Building Capacity and Broadening Capability

Grant program evaluation report

10 August 2026

Contents

Executive summary

This evaluation report provides the results of a series of analyses of NHMRC grant data, investigating long-term trends in the types of researchers and research being funded. The purpose of these analyses was to determine the extent to which NHMRC is supporting the research capacity and capability needed to underpin a world-class national health system.

Findings

Key findings of the analyses are as follows:

Capacity analysis

- Over the past three decades, although absolute levels of funding for the Medical Research Endowment Account (MREA) have increased in real terms, so too has the average funding amount for grants, and applicant success rates have dropped.
- The number of distinct Chief Investigator As (CIAs) being funded each year reached a peak about 2010 and has since declined to not far above its 1990 level.
- The number of new (first-time) CIAs being funded each year is about the same now as it was in 1990, but from the mid-1990s to the early 2010s it was about double the current level.
- As a proportion of total funded grants, new CIAs have been declining over the past two decades.
- While the number of CIAs at all career stages has been declining over the past two decades, early-career researcher (ECR) numbers have declined the most.
- Over the period of about 20 years, ECR CIAs have gone from being awarded the greatest to the fewest number of grants.
- As a proportion of all funded researchers, ECRs have been in almost continual decline since 2000.
- The number of Aboriginal and Torres Strait Islander (henceforth First Nations) CIs and CIAs receiving grants each year has increased steadily since 2000 and in 2021 reached the percentage of the Australian population identifying as First Nations.
- The proportions of grantees identifying as women and men have been gradually converging over the past two decades such that there is now only a negligible difference at all levels besides Investigator Grants leadership level 3 (L3).
- As a proportion of state/territory population, there have been consistently more grantees from Victoria (VIC) than other states, and the success rate of applicants from VIC has been consistently higher than for applicants from most other states.
- Over the past five decades, the application success rates for all states besides the Northern Territory (NT) have been converging. The success rate for applications from NT is substantially higher than that of the other states/territories.
- Group of Eight (Go8) universities have been receiving the majority of MREA funding over the past two decades.

Capability analysis

- Over the past three decades, the proportion of grants awarded to support basic science research has been higher than for health services, public health or clinical medicine research. However, the proportion of grants for these latter research areas have been gradually increasing over this time.
- Over the past two decades, the number of Fields of Research (FoR) being funded has increased, with no particular FoR being consistently funded more than others.
- Funding levels for various disease areas have generally been stable over the past two decades, with research relating to cancer and cardiovascular diseases generally receiving the most funding.
- Grants are not routinely classified by health population[1]. However, analysis based on population-related keywords used in grant applications indicates that funding associated with different health populations has remained relatively stable over the past two decades, with research relating to children and women receiving the highest levels of funding.

Next steps

The evaluation has identified several opportunities to enhance understanding of NHMRC's grant program outcomes and strengthen the evidence base for future policy, program and evaluation activities. The following next steps are intended to build on these findings and support evidence-informed decision-making and ongoing grant program improvement:

- undertake further analysis of the trends identified to better understand their underlying drivers and assess whether there are implications for existing policy settings, future policy development, or program design
- consult NHMRC Council and Principal Committees and the broader sector on the development of future evaluation questions, methodologies and data collection approaches, ensuring evaluations remain relevant, evidence-based and aligned with strategic priorities
- investigate opportunities to incorporate external data sources to complement NHMRC's existing data holdings. This could include sources such as OpenAlex, which may provide additional insights into observed trends and strengthen the evidence base for future evaluations
- assess performance against the remaining grant program objectives (addressing current and future health challenges, supporting research of unique importance to Australia) by undertaking targeted analysis to determine the extent to which the program is achieving its intended outcomes and to identify areas requiring further attention

Going forward NHMRC will work to ensure our data collection and evaluation activities align with and support the goals, focus areas and outcomes of the National Health and Medical Research Strategy, working with partners across government and the research ecosystem.

[1] Health populations were identified using keywords relating to specific population groups (e.g. women, woman for women's health) and population-specific diseases (e.g. gynaecological cancer for women's health) contained in grant applications. Grants may be relevant to multiple populations and not all grants included population-specific keywords. Consequently, these results should be interpreted as indicative rather than comprehensive measures of funding by population.

Introduction

As set out within NHMRC's grant program overview, NHMRC's grant program has three main objectives. These are to:

- ensure Australia undertakes the research needed to meet current and future health challenges, improving population health, patient outcomes and the effectiveness and efficiency of the health system
- ensure Australia has the research capability and capacity needed to underpin a world-class national health system
- support research of unique importance to Australia that is unlikely to be undertaken elsewhere.

The intended outcomes of this support are a national health system that is:

- increasingly effective and efficient in meeting current health challenges
- innovative and agile enough to respond to emerging and unforeseen health challenges
- able to support needs of unique importance to Australia and the public.

With respect to the first objective, it is through independent peer review that NHMRC ensures that it is funding the research that is needed, while NHMRC's primary mechanism for evaluating success in this regard is the Impact Case Studies. Each case study demonstrates how NHMRC-funded research has addressed a particular health challenge.

The third objective is evaluated through a range of (usually bespoke) mechanisms. Examples of evaluations of the third objective include:

- Road Map 3 report card
- Evaluation of large scale priority-driven grant opportunities

Performance against the third objective may also be demonstrated using case studies. Examples include:

- Discovering Ross River Virus
- Treating chronic childhood cough
- Safer birthing for First Nations families.

It is an evaluation of the grant program's second objective – ensuring that the national health system is underpinned by sufficient research capability and capacity – that is the focus of the present report.

Methodology

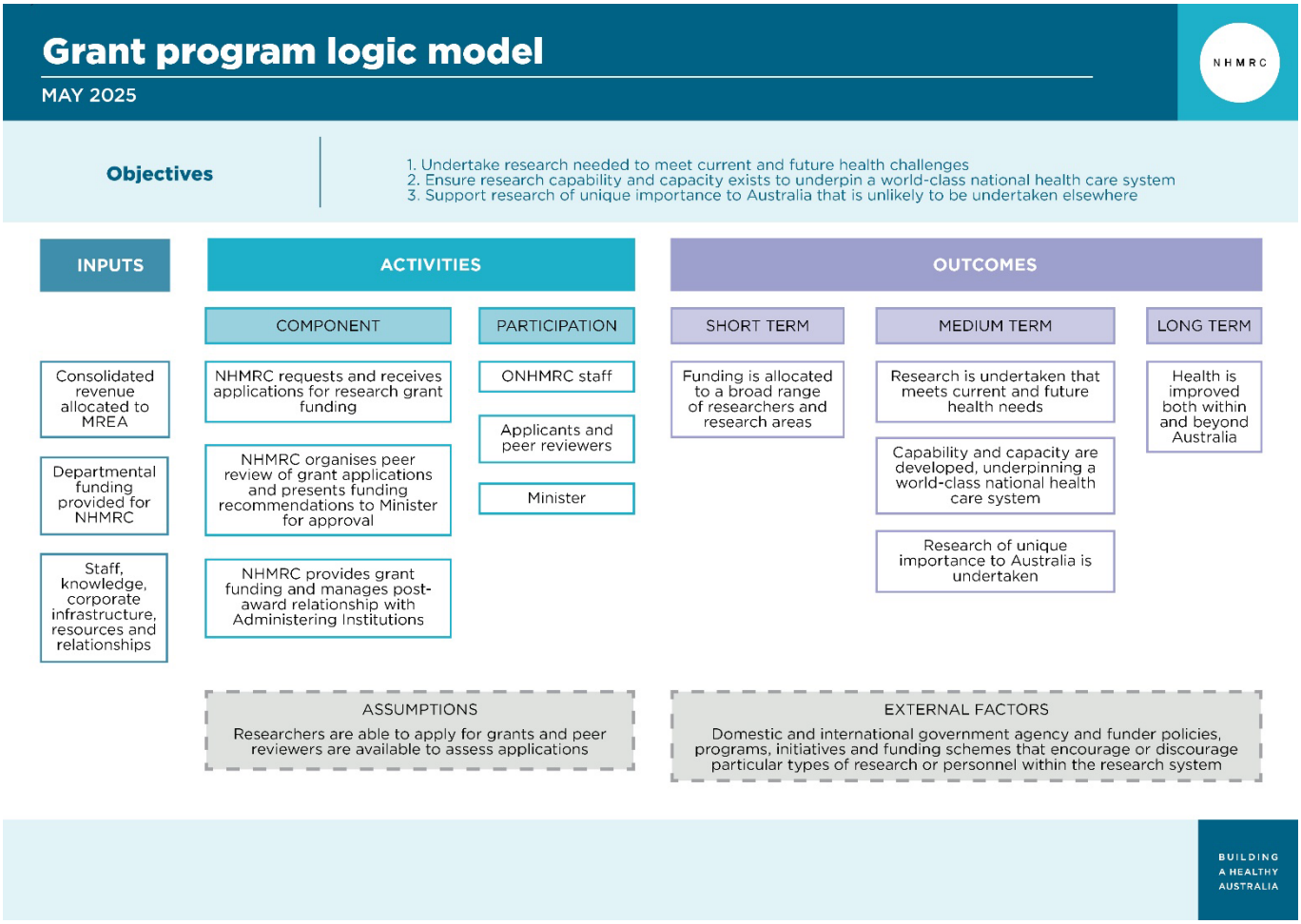
The Building Capacity and Broadening Capability (BC2) methodology enables the comprehensive quantitative evaluation of outputs arising from NHMRC's grant program. It complements the predominantly qualitative and selective approach used for the outcome and impact evaluations provided by the Impact Case Studies.

The BC2 methodology is based on the understanding that a key purpose of NHMRC's grant program — both currently and historically — is to develop sufficient capacity and broad capability

within Australia's health research system.[2] In this context, capacity refers to the number and characteristics of researchers while capability refers to types of research activities.

The process through which NHMRC's objectives are expected to be realised is summarised within the logic model at Figure 1.

Figure 1. Grant program logic model



NHMRC operates on the assumptions that:

1. teams of researchers and health-system workers, whose work is relevant to all areas of the national health system, are able to apply for NHMRC funding and will do so when appropriate
2. funded research teams will seek to generate important new knowledge and, where possible, to translate and implement it through one or more pathways to impact

[2] As an example of a past recognition of this goal, the 2016 Structural Review of NHMRC's Grant Program Consultation Paper lists 'National researcher capability' as a major objective of the grant program. Notably, the other listed objectives (Research excellence, Research breadth, Research translation, Collaboration and partnerships) could all be understood as descriptions of the type of national researcher capability that is desired.

