

Results of the use of the Quality Output Checklist and Content Assessment (QuOCCA)

Authors: Simon Gandevia, Martin Héroux, Annie Butler,
and the Neuroscience Research Australia Research Quality Committee

Sydney, Australia

Background

- Research is conducted with the aim of **supplying dependable new knowledge** and contributing to human health
- To supply robust new knowledge, research must be well designed, properly conducted, and accurately reported
- Unfortunately, a large portion of published literature **falls short** of the target



Quality Output Checklist and Content Assessment (QuOCCA)

AIMS:

Identify areas of concern in reporting

Educate researchers on reporting practices

Allow review of the effectiveness of interventions to improve research quality

Checklist and Methods

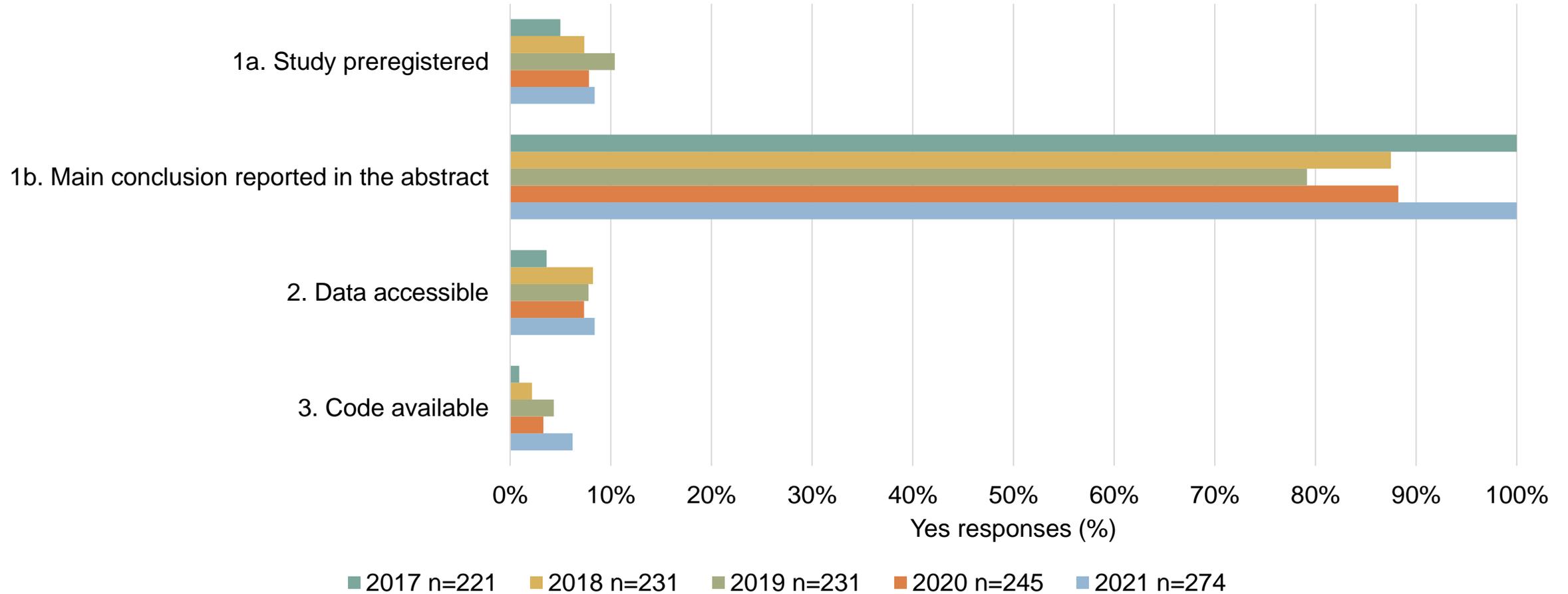
The checklist has 11 simple questions that evaluate three pillars of research:

1. Transparency
2. Design and analysis
3. Reporting practices

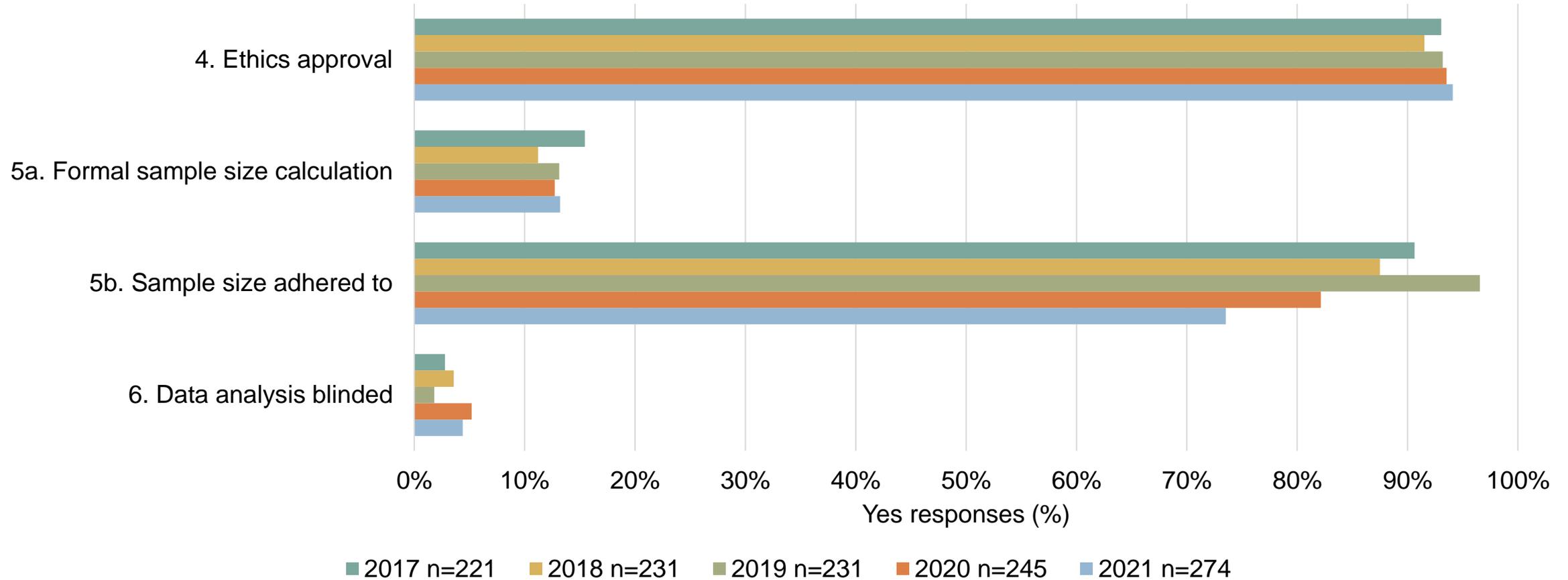
5 pairs of raters assessed all eligible 1202 articles published from 2017 – 2021 by NeuRA researchers

QuOCCA					
Quality Output Checklist and Content Assessment					
Manuscript Title:					
Manuscript Authors:					
Person submitting this form:					
Date:					
TRANSPARENCY:			N/A	YES	NO
1a.	Were the study's hypotheses and analyses plans registered prior to the conduct of the study (i.e. pre-registered)?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	If so, was the main conclusion reported in the abstract (or summary) based on the primary hypothesis/outcome?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Are the primary data accessible to independent researchers on a public website?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Is code used for the study available on a public website to allow for reproduction or analysis of data?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESIGN AND ANALYSIS:			N/A	YES	NO
4.	Was ethics approval obtained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5a.	Was the sample size based on a formal sample size calculation done prior to starting the study?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	If so, was the planned sample size adhered to?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Was data analysis blinded ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REPORTING PRACTICES:			N/A	YES	NO
7.	Are any reporting guidelines specified (such as those found at www.equator-network.org/)?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8a.	Are all measures of variability defined in figures, tables and text?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Are any data summarised using standard error of the mean (SEM)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	If the SEM is used, are sample sizes specified for all reported SEM?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9a.	Were any data excluded?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	If so, was a criterion given?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10a.	If null-hypothesis testing of significance was used, is a probability threshold specified for all statistical tests?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	If used, are exact probability values used throughout the report, excluding figure legends?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Are claims made for the importance or significance of results associated with a P-value greater than or equal to 0.05 (or other threshold) i.e. misleading spin of reported results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

