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The voice of Australia's future scientific leaders



Australian Academy of Science

Submission to the Inquiry into Funding Australia's Research by the EMCR Forum of the Australian Academy of Science

Executive Summary

Early- and mid-career researchers have identified the following key issues with research funding: administrative burden, the need to address systemic bias and the need to enable cross-sector mobility through the research funding system.

The current funding systems requires researchers to complete lengthy applications. Low success rates result in researchers making multiple applications across various schemes to fund the same project. This contributes to high administrative burden on researchers taking excessive time away from their core work of performing research. Administrative burden can be reduced by decreasing the length of applications and adopting a single format track record which is centrally lodged online and can be used for multiple schemes. Furthermore, expanding the interpretation of a successful track record to encompass diverse career pathways and decreasing the relative weighting of track record will help to address systemic bias in the system as well as enable cross-sector mobility.

In addition to these measures we recommend monitoring and reporting funding success rates for underrepresented minorities as we now do for gender, and rewarding institutions who implement successful minority and diversity policies. The ARC's Research Opportunity and Performance Evaluation (ROPE) framework should be expanded to encompass factors that negatively impact on the ability of individuals from underrepresented minorities to establish a competitive track record.

The government is also in a position to positively influence cross-sector mobility by allowing provisions for academic and government staff to hold joint appointments or spend time working in industry to build collaborations and relevant research outputs. Furthermore the government should mandate real flexible employment options (e.g. part time, job share, flexible hours), with minimum employment terms to counteract the increasing casualisation of the STEM workforce.

About the Early- and Mid-Career Researcher Forum of the Australian Academy of Science.

The Australian Academy of Science [Early- and Mid-Career Researcher Forum](#) (The EMCR Forum) is the national voice of Australia's emerging scientists, representing researchers who are up to 15 years post-PhD (or other research higher degree), irrespective of their professional appointment. Our membership is comprised of over 3,500 individuals employed in science, technology, engineering and mathematics (STEM) research positions in academia, industry and government. The EMCR Forum engages with early- and mid-career researchers (EMCRs) from around Australia and advises the Australian Academy of Science on issues relevant to EMCRs, to help inform policy recommendations to government and to support EMCR professional development and networking activities. The EMCR Forum liaises with other national organisations to positively contribute to both Australia's scientific research and the future careers of emerging research experts. The Forum provides a vital connection between Australia's most eminent scientists and tomorrow's future scientific leaders.

Introduction

EMCRs in Australia have a high degree of concern about the prospects for establishing and sustaining STEM research careers in Australia. This encompasses uncertainty about how to collaborate across and move between different sectors, fears about the casualisation of contracts and job stability, issues affecting the ability of emerging researchers to access funding allocated through competitive processes, and concerns about the subsequent impact of these factors on mental health and wellbeing. The EMCR Forum is also taking the lead on national discussions to improve representation of minority scientists in Australian research. We are building on the [Science in Australia Gender Equity \(SAGE\)](#) Initiative to consider how we can make science inclusive, driving discovery and innovation by supporting equity and diversity. Addressing these considerations **is crucial for future-proofing Australia's capacity to conduct world-class research and development in STEM. This has important implications for our economy, society and environment in a rapidly changing world.**

To prepare this submission, EMCR Forum members were surveyed to identify key challenges and opportunities for improving the administration of Australia's research funding. We have opted to specifically address the following point from the Terms of Reference: *opportunities to maximise the impact of funding by ensuring optimal simplicity and efficiency for researchers and research institutions while prioritising delivery of national priorities and public benefit.*" A total of 93 responses were received, which have been collated with respect to the key themes described above.

"The current funding models are so competitive (way beyond what is required to get world class research) that they are not good for work life balance and mental health of researchers."

Quote from EMCR Forum Survey.

