



Enablers and Inhibitors of Research Integrity

Annex A and B



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### **Summary**

#### ■ Phase 1

- Initial structured search of major databases
- Results screened for relevance to inhibitors or enablers of research integrity
- Screened papers analysed and sorted into thematic groupings

#### ■ Phase 2

- Thematic groups from phase 1 used as basis for targeted search for evidence
- Snowballing and expert recommendations used to extend search
- Results analysed, relevant data extracted, synthesised
- Report constructed via selected summarising of synthesised data

#### ■ Phase 3

- Five corroboratory interviews conducted with a range of stakeholders
- Multiple iterations of feedback via UKCORI including presentation to panel of experts

# Phase 1 - Structured Search Analysis

#### First stage eligibility criteria

All the included papers discuss enablers and inhibitors of research integrity as defined by the Concordat to Support Research Integrity (2019). Enablers and inhibitors are defined as any factors that promote or prevent honesty, rigour, transparency and open communication, care and respect, and accountability for research integrity in the UK research environment.

All the papers have been published within the last ten years (2013-23), and make reference to or show specific relevance to research in the context of the United Kingdom. Both primary and review (secondary) literature were considered for inclusion.

#### **Information sources**

The following academic literature databases were included in the search:

- Web of Science
- PubMed
- Scopus
- PsycInfo

Grey literature databases searched include OpenGrey, and PsychExtra, however due to restrictions on search functionality in these databases the majority of grey literature included in was compiled through consultation with experts and snowballing from the initial list provided by the funder.

#### **Search strings**

Title, abstract and keyword searches for broad level concepts relating to research integrity and facilitators or inhibitors were developed. The terms were arrived at via analysis of the terminology used in the Concordat, and through discussion with the review and quality assurance project team. The search string was adapted slightly for the idiosyncrasies of each database based on the following set of search terms:

- A: 'academic misconduct', 'academic integrity', 'research misconduct', 'research integrity', 'responsible research', 'scientific integrity', 'scientific misconduct', 'scientific fraud', and 'research fraud', 'academic fraud'
- B: 'facilitate', 'motivate', 'incentive', 'enable', 'promote', 'good practice', 'best practice', 'embed', 'strengthen', 'nurture', 'enhance', 'support', 'develop', 'engage', 'barrier', disincentive', 'obstacle', 'challenge', 'difficulty', 'problem', 'bad practice',

Each item within list A and B was separated by the 'OR' Boolean operator, and the two lists are joined by the 'AND' Boolean. Most terms were input in contracted form along with a wildcard symbol (e.g., in place of "facilitate" we have used "facilit\*" to capture any words with this stem).

Database filters were used to restrict the results to publications within the last ten years (01/10/2013-present), and only papers with at least one author based in the United Kingdom.

This search produced a total of 284 unique papers.

#### **Example search strings**

#### Scopus

(((TITLE-ABS-KEY("research ethics" OR
"responsible conduct of research" OR
"responsible research" OR "research integrity"
OR "scientific integrity")) AND TITLE-ABS-KEY
("barrier\*" OR "disincent\*" OR "obstacl\*" OR
"challeng\*" OR "difficul\*" OR "problem\*" OR
"bad practice" OR "facilitat\*" OR "motivat\*" OR
"incent\*" OR "enable\*" OR "promot\*" OR "good
practice" OR "embed\*" OR "strengthen\*")) AND
ALL ("review")) AND (LIMIT-TO (DOCTYPE, "re"
)) AND (LIMIT-TO (LANGUAGE, "English")) AND
(LIMIT-TO (AFFILCOUNTRY, "United Kingdom"))

#### WoS

(((TS=("research ethics" OR "responsible conduct of research" OR "responsible research" OR "research integrity" OR "scientific integrity")) AND TS=("barrier\*" OR "disincent\*" OR "obstacl\*" OR "challeng\*" OR "difficul\*" OR "problem\*" OR "bad practice" OR "facilitat\*" OR "motivat\*" OR "incent\*" OR "enable\*" OR "promot\*" OR "good practice" OR "embed\*" OR "strengthen\*" ))) AND AD=('UK' OR 'United Kingdom' OR 'England' OR 'Scotland' OR 'Wales' OR 'Northern Ireland')

