Author's response to reviews

Title: Using Spatial Analysis to Demonstrate the Heterogeneity of the Cardiovascular Drug-Prescribing Pattern in Taiwan

Authors:

Yea-Huei Yang-Kao (yhkao@mail.ncku.edu.tw)
Ching-Lan Cheng (lan6689@gmail.com)
Yi-Chi Chen (vichi@ncku.edu.tw)
Tzu-Ming Liu (liutm@mail.knu.edu.tw)

Version: 2 Date: 21 March 2011

Author's response to reviews: see over
21 March, 2011

Dear Editor,

Thank you for your consideration of publishing our paper. We also thank the reviewers for comments and questions about our study. Please find the response to reviewers in the next page. The areas highlighted in yellow are revise. Further comments or questions about this paper can be directed to me. Please feel free to contact me if there is any question. Your consideration and comments are deeply appreciated.

Sincerely,

Yea-Huei Kao Yang, BS Pharm.
Professor
Institute of Clinical Pharmacy
National Cheng Kung University
Tainan, 701
Taiwan
Tel. +886-6-2353535 ext. 5688
Fax. +886-6-2373149
Response to reviewer

Reviewer1: Frank Courteney Tanser

Major Compulsory Revisions

1. The authors' jump to the spatial analysis of Moran's I coefficient without summarizing the raw "defined daily dose" (DDD) data using basic descriptive statistics. It is therefore difficult for the reader to work out what defines "low" or "high" for this particular dataset. For example, a simple analysis (comprising a table and associated map) is required to show DDD across the country and a mean (SD) summary of DD by the North/South division (which the authors devote considerable attention to in the paper) with 95% CI.
Answer: We present descriptive statistics for drug consumption in Table 1 and conducted bivariate analysis of the Student's t test to compare the north/south division. In addition, we describe the detail in the statistical method (page 7) and the result sections (page 9).

2. The limitations of the use of Moran's I should be clearly outlined in the discussion and the authors' need to describe why they chose this LISA method and not another.
Answer: We add the description of the limitation of the Moran's I in the statistical analysis part and explain why we chose the LISA method in the discussion section (page 14). We add one reference to support our explanation. (reference 48)

3. Figure 2-6 should be included as a single multi-part figure so that the reader can directly compare the different map outputs. Following on from this, more discussion needs to be devoted to the similarities and differences in the prescribing patterns of the different classes of drugs.
Answer: We include a single multi-part figure to show the spatial autocorrelation of five-class drug in Figure 2. In addition, we discuss the prescribing pattern of the different classes of drugs in the discussion section (page 12) and the limitation part (page 16). We add a reference to support our viewpoint. (Ref 43)

4. The authors state that the displayed "hot spots" and "cold spots" on the map were "statistically significant" (page 9). However, the authors do not explain how such statistical significance was ascertained. The inclusion of p-values would be
Answer: We use 0.01 as the cutoff point for the level of significance and describe this in the statistical section (page 8).

**Minor Essential Revisions**

1. Page 13, last sentence - "lurking beneath" sounds a bit ominous. Perhaps "driving" would be better here.
   Answer: we revised “lurking beneath” to “driving” (page 16)

2. Page 9, para 1, last sentence - should be "meanings"
   Answer: we corrected “meaning” to “meanings” (page 10)

3. Page 9, para 3, first sentence - "summarized" should be "summarizes"
   Answer: we corrected “summarized” to “summarizes” (page 11)

**Minor Compulsory Revisions**

1) It would be nice to indicate what is the DDD in quantitative terms.
   Answer: We add an example in the method part to explain the DDD in quantitative term. (Page 6)

2) Can author provide references to section of Geographic distribution (page 6)?
   Answer: The reference of our geographic map and distribution is from geospatial information science of Academia Sinica, Taiwan. We add the official website as reference 28 (page 6).

3) Page 9: Authors says that:Such spatial variations carried three statistical meaning: (1) variations were non-random; (2) variations were statistically significant and (3) variations exhibited effects of neighboring interactions. I wish they could have explained it in more detail.
   Answer: We explain the statistical meaning of the LISA method and include it in the discussion section. (page 14)

4) Figure 5 and 6: I am surprised to see that there are High-High hotspot in Aboriginal Area. Which has not been explained in the discussion section. Some remarks on these interesting results are necessary/ 
   Answer: The medical resources and physician behavior might affect the utilization of
cardiovascular medication in the aboriginal area, because we found there are three counties that have High-High association in the aboriginal area and they overutilize Group B, C, D, or O medication but not Group A. (Page 13)

5) Conclusion section. Author says that priority setting in research heavily depends on the neighborhood association. I do agree with them but how the priorities were set is very subjective. Can the author explain this in the methodology section?
Answer: We provide an explanation on this point in the statistical part of methodology section. (page 9)

Minor Essential Revisions
1) Page 3 “GISs” should be replaced by “GIS”.
Answer: We corrected “GISs” to “GIS” (Page 3)

2) Figure 1: Specify source of this map. Mention the scale to provide the idea of size.
Answer: Our geographic map is from geospatial information science of Academia Sinica, Taiwan. We add the official website as reference 28. The scale bar is included in Figure 1.

3) Page 8, Line 7: (2) When both xi and “it” neighbors …..“it” should be changed to “its”
Answer: We corrected “it” to “its” (Page 8)

Discretionary Revisions
1) Authors says that “We hypothesized there would be significant geographic differences in prescribing cardiovascular medications among townships”. I think it is very natural as evident by many studies. It would have been more interesting to link it by other factors such as social, commercial (income level) and gender etc. I am suggesting to include these factors in this paper but it is a suggestion for future works.
Answer: We add this suggestion in limitation section. (page 16)

2) Authors have taken only one-year data i.e. year 2004. Which certainly cannot represent clear picture in statistical estimates. I suggest to use include more data from 5 years or so. I am sure data is available.
Answer: We add this suggestion in limitation section. (page 16)