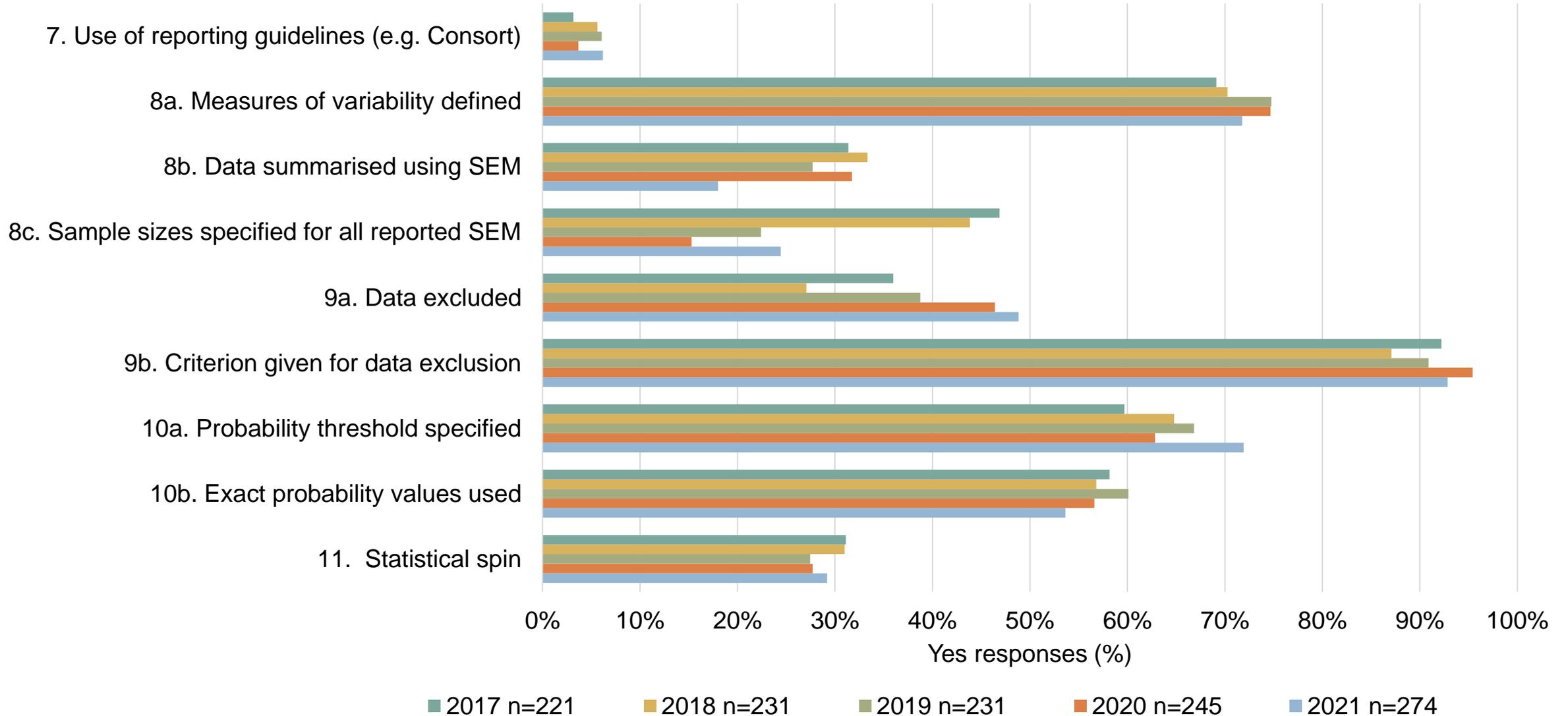
Transparency



Design and analysis



Reporting practices



Discussion

Overall, results from the QuOCCA were similar between the years 2017-2021:

- $\leq 10\%$ of studies pre-registered their study, or made their data or code available
- Data analysis was blinded in $< 5\%$ of studies
- $\sim 70\%$ studies define variability
- $\sim 65\%$ define probability threshold
- $\sim 30\%$ of articles included 'spin'

