# Geographical Analysis - Decision on Manuscript ID GEAN-06-21-053 [email ref: DL-SW-3-a]

**Rachel Franklin** <onbehalfof@manuscriptcentral.com> Mon, Sep 13, 2021 at 12:55 PM
Reply-To: "geographical.analysis@newcastle.ac.uk" <geographical.analysis@newcastle.ac.uk>
To: "Paez, Antonio" <paezha@mcmaster.ca>

13-Sep-2021

Dear Prof. Paez:

Manuscript ID GEAN-06-21-053 entitled "Reproducibility of research during COVID-19: examining the case of population density and the basic reproductive rate from the perspective of spatial analysis" which you submitted to Geographical Analysis, has been reviewed. The comments of the reviewers are included at the bottom of this letter.

It's taken me a while to issue a decision on this manuscript, for which I apologise—I needed to digest the 2nd reviewer's comments, especially with regards to critiquing work published elsewhere (and by a graduate student). I remain supportive of your manuscript, but would like to ask you to consider how you might revise your manuscript to perhaps be more supportive—particularly since the author of the original paper won't be able to respond directly to your own critique. I hope that makes sense to you—I think we agree that we would prefer to be constructive and build dialogues, where possible!

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Once again, thank you for submitting your manuscript to Geographical Analysis and I look forward to receiving your revision.

Sincerely,
Prof. Rachel Franklin
Editor, Geographical Analysis
geographical.analysis@newcastle.ac.uk

Reviewers' Comments to Author:

Reviewer: 1

Comments to the Author
The study aims to demonstrate the value of reproducible research, which involves making code and data publicly available. A strength of the manuscript is the expansion of relevant concerns with the SWN model, from the perspective of spatial analysis, and extensive and detailed justification for every model specification choice in the reanalysis. The inclusion of a RMarkdown file also guides the reader in understanding the models used in the reanalysis.

I have no major comments that can improve the study, as I believe the study is analytically sound and well-written. The only minor comment I have is the length of the background of the association of density and R0, which could be condensed further. Overall, the study is a good example of a manuscript that demonstrates the value of reproducible research, and would be an outstanding contribution to the scientific literature.

Reviewer: 2

Comments to the Author
The stated goal of this article is to promote reproducible research. This is done by reviewing another paper (SWN) that followed the standards advocated by this paper.

My summary of the paper: 1) It is partly a new "COVID-19 paper" because it provides a new way to understand the population density hypothesis. 2) It is partly a "response paper" because it provides in-depth criticism of a recent paper. 3) It is partly an "advocacy paper" because it is clearly promoting open science. I will address these in order.

1) The new models shown look sound and are an improvement over other models in this field. The density hypothesis is often discussed, so it is important to continuously improve our understanding of it.

2) Since this will not be published in PLOS, the original authors will not have the opportunity to respond. It does not feel fair. The authors of the GA paper might argue, “this is not a response paper.” SWN seems to be a strange choice for a larger example. The first author is a graduate student. No one should be immune from scientific criticism (the selection bias criticism is valid), but choosing a generally good graduate-led paper (if I correctly understand the GA authors) feels wrong. If the GA authors chose the papers led by well-established authors such as Paez or Wong, I would not feel so queasy.

3) A well-documented paper containing data and code is easier to replicate and improve than a paper without these items. This seems obvious. The paper possibly indicates to journal editors that response papers are more likely to be submitted under open science. It possibly forms a cautionary tale that authors need to be extra diligent if they make their work easily replicable. However, using a case study method, as the GA paper does, seems to hurt the original paper/authors more than promote open science.

I want to think the GA paper comes from a place that respects the SWN paper, but the implementation of the GA paper does not give that impression. However, I do like the improved COVID-19 density model.

Other suggestions

Schweinsberg et al. (2021) supports the view that different researchers reach different conclusions (https://doi.org/10.1016/j.obhdp.2021.02.003).

Pages 4,5. I think the authors have swapped the meanings of "large" and "small" scales.

The authors did not mention the time period studied.

I assume that the data for the GA paper comes from the Johns Hopkins database. This data is sometimes revised, so this

particular data set is an example of citations being insufficient to achieve exact replicability.

MAUP is a big problem for counties in the United States, but it is especially important for population density across all counties. Some large counties have large population and large open space, while some small counties are completely urban or completely rural. Another full critique of SWN can be written for these reasons.

Please define the basic reproductive number for non-epidemiologist readers earlier in the paper.

The first part of the discussion section contains additional results. The discussion seems to start on page 18, line 41.

These opinions on the SWN paper and its authors seem unnecessary.
Page 7, line 30. "reasonable modeling choice"
Page 7, line 40. "sensible controls"
Page 8, lines 34,35. "whether a graduate student or a seasoned scientist"
Page 18, lines 46-47. "required different technical skills than those available to SWN"

Page 8, line 19. It seems that the authors call themselves "expert"s. This seems unnecessary.

Page 9, lines 49-52. There are many reasons to delete this footnote.

Citation typos: page 6, line 44; page 6, line 51; page 7, line 9; page 7, line 20; page 8, line 51

Typos
Page 9, line 20. "RWN" should be "SWN"
Page 11, line 21. "fourth" should be "fifth"

Mapping
Figure 1: A narrower border on counties would better highlight the fill color.
Figure 2: Rainbow colors are difficult to interpret. A divergent color band would be better.
Figure 3: A single color could display counties with data. This will link the map to the binary variable in the model.