Author's response to reviews

Title: Temporal changes in geographical disparities in alcohol-attributed disease mortality before and after implementation of the alcohol tax policy in Taiwan

Authors:

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Author's response to reviews: see over
Dear Editor-in-Chief of BMC Public Health

Thank you for your encouraging response to our work. We followed the reviewer’s and editor’s suggestions. We are also grateful to the reviewer and editors for providing such constructive comments that help us improve our paper. We have revised our manuscript accordingly, with the alterations highlighted in red color. Thank you again for your kind consideration and we look forward to hearing from you soon. If you have any question, please feel free to contact me at wenthung@ntu.edu.tw

Sincerely yours,

Tzai-Hung Wen, Ph.D.
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Reviewer’s Comments:

1. The purpose of this paper is well defined though very limited. However, in the background the authors anticipate changes in “mortality rate to vary with geographical area depending on specific life styles or social circumstances.” (emphasis is mine). Instead of modeling changes in ADM before and after the tax increase in terms of socio-demographic characteristics, they seem to have aggregated the data to township and then done descriptive thematic mapping of the outcome measure.

Answer:

Thank you for your observations. In this paper, we attempt to identify geographical differences in ADM before and after the implementation of the new alcohol tax policy. We agree that changes in lifestyle or social circumstances are potential confounding factors. In the revised manuscript, we added one figure (Figure 1) to report changes in population density from 1997–2006. We found that there was no significant difference in population density between the two periods. We also followed your suggestions and changed the title to “Temporal changes in geographical disparities in alcohol-attributed disease mortality before and after implementation of the alcohol tax policy in Taiwan.” The title now clarifies our research purpose.

2. The description of methods is NOT adequate.

(a). They give no descriptives for the 359 townships other than the average population – not even a range or standard deviation so unless one is familiar with Taiwan (I am not), it is difficult to know what they were working with. Stating that “Appropriate geographic variations (sic) in population densities and socioeconomic conditions in Taiwan can be captured at this spatial scale.” is not adequate for a scientific paper. They should provide a table of basic demographics describing the townships.
We followed the given suggestion. In the revised manuscript, we added one table and described additional township-level statistics on socioeconomic conditions in Taiwan. In this study, “township” is an appropriate unit because it is the basic unit of master plans in Taiwan, including healthcare resource plans, medical emergency zoning plans, and central governmental budget allocation projects. In addition, townships can reflect differences in urbanization levels and social-demographic conditions across Taiwan. As shown in Table 1 in the revised manuscript, townships of different urbanization levels in Taiwan measure 8–120 square kilometers and support 3,700–60,000 households (population density of 0.1–20 thousand people per square kilometer).

(b). If they geocoded the death records, what was the geocoding rate? Was geocoding in mountainous regions as accurate as in urban areas? Were ungeocoded records lost to the analysis or was geocoding done to the township and not to the point location?

Answer:
Thank you for your insightful questions. We utilized individual-level mortality data and geocoded the residence of each case based on the name/code of township appearing on the TDR. In addition, we obtained township-level information pertinent to each case. However, to protect the privacy of people involved, we did not have specific addresses. We presented additional descriptions in the revised manuscript.

(c). Table I gives the tax before and after, but what is the real cost before (e.g., imported alcohol would include the tariff as part of the cost but we would need to know what portion of consumed alcoholic beverages were imported and subject to the tariff).

Answer:
There has been very little or no change in tax rates for imported alcoholic beverages before and after the new alcohol tax policy in 2002. Nonetheless, due to its low cost and given certain cultural traditions, the domestic rice spirit produced by TTWMB has always been the most popular alcoholic beverage in Taiwan (approximately 200 million bottles sold per year). Hence, US industries and the US government requested that Taiwan increase the tax on domestic rice spirits and reduce tariffs on imported spirits. To comply with its World Trade Organization (WTO)
commitments, the TTWMB agreed to impose an excise tax (in place of the previous tax on imports administered by the former monopoly authority) and eliminate tariffs on most imported spirits. As a condition to Taiwan’s WTO accession, a new domestic alcohol management and tax system went into effect on January 1, 2002. Subsequently, the volume of rice spirits sold was reduced to 10 million bottles per year. We included additional descriptions in the revised manuscript.

(d). How rapidly is population growing in Taiwan? Is it appropriate to use only data from 2002 for both the before tax change and after tax change datasets or will that artificially reduce the pre-tax change DSR (through an overestimated denominator) and overestimate the post tax change DSR due to low population estimates?

Answer:
Thank you for your helpful questions. We added one figure (Figure 1) and presented changes in demographic conditions from 1997 to 2006 in Taiwan. The average population densities in 1997–2002 and 2003–2006 were 611.8 and 628.1 people per square kilometer, respectively. There is no statistically significant difference in population density between these two periods ($p=0.23$), suggesting no significant demographic transition between these periods.

