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## Misinformation in COVID-19 Media and Literature, with an Emphasis on Open Data Policies

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### Abstract

Misinformation in the COVID-19 era may stem from social media, preprints, elite peer-reviewed journals, or predatory journals. In part, this has been caused by an infodemic of information. One extreme case was the retraction of a pseudo-scientific paper on 5G claiming that 5G induces COVID-19 in skin cells, published in a PubMed-indexed journal, *Journal of Biological Regulators & Homeostatic Agents*. In the COVID-19 era, social media has also catalyzed the spread of misinformation and false conspiracy theories about non-existent or unproven risks. COVID-19-related misinformation might also arise from poorly vetted literature, one reason being the continued failure of implementing an open data (OD) policy. This is a core reason for two high-profile retractions of COVID-19-related literature in leading medical journals, *The Lancet* and *New England Journal of Medicine*. Despite those retractions, those journals still do not mandate an OD policy, which, unlike an optional one, could instill greater rigor through heightened scrutiny of data sets, and thus fortified scientific integrity and public trust. If data is erroneous, it can negatively impact health policies. Thus, journals publishing original research on COVID-19 need to rethink their OD policies, and critically assess whether they are contributing to the medical misinformation stream, or not, and what this might imply to their reputation.

**Keywords:** COPE, health, infodemic, mandatory versus optional open data policies, open science, predatory publishing, PubMed, reproducibility, social media, transparency, trust.

### The COVID-19-infodemic within the wider context of fake news

Perhaps as never before, besides war-like crises or financial collapses, has society anywhere on this planet witnessed such an infusion of information about a single issue as is currently being experienced with the COVID-19 pandemic. Galvanized by common health and existential threat, populations are also being exposed to an extraordinary volume of information, an infodemic (Mheidly, Fares, 2020), that may leave them overwhelmed, and confused, especially if there are contradictory reports regarding, for example, the efficacy of a drug, a repurposed drug, a treatment, or more recently, vaccines (Cornwall, 2020). Misinformation may arise as a result of downstream source recontextualization, i.e., a modified interpretation akin to “spin” (Turrentine, 2017) that incorrectly portrays information in the original source, in part motivated by “altruism” or the desire to seek and share potentially useful information with others, seeking status,

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strengthening social ties (Apuke, Omar, 2020), or at another extreme, purposeful or deliberate transmission of false information (Pulido et al., 2020).

The fact that academia is already embedded in an era of fake (Teixeira da Silva, 2017), compounded by the current stream of fake health news and misinformation fueled by social media and academic and non-academic sources, including the mixture of both powerful and popular search engines like Google. This current stream adds additional pressure to academics, their institutions, health policymakers, and governments, who need to be increasingly perceptive, astute, and observant so as not to use or cite erroneous information, and journal editors, publishers and information platforms like PubMed or Publons, or indexing agencies or databases like Scopus or Web of Science, who need to be extra vigilant of attempts to use their platforms as vehicles for the propagation of fake news and misinformation, including conspiracy theories and pseudoscientific therapies (Naeem et al., 2020).

In this short *exposé*, select examples are highlighted that demonstrate the risks that exist at the information interfaces between academics, editors, journals and preprints, databases, funding agencies, policy proponents, health officials, and/or the general public.

### **COVID-19-inducing 5G paper retraction reveals PubMed weaknesses**

5G networks are the next generation of communication technology that could offer better tracking, testing, and diagnosis of COVID-19 (Soldani, 2020). Despite its actual strengths and potential applications, there are unknown risks and challenges of 5G (Sicari et al., 2020). Social media has served as a catalyst to spread misinformation and false conspiracy theories about non-existent or unproved risks related to 5G technology (Ahmed et al., 2020). COVID-19-related misinformation might also arise from poorly vetted literature (Chirico et al., 2020).

The retraction of a nonsensical and pseudo-scientific paper that claimed that 5G technology causes or induces COVID-19 in skin cells (Fioranelli et al., 2020), and which sparked massive negative criticism on social media, raises some issues worthy of discussion. Although the *Journal of Biological Regulators & Homeostatic Agents* is indexed in PubMed, claims to be peer-reviewed and to follow COPE ethical guidelines, the retraction of the paper was not COPE-compliant, i.e., the original article should have been left intact with “RETRACTED” pasted across each page, but was not. The paper has silently disappeared, i.e., a silent retraction (Teixeira da Silva, 2016), leaving a 404 error message where the PDF file had existed previously, and the PubMed page was modified from a withdrawal to a retraction. Several social media sites and blogs claim that this journal and publisher display predatory qualities, fortifying some concerns that PubMed may be increasingly housing unscholarly literature, or providing a platform for the recognition of predatory entities (Manca et al., 2018). The issue of silently retracted papers or opaquely retracted information related to COVID-19 is not restricted to peer-reviewed literature: there are dozens of silently withdrawn preprints with no transparent explanations or apparent ethical consequences to authors who may have infringed upon established publishing guidelines (Teixeira da Silva, 2020a).

