

Peer Review Report

Review Report on How vaccination rumours spread online: Tracing the dissemination of information regarding adverse events of COVID-19 vaccines

Original Article, Int J Public Health

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EVALUATION

Q 1 Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

Thanks for the interesting paper. This review might be a bit long, the reason is: I really like the concept the authors came up with, and I'd like to see it consolidated and happily published. However the study design might benefit from some modifications and amendments. The same is true for the results. Here are my considerations.

- METHODS (major comments) -

1. As the Authors pointed out in the 'Limitations' paragraph, Google Trends is far from perfect - and far from transparent. One (indeed minor) issue is language; a second one is the choice to use topics instead of keywords. Topics are de facto black boxes, and as far as I know there is no way to know what keywords are subsumed in a given topic. This is a fundamental flaw. The second issue connected with google trends data is that Google trends outputs 'relative interest', not 'number of queries', so a normalized value representing how prominent a query was - compared to the rest. Also, how this metric is defined is not really transparent, and this should be addressed as well, or at least explained and detailed in the 'Limitations' paragraph. All these issues are already known in literature. My suggestion to the Authors is to familiarize with the work of Mavragani and Ochoa (<https://publichealth.jmir.org/2019/2/e13439/> , <https://www.jmir.org/2018/11/e270/>) - it will come handy both to structure the data collection and for the reporting of the data. I recommend recollecting the data, working with keywords instead then with topics, and generally following the framework developed with Mavragani and colleagues (disclaimer: I have no connections with them, it's just the best framework I know of for working with Google Trends data). This approach could also enable consistency between queries performed on different datasets (i.e: google trends keywords could be used in CrowdTangle and Factiva).

2. AFAIK very few research has used CrowdTangle to date. Personally I never played with it (but I intend to give it a go, it looks interesting). Regarding this section of the methods, I have a couple of remarks. Although generally speaking Facebook is the social media with the most users, the claim 'it is the most widely used social media platform and the most commonly used for news sharing' might not be true, or at least needs some context. It is known and documented that demographics such as age, residency, educational level, and contextual variables like digital geofencing can deeply influence the public of a platform. E.g. Facebook is surely not so widespread in Russia or in China. This would contextualize better the 'interactions' reported in the 'Results' section. Also the second part of that claim, 'and the most commonly used for news sharing' would need some backing reference. The Authors should also take into account the recommendations of CrowdTangle about working with CrowdTangle data: <https://help.crowdtangle.com/en/articles/3192685-citing-crowdtangle-data>. Finally, access limited to public facing data is an important limitation, structural of the tool, that needs to be addressed in more depth, considering also its implications (i.e: this analysis is limited to the 'surface' of the spreading of these stories, and does not consider its submerged component - which could be bigger, or smaller, we just do not know).

3. Factiva: I do not really understand how the Factiva analysis connects with Google trends / CrowdTangle. I.e: if I understood correctly, CrowdTangle data already contain not only the interactions but also the link shared. If this is true, there is no need to explore Factiva in order to assess the origin of the story. What Factiva can contribute, however, is the amount of articles related to the story itself. This is reported sparsely and a bit implicitly in the 'Discussion' section. If that is the value that the Factiva corpus adds, I'd like to see it more explicitly and less sparsely. Another approach could be comparing the frequency of lemmas appearing in grey literature retrieved from Factiva and Facebook comments on the same story - to assess which keywords are picked up. Some software for this kind of tasks already exists, see <https://zenodo.org/record/4792669#.Ya9oX9DMIdU> (sw) and <https://zenodo.org/record/4792778#.Ya9oyNDMIdU> (output). This could complement and strengthen the narrative analysis in a strong mixed-methods direction.

