

# The Scientific Peer Review Process

**Semira Abdelmenan**  
Assistant Professor  
Department of Epidemiology and Biostatistics,  
Addis Continental Institute of Public Health  
October 2021

## Outline

- What is scientific peer review?
- How does peer review work?
- History of peer review
- Types of peer review
- Why do reviewers review? Why not?
- Criticism of peer review
- Initiatives towards improving peer review

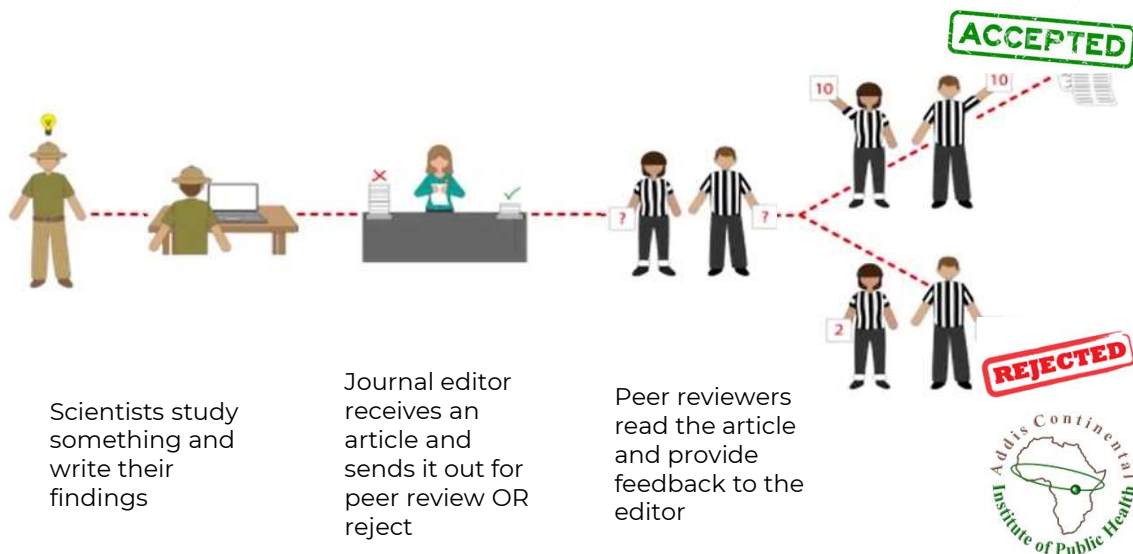
## What is peer review?

- “a process of subjecting an author’s scholarly work, research or ideas to the scrutiny of others who are experts in the same field”
- Intended to serve two primary purposes
  - Acts as a filter to ensure that only high quality research is published by determining the validity, significance, and Originality of the study
  - Intended to improve the quality of manuscripts that are deemed suitable for publication

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## How does peer review work?



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## History of peer review

- The first documented peer review process was in 9<sup>th</sup> century
  - Ethics of the Physician book
- After the invention of the printing press in 1453, it become more important
- first journal to formalize the peer review process was in 1665
  - Philosophical transactions of the royal society
- Peer review in the systematized and institutionalized form has developed immensely since the Second World War



Ishaq Bin Ali Al-Rahwi of Syria



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## Types of peer review

Commonly practiced:

- Single blind peer review
- Double blind peer review
- Open peer review

Emerging:

- Transparent peer review
- Collaborative
- Post publication



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## Single Blind peer review

- Author doesn't know the identity of the reviewer
- The most common type of peer review for science and medicine journals

Pros	Cons
<p>The reviewer can be totally honest with their thoughts on the paper as they will remain anonymous throughout the process</p>	<p>Risk of conscious bias, they might be tempted to give a more critical review to an article written by someone they consider to be a rival</p> <p>Risk of unconscious bias from the reviewer, they may make judgements on the paper based on details of the author without even realizing</p> <p>Some reviewers may use their anonymity to write reviews that are rushed, rude, or unfair, which they might not do if their name was being associated with the comments</p>

