic disadvantage, especially as these disparities appear to have increased. Reasons behind these disparities should be further examined in order to plan targeted actions. Collaboration between different stakeholders, including policy makers, government and health care providers, is important to ensure comprehensive approach as disparities are likely to be driven by multiple, complex processes. A policy emphasis on socio-economic disadvantage is required if the trend of the widening gap in death from cancer by socio-economic disadvantage is to be reversed.” (lines 359-366)
Francis P Boscoe (Reviewer 2):

1. As one who is not familiar with Australian Census Collection Districts, it would be useful to note their average population size.

Response: We thank the reviewer for noting this issue. We have now provided more information about Census Collection Districts, including their average size in the 2006 Census.

“CDs were the smallest geographic units with SEIFA information available. In the 2006 Census, they included approximately 250 households in urban areas and far fewer households in rural areas (28).” (lines 132-135)

2. Unknown birthplace complicates things just enough that it should at least be noted as a limitation. The fact that it is very highly protective reflects the fact that birthplace is often obtained from the death certificate itself. The authors do touch on this in lines 310-314, but there is still the question of whether this biases the results. If those with missing birthplace are more likely to be Australian-born or English-speaking born, then the birthplace disparity is overstated; if they are more likely to be non-English-speaking born, then the birthplace disparity is understated. In the US, the SEER program recently removed birthplace from its public-use data sets for this very reason, though the percent missing birthplace in the US is far higher than in Australia.

Response: We have provided more information concerning the issue of unknown country of birth in our response to the second comment by Reviewer 1. The main sources of country of birth information are death certificate and hospital admission notifications and, therefore, country of birth is missing if the Cancer Registry only receives a pathology report. Country of birth information is more likely missing for good prognosis cancers, such as melanoma where a hospital admission is less likely. This under-notification of country of birth for cancers with good prognosis is likely to explain the relatively low risk of death among people with unknown country of birth. This has now been clarified in the manuscript. In addition, we performed sensitivity analyses by excluding cases with unknown country of birth and results remained unchanged.
Line 265 - over time = two words.

Response: This typo has now been corrected (line 272).

Editorial Policies:

In accordance with BioMed Central editorial policies and formatting guidelines, all submissions to BMC Public Health must have a Declarations section which includes the mandatory sub-sections listed below.

Response: Declarations section has been included in the manuscript with all mandatory sub-sections (lines 386-420). Authors’ information has been provided on the title page (p. 1).

For the 'Availability of data and materials' section, please provide information about where the data supporting your findings can be found. We encourage authors to deposit their datasets in publicly available repositories (where available and appropriate), or to be presented within the manuscript and/or additional supporting files. Please note that identifying/confidential patient data should not be shared. Authors who do not wish to share their data must state that data will not be shared, and provide reasons for this in the manuscript text.

Response: Data analysed for this paper are not able to be shared on any publicly available repository due to NSW privacy laws. This has been explained in the Declarations (Availability of data and materials), and we have now provided this information in the manuscript text as well.

“Data analysed for this paper are not able to be shared on any publicly available repository due to NSW privacy laws.” (lines 115-116)
All revisions have been highlighted in the text. We would be happy to clarify any aspect of our response.

Yours sincerely,

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