



Steps to undertaking research in Healthcare

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Interests:

Research Methodology, Quantitative research in public health.

Editor:

PLOS ONE, Biomed Research International, BMC Pregnancy and Childbirth.

The screenshot shows a PubMed search results page for the user 'bishwajit ghose'. The search bar at the top contains the name 'bishwajit ghose' and a search button. Below the search bar are options for 'Advanced', 'Create alert', and 'Create RSS'. The results are sorted by 'Most recent' and there are buttons for 'Save', 'Email', and 'Send to'. A 'Display options' button is also visible. The page shows 122 results. The first result is titled 'SMS-based family planning communication and its association with modern contraception and maternal healthcare use in selected low-middle-income countries' by Hu Y, Huang R, Ghose B, Tang S. The second result is titled 'Sociodemographic characteristics associated with the utilization of maternal health services in Cambodia' by Zhou D, Zhou Z, Yang C, Ji L, Ghose B, Tang S. Both results include their respective journal names, dates, and PMIDs, and are marked as 'Free PMC article'. On the left side, there is a 'RESULTS BY YEAR' bar chart showing a significant increase in results from 2013 to 2020. Below the chart is a 'TEXT AVAILABILITY' section with checkboxes for 'Abstract' and 'Free full text'.

PubMed.gov

bishwajit ghose

Advanced Create alert Create RSS

Save Email Send to Sorted by: Most recent Display options

MY NCBI FILTERS

122 results

RESULTS BY YEAR

2013 2020

TEXT AVAILABILITY

Abstract

Free full text

SMS-based family planning communication and its association with modern contraception and maternal healthcare use in selected low-middle-income countries.

1

Cite Hu Y, Huang R, Ghose B, Tang S.

Share BMC Med Inform Decis Mak. 2020 Sep 10;20(1):218. doi: 10.1186/s12911-020-01228-5. PMID: 32912201 Free PMC article.

Sociodemographic characteristics associated with the utilization of maternal health services in Cambodia.

2

Cite Zhou D, Zhou Z, Yang C, Ji L, Ghose B, Tang S.

Share BMC Health Serv Res. 2020 Aug 24;20(1):781. doi: 10.1186/s12913-020-05652-1. PMID: 32831074 Free PMC article.

Outline of the discussion

- Some existential(!) questions about scientific research.
- Barriers to undertake meaningful research by students/early career professionals.
- How to get around the barriers?
- Where to start
- Good research vs not-so-good research
- Types of research
- Types of papers
- Standard structure of a manuscript
- Using the findings of other researchers
- Life cycle of research publication

Some existential thoughts...

What is Scientific Research

How Can it be Done?

What is the purpose of scientific research?

Does scientific research need a purpose?

What makes research scientific?

Biggest problems facing by science?

What is Scientific Research

- Systematic and creative actions taken to increase knowledge about humans, culture, and society and to apply it in new areas of interest. *UNESCO*
- The neutral, systematic, planned, and multiple-step process that uses previously discovered facts to advance knowledge that does not exist in the literature.

How Can it be Done?

- Start with a specific research question & the formulation of a CLEAR & TESTABLE hypothesis to answer this question. Hypothesis should be clear, specific, and directly aim to answer the research question. (Any example?)
- A strong and testable hypothesis is the fundamental part of the scientific research.
- The next step is testing the hypothesis using scientific method to approve or disapprove it.
- The research plan should include the procedure to obtain data and evaluate the variables. It should ensure that analyzable data are obtained. It should also include plans on the statistical analysis to be performed.
- Compliance with ethical principles.

Purpose of scientific research?

- Generate scientific knowledge. Making the world a better (factual and data-based) place.
- To explain/understand natural/social phenomena e.g. why pandemics happen? ([theoretical research](#)), and finding a cure/vaccin ([applied research](#)).
- To make practical applications possible. (safety/efficacy of a new healthcare policy/drug)
- Advancement of society: quality research is a strong metric of the quality of an academic institution.

Does scientific research always need a purpose?

