

Review of “Comparing the Effectiveness of the Choropleth Map with a Hexagon Tile Map for Communicating Cancer Statistics”

Overall Comments:

This paper performs a user study to compare and contrast the ability of two visual displays, a choropleth map and a hexagon tile map. It uses a line up protocol to test the effectiveness of the two displays. The study showed that the hexagon tile map was significantly more effective than the choropleth map with the authors advocating for its use in the cancer atlas.

The authors do a nice job introducing each map, the benefits of both and outlined how each would be applied to communicate cancer statistics as part of the Cancer Atlas. I think that Section 3 could be tightened up in places, especially with regards to generating the lineups and the section that outlines the analysis (see below for specifics).

Overall, I see this as an important contribution not only to the visualisation community but also to the statistics community who often leave the communication of statistics and modelled outputs as an afterthought. I therefore recommend this paper be published after the authors consider my comments and revisions below, largely relating to Section 3. I also believe the Cancer Atlas could benefit from such a visualisation and would encourage the authors to work with the authors of the Atlas to have this considered. As the acknowledgements suggest the Cancer Atlas team were involved in discussions, I suspect this would be an easy ask.

Specific Comments:

P7,L7 While the introduction focuses specifically on the maps communicating disease statistics, it would be good in the conclusion to extrapolate beyond that to gain a broader interest.

P8, L31-32. I would consider adding to the last sentence to write the following: “The results are summarized in Section 4, followed by a discussion about the broader implications for the use of this map style.

P9, L52. I’m on sure if the text in italics appears in the literature or if this is the author’s view. If the author’s view then I would replace “doesn’t” with “does not”. If it appears in the literature, please reference.

P9, L55. I would suggest replacing “better” with “adequately”.

P9, L77-78. Consider the following: “Figure 1 shows the hexagon tile map, where the map is coloured from ...

P10, L97. Omit the words “To do”.

P13, L167-170. Are you able to outline the smoothing procedure. This seems a little vague.

P14, L178-183. The process here seems a little subjective. Can you provide some reasoning as to why these decisions were made?

P14, L191-192. Why were the locations 1, 7, 10 and 11 not used?

P14, L193-195. This sentence does not make sense. Please revise.

P15, L226. Replace “will be” with “were”.

P15, L234. $y_{ij} = 0,1$ represents whether the subject detected the data plot (1) or did not (0). Please fix.

P15, L239-240. This could be written better. Should read a “logit” link. I would consider writing the model as follows:

$y_{ij} \sim \text{Bernoulli}(p_{ij})$, where

$\text{logit}(p_{ij}) = \mu + \tau_i + \delta_j + (\tau\delta)_{ij} \quad i=1,2. \quad J=1,2,3.$

Then discuss the random effects.

P16, L247. What is a “Figure Eight contributor ID”?

P11, Section 3.7. Could this information be captured more succinctly in a table perhaps? Line 290-293 just lists words. There are no questions relating to these 3 dotpoints. I’m also wondering why participants do not submit their responses as they go? Do they also have a chance to go back and change a response? It is difficult to determine what this process is.

P18, L297-301. The math does not seem to work unless I’m missing something. Responses were collected from 92 participants. Five were removed which leaves 87 for evaluation. However you go on to say that Set A were evaluated by 42 participants and set B, 53 which adds up to 95 participants. Then you go on to say this resulted in 1104 evaluations. Could you please revise and provide a more detailed outline of the evaluations you performed?

P22 Discussion through to Conclusions. As highlighted earlier, it would be good to extrapolate the results to other modelled outputs beyond cancer statistics to obtain broader coverage. There is considerable value in using a hexagon tile map for showing statistics and modelled output in statistical area levels across Australia or similar.