NUFFIELD COUNCIL ON BIOETHICS

Response to the Science and Technology Select Committee (Commons) Research Integrity Inquiry

Written evidence submitted by the Nuffield Council on Bioethics

April 2017

BACKGROUND

1 The Nuffield Council on Bioethics is an independent UK body that examines and reports on ethical issues arising from developments in biological and medical research that concern the public interest. We welcome the opportunity to comment on the House of Commons Science and Technology Select Committee inquiry into research integrity.

2 The Nuffield Council on Bioethics carried out a project in 2014 that explored the effects of the culture of scientific research in UK higher education institutions in terms of encouraging good, ethical research practice and the production of high quality science.[1] The Steering Group for the project was chaired by Professor Ottoline Leyser (University of Cambridge) and included staff from the Royal Society, Royal Society of Biology, Royal Society of Chemistry, Institute of Physics and Academy of Medical Sciences. Through these organisations we were able to explore the experiences of a large section of the UK research community.

3 The activities of the project included an online survey that received 970 responses (primarily from people who worked for a university or research institution), 15 discussion events co-hosted with universities around the UK involving 740 speakers and participants, and evidence-gathering meetings with funding bodies, publishers and editors of scientific research, and academics from the social sciences. The project findings were published in December 2014. Although the focus of the project was scientific research, the issues considered are likely to be relevant to many other areas of academic research. This response highlights findings relevant to the Committee's key areas of interest.

4 Firstly, however, it is worth highlighting that discussions over the past few years relating to research integrity have increasingly recognised that the culture

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[1] Nuffield Council on Bioethics (2014) *The culture of scientific research: findings from a series of engagement activities,* available at: www.nuffieldbioethics.org/research-culture.

surrounding research, rather than any individual factor or driver, has a strong impact on how researchers behave and the kind of research they pursue.

5   There is also increasing recognition that, as we concluded, there is a collective obligation for all actors in the system to ensure the culture of research supports good, ethical research practice, which in turn supports the production of high quality science. We note that at least 17 of the organisational responses to the Science and Technology Committee's inquiry draw upon the Council's report directly, and a further 20 discuss research culture more generally as a driver of problems relating to research integrity. These responses are from organisations that include funding bodies, universities, learned societies, and publishers. [2]

THE EXTENT OF THE RESEARCH INTEGRITY PROBLEM

6   Before the extent of any problem of research integrity can be assessed, it is important to consider what integrity in research means. We suggest that research integrity encompasses more than simply not committing research misconduct or using poor research methods; it is, rather, the production of research that is of high quality, has been carried out to high ethical standards, and is valuable to society.

7   In describing high quality research, respondents to our online survey selected *rigorous*, *accurate*, *original*, *honest* and *transparent* as the top five words. Respondents working in medicine, engineering, social science and computing included 'ethical' in their top five. Several other components were thought to be important in the production of high quality science, namely: collaboration, multidisciplinarity, openness and creativity.

8   Fifty-eight per cent of respondents to our survey reported that they were aware of scientists feeling tempted or under pressure to compromise on research integrity and standards, although evidence was not collected on any outcomes associated with this. Twenty-six per cent of respondents had themselves felt tempted or under pressure to compromise on research integrity and standards. The figure was higher amongst those aged under 35 years (33 per cent) and lower in those aged above 35 years (21 per cent).

9   Participants at the discussion events we organised at universities around the UK frequently noted that honesty and trust is fundamental to science, and high profile cases of research misconduct may be undermining public trust in science. Participants noted the distinction between research misconduct, such as fraud and fabrication, and other kinds of poor practice,

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[2] See: http://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2015/inquiry6/publications/

such as poor experimental design, and suggested they should be dealt with separately.

CAUSES AND DRIVERS OF RECENT TRENDS

10 We believe there is not a single cause or driver of problems with research integrity. Rather, the many factors that make up the culture of research together influence how researchers behave and the kind of research they pursue. During the course of our project, we found that in many ways the culture of research did not support or encourage scientists' goals and the activities they believe to be important to produce high quality science. As far as we are aware, there have been no significant changes to this situation since 2014, so our conclusions are still relevant today.

11 We identified the following key factors that contribute to the culture of research, which may have an adverse effect on research integrity.