3. the implementation of this new knowledge will contribute to improvements to health and wellbeing.

Given these assumptions, NHMRC's primary goal with respect to the administration of its grant program is to remove any obstacles or barriers (actual or perceived) that may prevent research teams from applying for or receiving funding. NHMRC also seeks to ensure that it does not embed obstacles within the program and that it removes them when they become apparent.

Since NHMRC commenced operations in 1937, the organisation has kept records regarding various dimensions of the grants that it has awarded. These records now form part of NHMRC's grants dataset and include:

- dimensions related to people and their institutions, such as:
  - career stage and grant funding history
  - academic titles and names
  - gender and First Nations identification
  - Administering Institution
  - Administering Institution state/territory location[3] and institution type.
- dimensions related to research projects such as:
  - Fields of Research (FoR)
  - Broad Research Areas (BRA)
  - disease areas and health populations
  - research topics and keywords.

Each dimension consists of two or more categories. For example, the BRA dimension includes the categories Basic Science Research, Clinical Medicine and Science Research, Health Services Research and Public Health Research.[4]

The BC2 methodology involves analysing data relating to each dimension to determine whether, over time, funding has become more broadly spread among the categories within the dimension, or more concentrated.

Where restrictions to capacity building or to capability breadth appear to exist, this could suggest that obstacles to NHMRC grant application or grant attainment exist. Follow-up evaluations may then be conducted to investigate whether a restriction genuinely exists and, if it does, to suggest options for rectification.

The evaluation reported here was predominantly undertaken between November 2023 and December 2024, using the latest available data. Refinements to the evaluation, as well as consultations on or related to the evaluation involving NHMRC's Research Committee and other groups, have been undertaken since that time.

The analyses in this report are presented in two separate sections. The first deals with analyses of capacity (people) while the second deals with analyses of capability (research areas). There is a degree of overlap between the categories of capacity and capability, however evaluations have been grouped in this way to provide clarity.

[3] Notably, this is not necessarily where the research takes place. NHMRC has not been collecting this type of data.

[4] Refer Australian standard research classifications and research keywords

The purpose of this report is to indicate long-term trends rather than explain short term fluctuations. Consequently, while the presented graphs may contain peaks and troughs these are only discussed and analysed when their causes are understood and appear relevant to the broader questions being asked by the evaluation.

Capacity analysis

Several types of information are relevant to understanding how NHMRC has supported research capacity development over time. These include information on numbers of distinct researchers in the NHMRC-funded workforce, the number of new researchers entering the NHMRC funding system and the career stages of those being funded.[5] They also include information about First Nations researchers, researcher gender and location.

Distinct researchers

During the period 1990 to 2022 and in real terms[6], the amount of MREA funding that NHMRC delivered as grants increased from $307 million to $838 million. During this same period the number of grants that NHMRC funded each year increased from 494 to over 1,000 in 2011, before steadily decreasing to 659 by 2022 (Figure 2).

The drop in number of awarded grants in 2019 can be attributed to the introduction of the current grant program. Notwithstanding the changes in number of grants awarded, the average funding amount per grant more than doubled from 1990 to 2022, increasing from $0.62 million to $1.38 million (Figure 3). The increase in average grant amount in 2019 was due to the introduction of the current grant program and Investigator Grants' research support packages of up to $3 million.

From 2010 to 2022, the success rate of NHMRC grant applicants decreased from 25.9% to 14.6% (Figure 4).

[5] The data used in the analyses below were sourced from the NHMRC grants dataset. The grants dataset provides information on the amount of funding allocated out from the MREA by NHMRC. These numbers will be different to those listed in the Australian Government's Science, Research and Innovation Budget Tables, which specify the amount of total MREA funding received by NHMRC from the government during any given financial year. All dollar amounts listed in this section (including figures) have been adjusted for inflation and shown in 2022-23 dollars.

[6] That is, these amounts have been adjusted for inflation, indexed to 2022-23 dollars.

Figure 2. Total MREA funding (2022-23 dollars) and number of funded grants by year, 1990-2022

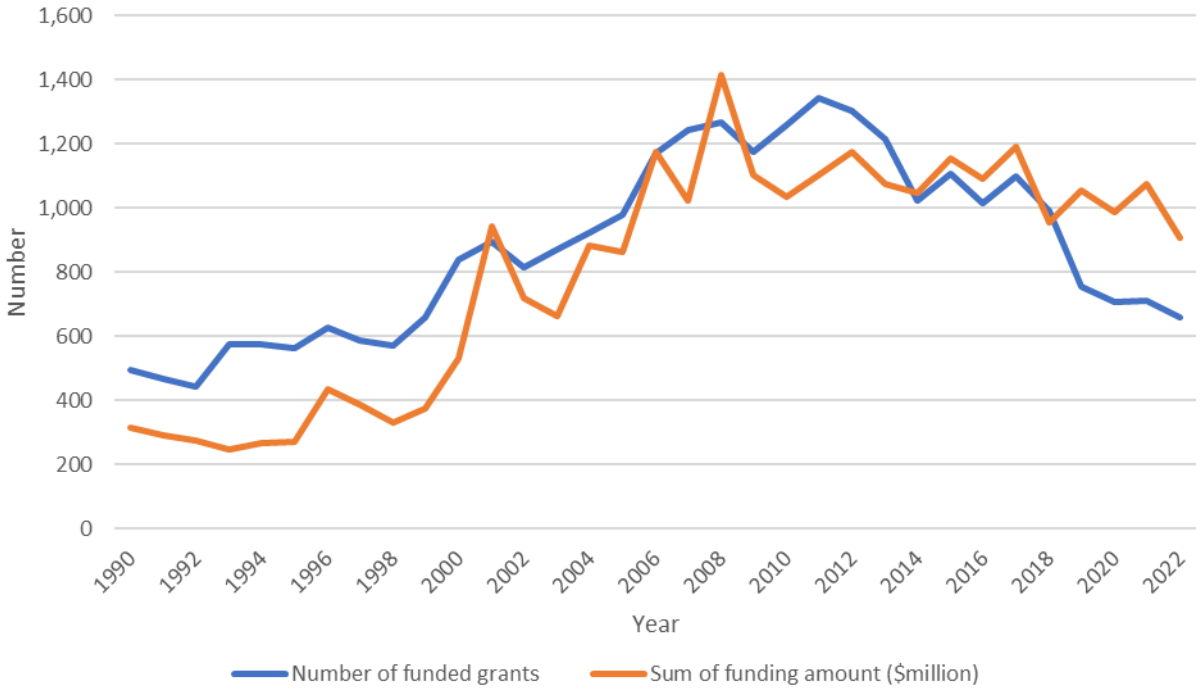


Figure 3. Average funding amount (2022-23 dollars) per grant, 1990–2022

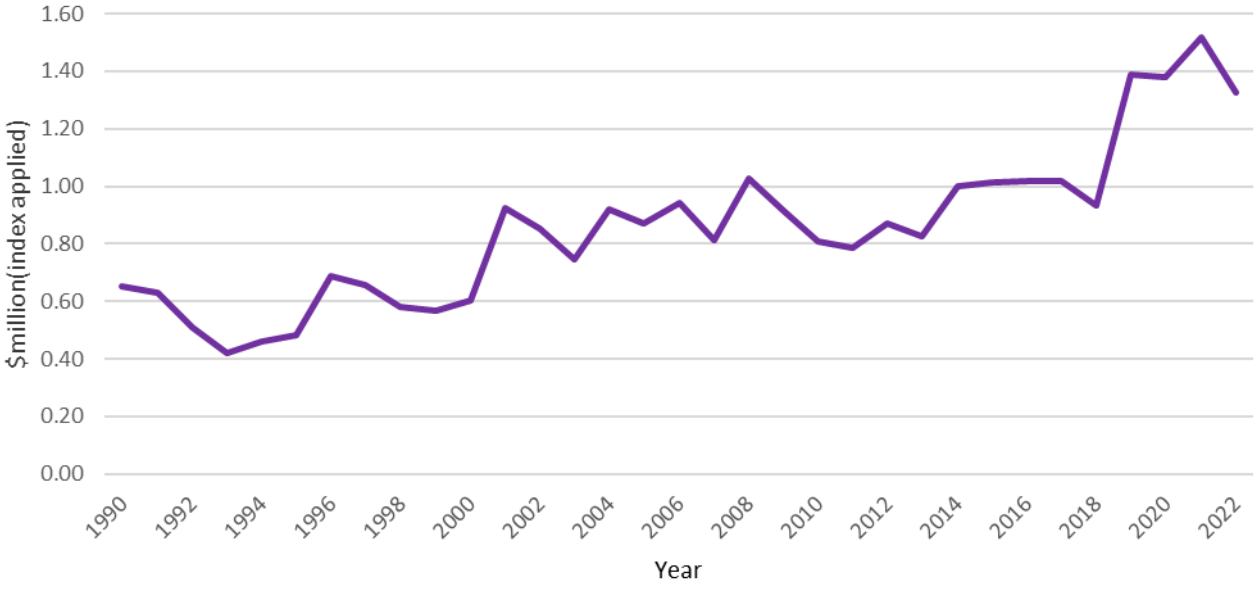
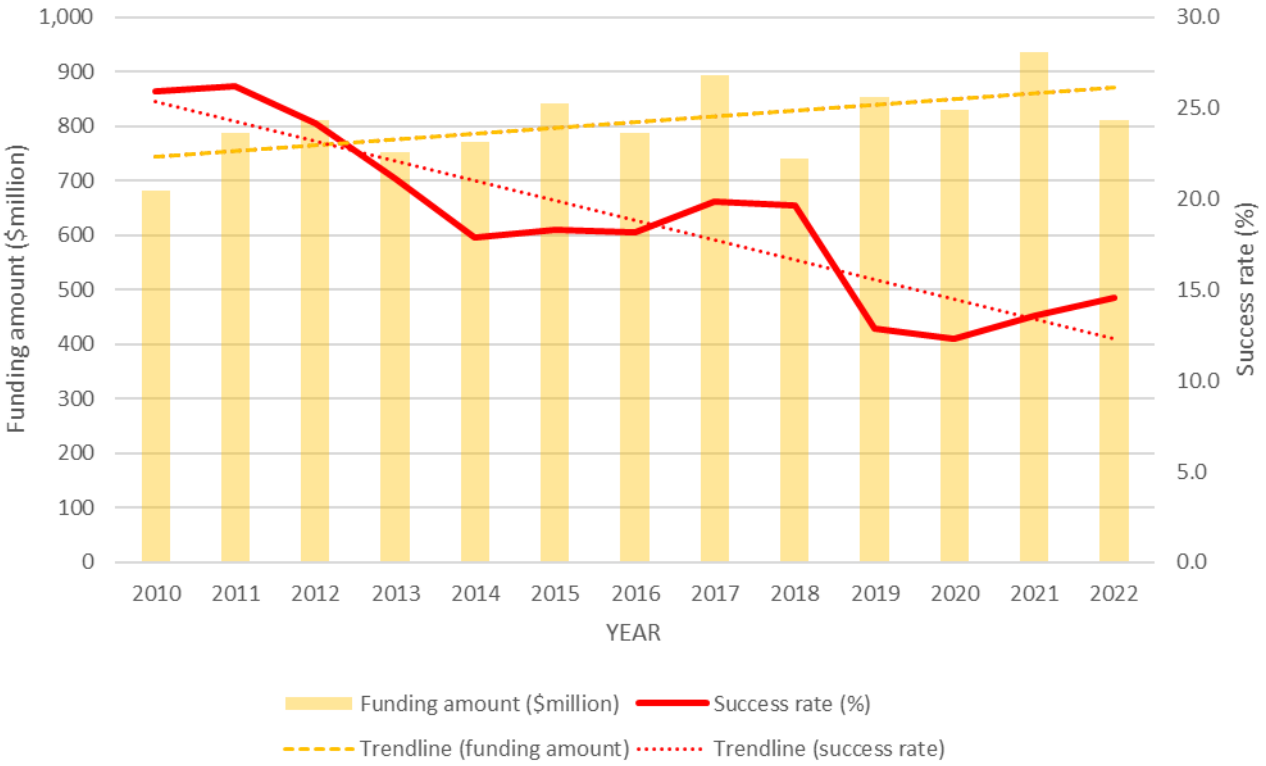