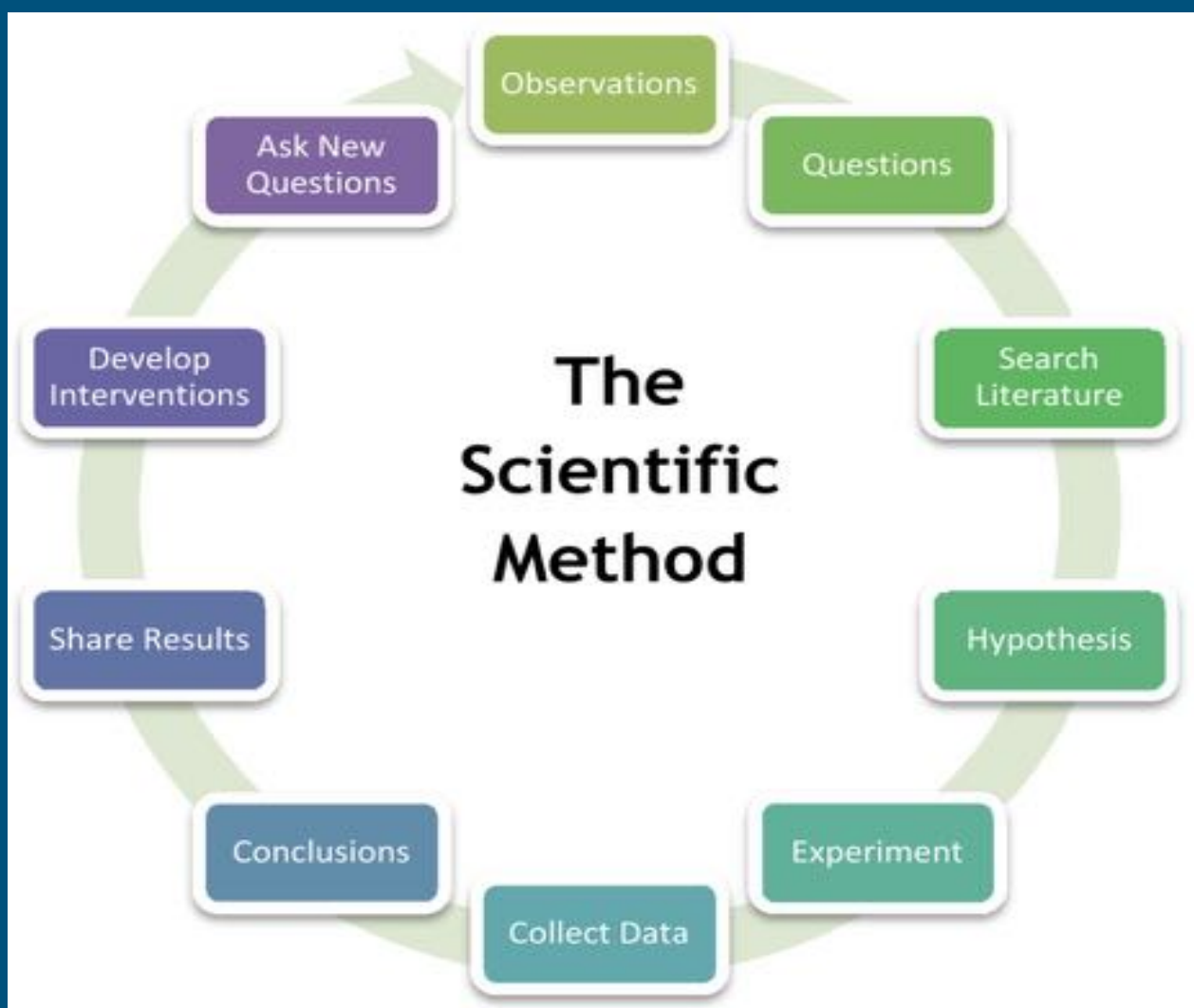
Why do you think?

I live in a small village in Madagascar. Why should I bother about global warming/ wildfire in Australia/ drought in Mali/ outbreak of a new virus in Brazil.

What makes research scientific?

- Reliability: Is the research study repeatable? i.e. are the measures reliable and consistent. If I repeat the measurements in the same conditions, will I get the same results?
- Replication: This refers to the idea that the procedures (methodology) employed in the study are reported in sufficient detail that a second researcher could repeat the study.
- Validity/integrity of conclusions: ***(1) does the measure employed accurately reflect the concept under investigation; (2) is the causal relationship robust - can we be sure that X is the cause of Y? (3) Can we be confident that we can extrapolate our findings beyond the research context?***

What
makes
research
scientific?