#### **PsycInfo**

("research ethics" OR "responsible conduct of research" OR "responsible research" OR "research integrity" OR "scientific integrity") AND ("barrier\*" OR "disincent\*" OR "obstacl\*" OR "challeng\*" OR "difficul\*" OR "problem\*" OR "bad practice" OR "facilitat\*" OR "motivat\*" OR "incent\*" OR "enable\*" OR "promot\*" OR "good practice" OR "embed\*" OR "strengthen\*" ) AND ('UK' OR 'United Kingdom' OR 'England' OR 'Scotland' OR 'Wales' OR 'Northern Ireland')

#### Filtering and selection process

Using Rayyan, an online systematic literature review tool, we first excluded duplicate results from the various databases. Each of the remaining papers was analysed via title and abstract for inclusion or exclusion. Definite inclusion papers in this stage specifically used one or more of the terms representing research integrity, and reported data (qualitative or quantitative) pertaining to enabling or inhibiting the progress of research integrity on a broad scale.

A second list of potential inclusions (marked 'maybe' in Rayyan) contained papers which addressed more specific areas of research, or were not data driven. Such papers, for example, may have addressed issues of inclusion of different populations of patients in biomedical research, or may have presented more theoretically driven recommendations pertaining to areas of research integrity for which the production of empirical data is difficult such as broad changes in research culture.

Following this initial screening process, a second round of screening was conducted by the review team such that each entry had been reviewed by at least three researchers. All included entries were approved by at least two reviewers. The second round of screening focused on potential policy relevance and applicability to research outside of specific settings. Again, papers marked as 'maybe' in this review stage appeared to contain material less obviously policy relevant, less obviously relevant to inhibitors or enablers of integrity in research, or more specifically focused on narrow areas of research.

#### **Grey literature**

The corpus of grey literature was a combination of a number of methods. Consultation with team members with expertise in the area of research integrity, non-systematic literature searches and snowballing, as well as the initial list provided by the funder, were compiled to produce the set of 11 definite inclusions, and seven potential inclusions. The same conceptual criteria for inclusion outlined above formed the basis of decisions regarding grey literature. The potential inclusions here largely comprised guidance documents from UK institutions. documents from UK institutions.

#### **Search strategy development and limitations**

In arriving at the above search strategy various methods were piloted drawing on the many years of combined experience of systematic literature reviews of our search and analysis team. The choice of the four included academic databases was intended to provide maximum coverage of the breadth of academic literature combined with highly functional search interfaces. Thus, Google Scholar for example, was excluded from our methods due to low customisability of search results, and the opacity of the algorithm which produces the results.

Methods trialled included a hierarchical search structure which incorporated many 'meso-level' terms drawn from the definitions of research integrity outlined in the Concordat to Support Research Integrity, and broad ranging searches which did not incorporate the elements of inhibition or enabling. The final decision was a balance of coverage and pragmatism.

This pragmatism, however, means that the strategy is not without limitations. For example, the only search which included all of the recommended articles provided by the funder was one that included only the broadest level terms relating to research integrity and excluded the enabler and inhibitor terms as well as any restrictions based on location. This search produced over 20,000 results in Web of Science alone, and was, as such, not a viable option as the basis of this review due to time and resource constraints.

#### Thematic analysis

The papers included after the selection processes were subjected to an iterative coding process by which RI relevant content (drawing on the language of the Concordat) of each paper was noted in a shared spreadsheet. The resultant list of 17 initial broad categories (see below), was reduced to the final selection of 8 themes based on the frequency of reference within the reviewed literature.

#### **Initial theme list**

- Training
- Mentoring
- Publishing Null/File drawer
- Data sharing/transparency
- Publication pressure/Emphasis on quality, judged qualitatively
  - Clear specific Guidelines/agreements vs Vague non existent/irrelevant guidelines/low compliance
- Review boards not having capacity/expertise
- Publishing industry standards: peer review/open access/corrections
- Pre registration
- Researcher/quality metrics
- Conflicts of interest
- Funding
- QRPs
- Plagiarism, fraud, retractions
- Social goals/SDGs/outcomes
- EDI/gender
- Publication plans
- Job characteristics security, career opportunities

#### **Selected themes**

- Publication pressure, journal and citation metrics
- Funding
- Training on responsible research practices
- Mentoring
- Pre registration
- Data sharing
- File drawer
- Questionable research practices (later integrated into other sections where relevant)

# Phase 2 - Targeted search and analysis

#### **Targeted search for evidence**

The above list of themes, developed through the structured search, was used as the basis for targeted searches of Google Scholar, Web of Science, and Scopus.