Figure 4. MREA funding and applicant success rates by year, 2010-2022



The trends shown in Figures 2 and 3 are repeated when looking at the number of unique[7] CIAs and NHMRC grant funding per CIA over time.

From the 2011 peak of 1,143 unique CIAs receiving NHMRC grant funding there has been a steady decline each year with only 564 unique CIAs receiving funding in 2022 (Figure 5). During this same period, the average amount of grant funding per unique CIA more than doubled, increasing by $0.69 million (Figure 6).

[7] 'Unique' means each individual CIA is only counted once per year, regardless of how many grants they have received during that year.

Figure 5. Number of unique CIAs by year, 1990-2022

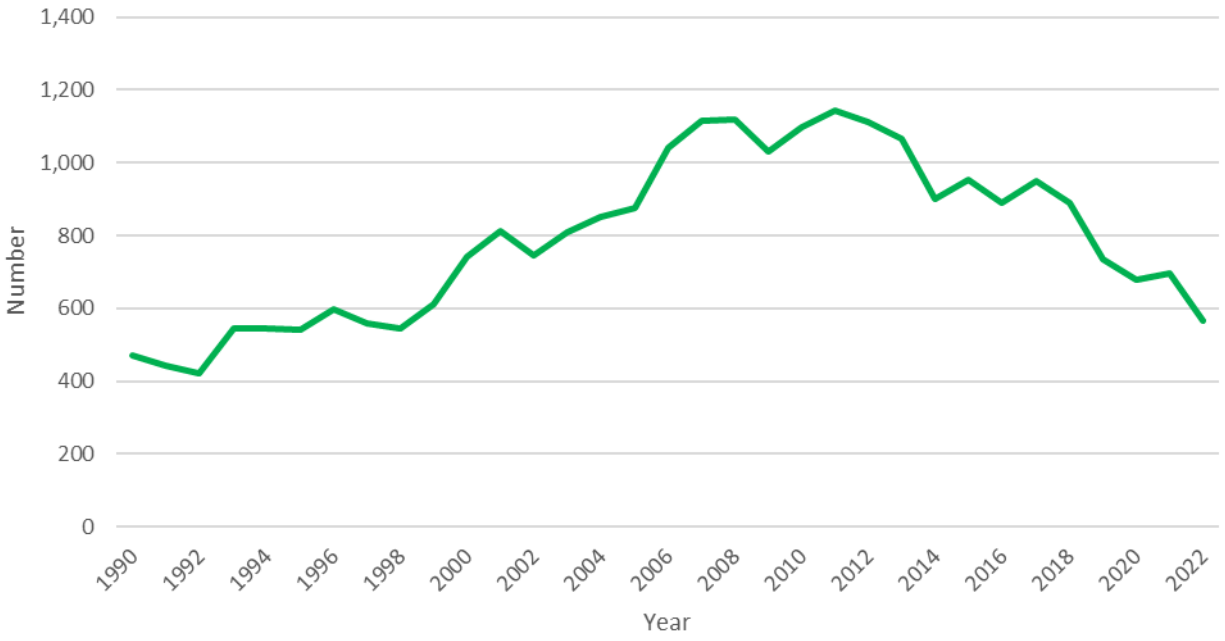


Figure 6. Average funding amount (2022-23 dollars) per unique CIA by year, 1990-2022

New researchers

The number of new[8] CIAs entering the NHMRC-funded health and medical research (HMR) workforce has fluctuated over the past four decades (Figure 7). During the period 1990 to 2022[9], on average, 348 CIAs received an NHMRC grant for the first time each year. There was a sharp increase in the number of new CIAs receiving funding in 1997. This may reflect changes to NHMRC programs where, following the cessation of block grants, researchers previously funded by these grants began applying for individual NHMRC funding.[10]

Figure 7. Number of new CIAs receiving NHMRC grants, 1990-2022

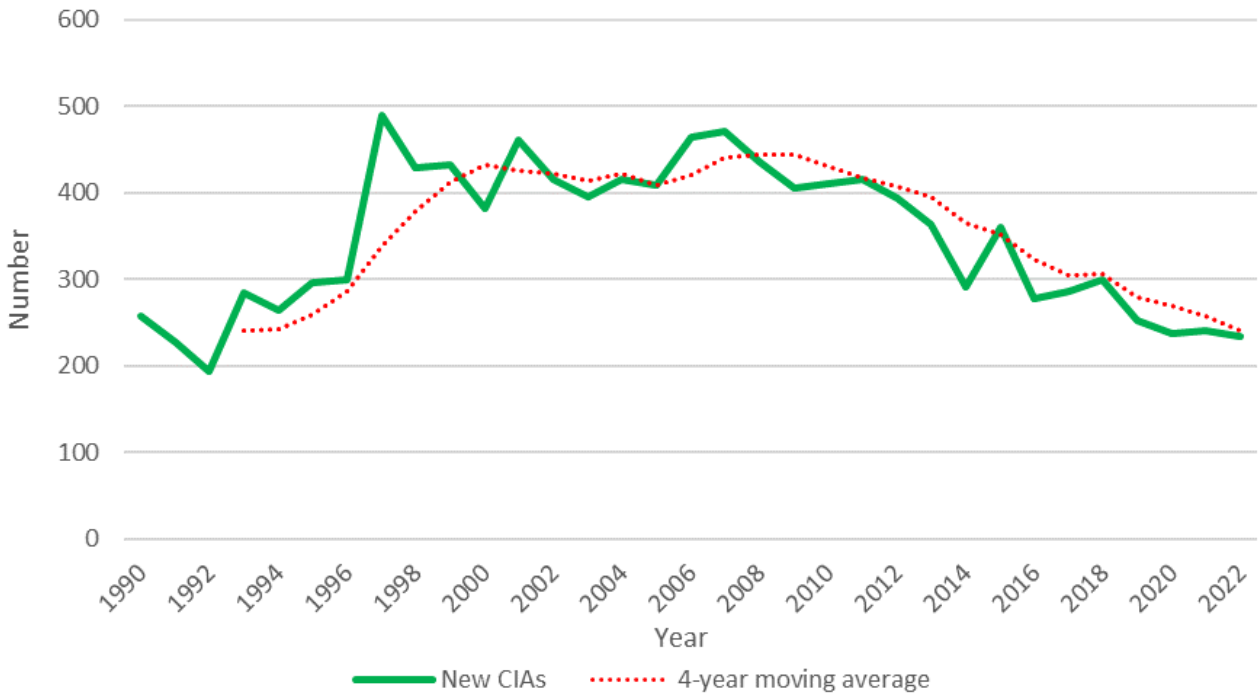


Figure 7 shows an upwards trend in the number of new CIAs from 1992 to 1997, reaching a peak at 489 new researchers in 1997. Between 1997 and 2007, the number of new CIAs fluctuated but remained relatively stable, until reaching its second peak of the time series in 2007 (471 new researchers). From 2007 to 2022, there has been a steady decline and return to numbers similar to the start of the time series.

The proportion of new CIAs in comparison to total funded grants decreased by 16.5% from 1990 to 2022 (Figure 8). During this period, an average of 42.3% total funded grants were awarded to new CIAs each year. There was a brief increase in this proportion during 1997 and 1998 where three-quarters of all funded grants were awarded to new CIAs. Specifically, these were Project Grants

[8] 'New' means that CIAs are only counted once from 1985 to 2023, from when they first enter the timeseries.

[9] CIA names from 1985 to 1989 data were used as the starting base for this time-series. Therefore, new CIAs appearing in 1990 are names that were not present in the data from 1985 to 1989.