Biggest problems facing by science?

- Too many cook in the kitchen?
- The irresistible rise of academic bureaucracy.
- Too many studies are poorly designed.
- Peer review is broken
- Science is poorly communicated to the public
- Life as a young academic is incredibly stressful.

Biggest problems facing by science?

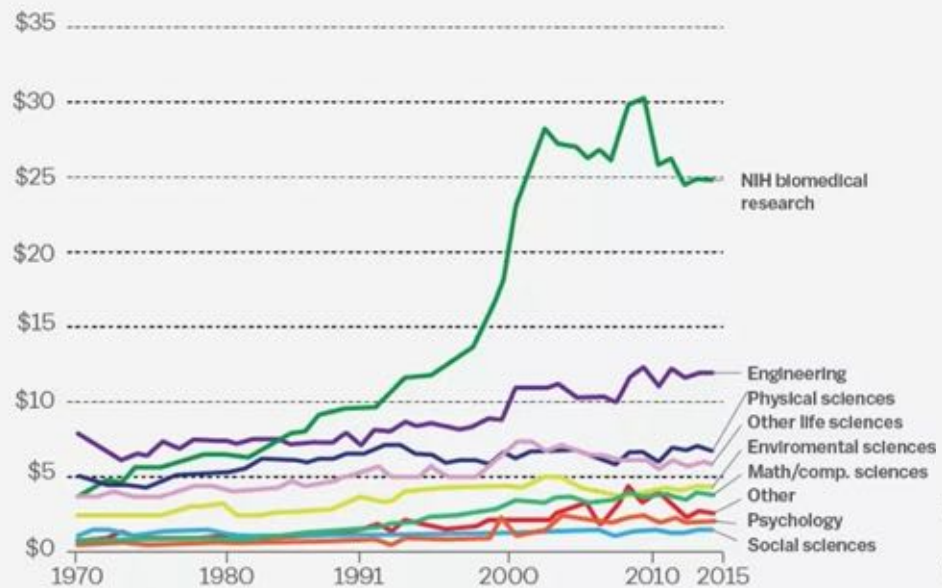
"Science, I had come to learn, is as political, competitive, and fierce a career as you can find, full of the temptation to find easy paths." — Paul Kalanithi, neurosurgeon and writer (1977–2015)

Science is in big trouble. Or so we're told.

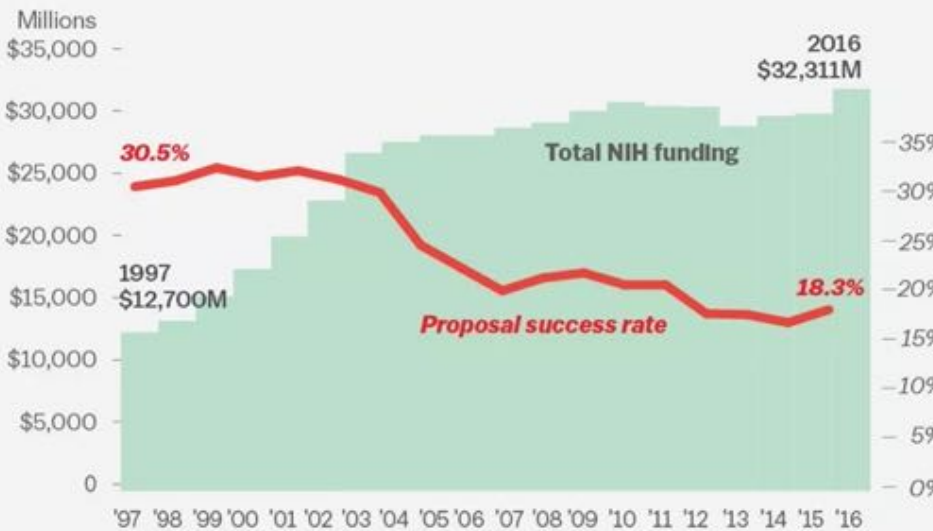
In the past several years, many scientists have become afflicted with a serious case of doubt — doubt in the very institution of science.

