The Scientific Index of Integrity among Authors of Articles Published in Major Journals: a new metric for evaluating the scientific ecosystem

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Objective

To propose the "index of integrity" and use it to describe scientific integrity among first authors of articles published in major journals.

Rational

- Assumption: before proven, the probability of a given hypothesis to be true is supposed to be < 50%.
- Therefore, there should be at least a similar number of positive and negative articles.
- However, design bias, imprecision, selective outcome reporting, spin in conclusions and publication bias fabricate a number of positive publications.
- An author of ideal scientific integrity should have at least equal number of positive and negative original studies.

Methods

Authors Selection

- JAMA, Lancet , BMJ - January 2019
- First authors of all original articles

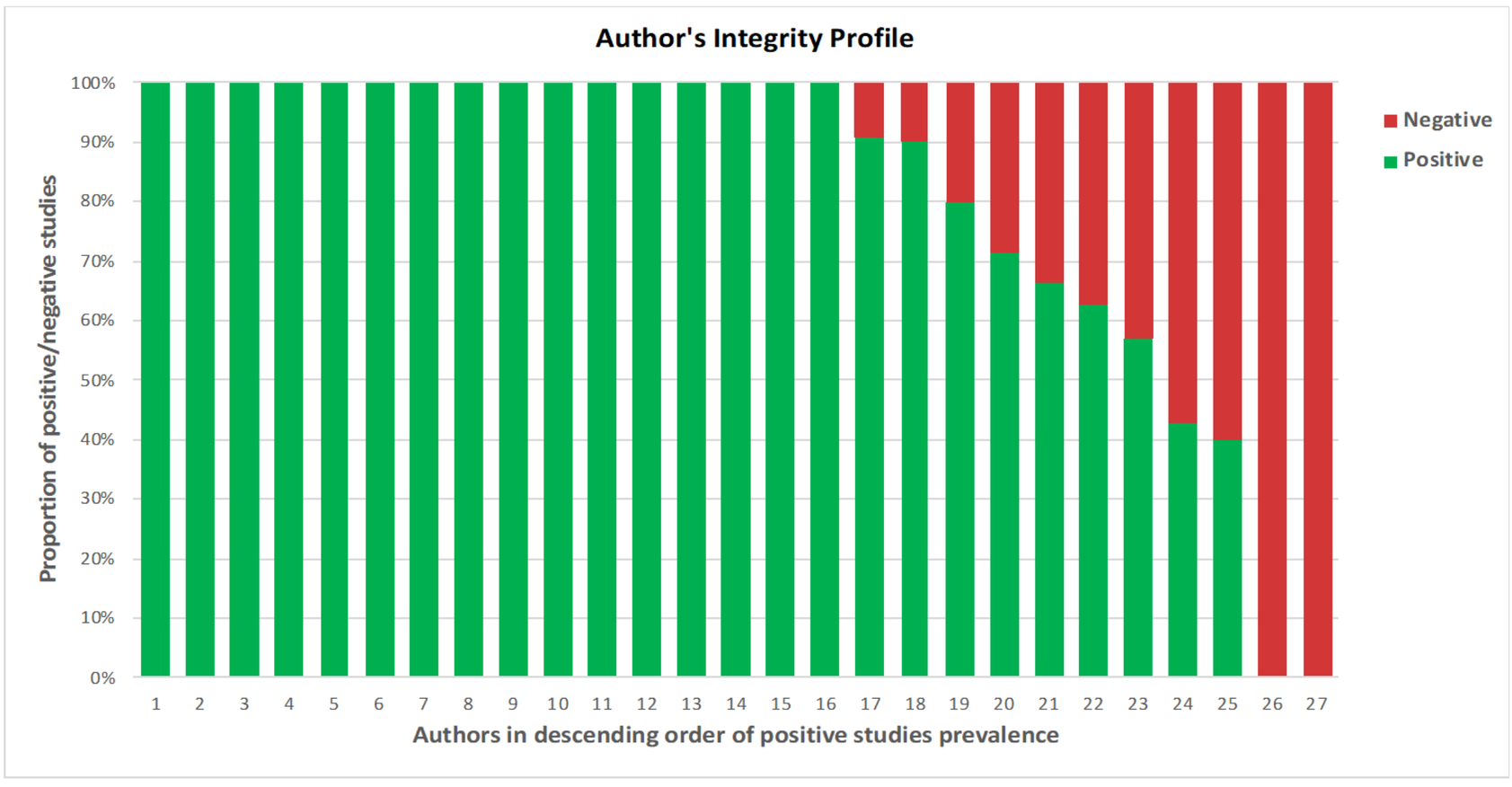
Data Collection

- Lifetime original articles of each author at Pubmed journals
- Positive study: (1) a positive conclusion based on the primary analysis or (2) a negative primary study with positive spin at conclusion
- Negative study: otherwise