[10] Refer discussion of NHMRC block funding in Appendix A.

predominantly awarded to CIAs within universities. This increase may relate to the Priming Grants that NHMRC had previously included as part of the Project Grant scheme.[11]

Figure 8. New CIAs as a proportion of total funded grants, 1990–2022

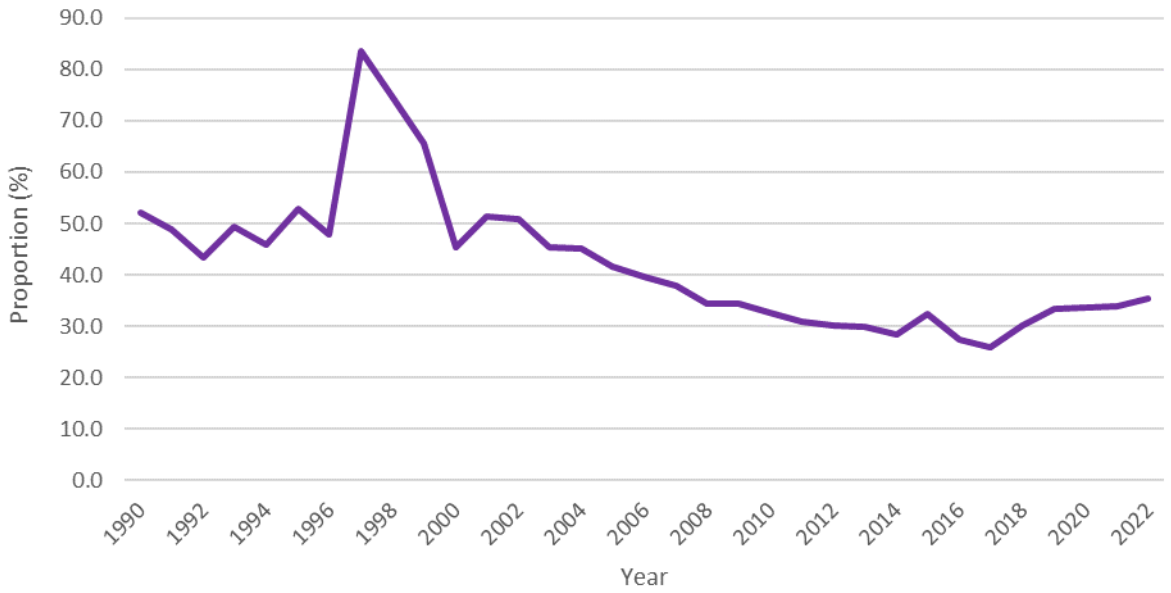


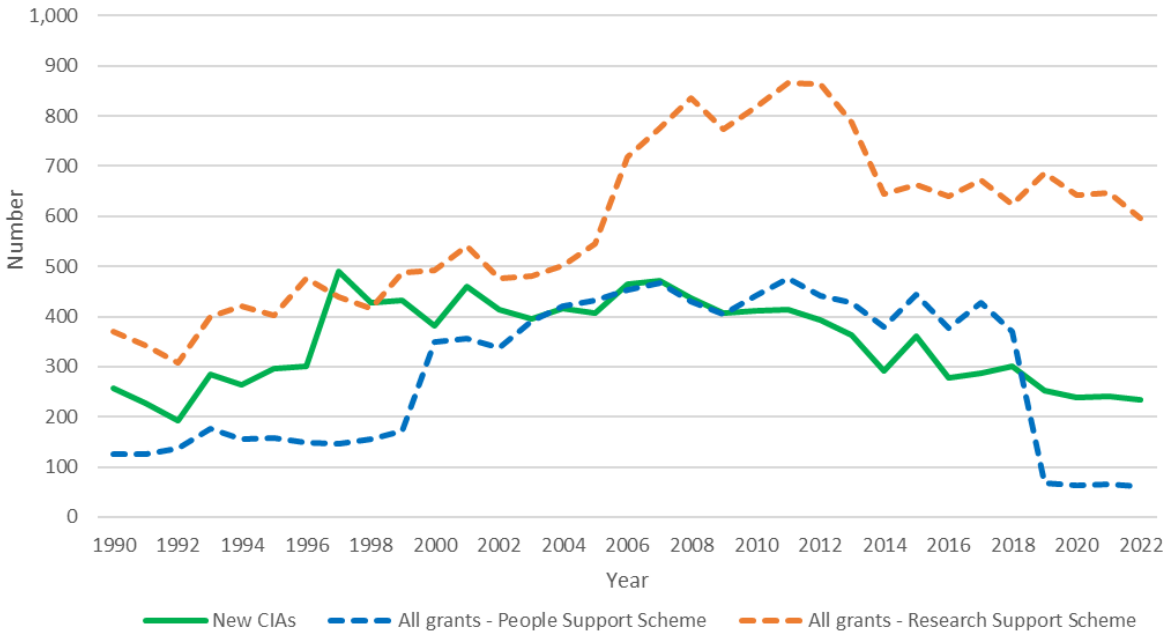
Figure 9 shows that the number of new CIAs from 1990 to 1997 increased in line with the total number of grants available under the (then) Research Support Scheme. [12] However, from 1997 onwards, the number of new CIAs aligned more closely with the total number of grants available under the (then) People Support Schemes.

NHMRC's current grant program was implemented in 2019, leading to the fall in 2019 for the total number of People Support Scheme grants. The current grant program schemes are not directly comparable to scheme types existing prior to 2019.

[11] Priming Grants were provided to new investigators who had not previously received NHMRC Project Grant support but whose research project merited priming support.

[12] The Australian Government committed additional funding for health and medical research in the 1995-96 federal budget, totalling $55 million over four years. This increased the total funds available for research support from $119.7 million in 1995 to $140.9 million in 1997. Through the two *Backing Australia's Ability* reform packages of the early 2000s, the Australian Government committed to strengthening Australia's capacity in research and innovation. The associated increase to NHMRC-funding led to a two-fold increase in new and continuing NHMRC grants from 2000 to 2008. Consequently, this resulted in the establishment of NHMRC People Support Scheme grants aimed at supporting postdoctoral and early-career researchers. This included the introduction of new Research Fellowships, Practitioner Fellowships, Career Development Fellowships, and an increase in Early Career Fellowships and Postgraduate Scholarships.

Figure 9. Number of new CIAs compared to all CIAs, 1990-2022



Career stage

Available data on the year of PhD completion of CIAs was analysed to investigate if and how the career stage of researchers correlates with grant outcomes. There are limitations in the data used for this analysis. Refer Appendix A for further information.

For this analysis, the following stages were defined:[13]

- Early-career researchers (ECRs) includes those with ≤5 years of post-PhD experience (including PhD candidates).
- Mid-career researchers includes those with >5 to ≤15years post-PhD experience.
- Late-career researchers includes those with >15 years of post-PhD experience.

During the period 2000 to 2022, the number of unique early-career CIAs decreased by 29.3%. By contrast, the number of unique late-career CIAs increased by 65.8%. The number of unique mid-career CIAs rose and then fell again during the period, ultimately increasing by 3.0% (Figure 10).

Early-career CIAs received the highest proportion of grants each year from 2000 to 2007, at an average of 42.1% (Figure 11). However, from 2016 to 2022 they accounted for the lowest proportions of CIAs in comparison to mid-career and late-career researchers (26.1% compared to 35.4% for mid-career and 38.6% for late-career researchers). The proportion of grants awarded to CIAs in the three career stages was comparable between 2008 to 2015: 33.2% for early-career, 33.2% for mid-career, and 33.7% for late-career researchers.

[13] Data were not amended for relative to opportunity adjustments to an applicant's track record. As per NHMRC's relative to opportunity policy, career disruptions such as pregnancy, illness and carer responsibilities are taken into account in track record assessment and in determining an applicant's eligibility to hold an Emerging Leadership Investigator Grant (in terms of years since their PhD pass date).

Overall, throughout the time series, the proportion of grants awarded to ECRs decreased from 37.1% in 2000 to 24.3% in 2022 (Figure 12).

