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Why retractions are growing so fast – and why there still aren't enough

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Retraction is the "nuclear option" in scientific correction. Whether the reason is misconduct – which it is in the majority of cases – or honest error, a "RETRACTED" watermark says "don't rely on this paper." I became interested in retractions after Adam Marcus broke a major story of scientific fraud involving Scott Reuben, an anesthesiologist in the U.S. (Marcus, 2009) That made me realize that retractions were stories hiding in plain sight – but also that retraction notices were often inadequate, and sometimes even misleading. So in 2010, Adam and I co-founded Retraction Watch as a window into the scientific process, particularly self-correction.

A lot has changed since 2010. While there were about 400 retractions from journals that year, there are now well over 3,000. (Retraction Watch Database) And while there is plenty of room for improvement, there is some evidence that retraction notices have become more transparent.

These trends suggest that researchers have been paying more attention to problems in the literature – good news. But that also obscures how much work remains to be done.

For one, the rate of retraction – about 8 in 10,000 papers, up from 4 in 10,000 just four years ago – is still too low, and should probably be closer to 200 in 10,000. (Oransky, 2022) We can make this estimate confidently based on multiple lines of evidence:

- Two percent of researchers admit to having committed misconduct (Fanelli, 2009)
- An examination of 20,000 papers found that 2% of images showed signs of deliberate manipulation (Bik 2016)
- Sleuths routinely report that journals do nothing in the face of obvious fraud (Grey, 2020)

Retractions also take too long, on average nearly three years. (Steen, 2013) The slow responses, and lack of response, is because the work is largely outsourced to volunteers without any authority. While some journals and publishers have hired staff to respond to allegations of misconduct and other issues, much of the effort is left to independent "sleuths." In the meantime, flawed or fraudulent research is allowed to propagate, earning citations, wasting valuable resources, and creating mistrust. Science can, and must, do better.

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