Several risks caused by the proliferation of fake or poorly vetted information in the COVID-19 pandemic are the expansion of predatory elements (Teixeira da Silva, 2020b), the risk of relying on false information to base health guidance or policies, and the degeneration of trust by the public in the scholarly enterprise (Roozenbeek et al., 2020), poor governance (Hartley, Vu, 2020), as well as the psychological and emotional well-being of academics, members of society and policy-makers (Xiong et al., 2020) that rely on accurate and strictly vetted science for reliable information and advice on health. To the author’s knowledge, there is still no study that provides compelling evidence showing any health risk caused by 5G technology, or a link to COVID-19. Communication specialists seeking ways to improve the scalability and reliability of 5G technology (Jain et al., 2020) would benefit by conducting studies that assess its possible negative impacts on health.

### **Retractions of *The Lancet* and *New England Journal of Medicine* papers reveal flawed open data policies**

January to June of 2020 data suggests that the level of corrections (errata and retractions) of COVID-19-related literature is similar to levels of general retracted literature (Teixeira da Silva et al., 2020b). In both COVID-19 and non-COVID-19-related literature, one of the risks that has arisen from a rush to publish research, especially in the first few months of the pandemic, was the failure of journals to request the raw data from authors, or the failure to mandate open data (OD)

policies. Even now, there is wide variation among OD policies in journals that are accepting and publishing COVID-19-related research, many – perhaps even the vast majority – still making OD policies optional.

The main reason for the high-profile retractions of *The Lancet* and *New England Journal of Medicine* COVID-19-related papers was unreliable and unverifiable data (Ledford, Van Noorden, 2020). The accompanying data should have been submitted by the authors and should have also been requested by the handling editors and peer reviewers had an OD policy been in place. In such a case, it is highly likely that the lack of data would have raised a red flag, and revealed papers potentially riddled with erroneous claims, and that would have led to an ethics investigation, with the subsequent papers not being published, thus ultimately avoiding their retractions. A mandatory OD policy would have also saved these highly ranked journals from long-term reputational damage.

Science's reliability, especially in the COVID-19 pandemic, can be a matter of life and death, so accurate, reliable, and reproducible science that is based on a mandatory OD policy serves all parties well: authors fortify their findings, peers and editors can pride themselves in more thorough peer review, and the journal and publisher gain public trust, confidence and respect from the academic community (Huston et al., 2019). Trustworthy science can then be used to confidently advance human health by policy-makers.

Research that employs open-source data and code has several advantages, and when combined with OD policies, can gain the trust of medical practitioners, such as the diagnosis of COVID-19 from medical images using artificial intelligence and machine learning, but this requires OD policies for verification, extension, and collaboration to effectively employ an open-source work to find solutions to combat this pandemic, an approach that has already led to its implementation in several leading hospitals worldwide (Shuja et al., 2020).

Ultimately, open science principles will increase the collaborative nature of COVID-19-related research, making findings more transparent and rigorous (Haddaway et al., 2020). If coupled with optimized peer review (Teixeira da Silva et al., 2020a), risks of COVID-19 misinformation, negative effects on public health, and reputational damage to science may be reduced, fortifying trust in medical findings (Falcone et al., 2020). Understanding the risk of uncertainty, determining the risk of misinformation, and appreciating that there exists inherent ignorance are needed for a strict epistemological ethos of COVID-19 research to advance and be useful (Solbakk et al., 2020).

### **Recommendations to reduce misinformation in the COVID-19 infodemic**

Broadly, misinformation can originate from several sources: the public through social media (Twitter, Facebook, YouTube, personal web-pages, personal blogs, etc.) (Rosenberg et al., 2020), mass media, and independent media (online newspapers, media blogs, etc.), pseudo-academic sources (predatory journals), mixed academic sources (Google and Google Scholar), pre-peer reviewed sources (preprints) and claimed peer-reviewed sources (academic journals, indexes and platforms like PubMed, Scopus, Web of Science, Publons, etc.). Although one or more of these sources might be interlined, for example, a news media coverage of a COVID-19 preprint, the quality control, verification, and screening mechanisms of each operate independently. Consequently, even though it may be possible to implement rigorous policies in one source, for example, rigorous methods to fortify and optimize peer review in peer-reviewed journals (Teixeira da Silva et al., 2020a), this might not necessarily translate into effective information quality control by downstream users, whether these be members of the public, other academics, policymakers, or the media. This suggests that cross-source vigilance needs to be complemented by more stringent punitive measures to deal with those who peddle fabricated information, intentionally, or not. While not in any way suggesting a blanket approach, since each case merits individual scrutiny, the retraction of false information from the literature (peer-reviewed or preprints), closure of web-sites, or even criminal prosecution of individuals who seek such methods to inflict harm on others, would be broad strokes to deal with extreme cases of misinformation. In all cases, heightened awareness, open and transparent communication, and greater vigilance would serve all parties well.

### Author contributions

The author conceived the idea, wrote the manuscript, approved the submitted version, and takes public responsibility for its content.

### Conflicts of interest

The author declares no conflicts of interest.

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