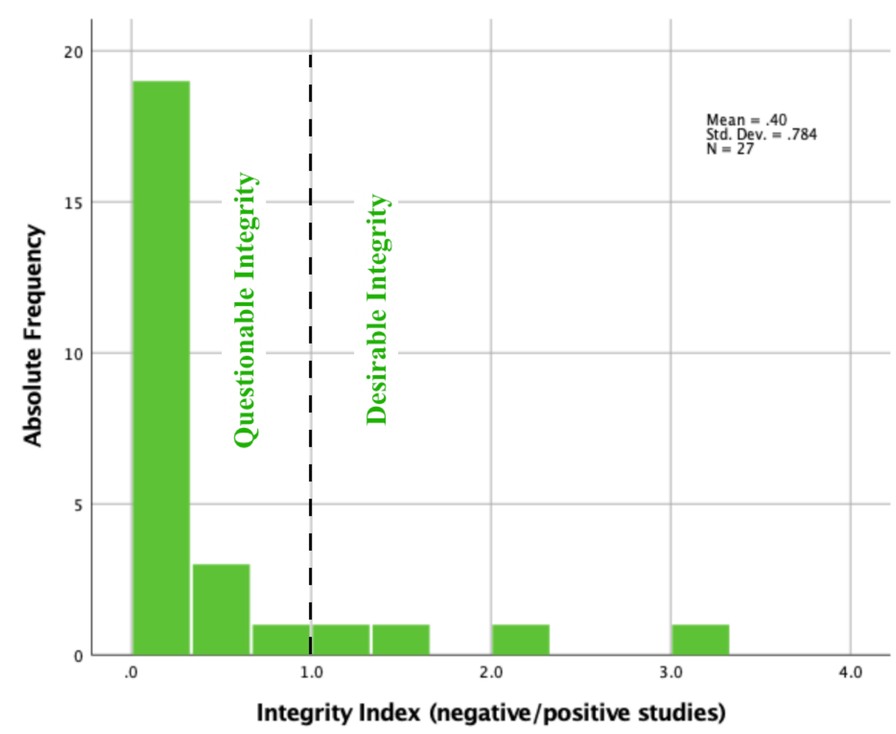
Integrity Index: number of negative studies / number of positive studies

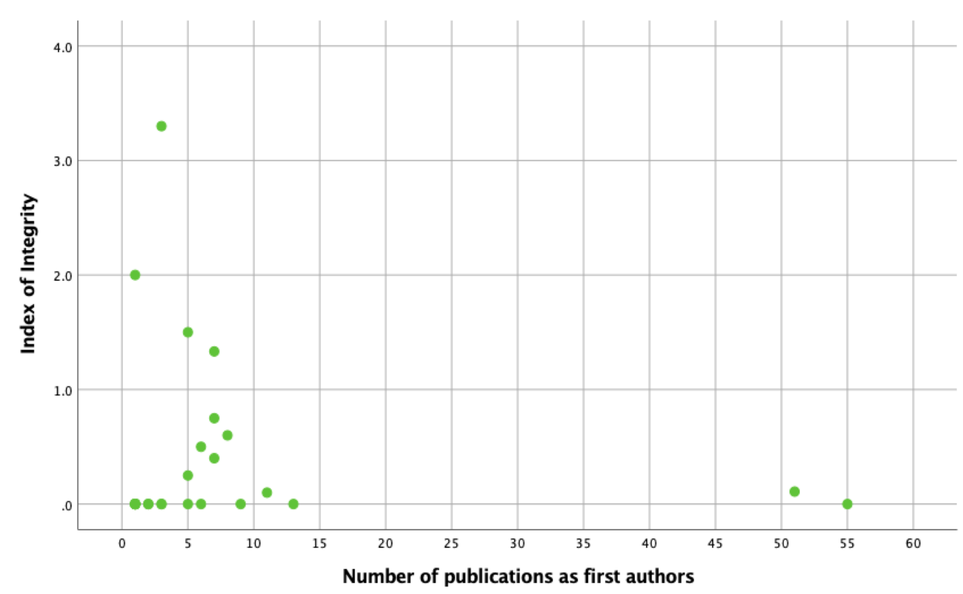
- Desirable > 1

Results



Number of First Authors	27
Region	**N (%)**
West Europe	15 (55.55)
North America	8 (29.62)
Northern Europe	2 (7.40)
Latin American	1 (3.70)
Africa	1 (3.70)
Specialty	**N (%)**
Cardiology	7 (25.92)
Oncology	6 (22.20)
Neurology	2 (7.40)
Endocrinology	2 (7.40)
Pediatrics	1 (3.70)
Neonatology	1 (3.70)
Radiology	1 (3.70)
Surgery	1 (3.70)
Infectology	1 (3.70)
Economy	1 (3.70)
Obstetrics and gynecology	1 (3.70)
Rheumatology	1 (3.70)
Genetics	1 (3.70)
Type of Index Study	**N (%)**
Randomized/Controled Clinical Trial	14 (51.85)
Cohort Study	5 (18.51)
Case-Control Study	2 (7.4)
Cross-Sectional Study	2 (7.4)
Observational Study	1 (3.7)
Pragmatic Clinical Trial	1 (3.7)
Mendelian Randomized Study	1 (3.7)
Number of lifetime articles (median, IQR)	5 (1 - 7)
Prevalence of positive studies	**87%** (95% CI = 82% – 91%)
Conclusion with positive spin	7,9%
Integrity Index	0.40 (95% CI = 0.10 - 0.70)





Conclusion

In this preliminary report, an especially higher number of positive articles compared with negative articles suggests undesired level of scientific integrity among first authors of major publications in medical science.

The index of integrity, first utilized in this report, should be validated in larger samples of authors by testing its association with practices that characterize scientific behavior.