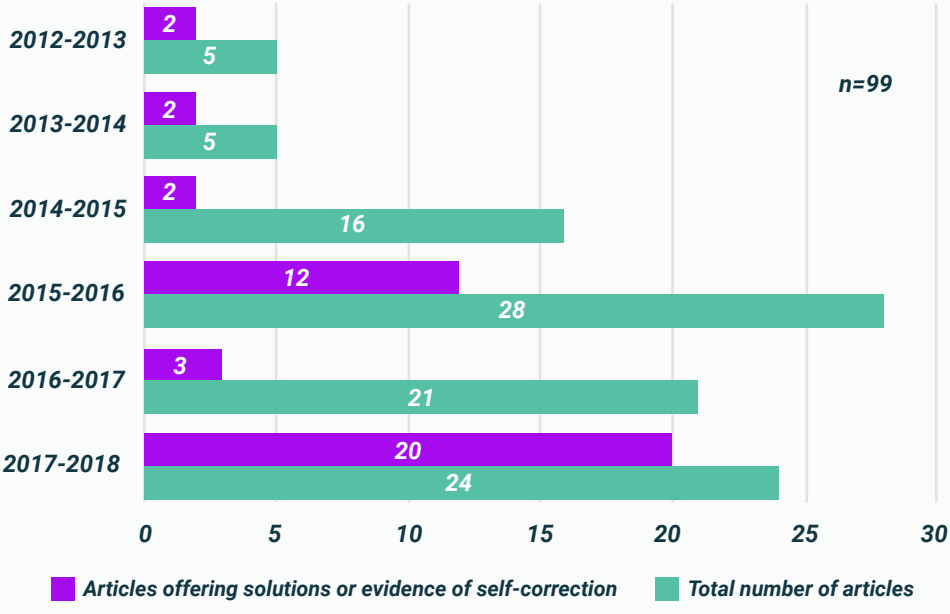
THE ANNENBERG PUBLIC POLICY CENTER
OF THE UNIVERSITY OF PENNSYLVANIA

Crisis and Self-Correction in Science

For science to be self-correcting, scientists must uncover problems that threaten its integrity, identify and implement remedies, and ensure that the remedies work. This digest of the fourth report of the Annenberg Science Media Monitor* focuses on media reports about problems in science and efforts to address them. Our content analysis† is based on 99 print and online articles published from April 2012 to April 2018. These were found in the LexisNexis and Factiva Dow Jones databases in a search for headline terms such as "crisis," "broken," "failure," "fraud," "peer review," "problem," "replication," "retraction," "scandal" or "self-correction" with the word "science." Here we report three findings:

- *More than half of the articles (52%) used a science is broken/in crisis frame*
- *More than a third of the articles (35%) were written by a scientist*
- *The percentage of articles that mentioned solutions to problems or evidence that science is self-correcting increased to 83% in 2017-18 from a prior high of 43% in 2015-16*

Articles Focused on Problems in Science



* The Science Media Monitor is a project of the Science of Science Communication program of the Annenberg Public Policy Center of the University of Pennsylvania and is supported by a grant from the Rita Allen Foundation.

† All inter-coder reliability met a Krippendorff's alpha of ≥ 0.7.

Media Framing: Crisis/Self-Correction in Science

Broken/Crisis

"The replication crisis as it's understood today may yet prove to be a passing worry or else a mild problem calling for a soft corrective. It might also grow and spread in years to come, flaring from the social sciences into other disciplines, burning trails of cinder through medicine, neuroscience, and chemistry."

Daryl Bem Proved ESP Is Real. Which means science is broken.
Daniel Engber, Slate (May 17, 2017)

Solution/Self-Correction

"[T]he benefits of open data are likely to far outweigh the current closed practices. And, as recent examples in astrophysics show, large-scale collaborations can produce breakthrough discoveries far beyond what individual scientists, hoarding their data, could produce alone. When the Higgs boson was discovered, the article had thousands of authors, each of whom had worked on a small piece of the whole. And the data, generated at CERN, is open to the public – which has already led to new ideas and discoveries."

Science's data secrecy problem
Josh Nicholson, Politico (December 7, 2017)

"Is science truly in trouble? Rife with fraud? Losing reliability? Absolutely not. Science is doing what it always has done – failing at a reasonable rate and being corrected. Replication should never be 100%. Science works beyond the edge of what is known, using new, complex and untested techniques. It should surprise no one that things occasionally come out wrong, even though everything looks correct at first."

Why failure to replicate findings can actually be good for science
Stuart Firestein, Los Angeles Times (February 14, 2016)