Transparency and reproducibility of biomedical research is improving

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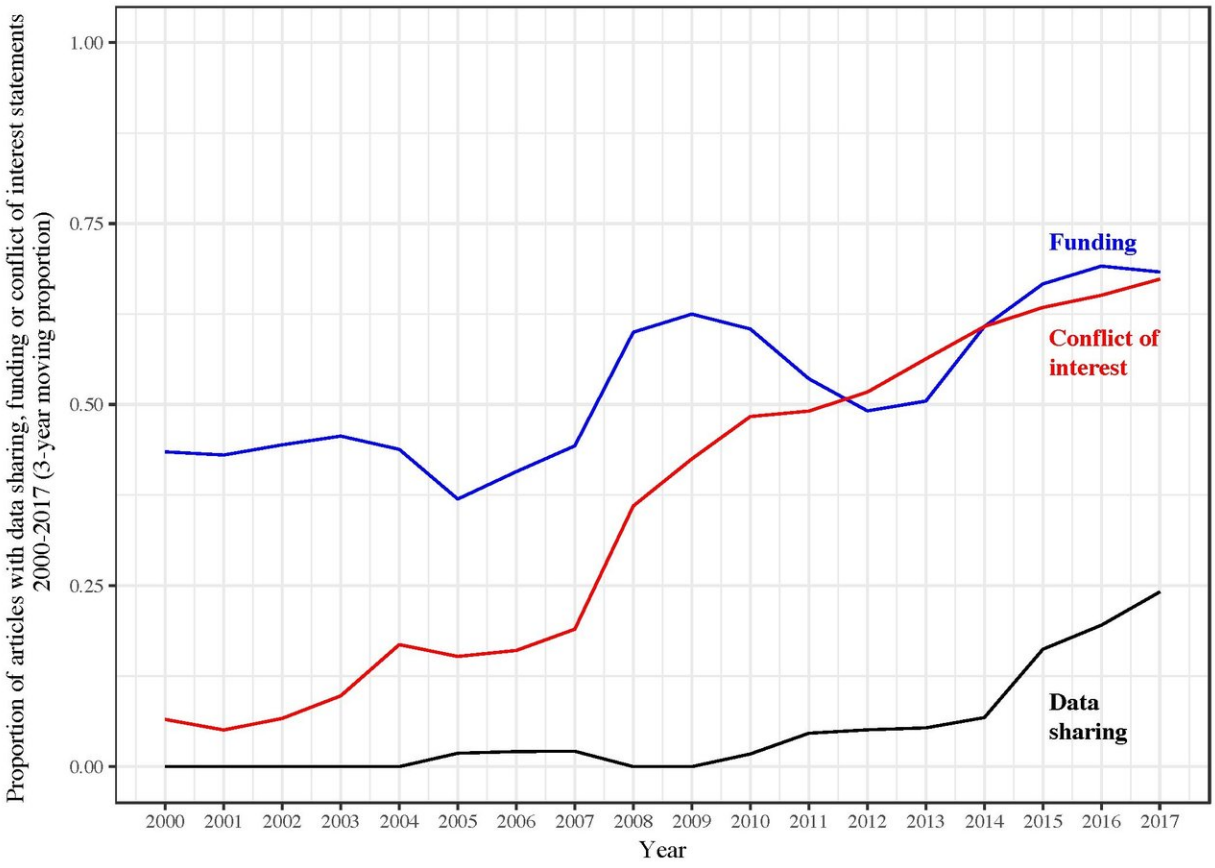

Proportion of articles with data sharing, funding, and conflict of interest statements, 2000-2017 (3-year moving proportion). Credit: Joshua D. Wallach

Over the past few years, there have been numerous efforts to promote

open science practices across the scientific literature. With increased support for sharing of both data and study protocols, an increased appreciation of the importance of reproducing prior research results, and a growing number of journals requiring reporting guidelines and disclosure statements, is there a noticeable impact of open science culture on the biomedical literature?

New research publishing November 20 in the open-access journal *PLOS Biology* from Joshua Wallach, Kevin Boyack, and John Ioannidis suggests that progress has indeed been made in key areas of research transparency and reproducibility. The authors randomly sampled biomedical journal articles published between 2015 and 2017 and assessed measures of reproducibility and transparency.

This new study builds upon the authors' previous evaluation of articles published between 2000 and 2014, which demonstrated that the biomedical literature largely lacked transparency. In their second assessment, the authors instead find that the majority of recently published articles provided information on funding and conflicts of interest, and statements related to data-sharing had become more widespread.

"Our survey of recently published biomedical articles suggests that there have been some promising improvements in the transparency and openness of the scientific literature," says the paper's lead author Dr. Joshua Wallach, an assistant professor of epidemiology within the Department of Environmental Health Sciences at the Yale School of Public Health. "In particular, one in five papers included a statement related to data sharing, and many of these referenced specific data repositories."

However, the authors identified only one study that cited a full study protocol, a key element of research reproducibility that allows study

procedures to be repeated. Furthermore, although the number of articles attempting to validate previous findings had increased since 2000-2014, only 5% of the current sample was inferred to be a replication effort.

According to Dr. John Ioannidis, the paper's senior author and professor of medicine, health research and policy, biomedical data science and statistics at Stanford University, "There is still much to be desired in terms of transparency and reproducibility for the average paper, but we see major improvements within a short period of time. I am even more optimistic for the future."

The authors conclude that although many scientists may now be aware of the importance of open science, there are still clear opportunities to continue to improve research practices. "We hope our new report highlights key areas of transparency where additional attention is necessary, such as protocol sharing," says Dr. Wallach. Drs. Wallach and Ioannidis are currently collaborating with other investigators to determine the status and trends of reproducibility and transparency in other research fields, including sociology and psychology.

More information: Wallach JD, Boyack KW, Ioannidis JPA (2018) Reproducible research practices, transparency, and open access data in the biomedical literature, 2015-2017. PLoS Biol 16(11): e2006930. doi.org/10.1371/journal.pbio.2006930