Administrative burden

Australia's early and mid-career researchers in academia experience a high administrative burden when applying for funding in highly competitive schemes with a low success rate. Currently, it takes a significant investment of time to prepare submissions for funding through the various funding schemes available. Taking the Australian Research Council (ARC) as an example the Discovery Early Career Researcher Award (DECRA) and the Discovery Project schemes are those most relevant to EMCRs. In 2017 the success rate was 16.7% for DECRA applications and 17.8% for Discovery Projects. The administrative burden is related to a combination of elements in the application process. Full

applications (100-200 pages) are required for assessment. These are time-consuming to prepare due to their size and formatting requirements, as well as appropriate institutional compliance checking. EMCRs feel that the time spent applying to these schemes does not represent reward for effort, and that this takes them away from the “core business of research”. The administrative burden is also felt by established researchers in academia due to the above application process, cumbersome assessment process and sheer volume of applications. Increased overall funding for research may act in the long term to improve success rates, decreasing the relative administrative burden on researchers and improving their perceptions of competitiveness, resulting in fewer exiting the sector. More acute impacts on administrative burden could be achieved by **streamlining across multiple schemes by adopting a single format track record which is centrally lodged and stored online**. In addition the entire application should be simplified and shortened. A number of approaches could be taken to achieve this and these should be thoroughly investigated. One example is to implement a two-stage process, whereby prospective applicants submit a short expression of interest based on key criteria to be assessed and only complete a full application if they progress to the next round.

"Most funding schemes for EMCRs are just on the brink of not being worth it - e.g if a DECRA takes 3 months to write and has 18% chance of success, it will on average take 16 months [of your time] to get one. Stricter, less time consuming entrance requirements would be beneficial."

Quote from EMCR Forum survey.

Funding bias

Biases inherent in funding processes create a higher administrative burden for EMCRs, particularly women and underrepresented minorities. Proactive efforts to foster diversity and inclusion in STEM are vital for the future of scientific research in Australia. Systemic bias should be viewed as an inefficiency in the system which creates barriers to the full participation of some individuals in the sector.

Data from the [Selection Report for ARC Discovery Projects 2018](#) (Figure 1) demonstrates an imbalance in this particular scheme: at all career stages, men outnumber women as named chief investigators on proposals, with much greater than twice as many men as women EMCRs (up to 15years post-PhD) named on proposals. Similar trends exist in data relating to ARC DECRA and Future

Fellowships, and this data reinforces the recurring themes from our survey which relate to competitive funding schemes more widely. This include **the perception of bias in grant allocation, poor evaluation of track record relative to opportunity in funding assessments, and a dominance of privileged “gatekeepers” leading to a significant disadvantage for women and minorities in the competitive funding process.**