Figure 10. Number of CIAs by career stage and year, 2000-2022

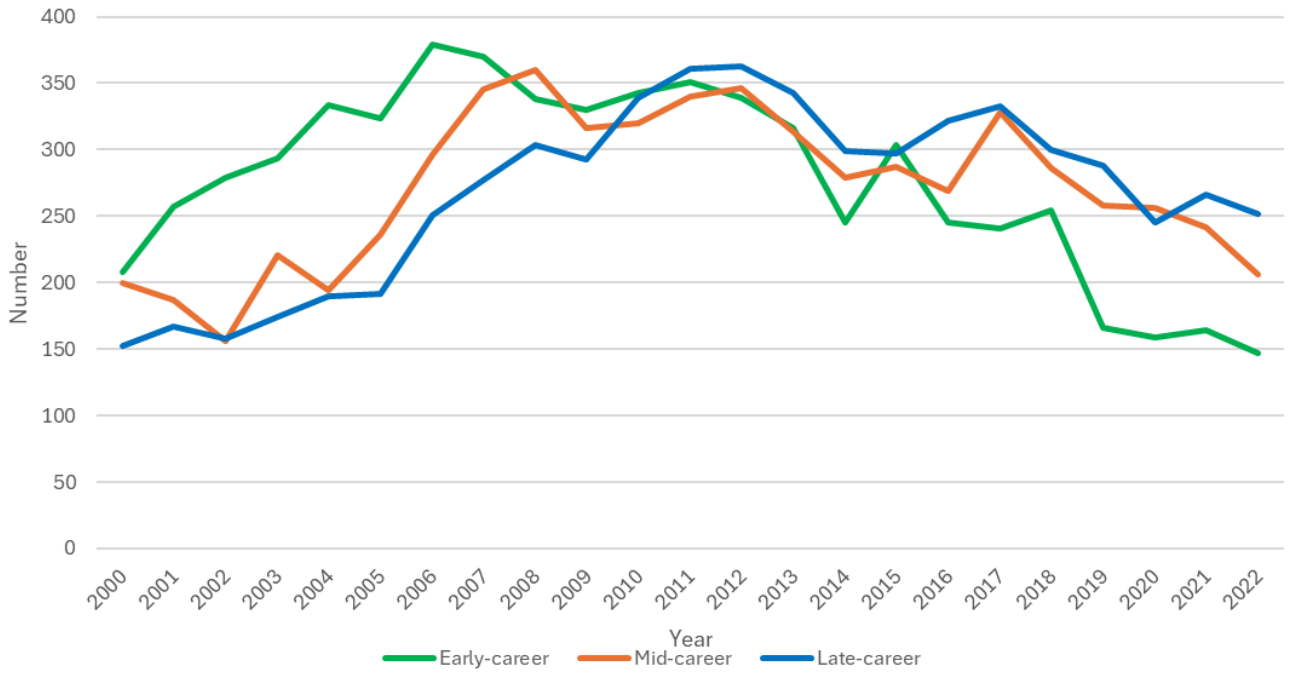


Figure 11. Proportion of total grants by CIAs career stage by year, 2000-2022

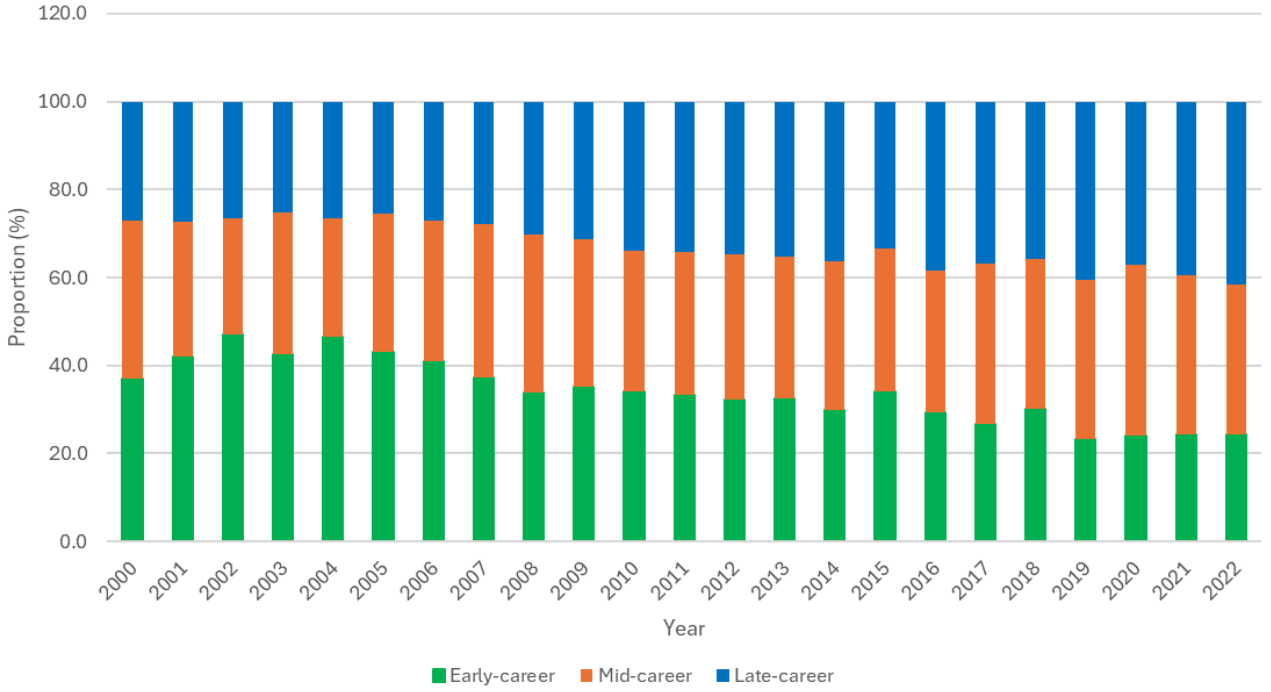


Figure 12. Early-career CIAs as a proportion of all funded CIAs, 2000-2022

The fluctuations and overall downward trend in the number of ECRs was mostly driven by changes in grant types aimed at supporting ECRs.

The introduction of NHMRC's current grant program in late 2018-early 2019 involved a restructuring of the types of grant schemes available and their funding levels. This resulted in the replacement of Early Career Fellowships and Career Development Fellowships with Investigator Grants.

From 2000 to 2018, the previous NHMRC grant program was in effect. During this period, the following four grant scheme types accounted for almost 99% of all grants awarded to ECRs:

- Postgraduate Scholarships – 42.8%
- Early-career Fellowships – 33.8%
- Project Grants – 16.7%
- Career-development Fellowships – 5.4%

In contrast, during 2019-2022, the implementation of NHMRC's current grant program resulted in the following top four grant scheme types for ECRs, accounting for almost 94%:

- Investigator Grants – 42.0%
- Postgraduate Scholarships – 39.8%
- Ideas Grants – 9.9%
- Clinical Trials and Cohort Studies Grants – 2.2%

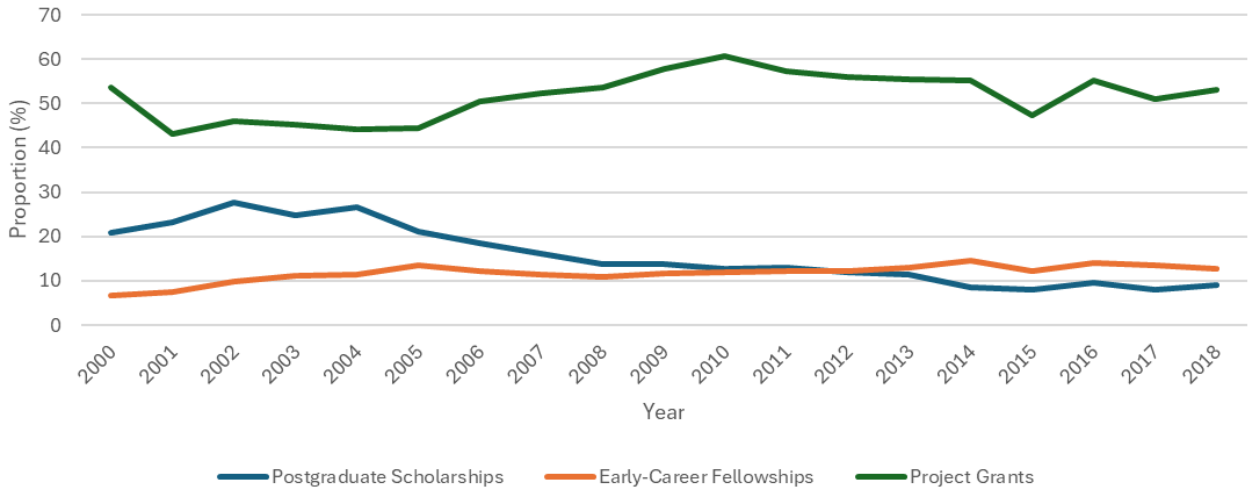
The availability of Postgraduate scholarships has almost halved since 2000. This reduction in scholarships was due to a combination of a reduction in the MREA allocation for the scholarships

from $10 million to $7 million in 2013 and increasing stipend amounts. The average grant payment for Postgraduate scholarships from 2000 to 2018 was around $125,000, compared to $141,000 from 2019 to 2022 (all figures in 2022-23 dollars).

For ECRs, Postgraduate Scholarships (41%) and Early-Career Fellowships (32.4%) accounted for almost three-quarters of grants awarded. In contrast, both mid-career and late-career researchers received a Project Grant most often, accounting for 68.5% and 70.1%, respectively.

From 2000 to 2018, the proportion of early-career CIAs compared to all CIAs decreased from 37.1% in 2000 to 30.2% in 2018 (Figure 12). This aligned with a decrease in the availability of Postgraduate Scholarships: 20.7% of CIAs received a Postgraduate Scholarship in 2000, compared to 9.0% in 2018 (Figure 13). The increase seen in 2015 was a result of the Boosting Dementia Research initiative established in 2015, for which NHMRC opened a separate funding call to support new researchers from a range of disciplines.[14]

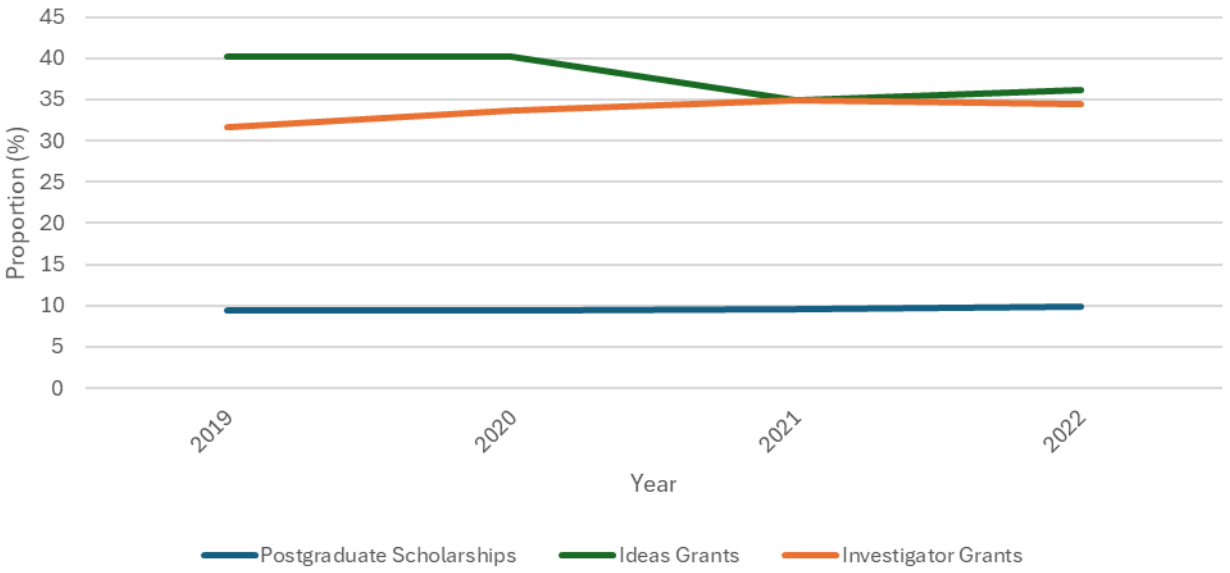
Figure 13. Distribution of NHMRC funding by selected scheme types, 2000 to 2018



From 2019 to 2022, the proportion of grants awarded to ECRs remained relatively stable, increasing by 1.0% from 23.3% in 2019 to 24.3% in 2022 (see Figure 14). This aligned with the proportion of Postgraduate Scholarships awarded, which increased slightly (by 0.5%) from 9.4% in 2019 to 9.9% in 2022.

[14] National Health and Medical Research Council, *Annual Report 2014–2015*

Figure 14. Distribution of NHMRC funding by selected scheme types, 2019 to 2022



Overall, early-career CIAs accounted for 36.2% of all CIAs during 2000-2018. However, they only accounted for 24.0% of all CIAs during 2019-2022.

NHMRC's current grant program, implemented in 2019, was designed to, "...provide opportunities for talented researchers at all career stages..." and that all new schemes could support early and mid-career researchers (EMCRs)[15]. This included Ideas Grants, which would "...provide greater funding opportunities for EMCRs." Figure 10 illustrates that in 2019, the number of ECRs funded fell by approximately 35%, compared to mid-career, 10% and late-career researchers, 4%. Prior to 2019, the cohort of researchers with ≤5 years post-PhD experience was funded predominantly via the Early Career Fellowship scheme which comprised approximately 4% of NHMRC funding. Although in 2019 and 2020, the proportion of grants awarded to ECRs in Ideas Grants was the highest, this has since dropped to the same proportion that are awarded in Investigator Grants (see Figures 12,14).

First Nations

Applicants have been able to report whether they identified as a First Nations researcher from the early 1990s. Since 1999, more than 99% of annual grant recipients have answered either 'Yes' or 'No' to First Nations identification.

