The Global Publication Crisis

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Publicare: to make public

• Prior to the development of the printing press in 1450, knowledge was mostly communicated verbally.
• By the 17th century the literate upper class in Europe had established societies “to discuss and open up scientific discoveries”.
• The Royal Society of London developed the periodical journal: one experiment or observation per article.
• The Smithsonian now estimates over 1.8 million scientific articles each year in over 28,000 journals
• It’s not clear how many of these papers are even read, less cited. One study in 2007 claimed that over 50% of all published papers were never read, and 90% were never cited.

• Independently, ISI claimed that 55% of all papers were not cited within five years of publication.

• Exact figures are hard to come by, but it is clear that publication is less and less an act of “making public”
There's a huge money problem
Too many studies are poorly designed
Too much science cannot be replicated
Peer review is broken
Too much science is locked behind paywalls
Science is poorly communicated
Academic life is incredibly stressful
Research is in trouble
As NIH funding plateaued, grant applications grew much more competitive.

Total NIH funding:
- 1997: $12,700M
- 2016: $32,311M

Proposal success rate:
- 30.5%
- 19.3%

NHMRC project grant funding:
- No. applications & No. funded
- % Funded

Source: NIH.gov
"You are completely free to carry out whatever research you want, so long as you come to these conclusions."
Too much science can’t be replicated
Well it looks ok from here.

PEER REVIEW
(BBC RADIO 4 “SCIENCE BETRAYED”)
Before the great subscription crash of 2017, scientists believed the more inaccessible the study, the greater the impact.
Hype in science is on the rise

The use of positive words has increased in the titles and abstracts of research papers in PubMed.

% of Pubmed papers


Positive words

Use of the word “novel”

Negative words

SOURCE: BMJ/Nature
• Academics typically work against set publication targets
• In 2017, Australia published 103,817 publications that were indexed by Clarivate
• Universities drive volume because volume of research output is directly related to University rankings
• University rankings drive a multi-million dollar international student market
• The Australian Trade and Investment Commission estimates the international student market will be worth $33 billion dollars by 2025
The broken publication model

• Universities pay academics to write papers
• Universities pay academics to review papers
• Academics sign over their copyright to publishers
• Publishers charge universities to subscribe to journals
• Publishers charge individual academics to make their publications open access
A bubble that must burst

• Elsevier has the single worst reputation in this market
• Annual profit margins are around 37%, bigger than Apple and big oil companies
• Elsevier has been caught in a number of scandals, including providing incentives for reviewers to give books five stars
• Elsevier seeks to regulate text and data mining with private licences. This often results in researchers being blocked from their own work.
• Elsevier has been caught in a peer-review sting set-up – bogus papers have been accepted for publication when they should clearly have been rejected
• Fake journals have appeared
• Editors have used their power to publish their own work without peer review
The resistance has started

• In 1999 the entire editorial board of the *Journal of Logic Programming* resigned over library subscriptions

• By 2003 university librarians began complaining about journal bundling

• By 2017 many countries were now threatening to boycott or actually boycotting Elsevier: Finland, Germany, The Netherlands, South Korea, Sweden, ...

• In March 2018 Florida State University cancelled a $2M subscription to a bundle of journals
What next?

• Elsevier are in conflict with Sci-Hub and LibGen, which make available copyright protected articles for free

• Elsevier have also sent out “take-down” notices to individual academics and universities posting articles to be freely available online.

• ArXiv, started by physicists and now used in many disciplines, is leading the current open access movement
The near future

• Blockchain technologies are being considered for publication
• A blockchain is a shared, decentralized ledger.
• The information in a blockchain is stored across a peer-to-peer network. A single user can’t change the records in the ledger, making the data stored in a blockchain more secure.
• Blockchain technology could be used to solve the current problems of peer review, costs, trust, and universal accessibility to scientific information
• The future “making public” of new knowledge must include data, data pipelines, information, and context