



# What makes a 3\* / 4\* paper?

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# Hypotheses

- 4\* papers don't happen by chance
- 3\* papers probably don't either
- 2\* and 1\* papers can happen by chance



# Overview

- Introduction
  - REF star ratings, REF planning
- How do you know when you have a 3\*/4\* paper?
- Characteristics of 3\* / 4\* papers
- The research environment
- Open access publishing
- Which journal?
- Examples of 1\*,2\*,3\* and 4\* papers

# REF star ratings

\*\*\*\*

Quality that is world-leading in terms of originality, significance and rigour.

\*\*\*

Quality that is internationally excellent in terms of originality, significance and rigour but which falls short of the highest standards of excellence.

\*\*

Quality that is recognised internationally in terms of originality, significance and rigour.

\*

Quality that is recognised nationally in terms of originality, significance and rigour.

Unclassified

Quality that falls below the standard of nationally recognised work or does not meet the published definition of research for the purposes of this assessment.

# REF planning

- Starts years ahead of a submission date (?10?)
- Last one
  - 2014
- Next one
  - ?2021?
- Stuff to consider
  - Papers; impact; environment
- Extra stuff to consider - Stern<sup>1</sup>

1. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/541338/ind-16-9-ref-stern-review.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/541338/ind-16-9-ref-stern-review.pdf)

# How do you know when you have 3\*/4\* paper?

- REF evaluation process (?)
  - Criteria used to judge
  - Papers are judged by a panel
  - Panel is multiprofessional
- You need an internal judging mechanism<sup>1</sup>
  - All journal papers judged
  - Multi-professional panel
  - Consensus
  - Assessed against REF criteria

1. <http://www.salford.ac.uk/research/health-sciences/research-impact-and-ref/research-outputs-monitoring-and-evaluation-rome>

# My internal panel

- Chair
  - Professor *and* a senior researcher (MCR)
- Membership
  - Professoriate + senior researchers
  - Qualitative and quantitative
  - Junior researchers (developmental)
- Process
  - Papers circulated and read
  - Panel meets and agrees

# My internal panel

- Assessment of *my* papers
  - I can't contribute
  - Kind of intimidating
  - Valuable learning exercise
- Results
  - Made available to authors by email
  - Accessible log kept
    - Details
      - Paper
      - Proposed REF score
    - Purpose
      - Preparation for REF
      - Others can view the papers (learning exercise)



# Reflection

- What internal review processes do you have?
- How do you make effective use of them?
- If you do not have an internal process then how might you create one?

# Characteristics of 3\*/4\* papers

## *REF criteria*

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# World leading, internationally excellent,...

- World leading (\*\*\*\*)
  - Potential game changer
  - Potential major impact
- Internationally excellent (\*\*\*)
  - Potential high value
  - Potential high impact
- Recognised internationally (\*\*)
  - Probably limited in value
  - Probably limited in impact
- Recognised nationally (\*)
  - Probably has local value
  - Probably has local impact



# Originality

- Nobody has done it before
- A new method
- New findings
- A new method with new findings<sup>1</sup>
- Could be a new philosophical position<sup>2</sup>



1. Normally these would be separate papers
2. Risky, if not a 'research paper' for our subject

# Rigour

- Applies to every aspect of the research
  - From conception to quality of publication
- Key elements
  - Research question
  - Rationale
  - Method
  - Results and their analysis
  - Inferences drawn from results / analysis
  - Relationship with existing body
  - Conclusions / recommendations

# Research question

- Get this wrong and you can't retrieve it later on
  - Bad question
  - Question has limited (local) value
- Clear, focused, usually addresses one key issue
- 3\*/4\* normally address *the big questions*
  - REF levels of importance
    - International (\*\*\*\* and \*\*\*)
    - National (\*\* and \*)

# Example 4\* research question

*What are the differences in the dose to organs at risk when the support bra is used compared with no support bra?<sup>1</sup>*

1. Heidi is developing / testing a new bra design for positioning in breast cancer DXT treatment / 4\*

# Rationale

- Makes the case for doing the research
- Explains the importance of the research
- If available, builds on published evidence
- Clear and concise



# Method

- Answers the research question
- Robust
- Demonstrates the required quality indicators
  - Quantitative
    - Adequately detailed for replication
    - Validity / reliability
    - Error sources identified and minimised / accounted for
    - Power
    - Correct statistical tests
    - etc

