

## The Challenges of Sharing Data in an Era of Politicized Science

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**The goal** of making science more transparent—sharing data, posting results on trial registries, use of preprint servers, and open access publishing—may enhance scientific discovery and improve individual and population health, but it also comes with substantial challenges in an era of politicized science, enhanced skepticism, and the ubiquitous world of social media. The recent announcement by the Trump administration of plans to proceed with an updated version of the proposed rule “Strengthening Transparency in Regulatory Science,”<sup>1</sup> stipulating that all underlying data from studies that underpin public health regulations from the US Environmental Protection Agency (EPA) must be made publicly available so that those data can be independently validated, epitomizes some of these challenges.<sup>2,3</sup> According to EPA Administrator Andrew Wheeler: “Good science is science that can be replicated and independently validated, science that can hold up to scrutiny. That is why we’re moving forward to ensure that the science supporting agency decisions is transparent and available for evaluation by the public and stakeholders.”<sup>3</sup>

Virtually every time *JAMA* publishes an article on the effects of pollution or climate change on health, the journal immediately receives demands from critics to retract the article for various reasons. Some individuals and groups simply do not believe that pollution or climate change affects human health. Research on climate change, and the effects of climate change on the health of the planet and human beings, if made available to anyone for reanalysis could be manipulated to find a different outcome than initially reported. In an age of skepticism about many issues, including science, with the ability to use social media to disseminate unfounded and at times potentially harmful ideas, it is challenging to balance the potential benefits of sharing data with the harms that could be done by reanalysis.

Can the experience of sharing data derived from randomized clinical trials (RCTs)—either as mandated by some funders and journals or as supported by individual investigators—serve as examples as a way to safeguard “truth” in science. Over the past 3 years, the International Committee of Medical Journal Editors (ICMJE) has issued 2 statements regarding the sharing of data that underpin RCTs. The first statement, published in January 2016, was a proposal for the research community to consider.<sup>4</sup> There was criticism of the proposal: some investigators thought the ICMJE was not moving fast enough to insist on immediate availability of all data that underpin the publication of RCTs, whereas others felt that the ICMJE was moving too quickly and had not considered all of the methodologic, statistical, ethical, administrative, and cost issues related to sharing data.

This led to the second ICMJE announcement in June 2017, in which this group issued a requirement that manuscripts reporting the results of clinical trials must include a statement that indicates “whether individual deidentified participant data (including data dictionaries) will be shared; what data in particular will be shared; whether additional, related documents will be available (eg, study protocol, statistical analysis plan); when the data will become available and for how long; and by what access criteria data will be shared (including with whom, for what types of analyses, and by what mechanism).”<sup>5</sup>

Prior to the ICMJE announcements, *JAMA* and other journals had published various articles about data sharing. For example, in 2013, Christakis and Zimmerman<sup>6</sup> detailed some principles that should be the basis for data sharing. These included that the new methodologic approach needs to be explicitly stated in advance and justified, and the presumption of bias arising from financial, ideological, or political interests should be carefully understood and documented.

Can journals help to “protect” the scientific community and the public from unscrupulous reanalysis of data? Maybe. Journals could insist on some of the principles detailed by Christakis and Zimmerman.<sup>6</sup> That is, the guiding principle of reanalysis should be complete transparency, with prespecified aims and methods and a clear statement of conflicts of interest. Like with well-done RCTs, a protocol and statistical analysis plan should be created prior to reanalysis and these documents should be made available, so that the reanalysis can be carefully evaluated and perhaps reanalyzed. Although this approach may help, it might also lead to a world of competing analyses, particularly in areas of health and science that are highly contentious.

However, not all journals will adhere or have the resources to adhere to these principles, and the same platforms that can be used to support data transparency could be used to disseminate the results of these new analyses. In addition, social media could be used to disseminate these new analyses regardless of whether the report of these findings had undergone rigorous peer review and thorough evaluation of scientific validity. Much of the public may not understand the potential value of high-quality peer review in an attempt to ensure appropriate analysis and interpretation of data. It has become increasingly clear that social media, in ways not considered when it first emerged as a new form of communication, can be used (and at times is used) to manipulate thought, ideas, and beliefs.

Although the sharing of data may have numerous benefits, it also comes with substantial challenges particularly in highly contentious and politicized areas, such as the effects of climate change and pollution on health, in which the public

dialogue appears to be based on as much fiction as fact. The sharing of data, whether mandated by funders, including foundations and government, or volunteered by scientists who believe in the principle of data transparency, is a complicated issue in the evolving world of science, analysis, skepticism, and communication. Above all, the scientific process—including

original research and reanalysis of shared data—must prevail, and the inherent search for evidence, facts, and truth must not be compromised by special interests, coercive influences, or politicized perspectives. There are no simple answers, just words of caution and concern.

(This Editorial is available for online commenting.)

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