Results from the targeted search were supplemented by drawing on the expertise within the research team, and the list of suggested literature from the funders. This extended corpus, along with the results from the initial structured and grey literature search was also used to snowball relevant literature from references.

#### **Selection criteria**

- Published from 2013 onwards
- Relevant to UK

The initial intention for evidentiary criteria was to include, as far as possible, only papers which provided empirical evidence as to the effectiveness of interventions relevant to the selected themes or to the inhibitory or enabling effect of an extant process or phenomenon. Due to a paucity of such evidence these criteria were expanded to include the large number of papers which produced survey data on stakeholders' beliefs or opinions regarding such interventions.

Where available, papers that presented strong empirical evidence, via meta-analysis or large sample empirical studies, were prioritised.

#### Analysis, data extraction, report construction

The resultant corpus was subjected to targeted analysis focusing on extraction of evidentiary claims for inhibitors of enablers of research integrity. That is, each source was skimmed and searched for key words relating to the above themes, with subsequent close reading of relevant sections. <sup>59</sup> Pertinent information was extracted to shared documents. This information was summarised and synthesised to produce short reports on each of the themes. These formed the basis of the first draft of this report.

### Phase 3 -Review, corroboratory interviews, and redrafting

The initial draft was reviewed first internally by the entire project team, and subsequently by the funding body (UKRI) and the committee of relevant experts (UK Committee on Research Integrity). Comments were immediately addressed where possible or, where requiring more substantial work, compiled to be addressed for the subsequent iteration of the report.

#### **Corroboratory interviews**

Five interviews were arranged with a range of stakeholders through collaboration with the sponsors (the UK Committee on Research Integrity). This included representation from government, industry, and academia, across multiple career stages.

Each interviewee was provided a copy of the draft report. The following interview template was used.

## RI Enablers/ Inhibitors project: interview template

Introduce project and seek confirmation of consent: The UK Committee on Research Integrity has commissioned the UK Reproducibility Network, the UK Research Integrity Office and the Science Policy Research Unit to carry out a review of the available published information on enablers and inhibitors of research integrity. The focus is on evidence relating to the UK research sector and that already synthesises or summarises relevant information and the output of the review will be a policy document to inform the committee and others in the sector.

Following a review of the available literature, we are carrying out a series of interviews to verify and/ or challenge the conclusions of the review. Your perspective on the issues would be invaluable and we would like to invite you to attend a 45-minute online interview, which will be conducted by ames Parry, Chief Executive of the UK Research Integrity Office.

Your participation in the project will be credited in the acknowledgements section of the report, but we do not envisage any direct quotations or directly attributed remarks being included in the report. In this way, you will be able to speak freely about the topics under discussion. No fee will be paid for participation in the interview.

Use of data: your views and responses to interview questions will be used to inform the review report. To aid summarising your views, the meeting will be recorded on UKRI servers, shared with UKRIO, and deleted from both organisations at the end of the project. A written summary will be shared with the project team from UKRN, UKRIO and SPRU, and with the UK Committee on Research Integrity on completion of the project. The recording will be deleted on conclusion of the project and the written summary will not be published or circulated further.

- 1. How much do you agree with/ disagree with the findings of the report?
- 2. Are there any key findings which you strongly agree with?
- 3. Are there any key findings which you strongly disagree with?
- 4. Is there anything in the report which surprised you?
- 5. Is there anything which you were surprised not to find included in the report?
- 6. What was your view of the 'traffic light' system included in the report?
- 7. When the report discusses preregistration and data sharing, it finds that there is an apparent gap between researcher attitudes towards these topics (generally positive about both) and prevalence (fairly low uptake of both across disciplines). What are your views on this apparent gap?

Ask interviewee if they have any other comments

Thank interviewee and close the interview

#### **Final drafting**

A final draft of the report was produced drawing on the feedback from interviews and review panels.