Trends in federal science funding, by discipline

All figures are represented in billions of 2015 dollars

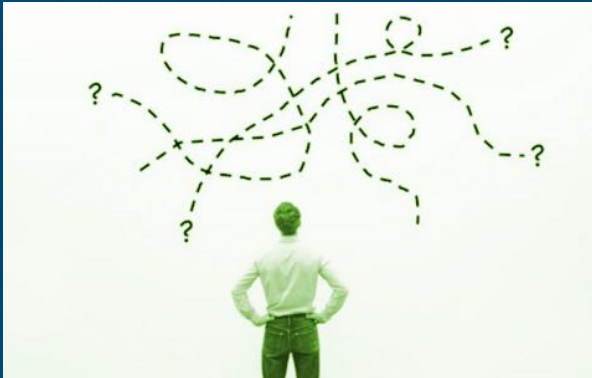


As NIH funding plateaued, grant applications grew much more competitive



Barriers to undertake meaningful research by students/early career professionals.

- Lack of motivation (not know what to do, or why)
- Lack of research skills
- Lack of resources for students e.g fund for generating/accessing data, publication charges



"We've never published anything by a Pearl Harbor denier before."

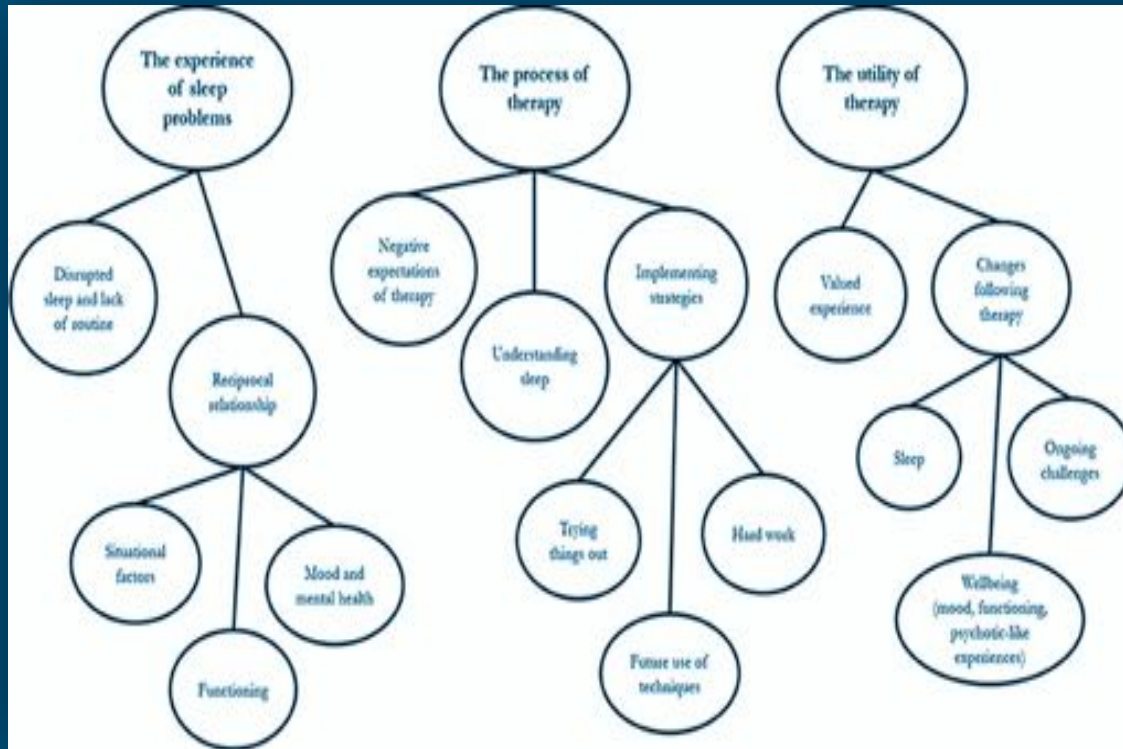
Where to start?