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## Double blind peer review

- Reviewer doesn't know the identity of the author, and vice-versa

Pros	Cons
<p>Less risk of conscious or unconscious bias from either the reviewer, or the author</p> <p>Reviewers can feel more protected from criticism of their review</p>	<p>It's not possible to guarantee the anonymity of the author</p> <p>Some reviewers may use their anonymity to write reviews that are rushed, rude, or unfair, which they might not do if their name was being associated with the comments</p>

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## Open peer review

- The identity of the author and the reviewer is known by all participants, during or after the review process
  - publishing the names of the reviewers and even the reviewers' reports alongside the article
  - publish any earlier versions of your article

Pros	Cons
Authors might receive more constructive and polite reviewer comments	Researchers who are invited to review may be less inclined to do so under an open model
Depending on the model, it allows readers of the published article to see more detail of the review process, increasing their trust	There is a possibility that if a reviewer knows an author and doesn't want to offend them, they give them an overly favorable review

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## Common reasons cited for accepting invite to review

- Sense of academic duty to perform reviews
- Desire to keep up-to-date with the latest developments in their field
- Opportunity to advance their own research
- building associations with prestigious journals and editors and becoming part of their community
- Some see it as a chance to become aware of the latest research before their peers
- Academic reward

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## Common reasons cited for declining invite to review

- Insufficient interest in the paper
- Having to review too many manuscripts for this/other journals
- Length of the manuscript
- Quality of the manuscript
- Tight deadline for completing the review
- Conflicts with other workload
- Reputation of the journal
- Lack of formal recognition of reviewer contribution
- Lack of clear incentive

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## Pros and Cons of incentive options for reviewers

### Financial incentives

- many reviewers agreed that financial incentives encourage reviewers to accept requests to review

#### **BUT**

- incentives will not be effective when there is time constraints
- Small incentives
- Improve the quality of review is still under question

### Non-financial incentives

Many agreed on the following

- Free access or subscription to journal content
- Annual acknowledgement on the journal's website
- More feedback about the outcome of the submission and quality of review
- appointment of reviewers to the journal's editorial board

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## Criticism of the “Classic peer review” (1/3)

- Delay
- Bias against specific categories of paper
  - reviewers prefer papers reporting positive results to those reporting negative or mixed results, even when the underlying methodologies are identical
- Social and cognitive biases
  - authors from particular geographical areas, authors from low prestige institutions, authors from countries where English is not a native language

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## Criticism of the “Classic peer review” (2/3)

- Inability to detect errors and fraud
  - fails to detect papers containing serious errors in methodology, manipulated figures or even fabricated data
  - most papers are reviewed by just 2–3 reviewers: who cannot perform replication experiments, and may not have the expertise to evaluate some aspects of the paper such as statistical methodology
- No standardized metrics exist for evaluating the quality of peer reviews provided
  - (<http://www.publons.com/>)

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## Criticism of the “Classic peer review” (3/3)

- Lack of transparency—unethical practices
  - Puts editors in a position to exert unfair influence over the review process, choosing reviewers, favorable or unfavorable to a particular thesis or a particular author
  - Some reviewers also behave unethically including rejecting, delaying or copying work by competitors
- Lack of recognition for reviewers
  - anonymous review provides no recognition for reviewers' unpaid work, and their often substantial contributions to the papers they review

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## Initiatives towards improving peer review

- **Immediate publication with no formal review**
  - Emerged in the last 20 years
  - by-pass the delays, biases, unreliability and restrictions associated with classic peer review, by publishing their work directly on preprint servers
  - publish materials not suitable for submission to journals (technical materials, course materials, presentations, figures, datasets)
  - republish materials that have already appeared elsewhere

**Non-commercial preprint servers**  
**Preprint services from journal publishers**

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## Initiatives to improve peer review

### ■ Immediate Publication with Post-publication Review

- publish submitted papers immediately (usually after a rapid “access review”) and to perform formal peer review after publication
- If names of reviewers and reviewer reports were published: *Open review system*

#### **In-channel post-publication review**

F1000Research

#### **Out of channel post-publication review**

ResearchGate's Open Review service



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## Conclusion

- Peer review is still fundamental in selecting credible, high quality, novel and interesting research papers for publication.
- Efforts and innovative practices are underway to address the deficiencies of the peer review process.



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