Between 1999 and 2022, each year on average, 29 distinct CIs have identified as First Nations researchers. This equates to an average of 1.5%[16] of grant recipients annually.[17] A total of 274

[15] The Overview of the 2019 New Grant Program provides an overview of NHMRC's new grant program the structure, objectives, and funding mechanisms aimed at supporting health and medical research in Australia 01 Apr 2025 - Overview | NHMRC - Trove

[16] 1.4% for distinct CIs, 1.6% for non-distinct CIs

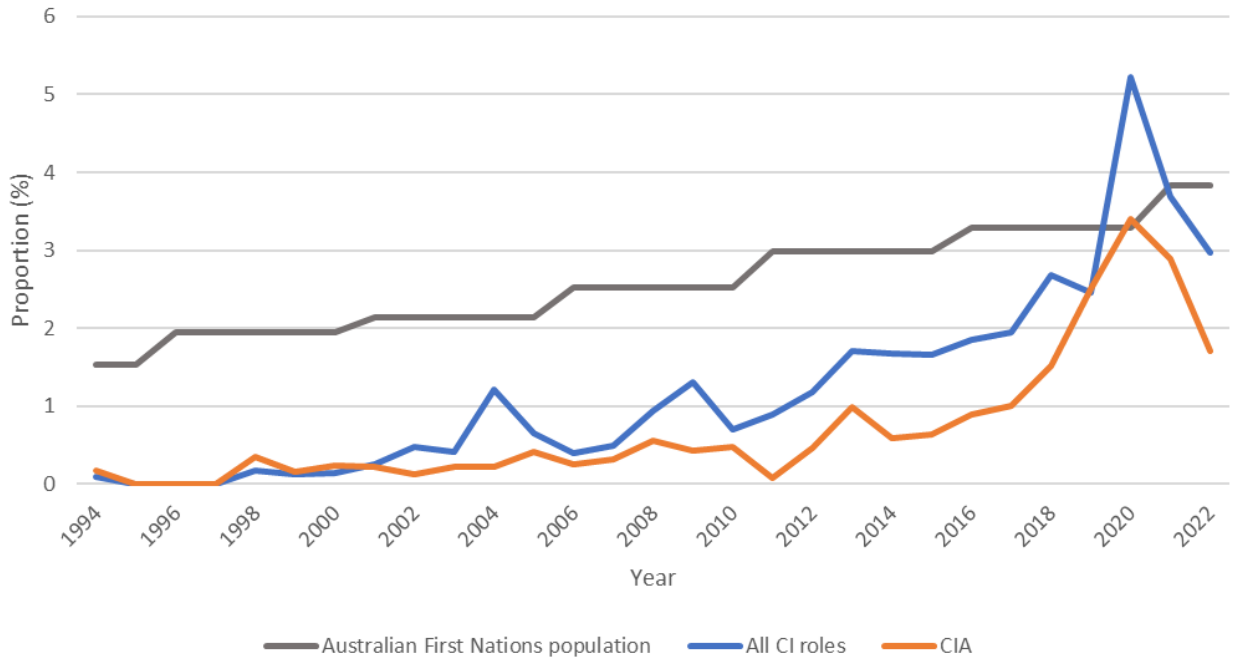
[17] Since 1999

distinct First Nations researchers have been awarded grants from 1984-2022, filling 963 CI positions.[18]

The number of First Nations CIs and CIAs receiving grants each year has increased steadily since 2000 and has been approaching the percentage of the Australian population identifying as First Nations peoples, which was 3.8% in 2021[19] (Figure 15).

If CIs are counted multiple times in a year (i.e. when appearing on different grants) the number of First Nations CIs has steadily increased since 2000, reaching 3.7% of all CIs and 2.9% of all CIAs in 2021 (Figure 15). If CIs are only counted once per year regardless of grants, the number of First Nations CIs has still steadily increased since 2000, reaching 3.1% of all CIs and 2.8% of CIAs in 2021.

Figure 15. Proportion of First Nations identifying grantees by year by CI role[20]



NHMRC has committed to spending a minimum of 5% of the annual MREA allocation on research focusing on First Nations health[21]. This target was first reached in 2008 and has been met consistently since. In 2022, NHMRC established a target of 3.4% for annual grants led by a First Nations CI.

The location of First Nations populations is relevant to considerations regarding the locations where NHMRC funding is being directed.

[18] One individual may hold multiple CI positions. On average each First Nations researcher has been a CI on 3.2 grants.

[19] Based on revised estimates released in 2023 which supersede those release in 2021. https://www.abs.gov.au/methodologies/estimates-aboriginal-and-torres-strait-islander-australians-methodology/30-june-2021

[20] 1994 to 2005 data represent census counts and may undercount First Nations populations. For example, undercounts for 2016 and 2021 were estimated between 17.4% and 17.5%. 2006, 2011, 2016 and 2021 data are taken from the revised estimates released approximately two years after each census. https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/estimates-aboriginal-and-torres-strait-islander-australians

[21] To qualify as Aboriginal and/or Torres Strait Islander health research, NHMRC Funding Rules state that "at least 20% of the research effort and/or capacity building must relate to Aboriginal and/or Torres Strait Islander health."

As shown in Figure 16 and Figure 17, a large proportion of all First Nations people in Australia live outside of the greater Sydney and Brisbane regions within those (respective) states, and the First Nations populations in these regions have increased substantially (by 59% and 41% respectively) between 2011 and 2021.

Figure 16. Number of First Nations people in Australia by location by census year

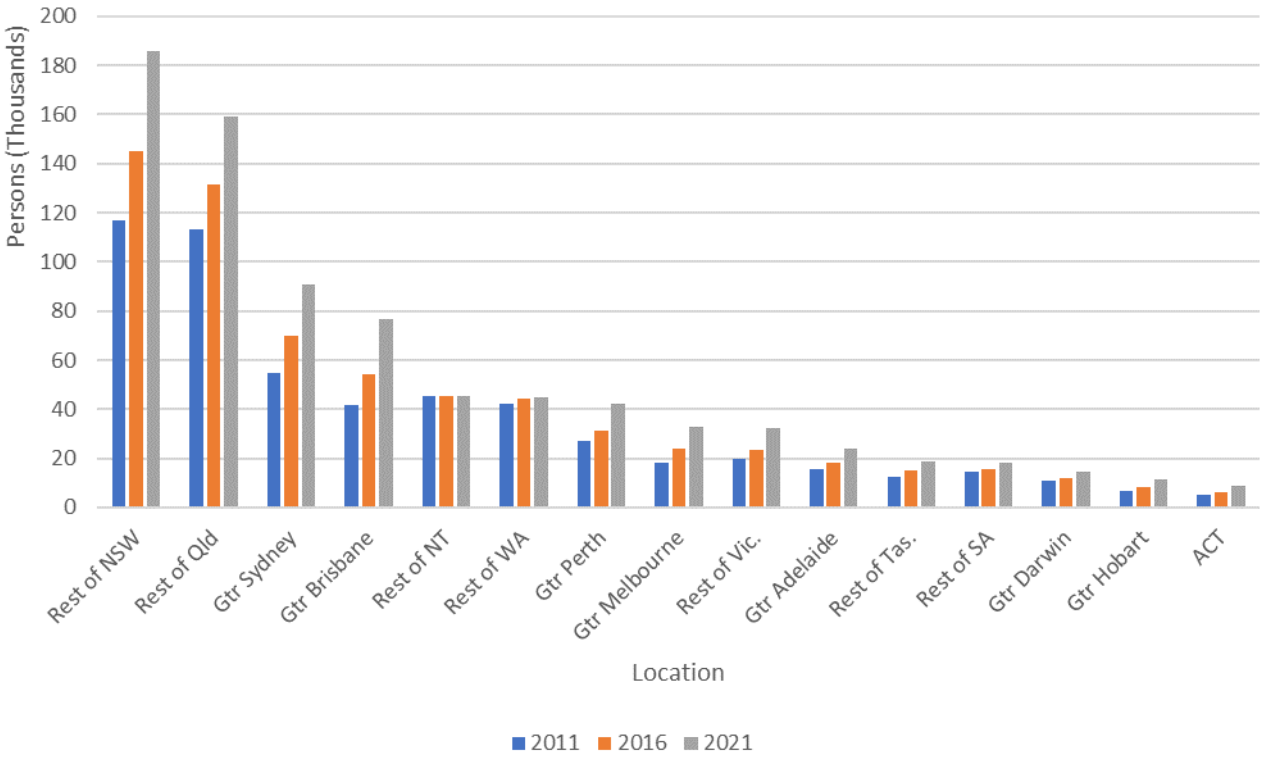
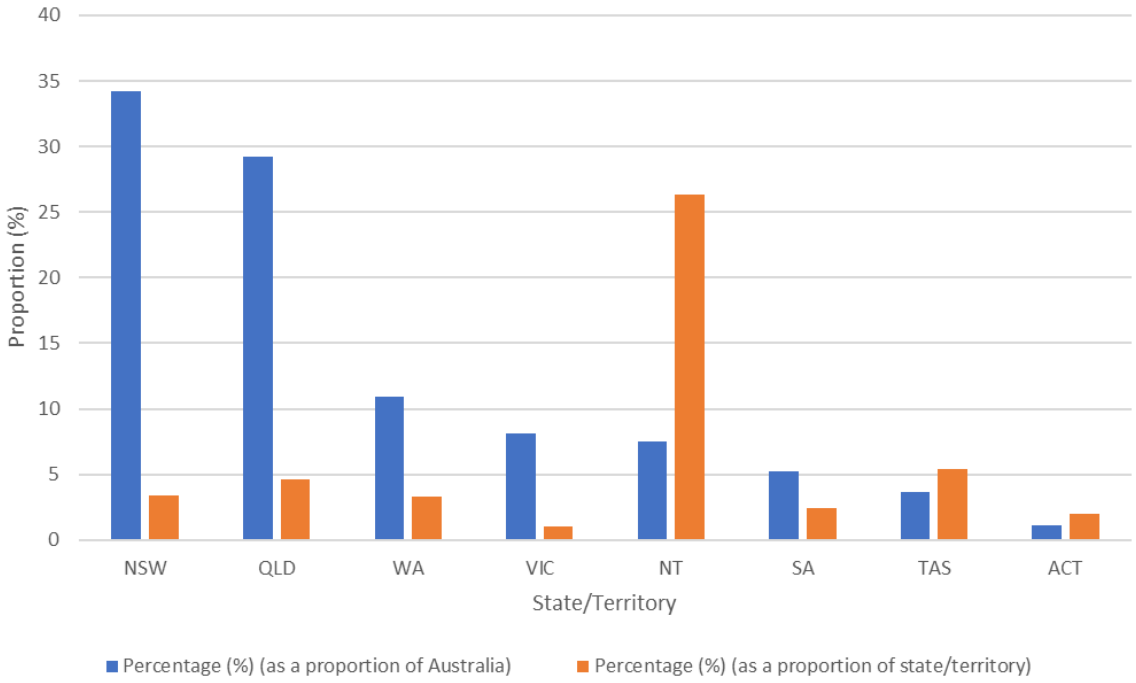


Figure 17. Proportion of First Nations people by location (national, state/territory), 2021[22]



At the same time, First Nations people make up over one quarter of the population of the Northern Territory, though that territory only accounts for about 7% of all First Nations people in Australia.

