Author’s response to reviews

Title: Mapping Cancer Incidence Across Western Victoria: The Association with Age, Accessibility, and Socioeconomic Status Among Men and Women

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RESPONSE TO REVIEWERS

EDITOR COMMENTS:

1. Please change the Introduction heading to Background.

RESPONSE: This has been amended. See page 3, line 1.

2. Please confirm whether informed consent, written or verbal, was obtained from all participants and clearly state this in your Methods and Ethics approval and consent to participate sections. If verbal, please state the reason and whether the ethics committee approved this procedure. If the need for consent was waived by an IRB or is deemed unnecessary according to national regulations, please clearly state this, including the name of the IRB or a reference to the relevant legislation.

RESPONSE: Written and/or verbal individual consent was not required as there was no direct patient or public involvement. Aggregate data was utilised; this data contained no personal or identifying information. All data for this region and the 21 local government areas was obtained from existing local, national and state registries. See statement included in the ethics declaration on page 15, line 3-6.

3. Please indicate the role of the funding body in the design of the study and collection, analysis, and interpretation of data and in writing the manuscript in the Funding section.

RESPONSE: The role of the funding body has now been clearly stated. See page 15, ‘Funding’ section, line 20-21: “Funding is provided for research in line with the Western Alliance’s vision, mission and principles. They provided no other role in this study”.
4. The individual contributions of ALL authors to the manuscript should be specified in the Authors’ Contributions section. Guidance and criteria for authorship can be found here:

http://www.biomedcentral.com/submissions/editorial-policies#authorship

Currently, Lana J Williams, Mustafa Khasraw, Sharon Hakkennes, Trisha L Dunning, Susan Brumby, Richard S Page, Alasdair Sutherland, Sharon L Brennan-Olsen, Michael Berk, David Campbell are currently missing from the contributions.

RESPONSE: In the ‘Authors contribution section under ‘Declarations’, the final line stated “…all authors read and approved the final manuscript”. To increase clarity, this has been updated and now reads “…LJW, MK, SH, TLD, SB, RSP, AS, SLBO, MB and DC all provided intellectual feedback into the design of the study, reviewed the manuscript and approved the final version”. [See page 16 line 9-11].

5. Please clarify whether the Department of Health and Human Services, State Government of Victoria, Australia provided permission for this study to reproduce Figure 1, and if so, please send the proofs to BMCSeriesEditorial@biomedcentral.com.

RESPONSE: The figure legend states “Data for graphic obtained from the Department of Health and Human Services, State Government of Victoria, Australia [35]. (Graphic prepared by MAS and KLH)”. Permission to reproduce this figure from has been provided. Proof has been sent to BMCSeriesEditorial@biomedcentral.com.

6. Please state in the figure legends whether the maps depicted in figure 4 are your own or taken from another source.

7. If taken from another source please acknowledge the source in the figure legend, and if it is under copyright also state the written permission given to use and adapt it.

If the above conditions are not met the image needs to be removed. Please note the editors may request proof of permission at any time.

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http://commons.wikimedia.org/wiki/Main_Page

RESPONSE: The maps in figure 4 are our own and have not been taken from another source. The figure legend now states, “Configured heat maps showing age adjusted incidence rates for
men and women for a) all cancers, b) bowel, c) lung, d) melanoma, e) prostate and f) breast cancer, aged 40+ years across the study region 2010–2013 inclusive…”.

FREDDY SITAS (REVIEWER 1): This is a well-written paper but the novelty of Western Victoria is not explained to an international reader.

RESPONSE: The novelty of western Victoria has now been addressed. “As this study comprised a large geographic area and included populations with varying degrees of remoteness and socioeconomic advantage and disadvantage, it is uniquely posited to further raise rural and remote health disparities. An introduction to this region which further describes its novelty has been provided elsewhere [14]. Outcomes of this study can target healthcare utilization and management of disease locally. Importantly this study can be utilised as a repeatable profiling model in other geographical settings, where a variety of population densities are present to identify targeted interventions to reduce disparities in cancer outcomes in regional and rural communities.

The data and limitations of the analyses are not new. The authors mention the richness of the ACDI data but this is a basic geographical analysis of cancer registry data without use of anything else. It is unclear what the data add given the recent Australian cancer Atlas [https://atlas.cancer.org.au/app] and how these data compare to that.