High levels of competition

12 Researchers, particularly those under the age of 45, reported experiencing high levels of competition when applying for funding, jobs and promotions, and in attempting to make discoveries and gain peer-recognition. Many believed that competition can bring out the best in people as they strive for ever better performance, and that science advances more rapidly as a result. It was also thought that high levels of competition go against the ethos of scientific discovery and can create incentives for practices that are damaging to the production of high quality research. These include rushing to finish and publish research, employing less rigorous research methods and increased 'corner-cutting' in research.

Funding

13 There were concerns about a loss of creativity and innovation in science caused by perceived funding shortages, strategically-directed funding calls, short-term funding, and trends towards funding of safer research projects. Short-term funding in particular was suggested to result in a decrease in the time available to plan good research and people cutting corners in their research.

14 We also heard concerns that a focus on impact was resulting in researchers exaggerating the potential application of research in grant proposals and the timescales in which it might be delivered. However, the Research Councils we spoke to emphasised that though they have a duty to explain to the public and the Government the impact of public investment in science, this is done mostly retrospectively, and that, contrary to perceptions amongst researchers we

heard from, applicants were not expected to be able to predict at the application stage the economic or societal impacts that research will achieve.

Assessment of research and researchers

15 Throughout the project we heard that publishing in high impact factor journals is still thought to be the most important element in determining whether researchers gain funding, jobs and promotions. This has created a perceived pressure on scientists not only to 'publish or perish', but to publish in particular journals. In the view of some survey respondents, this may be encouraging the fabrication of data, altering, omitting or manipulating data, or 'cherry picking' results to report. The pressure to publish in certain journals may be resulting in some types of important research findings not being published or recognised, for example, research with negative findings or research that replicates or refutes others' work. It may also be creating disincentives for multidisciplinary research, authorship issues, and a lack of recognition for non-article research outputs.

16 The Research Excellence Framework (REF) exercise, which was underway when we were carrying out our project in 2014, was highlighted as a particular driver of the pressure on researchers to publish their work in high impact journals. Many were unaware or untrusting of the instructions given to REF panels not to make any use of journal impact factors in assessing the quality of research outputs. A review carried out by Lord Stern in 2016 criticised the REF process for tying research quality too closely with individual performance, as opposed to team-based research activity, and recommended that research outputs should be collated at 'Unit of Assessment' level rather than the individual level. [3] This has the potential to encourage institutions to present a diversity of outputs in a more portfolio-oriented approach, rather than only focusing on high impact journal articles. The UK Higher Education Councils have now proposed a number of changes to the next REF that seek to remove incentives to publish in high impact factor journals, such as decoupling staff and outputs in future assessments.[4] A further positive development is the creation of the Forum of Responsible Metrics, which aims to promote the responsible use of research metrics in higher education institutions and, will offer advice to the UK higher education funding bodies on

[3] Stern N (2016) *Building on Success and Learning from Experience. An Independent Review of the Research Excellence Framework*, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/541338/ind-16-9-ref-stern-review.pdf
[4] HEFCE (2016) *Consultation on the second Research Excellence Framework*, available at: http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2016/201636/HEFCE2016_36.pdf

how quantitative indicators might be used in assessing research outputs and environments. [5]

17 The UK Higher Education Councils have also proposed a more structured approach to the assessment of the research environment within the REF. This has the potential to improve the way in which the hard-to-measure and often invisible ways in which researchers contribute to the production of high quality science. This may include mentoring, training, teaching, peer review, university administration, public engagement and contributing to the work of national bodies and policy makers. Almost half of the survey respondents believe provision of professional education, training and supervision in the UK is having a positive or very positive effect overall on scientists in terms of encouraging the production of high quality science.

18 Peer review continues to be recognised as the most appropriate and effective method of assessing research and researchers. Seventy-one per cent of our survey respondents believed that, in terms of encouraging the production of high quality science, the peer review system in the UK is having a positive or very positive effect overall. Concerns were raised, however, about inappropriate reviewer behaviour and shortages of reviewers. New approaches to peer review, such as open peer review, are being trialled by a number of publishers and may help avoid some of these problems.