Gender

In 1985, 15.9% of NHMRC CIAs whose gender is stated in NHMRC's grant dataset were women.[23] By 2022, there had been a three-fold increase in the proportion of women receiving NHMRC funding with 49.8% of recipients being women, compared to 49.3% men (where gender was stated - refer Figure 18). Reporting of CIA gender also increased in this period from 27.7% in 1985 to 99.7% in 2022.

Similarly, in 1985, where gender was stated, 11.2% of MREA funds were awarded to grants where the CIA was a woman. This proportion steadily increased over time approaching parity in 2022 where 47.7% of MREA expenditure was on grants where the CIA was a woman (Figure 19).

[22] The blue bars show the proportion of all First Nations people in Australia who live in each state or territory, while the orange bars show the proportion of all the people in a state or territory who identify as First Nations.

[23] Earlier data may not distinguish between sex and gender. For simplicity, this evaluation assumes that the supplied information reflects a grantee/applicant's gender, not their sex.

Figure 18. Proportion of CIAs by year by gender identification[24]

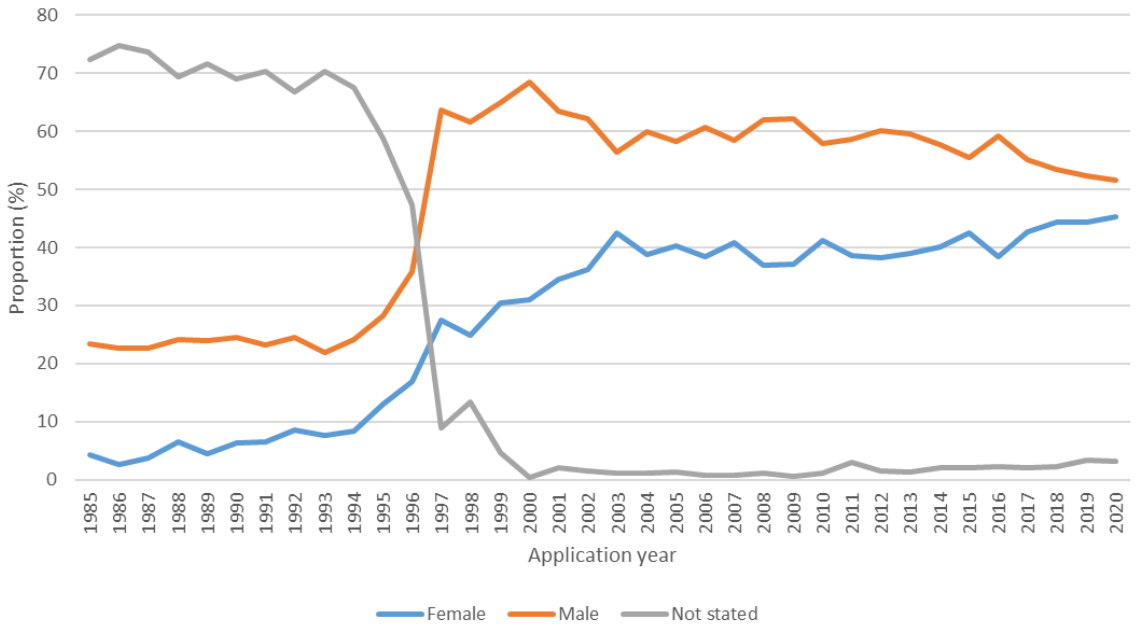
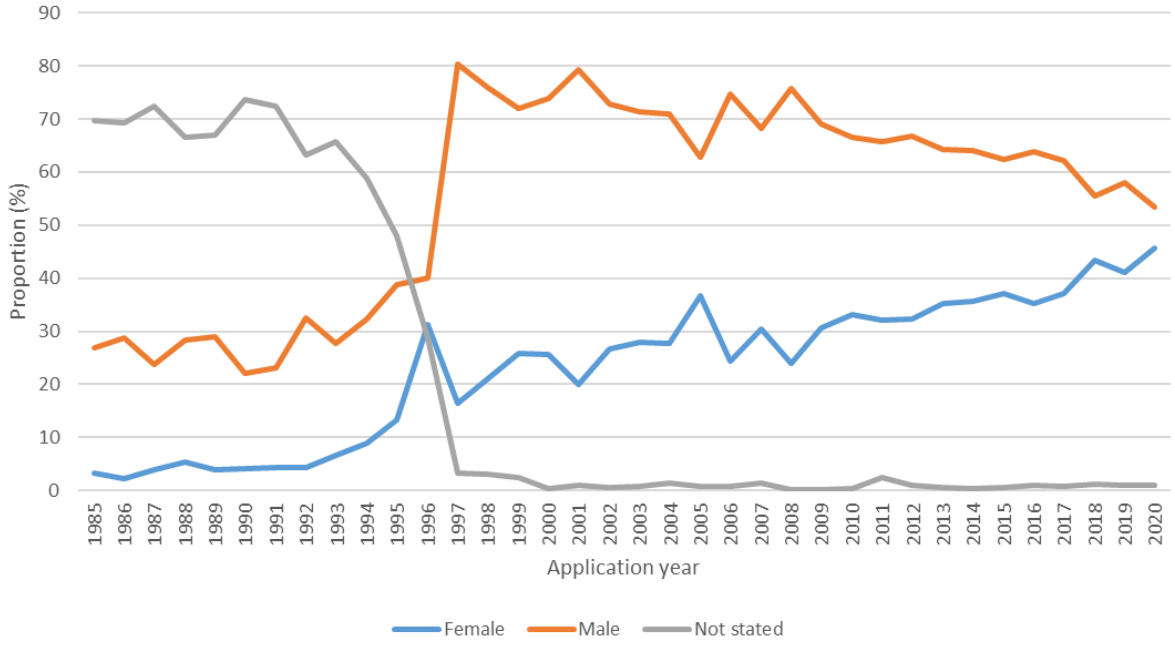


Figure 19. Proportion of MREA expenditure by application year by gender identification[24]



Investigator Grants are divided into multiple categories and levels. Specifically:

- Emerging Leadership levels 1 and 2 (EL1 and EL2)
- Leadership levels 1, 2 and 3 (L1, L2, L3).

[24] Where gender was not stated, this has been removed from calculations and placed separately on the secondary y-axis to indicate the uncertainty within the data set.

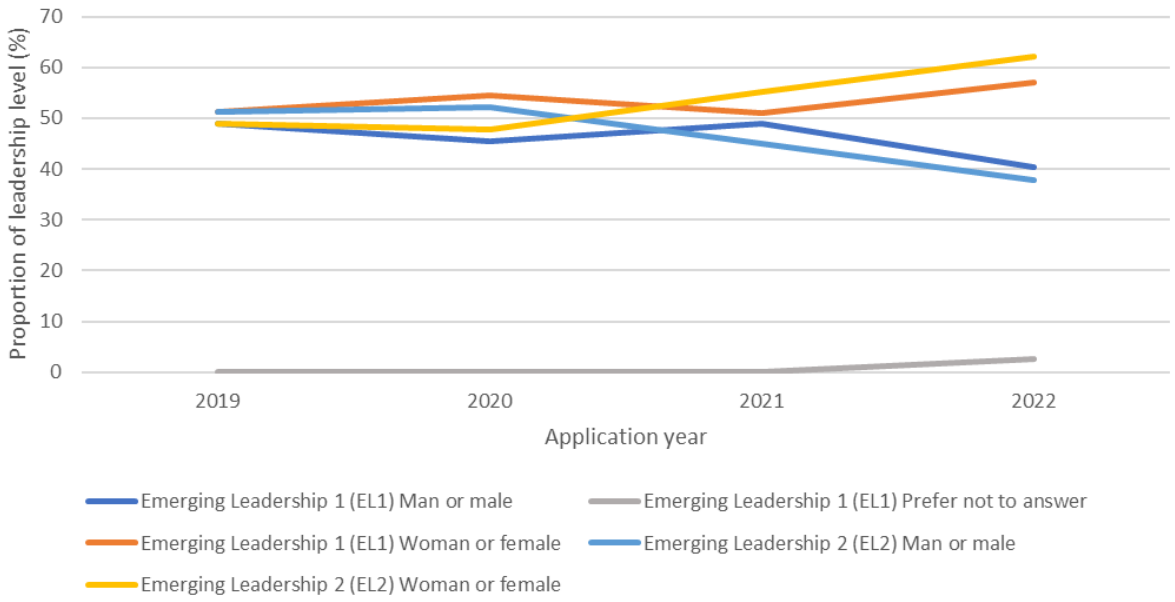
These correspond to the applicant's number of years post PhD (or equivalent), their appointable academic level and experience.[25] Since 2019, the proportion of EL1 and EL2 grants awarded to men and women have been relatively equal (Figure 20).

In 2019, L1-L3 grants were more heavily weighted towards men (71.8% of recipients), however this figure dropped to 52.8% in 2022. L3 grants maintain the largest gender discrepancy with 35.1% of recipients in 2022 identifying as women (Figure 21).[26]

NHMRC is committed to achieving gender equity across the grant program. From 2023, NHMRC has implemented new special measures under the *Sex Discrimination Act 1984* to achieve near equal gender outcomes in the Investigator Grant scheme. This action seeks to address systemic disadvantage faced by women and non-binary applicants. The decision to introduce the special measures followed a national consultation process.

With respect to peer reviewers, and within overall grant schemes between 2020 and 2023, 47.2% of reviewer roles were filled by women and 51.4% by men (with 1.5% listed as another category).

