

How many scientists fabricate and falsify research?

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It's a long-standing and crucial question that, as yet, remains unanswered: just how common is scientific misconduct? In the online, open-access journal *PLoS ONE*, Daniele Fanelli of the University of Edinburgh reports the first meta-analysis of surveys questioning scientists about their misbehaviours. The results suggest that altering or making up data is more frequent than previously estimated and might be particularly high in medical research.

Recent scandals like Hwang Woo-Suk's fake stem-cell lines or Jon Sudbø's made-up cancer trials have dramatically demonstrated that

fraudulent research is very easy to publish, even in the most prestigious journals. The media and many scientists tend to explain away these cases as pathological deviations of a few "bad apples." Common sense and increasing evidence, however, suggest that these could be just the tip of the iceberg, because fraud and other more subtle forms of misconduct might be relatively frequent. The actual numbers, however, are a matter of great controversy.

Estimates based on indirect data (for example, official retractions of scientific papers or random data audits) have produced largely discrepant results. Therefore, many researchers have asked scientists directly, with surveys conducted in different countries and disciplines. However, they have used different methods and asked different questions, so their results also appeared inconclusive.

To make these surveys comparable, the meta-analysis focused on behaviours that actually distort scientific knowledge (excluding data on plagiarism and other kinds of malpractice) and extracted the frequency of scientists who recalled having committed a particular behaviour at least once, or who knew a colleague who did.

On average, across the surveys, around 2% of scientists admitted they had "fabricated" (made up), "falsified" or "altered" data to "improve the outcome" at least once, and up to 34% admitted to other questionable research practices including "failing to present data that contradict one's own previous research" and "dropping observations or data points from analyses based on a gut feeling that they were inaccurate."

In surveys that asked about the behaviour of colleagues, 14% knew someone who had fabricated, falsified or altered data, and up to 72% knew someone who had committed other questionable research practices.

In both kinds of surveys, misconduct was reported most frequently by medical and pharmacological researchers. This suggests that either the latter are more open and honest in their answers, or that frauds and bias are more frequent in their fields. The latter interpretation would support growing fears that industrial sponsorship is severely distorting scientific evidence to promote commercial treatments and drugs.

As in all surveys asking sensitive questions, it is likely that some respondents did not reply honestly, especially when asked about their own behaviour. Therefore, a frequency of 2% is probably a conservative estimate, while it remains unclear how the figure of 14% should be interpreted.

More information: Fanelli D (2009) How Many Scientists Fabricate and Falsify Research? A Systematic Review and Meta-Analysis of [Survey Data](#). [PLoS ONE](#) 4(5): e5738. doi:10.1371/journal.pone.0005738, [dx.plos.org/10.1371/journal.pone.0005738](https://doi.org/10.1371/journal.pone.0005738)

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