- Knowing what to do! (Harnessing the power of open source data and technology)
- Connecting with peers (gathering ideas): e.g. Researchgate
- Getting acquainted with databases: *Chapman D. Health-Related Databases. J Can Acad Child Adolesc Psychiatry. 2009;18:148–9.*
- Finding data (nothing like free lunch)
 - World bank micro data: <https://microdata.worldbank.org/index.php/home>
 - DHS: <https://dhsprogram.com/>
 - ESS: <https://www.europeansocialsurvey.org/>
- Statistical softwares (SPSS/Stata/R)
- Forums/tutorials on advanced research(<https://stackoverflow.com/>)

Good research vs not-so-good research

- Originality: avoid redundancy
- Significance: making an effect
- Rigor: soundness of the research components

Finding a creative topic is half the journey?



Choose your research topic

Narrow it down and find your niche

Identify a research problem

Develop clear research questions

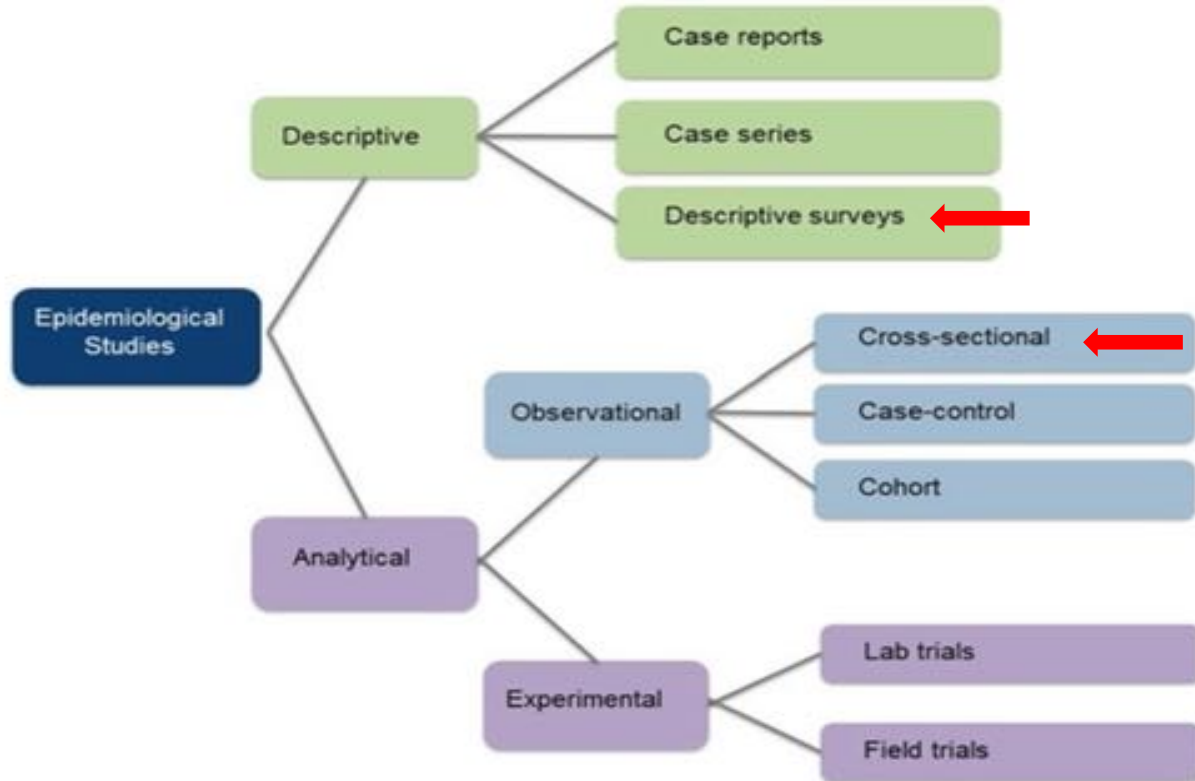
Create a research design to answer them

Write your research proposal

Types of research

1. According to data collection techniques:
 - Observational
 - Experimental
2. According to causality relationships:
 - Descriptive
 - Analytical
3. According to relationships with time:
 - Retrospective (subjects studied into the future in order to record the development of any of the outcomes of interest.)
 - Prospective
 - **Cross-sectional**
4. According to the medium through which they are applied:
 - Clinical
 - Laboratory
 - Social descriptive research

