AE review of JDSSV ms 64: Visual Narratives of the Covid-19 pandemic

Overall evaluation

This paper provides an interesting overview of graphics used to portray data on the COVID-19 pandemic, largely from popular media. It attempts to use ideas and principles of graphics design and human factors studies of graphical perception to evaluate the effectiveness of these displays for the public and policy makers.

All in all, I think it largely succeeds in these aims and would be a suitable and interesting article for JDSSV readers. However, the two reviewers make substantial suggestions and comments which need to be considered before it is ready for publication. I recommend acceptance, following suitable revision (together with a reply from the authors to these reviews).

Reviews

Reviewer 1 makes many detailed editorial suggestions, designed I think, to improve the narrative and avoid some potential problems or objections. I suggest that the authors read these carefully and which and how to take these into account. Many of these are stylistic, but a few are more substantive.

Reviewer 2 has three categories of comments:

Sample illustrations: The reviewer states that "the selection seems arbitrary and very limited" and could usefully be greatly expanded to give a "global overview". I don't believe this is necessary. Indeed, I feel the authors have chosen a reasonably representative collection of types of maps, charts and graphs to highlight the substantive issues they discuss. However, to avoid a charge of "cherry-picking" I suggest the authors state explicitly their consideration of the scope and sampling frame that guided their selection.

Principles: The reviewer suggests that the data-ink ratio is not needed, indeed misleading as a principle for evaluating these graphs, and I concur. This is nowhere used in the critique and can be simply omitted. The other principle, "ensuring clear understanding" is indeed the crucial one, and, as the reviewer suggests could be usefully expanded.

To the reviewer's comment, I add that there needs to some clear statement regarding the match between the design of a graphic and the capabilities of the intended audience in determining whether a graphic display is successful for its intended purpose. This is more important than simple design rules.

Graphics commentary: I agree with the reviewer that there is room for a somewhat more extensive critical commentary on the features of some of the illustrations that make them work or not (but not to the extent of doubling the length!).

Other comments

Choropleth / proportional symbol maps (Fig 1, 2): I was very surprised to see no mention or illustration of anamorphic maps or cartograms, where the area of each geographical unit is transformed to represent the count (cases/deaths). For one example, see: https://www.tandfonline.com/doi/full/10.1080/10106049.2020.1844310 I strongly suggest including something on this.

P 3: **Color-scheme obstructions**—color scheme is mentioned only in regard to Fig 6 (p. 7), but there are other examples where the color scheme used could be noted, either positively or negatively (Fig 8, 12).

Uncertainty: In the list of aspects mentioned in the middle of P 2, I am struck by the absence of mention of uncertainty in visual representations of COVID. Clearly, the data are complex as they are, but understanding their uncertainty is also a topic that could be mentioned or discussed.

In Section 3, *The temporal narrative*, there could usefully be some discussion, and perhaps an illustration of the use of dynamic charts like the **moving bubble chart**, to liberate the X axis from time, using animation or an interactive slider.

More prominence could be given to the thoughtful **standardization** that went into some of these displays to provide comparability of representation across global and local geographies and over multiple waves of the pandemic. For example, in the early days cases and deaths were tied to calendar dates giving time series charts with different origins. The simple device (I believe from Burn-Murdoch of the FT) of making these all start when N cases had been observed was a game changer. There are probably other examples.

More generally, God is in the details in graphic design, and there may be some other examples of data standardization and display that deserve mention in commentary on the illustrations.

I appreciate the few examples of "reenvisioned" displays of a given set of data using R (Fig 9, 14, 16, 18). The supplementary R script may be useful to readers.