# Method

- Qualitative
  - Same quality rules as quantitative (rigour and originality)
  - Remember the REF assessment criteria
    - \*\*\*\*
    - Quality that is world-leading in terms of originality, *significance* and rigour.
- You must make the case for significance
  - Qualitative
  - And quantitative

# Well written

- Make things really clear in your article<sup>1</sup>
  - Adequate English
  - Highlight novelty
  - Clear rationale which demonstrates it's importance
  - Detailed method
  - Clear results / enough results
  - Discussion highlights the importance of the results, what they mean and to whom
  - Clear conclusions / recommendations

1. Get it proof read by a good quality researcher in your university before submission

# Reflection

- At the conception stage do you consider
  - Significance / level of the research question
  - Which journals you are aiming at
  - (Skill mix (authorship) needed to assure quality)
  - (Physical resource)

# The research environment<sup>1</sup>

- Culture
  - Values and fosters research
- Grant bidding
- Physical resource
  - e.g. CT scanner, phantoms, TLDs, etc
- Critical mass - enough people doing research
  - Radiography / University of Salford
  - PhD students
    - 13 (FT), 2 (PT), 5 (staff) = 21
  - Academic staff
    - 14 staff do research / the rest value and support it
  - BSc / MSc taught students
    - RiT

# The research environment

- Method to assess journal papers (REF)
- Early Career Researchers (5 years post-doc)
  - Mentorship
  - Development opportunities
- Mid Career Researcher
  - Mentorship
  - Development opportunities
- Specialist availability
  - e.g. Medical statistician

# The research environment

Don't underestimate the value of a good  
research environment

# Reflection

- Is your research environment conducive to achieving good quality research (3\*/4\*)?
- If not then what can you do to change your environment?



# Open access publishing

- If not complied with then your publications are worthless (in REF terms)
- Applies to papers accepted for publication after 1-4-2016
- Institutional / subject repository
- 3 months from acceptance date

# Which journal?

- Doesn't matter for REF, however
- High IF journals usually give *harsh* reviews<sup>1</sup>
- High IF journals have higher citation rates / article
- Therefore
  - Publication strategy
    - Personal
    - For each paper, individually
  - Research question, study design, etc
    - Aimed at particular *group* of journals

1. Super important for improving quality

# Reflection

- Do you have a personal publication strategy?
- Does it involve submitting to high IF journals to get harsh reviews?
- Do you have a publication strategy for each paper you write?

# Example 4\*

- Quantitative
- Multicentre
- Large (approx 4000 patients)
- Focused research question
- Clear conclusion – ‘stop doing it’
- Potential to change practice – ‘high’ (impact)
- National authorship
- Citations are currently low (2)

Coward, Lawson, Kane, Elias, Howes, Birchall, Hogg, Multicentre analysis of incidental findings on low-resolution CT attenuation correction images: an extended study , British Journal of Radiology, 2015

# Example 3\*

- Qualitative
- Multicentre
- Many focus groups
- Clear research question
- New theory proposed
- Might have international impact (review score?)
- National authorship
- Citations are currently low (2)

[Breast compression—An exploration of problem solving and decision-making in mammography](#),  
Nightingale, Murphy, Robinson, Newton-Hughes, Hogg, 2015, Radiography

# Example 2+\*

- Quantitative
- Clear research question
- Very rigorous and detailed study
- Took 3 years
- Very controversial (IR isn't that good)
- International authorship
- Citations are currently low (1)
- Phantom-based (?negative?)

[Effect of reconstruction methods and x-ray tube current–time product on nodule detection in an anthropomorphic thorax phantom: A crossed-modality JAFROC observer study](#), Thompson, Chakraborty, Szczepura, Tootell, Vamvakas, Manning, Hogg, Medical Physics, 2016

# Example 1\*

- Pilot study
- Clear research question
- Qualitative; rigorous
- Local (one cohort in one course)
- Has local value; main study might have broader value?
- National authorship
- Low citation rate (3)

[Integrating research-informed teaching within an undergraduate level 4 \(year 1\) diagnostic radiography curriculum: a pilot study](#), Higgins, Hogg, Robinson, Journal of Vocational Education & Training, 2013

# Unclassified

- Narrative style review article
- First place / Radiography 2015
- 8 citations in 10 months (++)
- International authorship
- Worth nothing to REF, as a research paper
- However might have value for REF impact



Next ... Heathrow ...  
for a holiday in Hong Kong 😊