Types of research



Types of papers

- Original research (~3500 words(excluding abstract, ref, appendix), 5 tables/figures, 30 references)
- Protocol (Typically 3500 words, 5 tables/figures, 30 references)
- Review: mini (~4000), systematic, meta-analysis:(~7000 words, 80 references)
- Commentary (~1000 words, 10 references)
- Short reports (~1000 words, 10 references)
- Letter to editor (~600 words, 5 references)

Standard structure of a manuscript

'AIMRDC' structure

Title: Should reflect the:

Key words + target population + setting + type of research

HIV and stigmatization among university students in Accra, Ghana: a cross-sectional study

Abstract

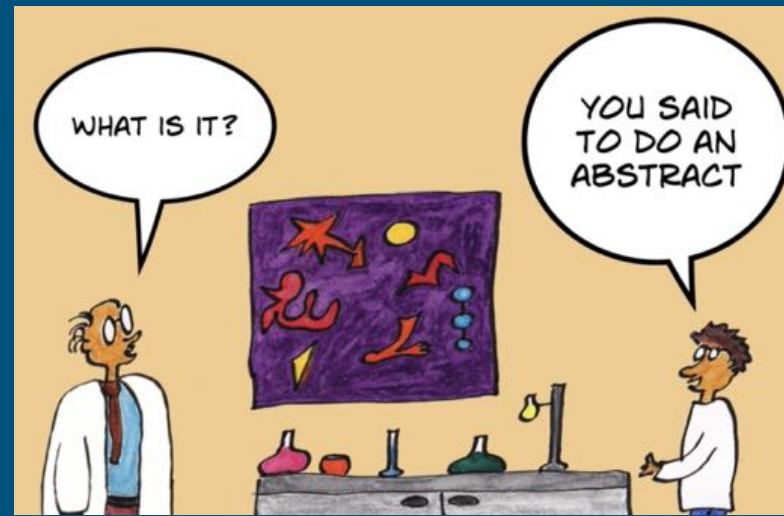
Background: What is the problem?

Objectives: What was done?

Methods: Study type (Qualitative/cross-sectional), timeline (from June to July 2020), sample population (adolescents), number (n=), key variables, statistical approaches.

Results: key findings

Conclusion: What do the findings refer to? What could be done now?



Introduction

1. General description (~150 words): HIV is a global health issue...
2. Contextualization (~200 words): Treatment seeking for HIV can be influenced by stigma, **especially** among elderly/women)
3. Mechanisms (~250 words): how stigmatization affects treatment-seeking)
4. Rationale (~100 words): The present study addressed the research gap by...
5. Potential outcomes (~50 words)

Methods

Study design: sampling, data collection.

Definition of variables (Clearly identify outcome & explanatory variables, define with references)

Statistical approaches: How missing values were treated, what are the main analyses, sensitivity tests, model fitness, level of significance

Ethical clearance: IRB no/not applicable.

Results

1. Sample profile
2. Main course of analyses
3. Sensitivity analyses
4. Model fitness

Discussion & conclusion

1. Main findings - ~200 words
2. Contrasting interpretation - ~100
3. Policy implication ~ 200
4. Strengths and limitations

Order of AIMRDC



M

R

D

C

I

A

Life cycle of research publication

1. Conceptualization (e.g. identifying the problem/hypothesis)
2. Study design (e.g. data collection approach)
3. Carrying out the research (e.g. data analysis, interpretation)
4. Preparing the manuscript (rationale, style, structure)
5. Finding the right journal/s (areas of focus)
6. Manuscript submission
7. Peer-review

Short quiz

- Where to add:
 - study limitations?
 - Sampling method?
 - Selection of variables?
 - Main findings?
 - Rationale?
 - Knowledge gaps?

Using the findings/materials from other researchers?