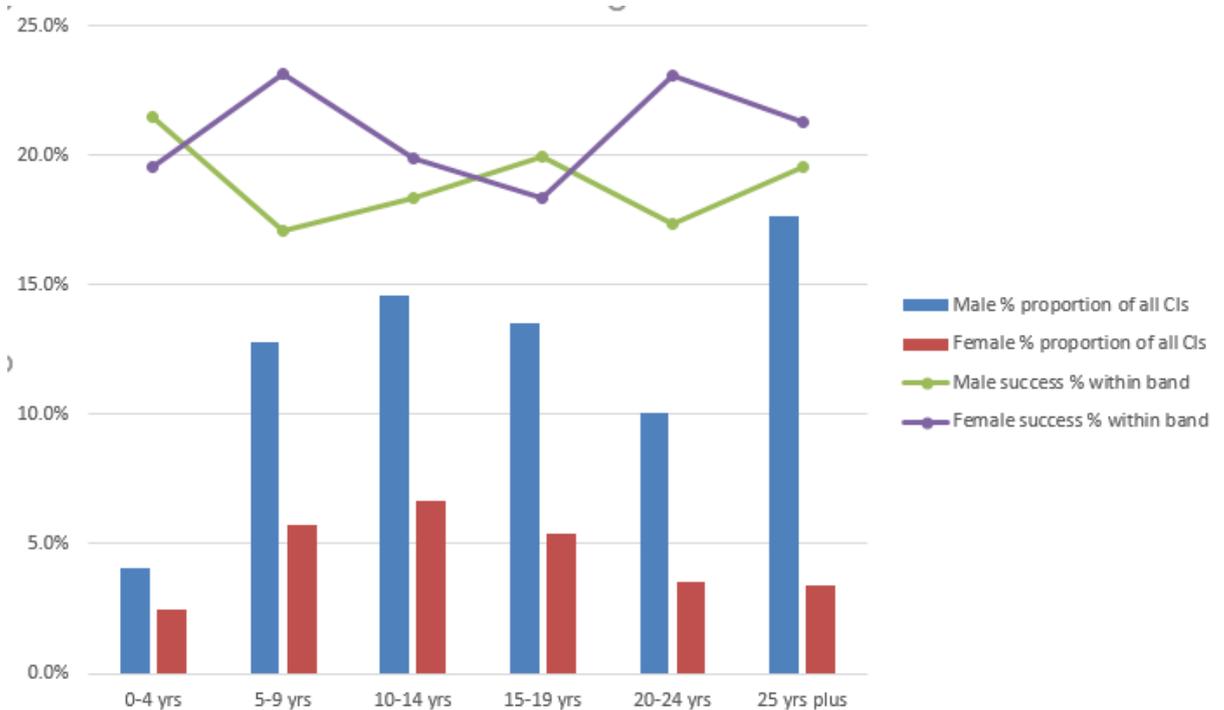


Figure 1: Participation and success rate of Chief Investigators (CIs) in Discovery Projects 2018 by gender and career age Percentage breakdown of listed investigators on submitted ARC Discovery Project proposals (column graph), in each bracket of years since completing their PhD; and, the respective success rate for male and female applicants (data points) in each year bracket. Note that EMCRs are considered up to 15 years post-PhD. Reproduced from <http://www.arc.gov.au/selection-report-discovery-projects-2018> on 26 June 2018.

When considering the administrative burden imposed by the current government funding schemes, it is important to also acknowledge that systemic bias leads to a disproportionately increased workload for disadvantaged individuals. In order to be awarded competitive funding, individuals from underrepresented groups will need to submit more applications on average to be successful. This has flow-on effects for their ability to spend valuable time on the research required to demonstrate track record. This may eventually discourage them from applying and results in loss of highly skilled individuals from the sector. Since innovation is underpinned by diversity of thought, it is crucial that Australia’s STEM research workforce is broadly representative of our population demographics. This is not the current reality, and **it is vitally important to**

address these biases within the system to ensure that our economy can benefit from awarding research funding in a fair and equitable way.

Compounding this, marginalised EMCRs are often the individuals who advocate for improved conditions and policies that will support their inclusion, which is an additional administrative burden over and above the application process. An example of this is that women are the predominant drivers of SAGE self-assessment teams and initiatives. Opportunities to counter this include:

1. Measuring and reporting success rates for underrepresented minorities as we now do for gender
2. Rewarding institutions who implement successful minority and diversity policies. As the SAGE program matures, accreditation through the Athena SWAN Charter could be considered as a prerequisite for institutions wishing to apply for government funding schemes. Both the United Kingdom and Ireland have indicated that similar requirements will be applied to their funding schemes in the future.
3. Considering how the Research Opportunity and Performance Evaluation (ROPE) framework used by the ARC can be expanded to encompass factors that negatively impact on the ability of individuals from underrepresented minorities to establish a competitive track record (see also the EMCR Forum's [submission to the ARC's consultation on ROPE](#)).
4. Reduce the weighting on track record, so that proposals are judged primarily on scientific quality, innovation, benefit and feasibility considerations.

While decreasing administrative burden in relation to research funding will have positive outcomes for women and underrepresented minorities, caution must be exercised in how this is achieved such that it does not further discourage the submission of applications. For example mechanisms which act at the institutional level to decrease overall number of applications submitted to funding bodies must be accompanied by strong guidelines for institutions to ensure that equity and diversity is not compromised at this stage.

Workforce Casualisation

Casualisation of the STEM workforce contributes to the loss of talent from the sector. A lack of medium- to long-term certainty about employment and funding continuity presents significant barriers to research, disincentivising long term projects and planning, discouraging risk taking and innovation in the research undertaken, and driving researchers to exit the sector. Together these

can seriously undermine the objectives of government research and development investment. This situation also biases the STEM workforce to those who can weather the uncertainty, disadvantaging further those already subject to other systemic biases. EMCRs who exit research as a result may be lost from the sector entirely, adding to a significant loss of previous investment in skills, training and education. If all federal research and development spending were to **mandate real flexible employment options, with a minimum employment term, it would go some way to addressing the economic loss associated with casualisation**. Providing flexible employment with security of longevity will allow these well-trained professionals to have greater engagement in our economy.