(e). The spatial analysis is based on an unidentified distance (d). Is it possible this is an adjacency (since it seems to be 1 or 0 and the size of townships appears to vary greatly).

Answer:
Thank you for your suggestions. We tried other definitions of adjacency, including ROOK contiguity and inverse distance weighted, and found similar results. In the revised manuscript, we included additional discussion on the definition of spatial adjacency.

(f). It appears they used the High/Low clustering (Getis-Ord General G) tool in Spatial Statistics toolbox of ArcGIS but if so they should have had z-score and $p$-values so it is unclear what the “Monte Carlo significance test” was about. And they don’t describe what or how they did their MC testing. Are “administrative tracts” smaller than townships? Could this mean they were doing a within township analysis?
We followed the suggestions provided. First, we revised our description of the Getis-Ord G* statistic and changed the map legend in Figure 3 to indicate z-scores. The statistically significant hot (cold) spots can be identified when the z-score is larger than 1.96 (less than -1.96) at a significance level of 0.05. Second, the term “administrative tracts” was changed to “townships” for consistency. We made pertinent revisions in the manuscript.

3. Are the data sound? Probably. Further, it appears they have point located data which is rarely obtainable and very valuable in geospatial analysis. I hope the authors will further analyze this data to determine how much of the change is due to socio-demographics and whether any is due to the actual geographic location.

Answer:
Thank you for your suggestion. As earlier explained in our response to Q2-(b), we obtained township-level information relevant to each case. However, to protect the privacy of people involved, we did not have specific addresses. The point event-based approach cannot be used in this study. We included additional discussion in the revised manuscript.

4. Yes, they explain the data source

5. The discussion and conclusion are adequately supported by the data but they did not do more than a descriptive analysis and did not adequately describe what they did do (see Q2 above).

Answer:
We followed the above suggestions. In our revised manuscript, we included additional descriptions and one table (Table 1) showing a summary statistics of township-level demographic and social variables.

6. Yes, they discussed limitations, but I see the admission that townships are not appropriate for defining communities or cultural boundaries as very problematic, as is the admission that township as the unit of analysis is not appropriate for detection of community level differences. If they have point located data why was it not aggregated to the village level and perhaps do a Bayesian Poisson analysis?
Answer:
Thanks for your suggestions, and we agree with your points. We presented additional discussion on issues of boundaries and spatial adjacency. Moreover, we obtained township information relevant to each case. However, for privacy protection, we did not have detailed addresses. The point event-based approach cannot be used in this study.

7. Yes, they provide an adequate background though
(a). I find it humorous that they would say “there have been no studies assessing the effects of alcohol taxes in national-scale geographic and demographic settings.” When Taiwan is only 13,951 sq miles and is not a country any more (it is technically part of China), and they seem only to have used population based death rates not “demographic settings.” Many of their cited U.S. studies are state or multi-state level population based analyses where the states are large than Taiwan. If they had addressed demographic or socio-economic differences within the country this comment might have been reasonable.

Answer:
Thanks for your suggestion. We revised the noted description to read: “However, there have been no studies comparing temporal changes in geographical disparities in ADM.”

(b). Some of their references are not restricted to chronic Alcohol Disease mortality. For example in both the Finnish and US studies, alcohol related traffic deaths and alcohol toxicity account for a significant portion of the 6 alcohol related deaths.

Answer:
Thank you for your suggestions. Although some of our references in the discussion section are not restricted to chronic alcohol disease mortality, the outcome measures of these references were defined either using acute (e.g., traffic, toxicity, etc.) and chronic (e.g., liver disease) alcohol-related mortality or using information on the underlying and contributory causes of death that include acute and chronic mortality. To clarify our statement, we presented additional descriptions in the revised manuscript.
8. The title adequately reflects the content though it is a bit misleading and is clarified by the abstract. For example if they were indeed analyzing Tax Policy, they would need to compare the impact of changes in import tariffs to changes in alcohol beverage taxes. Instead they compare a “before” based on tariffs with an “after” based on beverage tax.

Answer:
Thanks for your suggestion. To clarify the research purpose, we changed the title to “Temporal changes in geographical disparities in alcohol-attributed disease mortality before and after implementation of the alcohol tax policy in Taiwan.”

9. The writing is acceptable but there are a few places where English is clearly not their first language. Presumably the editors will fix those.

Answer:
Thanks for your suggestion. The manuscript has now been edited by a native English-speaking editor.
Editorial Office’s Comments

Please make the following formatting changes during revision of your manuscript.

1. Please remove the authors' qualifications (e.g. PhD / MD) or job titles from the submission system.

2. Competing interests: Manuscripts should include a "Competing interests" section.

3. Acknowledgment: We strongly encourage you to include an Acknowledgments section between the Authors' contributions section and Reference list.

4. Figure titles: All figures must have a figure title listed after the references in the manuscript file.

5. Figure cropping

Answer:
Thanks for your suggestions. We followed the recommended formatting changes in the revised manuscript.