- What if part of your research partially overlaps with others'? (3 papers using same title, same data, but different objectives)
- Conceptual framework
- Methodologies

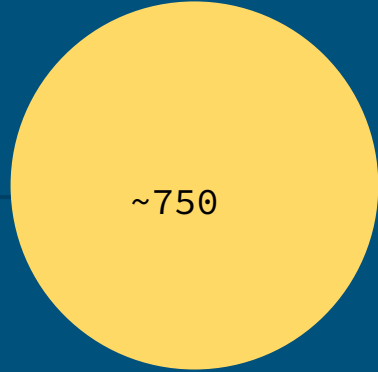
1. Conceptualization, 2. Study design & 3. Carrying out the research

- How to find a creative & feasible topic? (being too ambitious)
- What are my research objectives? (is the effort worthy)
- Original Vs review
- Qualitative vs quantitative
- Building the tools/questionnaire
- IRB approval, funding, sampling and data collection

Preparing manuscript

Standard length of a manuscript (~3500 words)

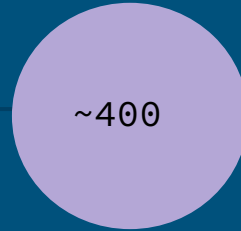
Abstract



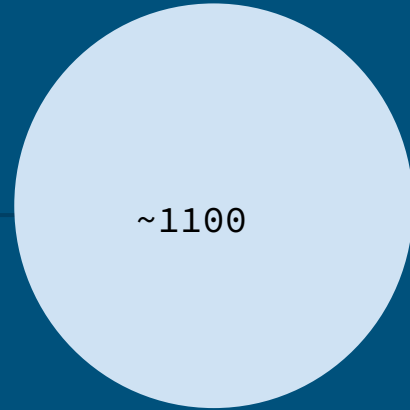
Introduction



Methods



Results



Discussion



Conclusion

Finding journals

1. Checking references
2. Using journal finders

<https://journalfinder.elsevier.com/> <https://journalsuggester.springer.com/>

Review recent publications in each candidate journal.

Journal specifications:

- Peer-reviewed
- Open access/subscription based
- Average time to publish
- Impact factor

Submission & peer-review

- **Author guidelines**
 - word count
 - placement of figures/tables
 - reference style
- **Rebuttal letter (point by point response)**
 - Answer each question with adequate details, with references if necessary (We choose this method based on the guidelines published by John et al...)

Rebuttal letter

- Disagreeing with comments
 - Why you didn't explain HIV status in the context of poverty?
(e.g. We believe this would contradict the objectives/findings from the main theme of the study)
- Contacting the editor (e.g. we believe the comments by reviewer A are not constructive at all....)

The Academic's Serenity Prayer*

Grant me the serenity to write
what I can write,

The courage to *delete* what
needs to be *deleted*,

And the wisdom to dump the
rest on my
co-authors.



Quality assurance, 1 (Write as a researcher, think as a reviewer, act as an editor)

- Coherence (redundancy, repetitions)
- Style, readability, spelling & grammatical errors
- Consistency of terms across the text (HIV patients, people living with HIV/AIDS)
- Defining abbreviations/acronyms at their first use.
- Citing all table/figures on the text in the right order
- Using easily readable tables (not too many columns) and figures (pleasant color schemes), adequate font size.
- Use footnotes whenever necessary (column 1 represents percentages/odds ratios)
- Results (use easily understandable terms e.g. 25% or one-quarter instead of 237 students)

Dealing with rejections, 1

- Every artist was once an amateur!