"The future for research as a career in Australia is bleak. The level of competition requires a level of dedication and sacrifice that exceeds most competitive industries - yet the opportunity for continuing employment is uncertain"

Quote from EMCR Forum survey.

Collaboration and mobility

EMCRs in STEM have a strong desire for cross-sector collaboration and mobility, but face barriers that prevent this from occurring. There are several funding schemes that aim to promote research interactions between scientists in academia, industry and government. Our survey identified a need to promote the available opportunities more widely, something the EMCR Forum is well positioned to assist with. EMCRs in academia who have collaborated with industry partners identified protracted funding cycles as a significant impediment to establishing research projects. Schemes based on co-investment (such as ARC Linkage and CRC-P) can take up to six months from submission to announcement, yet many businesses cannot commit funding based on these cycles. Academia operates on slow timelines and suffers from a lack of agility to respond to industry needs. Dealing with university or government department "red tape" can discourage industry partners from participating in joint funding arrangements. Challenges were described in relation to negotiating contracts and intellectual property agreements. This may suggest a role for the [Industry Growth Centres](#) in assisting to traverse these issues. **EMCRs expressed a desire for training and targeted support to reduce the administrative burden associated with establishing cross-sector research partnerships**. The EMCR Forum's [Kick-starting Collaboration](#) project provides EMCRs with advice

on cross sector collaboration and includes recommendations on how to [support a culture of engagement](#), including aspects like training for EMCRs.

Whilst industry engagement is increasingly encouraged in the sector, the metrics by which research funding is assessed and awarded have not kept pace with this change. This has resulted in a continued emphasis on publication of “high impact” journal articles as the most important determinant of a “successful track record” and thus success in research funding schemes. As a **result there is a strong perception that pursuing industry focused projects and/or seeking employment in the industry or government sectors will be detrimental to the long-term career prospects of EMCRs. This has implications for Australia’s innovation agenda and our ability to solve the grand challenges we face as a nation.**

Several solutions were proposed to incentivise cross-sector research and mobility. These will also have a positive effect on EMCR concerns about administrative burden, career stability and STEM research workforce diversity. There was **strong support for expansion of the definition of what a successful track record looks like** for EMCRs who apply for ARC funding. For example, this could consist of a one-page statement describing the relevance of an applicant’s top five outputs in the last five years to the proposed research (allowing for relative to opportunity assessments to be applied). To build on this theme, we suggest that a **reduction in the relative weighting of track record during assessment would shift the focus towards funding of good ideas, while also streamlining processes and addressing key factors that contribute to inequity of funding allocation.** We note that the CRC-P merit criteria do not include a track record assessment, and grants can be used to cover salary costs. These are two important differences to the ARC Discovery Project criteria that allow funds to be used flexibly and according to specific needs.

EMCRs expressed a desire for flexible opportunities that promote mobility and value diverse experience. Under the current system, the time taken to establish meaningful cross-sector relationships is not accounted for. Suggestions included provisions for academic and government staff to hold joint appointments or spend time working in industry to build collaborations and relevant research outputs. **A targeted Fellowship scheme specifically for this purpose would promote a focus on innovation and provide career stability** while also still ensuring competitive grant funding (e.g. ARC Discovery or Linkage) is used to cover operational costs.

Conclusion

Australia's early- and mid-career researchers have provided detailed feedback on the administration of Australia's research funding, including first-hand experience of problems and a range of potential solutions. The EMCR Forum believes that a critical first step is for research funding agencies to acknowledge and begin to work towards addressing the issues raised here: the high administrative burden on EMCRs, inequities faced by women and underrepresented minorities, barriers to cross-sector mobility and collaboration, and the increasing casualisation and short-term nature of research positions. We have raised a number of possible ways of beginning to deal with these issues and are available to work with decision makers in government, academia and industry to develop these further in the interests of a strong and healthy Australian science sector into the future. Reduced administrative burden leading to greater sector participation has positive benefits for many more highly skilled individuals contributing to Australia's economy and participating in Australian society - a benefit for all.

This submission was prepared by Dr Róisín McMahon, Dr Carly Rosewarne, Associate Professor Drew Evans and Dr Sandra Gardam on behalf of the EMCR Forum Executive. Dr Renaud Joannes-Boyau provided assistance in analysing survey results.