American Journal of Biomedicine and Pharmacy
https://biojournals.us/index.php/AJBP
ISSN: 2997-7177

Research Integrity Risk Index (Ri²): A Critical Evaluation Review

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Received: 2024, 15, Jun
Accepted: 2025, 21, Jul
Published: 2025, 26, Aug

Annotation: Background: RI2 is a newly founded measure, designed to assess the research integrity in the world universities. This measure is based on two indicators; these are the published-research retraction rate and the rate of researches published in journals that have been delisted from Scopus and Web of Science indexes. The measure is characterized by its reliance on verifiable references including monitoring the number of retracted published studies, which enables the universities and other research relevant bodies to diagnose any research integrity concerns. This means that RI² is a mixed quantitative-qualitative measure. Purpose: This paper aims at evaluating RI² via analyzing its systematic methodology, data accuracy, transparency, and effectiveness. Method: The study was conducted through reviewing the available relevant literature, including the RI2 evaluation process mechanisms. Results: Although the approaches followed by the measure were qualitative quantitative, there are some criticisms that need to be solved to improve the performance of the measure. Conclusions: Caution is warranted, as research retraction rates can have different implications and may be indicative of high levels of monitoring and oversight rather than misconduct. Moreover, issues such as incomplete metadata

and methodological decisions can influence results. Recommendations: It is argued that improving normalization methods and data quality would enhance RI²'s fairness and reliability.

Keywords: RI^2, Research Retraction, Journal Delisting, Research Integrity.

INTRODUCTION

Most global university rankings prioritize quantity-publication counts and citations over research integrity or quality (1). Even, evaluation research has been following quantitative approaches more than qualitative ones (2). Given the growing need to ensure a realistic assessment of the integrity of academic publications, Miho *et al*. developed RI², a bibliographic index that attempts to identify institutions facing potential risks to research and publication integrity based on data from retracted research or delisted journals. (3). This approach responds to the global push for embedding ethical standards in how research institutions are assessed (4, 5). Accordingly, the release of the first assessment report, in June 2025, has created an extensive discourse in some countries (6).

METHOD

Through relevant literature reviewing and exploring the process of evaluating the research articles using RI^2, this study was conducted.

RESULTS

RI² comprises two main elements:

1. Research Retraction Rate (R)–the number of retracted publications per 1,000 papers, specifically focusing on cases of misconduct. The research retraction data is sourced from Research Retraction Watch, Web of Science, and MEDLINE, and emphasizes research retractions related to fraud, plagiarism, and data manipulation (3). Fang *et al.* showed that misconduct accounts for 67% of research retractions, lending support to RI²'s focus (7).
2. Delisted-Journal Rate (D)–the percentage of an institution's publications that appear in journals delisted from Scopus or Web of Science due to ethical violations (3). The inclusion of delisted journals is justified by findings that these journals continue to be cited even after their removal (8).

To produce a final RI² score ranging from 0 to 1, both indicators are normalized, using a min-max approach across a global reference group, and averaged. Institutions in the top 5% are labeled as "Red Flag" institutions (3).

Despite advancements, research retraction data still present challenges. Metadata inconsistencies, ambiguous research retraction causes, and inaccurate institutional affiliations can introduce bias (5, 9). An article published in Nature, found that some published researches were mistakenly retracted from publishing in scientific journals (5). In addition, not all research retraction processes arrow to the presence of fraud in the retracted studies, but some contained non intended mistakes. This necessitates digging deep in the reasons behind retraction (4, 10).

The rules of research retraction are not the same in different countries, specialties, nor academic/scientific bodies. A study, which was conducted by Ioannidis *et al.*, found that about 66.7% of Senegalese scientific authors, who published the top ranked research papers that were cited by other authors, retracted at least one research paper. When this was compared to research retraction in other places of the world, different findings were found. This ensures that there is a

systematic variation in assessing research integrity (4, 11)

RI^2 measure concentrates on literature written in English. This can ignore the research carried out in non-western countries (5, 12). Therefore, it is needed to accurately review the researches produced in different scientific bodies, specialties, and geographical areas.

The lists of delisted journals were taken from Scopus and Web of Science (3, 8). However, the disclosure approach to make the methodologies of RI^2 clear for the public has made it totally transparent, although its reliance, on two indexes only, makes it of limited effectiveness (3).

This study was carried out aiming at evaluating RI^2 via analyzing its systematic methodology, data accuracy, transparency, and effectiveness.

Strengths:

RI^2 measure aims to manage a critical weakness in the research assessment approaches through highlighting the role of integrity, which is usually missed by other research assessment measures. Its concentration on research retraction reduces research hyper-publication, which increases the quantity at the expense of quality. This approach promotes governance of quality (1, 3). Moreover, RI^2 aims at making manipulation in research retraction more difficult (3, 13). The measure also uncovers some questionable publication practices that have not been diagnosed earlier, when it determined the research bodies that possess extraordinary research retraction rates and citation policies that have not been addressed before via the traditional measures (3).

Weaknesses:

The RI^2 index has some weaknesses:

1. Ambiguity:

It is controversial whether the increase in the rate of research retraction is considered an indicator to the presence of serious problems or to presence of effective efficient review policy (5, 10).

2. Disciplinary bias:

Logically, the fields/disciplines, which their researches undergo more review by the RI^2 will show more research problems, and this is unfair (4).

3. Concerns relevant to data:

The research retraction measure is not an approach without mistakes. Moreover, the reasons behind journal delisting from Scopus index are not clearly transparent (8, 9).

4. Limited scope:

RI^2 ignores forms of misconduct other than research retraction and journal delisting, such as manipulation in citation, dishonest peer review and others (14, 15).

5. Counterproductive results:

Classifying the research/academic bodies, publicly, as "red-flagged" may negatively affect their scientific reputation instead of leading to real reform (5, 14).

6. The RI^2's evaluation thresholds are close together; that means any minute change in the assessment score can move a university/research body from a zone to another without a considerable change in the institution behavior.

CONCLUSION

RI^2 is a promising tool to re-evaluate the research integrity risks, which unifies the moral aspects with the quantitative aspects to create a needed balance in the current assessment measures. Through well-studied improvements, it can become an acceptable international measure to conduct an integrity based research assessment.

RECOMMENDATIONS

To improve the performance of RI^2, it is needed to:

1. Put rules for research retraction that are applicable to all specialties in the same degree.
2. Use COPE or NISO guidelines in the process of research retraction
3. Add to the approaches used other ones like manipulation in citation, dishonest peer review, … etc.
4. Introduce a feedback mechanism to improve the performance of the research institutions and researchers.

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