Everybody faces manuscript rejection, even a Nobel Laureate

This interview is in Industry Interviews, Dealing with Rejection

Series: Part 03 - Interview with Dr. Tim Hunt



Clarinda Cerejo

Oct 03, 2015

27k views

Reading time

🕒 12 mins

INTERVIEW

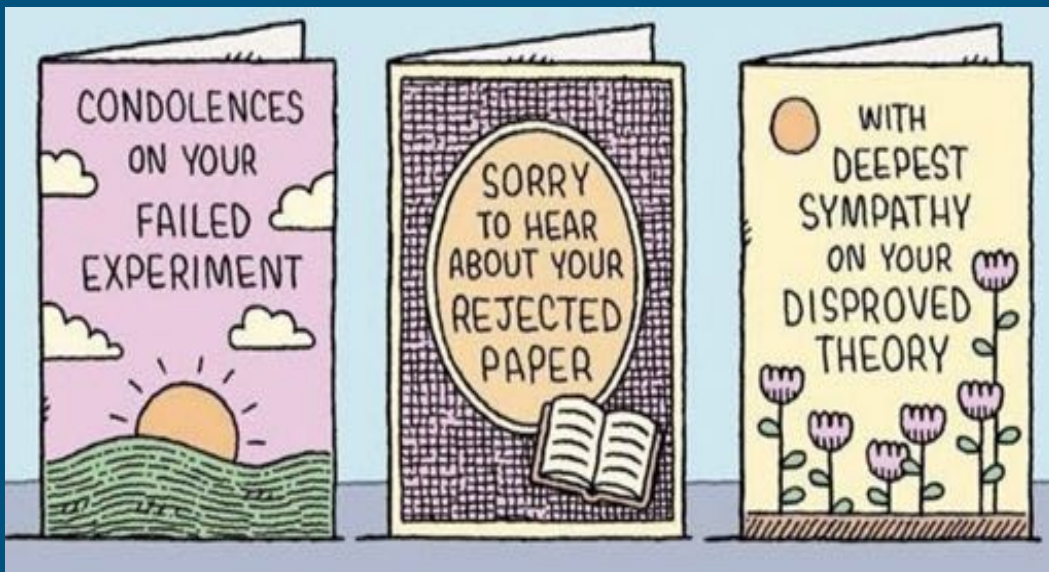


DR. TIM HUNT

Winner of the 2001 Nobel Prize in Physiology or Medicine

Dealing with rejections, 2

- Doesn't necessarily mean the paper is bad
- Rejection: fail again, fail better!
- Submit and forget
- Do better



Scholarly communication: Where do we go from here?



Jaclyn A. Siegel

@JaclynASiegel

It is my great honour to announce that today, my third consecutive paper was rejected for publication. I am truly grateful for the opportunity to continue to not share my research with the fine academic community.

8:29 p.m. · 10 May 20 · [Twitter Web App](#)

15 Retweets 658 Likes



Claire Lehmann ✓

@clairlemon

Academic journals:

- don't fund research
- don't pay authors
- don't pay peer reviewers
- charge libraries & the public for access to research that is publicly funded
- issue copyright violations to researchers

Why do we put up with this?

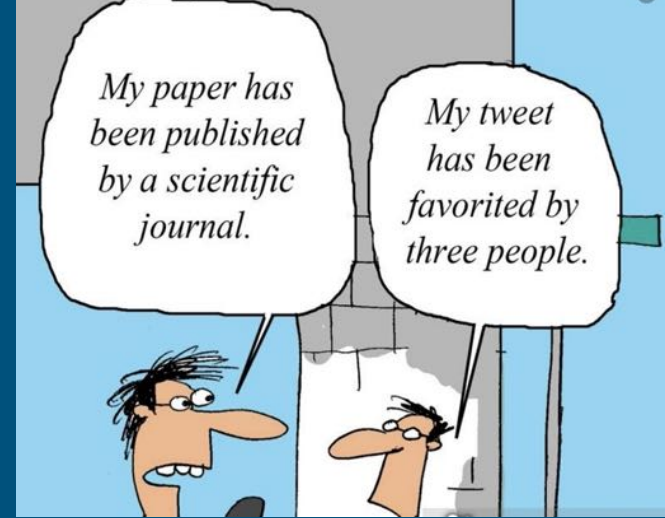
3:03 PM · 2019-10-27 · [Twitter for iPhone](#)

What to do after a rejection?

- Reformatting the same paper for a new journal is discouraging (must preserve the references in ref manager)
- Weigh and correct the mistakes
- Update the content
- Find a more suitable journal
- **Worst case scenario: A similar paper has been published by your colleague in the meantime!**

Interactive discussion: ~15 minutes

- Underlying motifs for publication?
- What is importance of academic publishing?
- What do you want to publish? (e.g. book, article, thesis)
- How much time would spend to write one: book, article, thesis
- How many papers per year? How many is enough?
- If there is no potential reward, would you still publish?
- Would you choose to publish as pre-prints?



Questions

Contact

bghose@cheo.on.ca

Further reading

What is Scientific Research and How Can it be Done?:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5019873/>

Research Methodology: Choices, Logistics, and Challenges:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4052625/>

Methodology for research I:

<https://pubmed.ncbi.nlm.nih.gov/27729690/>