Career progression and workload

19 Concerns about the challenges of career progression and heavy workloads for researchers on the production of high quality science were raised frequently during the project. Reliance on external funding for job retention was thought to be a further factor driving the 'pressure to publish' discussed earlier. Competitive career paths and heavy workloads were thought to contribute to a culture of short-termism, high levels of stress, a lack of time to think and the loss of talented individuals from academia, which in turn may result in a loss of creativity and innovation and may encourage poor quality research practices. Mentoring of early-career scientists and the provision of appropriate career advice was suggested at several of the events as a possible way to help mitigate anxieties, help researchers be realistic about their prospects for a career in research, and tackle feelings of failure in those who transfer to other sectors.

THE EFFECTIVENESS OF CONTROLS/REGULATION (FORMAL AND INFORMAL) AND WHAT FURTHER MEASURES IF ANY ARE NEEDED;

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[5] See: http://www.universitiesuk.ac.uk/policy-and-analysis/Pages/forum-for-responsible-research-metrics.aspx

WHAT MATTERS SHOULD BE FOR THE RESEARCH/ACADEMIC COMMUNITY TO DEAL WITH, AND WHICH FOR GOVERNMENT

20 Sixty per cent of our survey respondents thought that initiatives that promote integrity in science in the UK, such as codes of conduct, are having a positive or very positive effect overall on scientists in terms of encouraging the production of high quality science. We heard from event participants that *The Concordat to Support Research Integrity* can be a helpful reminder of the importance of ethical values in scientific research.[6] *The Concordat to Support the Career Development of Researchers* was also highlighted as a positive development in improving the way in which researchers are promoted and recruited.[7]

21 However, we suggest that a culture-wide approach should be taken to tackling problems with research integrity. Changing any culture is a challenge. This is not made easier by the fact that the actors in the system we engaged with often expressed the view that problems with the culture of research are outside their control or are someone else's responsibility. We believe there is a collective obligation for these actors to do everything they can to ensure the culture of research supports good research practice and the production of high quality science.

22 This view is widely held across the research community. For example, the Royal Academy of Engineering, in its response to this inquiry, suggests *"Research integrity is in many ways a cultural issue, reliant on the behaviour of many diverse organisations and individuals."* The Russell Group response states: "*Supporting and encouraging a positive RI culture requires all stakeholders in the research lifecycle to collaborate.*" The response from the Committee on Publication Ethics (COPE) says: *"Effective collaboration is the only real way to address the system-wide issues at the heart of this problem."*

23 As part of their contribution to a collective obligation, we provided suggestions for action to funding bodies, research institutions, publishers and editors, professional bodies and individual researchers. Many of the issues had already been identified and steps being taken to address them. We presented our suggestions, and the evidence that supported them, as encouragement for this work to continue, but also to emphasise that a collective and coordinated approach is likely to be the most effective. Examples of our suggestions for action include:

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[6] Universities UK (2012) *The Concordat to Support Research Integrity*, available at: http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2012/the-concordat-to-support-research-integrity.pdf

[7] Vitae (2008) *The Concordat to Support the Career Development of Researchers. An Agreement between the Funders and Employers of Researchers in the UK,* available at: www.vitae.ac.uk/policy/vitae-concordat-vitae-2011.pdf

- **Funders:** ensure funding strategies, policies and opportunities, and information about past funding decisions, are communicated clearly to institutions and researchers; and provide training for peer reviewers to ensure they are aware of and follow assessment policies.

- **Research institutions:** cultivate an environment in which ethics is seen as a positive and integral part of research; ensure that the track record of researchers is assessed broadly; and provide mentoring and career advice to researchers throughout their careers.

- **Publishers and editors:** consider ways of ensuring that the findings of a wider range of research meeting standards of rigour can be published; consider ways of improving the peer review system; and consider further the role of publishers in tackling ethical issues in publishing and in promoting openness among scientists.

- **Researchers:** actively contribute to the adoption of relevant codes of ethical conduct and standards for high quality research; use a broad range of criteria when assessing the track record of fellow researchers; and engage with funders, publishers and learned societies to maintain a two-way dialogue and contribute to policy-making.

- **Learned societies and professional bodies:** promote widely the importance of ensuring the culture of research supports good research practice and the production of high quality science; and take account of the findings of this report in relation to guidelines for members on ethical conduct and professionalism.