- RESULTS (major comments) -

1. While I like the 'topical' organization, I think that the discussion could be a bit more systematic. E.g: introduce the topic from the quantitative lens (maybe taking appropriate care of the lexicon - 'bump', 'spike' and 'jump' are a bit too vague). Also the data visualization can be vastly improved - downloading the data (at least for Google Trends this is possible) and preparing a proper plot, rather than attaching a screenshot.

- DISCUSSION (major comments) -

1. Here I would generally like to see more engagement with existing literature on the topic - it is true that the results are novel, but claims like 'traditional media play an integral role in the transmission of information [...]' could and should be contextualized and eventually backed referencing existing literature.

2. I disagree with the claim that 'these media generally do a good job of fact checking and preventing the spread of fake news'. As also the Authors noted, it happened more than once that selected fragments from articles or videos were used to back stories reporting fake news. One concrete example (p.7) regards the sarcastic recontextualization of headlines regarding Hank Aaron; another the nurse's fainting on WRCB - I quote the Authors: 'traditional media reports included the nurse's own disclosure that she had a history of fainting [...]. However, many social media posts either failed to mention this or derided her disclosure as a cover up'.

3. While it is true that 'professional journalists and news publications play a role in fact checking', I am not sure this can limit the spread of fake news, as argued using the Authors' data. Furthermore, the definition of 'professional journalism is vague - as testified by the Daily Mail examples reported at p. 9 lines 226 - 229.

- LIMITATIONS (major comments) -

1. I already pointed out some issues regarding the limitations before. A final word on this: a correlation is not something you 'feel'. A correlation is measurable and expressible with a correlation coefficient, such as Pearson's R.

- CONCLUSIONS (major comments) -

1. 'Markers of source credibility on social media' are a very very painful nut to crack. Even though it is beyond the scope of this paper, how do the findings of the Authors connect to this concept? This could be explored further.

2. 'and engage the vaccination social science community to examine their veracity before publishing a story - p. 11 lines 275 - 276. Why the 'vaccination social science community' should guarantee the veracity of a story? Why this specific community? This looks a bit self-referential IHMO.

I am aware of the fact that this review is unusually long and potentially very burdensome to implement. I hope the Authors will still appreciate the time I dedicated them and will opt for revising their paper. But again, the concept is very interesting and it would be a pity to just dismiss it as 'not mature enough for publication'.

Q 2 Please summarize the main findings of the study.

In order to assess the impact of media narratives on vaccine hesitancy, the Authors employ a mixed methods approach to map the content and dissemination of rumours regarding COVID-19 vaccines.

The approach detailed in this study consists in:

1. Identifying queries concerning adverse effects correlated with queries on COVID-19 vaccines via Google Trends;
2. Exploring the prevalence of the terms contained the queries in Facebook's public content;
3. Exploring grey literature concerning these topics, published in the same time intervals, via Factiva.

Although the concept of this study is really interesting and of great value, the methods suffer from some significant flaws that once addressed could greatly improve the value of this article - both in terms of content and of methodology.

Q 3 Please highlight the limitations and strengths.

detailed in q1.

PLEASE COMMENT

Q 4 Is the title appropriate, concise, attractive?

One important limitation of the study is the target language - I believe this should be reflected in the title, as this can create a mismatch between the content and the readers' expectations.

Q 5 Are the keywords appropriate?

ad IJPH is indexed in Medline, the Authors could consider including relevant keywords from the MeSH tree - e.g: 'infodemic', 'communications media', ...

Q 6 Is the English language of sufficient quality?

as a non-native speaker, I find it acceptable.

Q 7 Is the quality of the figures and tables satisfactory?

No.

Q 8 Does the reference list cover the relevant literature adequately and in an unbiased manner?)

some integrations suggested in q1

QUALITY ASSESSMENT

Q 9 Originality



Q 10 Rigor



Q 11 Significance to the field



Q 12 Interest to a general audience



Q 13 Quality of the writing



Q 14 Overall scientific quality of the study



REVISION LEVEL

Q 15 Please take a decision based on your comments:

Major revisions.