RESPONSE: The launch of the recent Australian Cancer Atlas (ACA) interactive online map is of similar design to this study. The ACA maps the incidence and excess mortality rates of cancer(s) to determine how specific geographical areas compare to Australian norms. Further information on the Atlas can be found online (ACA, 2019). There are however important features from our study which sets the work apart from that achieved through the ACA. Notably, the region of western Victoria is a well-defined geographical area, which is part of a single Primary Health Network (PHN), and we examined patterns of cancer incidence across age decades, thus providing comprehensive insight on the association between age and cancer incidence for those aged 40+ in the region. Furthermore, we have investigated the associations between cancer incidence and SES and ARIA in more detail.

Associated Reference:

The references are poorly formatted. RESPONSE: The references have been reformatted in accordance with journal requirements.

The discussion ought to mention how these data are going to inform the ACDI program. The conclusions are too generic.

RESPONSE: We agree that further discussion addressing the direct implication(s) of these findings with regards to its impact on the ACDI study, and not just the broader implications, was required. Refer to page 12 lines 5-11. “The ACDI study aims to describe the pattern of chronic disease and injury and its relationship with age, sex and location for the region of western Victoria. To date, this study has investigated several diseases and injuries including diabetes, fracture and joint replacement [11, 32-35]. The addition of comprehensive information regarding cancer incidence not only provides a snapshot of this disease across the region and its 21 LGAs but allows for comparison among disease and injury categories. Outcomes of this analyses can be utilised to produce a highly comprehensive community profile with the potential to improve interventions impacting cancer incidence.

ABDOLLAH MOHAMMADIAN, PH.D (REVIEWER 2): Please see attached report.

RESPONSE: Please see track changes in the manuscript document addressing the minor grammatical revisions suggested from this reviewer.

HONGMEI ZENG (REVIEWER 3): The study used data on cancer incidence in Victorian Cancer Registry and explored the association of age, ARIA and area-level socioeconomic status with cancer incidence. There are several factors that the authors need to consider to strengthen the manuscript.

1. In the discussion part, the authors stated that VCR is the most comprehensive and reliable cancer registry in the state, but they did not provide any quality control indicators of the VCR data. It is better to add the MV%, DCO%, M/I, etc. indicators in the paper so that we may have an overall evaluation of the data quality.

RESPONSE: Information regarding quality control of the registry is now provided in the method section under ‘2.3 Data Sources’, from page 6, line 25-page 7 line 3 “Comprehensive information concerning data quality for the VCR have been provided elsewhere [16]. This most recent report included three indices of data quality; death certificate only (DCO%), histological
verification (HV%) and mortality to incidence ratio (M/I%) for specific anatomical cancer sites as well as for all malignant tumours combined (2.0, 93 and 37 respectively).“

The following reference has been added;


2. The paper reported 95% CI of cancer incidence, but they did not report how they calculated the Confidence interval. Please explain this in the statistical analysis section.

RESPONSE: 95% CI was calculated via Poisson Regression. This has been added to the statistical analyses section on page 8, line 7-8 “Poisson regression was used to estimate model adjusted Incidence Rate Ratios (IRR) and their 95% confidence intervals (CIs).” and line 12-13 “…and 95% CIs reported after Poisson regression analysis.”

3. The study found LGAs scored as less accessible and more remote were associated with higher cancer incidence. They stated that these results correlate with the current available literature but no references were shown. Could the authors make further potential explanations on this finding? Why people in those areas had higher cancer incidence?

RESPONSE: Please see track changes on page 11 line 14-24, with appropriate references included. “These results correlate with the current available literature for Australian populations, which demonstrate disparities in cancer incidence between rural and metropolitan regions [[5, 6, 9, 24]]. Whilst disparities in incidence between metropolitan and more remote and rural areas exist, the driving forces underpinning this association are complex. Rural areas have higher levels of disadvantaged communities, are older, poorer and likely to have less access to screening and treatment services which can impact willingness and access to care [25, 26]. Rural communities may include agricultural workers which have been shown to have increased rates of some cancers [27]. Furthermore, socioeconomic disadvantage has been associated with lifestyle factors known to directly contribute to cancer risk, such as increased levels of smoking[28], alcohol consumption, physical inactivity and poor diet [29-31]. Thus, it is likely that the observable disparity between urban/metro areas and more rural and remote areas is due to many contributing factors.