The **QuOCCA is quick** to administer and **broadly applicable**

It can be used by **biomedical institutions** and **individual researchers** to guide improvements in open, reproducible, and well-reported science

Much room for improvement

Quality Output Checklist and Content Assessment

- Instructional videos, guidelines and checklist available at NeuRA: <https://neura.edu.au/resources-tools/quocca>
- Available on the Declaration on Research Assessment (DORA): <https://sfdora.org/resource/quality-output-checklist-and-content-assessment-quocca-a-new-tool-for-assessing-research-quality-and-reproducibility/>



QuOCCA Quality Output Checklist and Content Assessment			
This checklist is intended for peer-reviewed research papers. It should not be used for reviews, chapters, editorials etc.			
Manuscript Title:			
Manuscript Authors:			
Person submitting this form:			
Date:			
TRANSPARENCY:	N/A	YES	NO
1a. Were the study's hypotheses and analyses plans registered prior to the conduct of the study (i.e. pre-registered)?		<input type="checkbox"/>	<input type="checkbox"/>
b. If so, was the main conclusion reported in the abstract (or summary) based on the primary hypothesis/outcome?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are the primary data accessible to independent researchers on a public website?		<input type="checkbox"/>	<input type="checkbox"/>
3. Is code used for the study available on a public website to allow for reproduction or analysis of data?		<input type="checkbox"/>	<input type="checkbox"/>
DESIGN AND ANALYSIS:	N/A	YES	NO
4. Was ethics approval obtained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5a. Was the sample size based on a formal sample size calculation done prior to starting the study?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. If so, was the planned sample size adhered to?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was data analysis blinded ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
REPORTING PRACTICES:	N/A	YES	NO
7. Are any reporting guidelines specified (such as those found at www.equator-network.org)?		<input type="checkbox"/>	<input type="checkbox"/>
8a. Are all measures of variability defined in figures, tables and text?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Are any data summarised using standard error of the mean (SEM)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. If the SEM is used, are sample sizes specified for all reported SEM?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9a. Were any data excluded?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. If so, was a criterion given?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10a. If null-hypothesis testing of significance was used, is a probability threshold specified for all statistical tests?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. If used, are exact probability values used throughout the report, excluding figure legends?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Are claims made for the importance or significance of results associated with a P-value greater than or equal to 0.05 (or other threshold) i.e. misleading spin of reported results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Welcome to Retractions Australia

Retractions Australia is an online resource dedicated to highlighting data regarding scientific retractions - the removal of published research papers from scientific journals.

This is presented via the Retractions Australia Explorer, which is an interactive tool that allows you to visualise and investigate retracted papers from Australian and New Zealand researchers and collaborators.

Retractions Australia uses data from Retraction Watch, a website founded in 2010 by science journalists Iain Dransky and Adam Marcus.

Retraction Watch has since become a widely recognised resource for tracking and analysing retractions in the scientific community.

[Access the Explorer >](#)



Our Sources

Data used on Retractions Australia is used under license and is shared with permission from the Retraction Watch Database. The Retraction Watch Database is a product of the [Center for Scientific Integrity](#).

[Learn More >](#)

Research Integrity, and why it matters

There is a growing recognition that reproducibility of scientific results

Top 10 Journals/Books

Journal/Book

- PLOS One
- The Periodic Table: Nature's Building Blocks
- The Journal of Biological Chemistry
- Mathematics and Mechanics of Solids
- British Journal of Sports Medicine
- Journal of Crohn's and Colitis
- 2011 International Conference on E-Business and E-Governance
- Scientific Reports
- The Journal of Clinical Investigation (JCI)
- Renewable and Sustainable Energy Reviews

Top 10 Institutions

Institution

- University of Melbourne
- University of Queensland
- University of New South Wales
- University of Sydney
- Monash University
- University of Technology
- University of Auckland
- The Australian National University
- Griffith University Gold Coast
- University of Western Australia

Retractions Australia website

AIMOS 2024: The sixth annual conference of the Association for Interdisciplinary Meta-research & Open Science (AIMOS)

AIMOS Conference 2024

19 to 21 November 2024
ANU, Canberra/Kanbarra