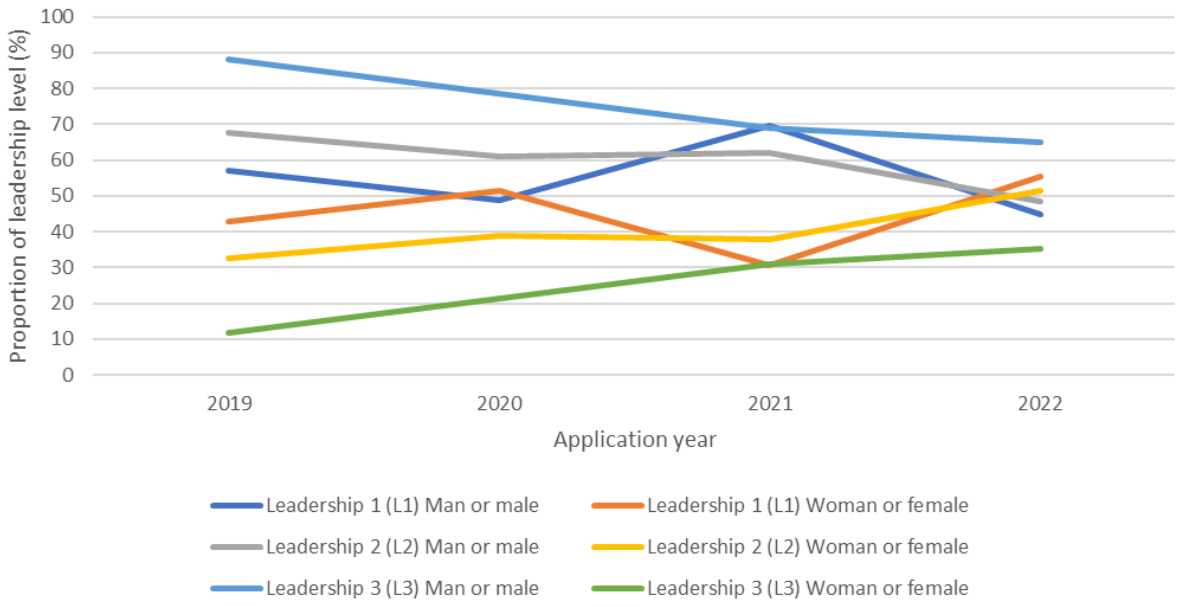
Figure 20. Proportion of leadership level CIAs by application year by gender (EL1-EL2)



[25] A statement of expectations of leadership levels is published on the NHMRC website.

[26] Also refer Gender equity

Figure 21. Proportion of leadership level CIAs by application year by gender (L1-L3)



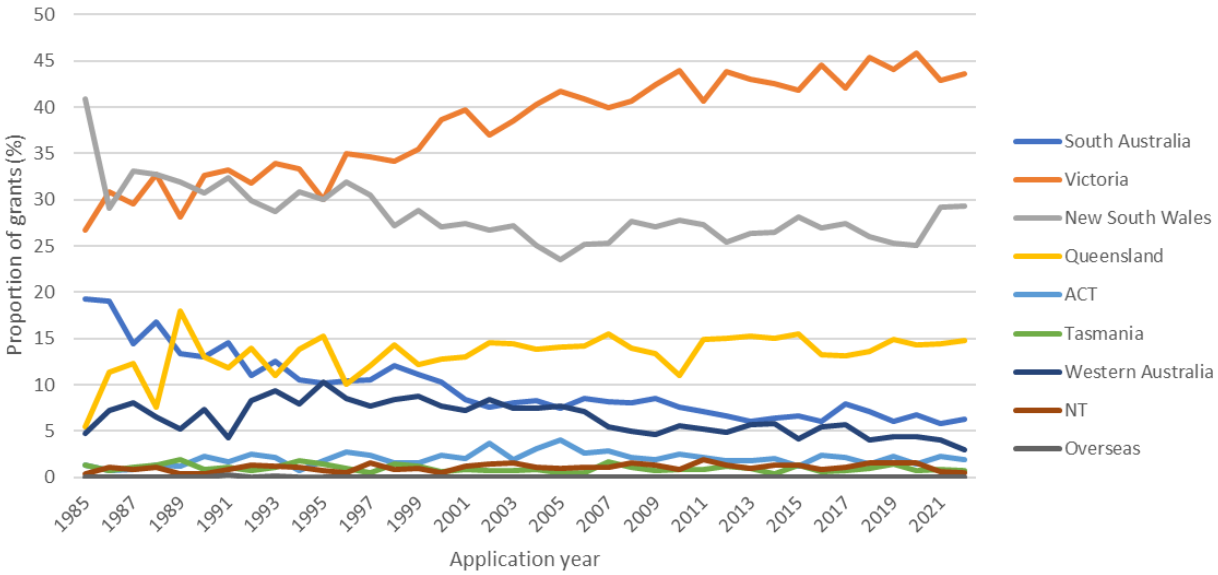
Institution location

Location can be considered in a number of ways, including by state/territory and by 'regionality'.[27]

Since 1989, CIAs whose Administering Institution was based in the state of Victoria (VIC) received more grants than CIAs based in any other state or territory. As shown in Figure 22, this disparity has increased over time, with VIC-based Administering Institutions receiving over 45% of the total MREA in some recent years.

[27] NHMRC's location data refers to the physical address of the Funding Agreement signatory, presumably the Administering I's head office location.

Figure 22. Proportion of grants by application year by Administering Institution state/territory



This trend is not simply reflective of changes to populations in the states and territories over this period. As shown in Figure 23, when the MREA allocation figures are adjusted for state/territory population, VIC's share can still be seen to be increasing.

A similar pattern is shown in Figure 24. Within this scatterplot which places states/territories by the proportion of grants on the Y axis, and the state/territory's proportion of the total Australian population on the X-axis, in 2021, VIC sits well above the trend line, while NSW, QLD and WA sit below it.

Figure 23. Relative grant intensity by population by year by state[28,29]

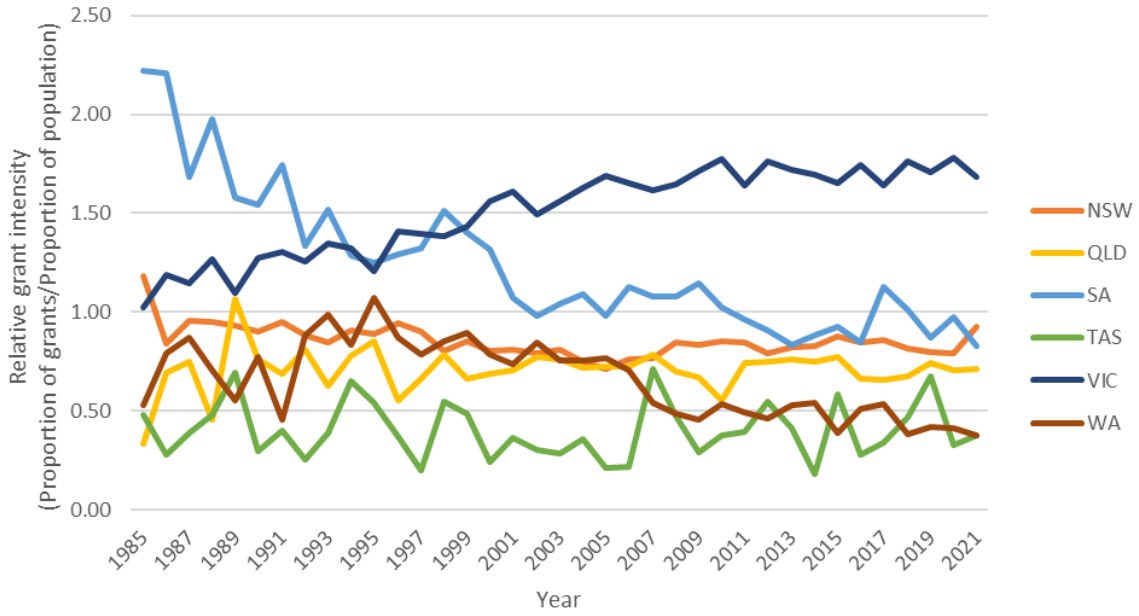


Figure 24. Proportion of grants by proportion of Australian population by state/territory (2021)

This disparity is not straightforwardly a result of the lack of Administering Institutions within some locations compared to others. Notably, in November 2023, of the active NHMRC Administering

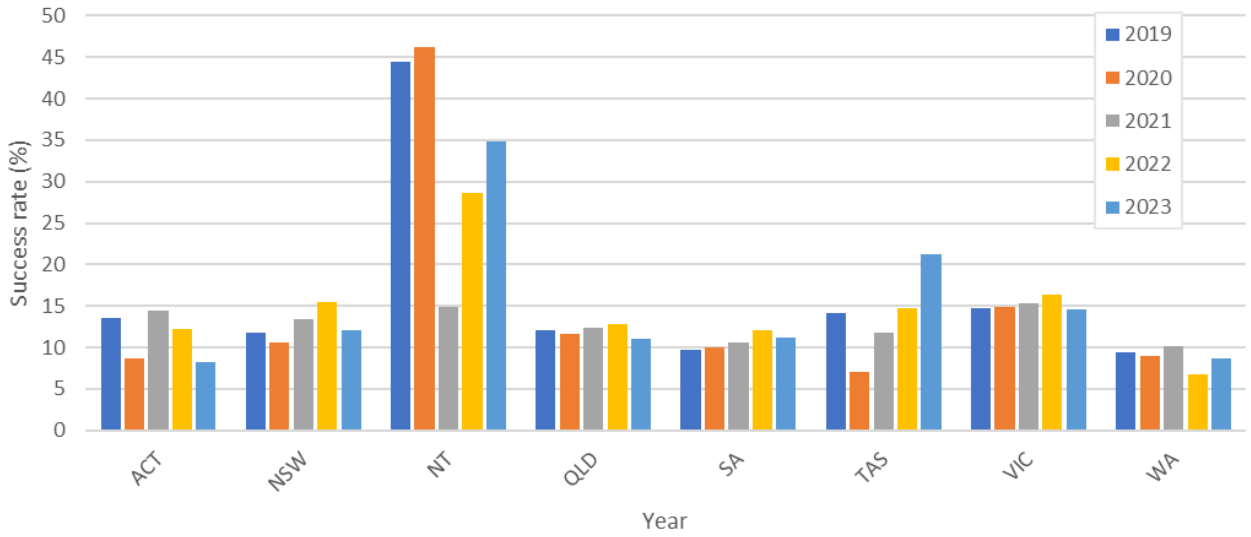
[28] Due to their small populations, data for ACT and NT were variable and noisy. For clarity, these data have been removed from this figure.

[29] Source: population data sourced from ABS 3101.0 National, state and territory population TABLE 4. Estimated Resident Population, States and Territories (Number) https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release#data-downloads

Institutions, the majority had their main campus or primary location based in NSW (33%), with VIC coming second (27%).

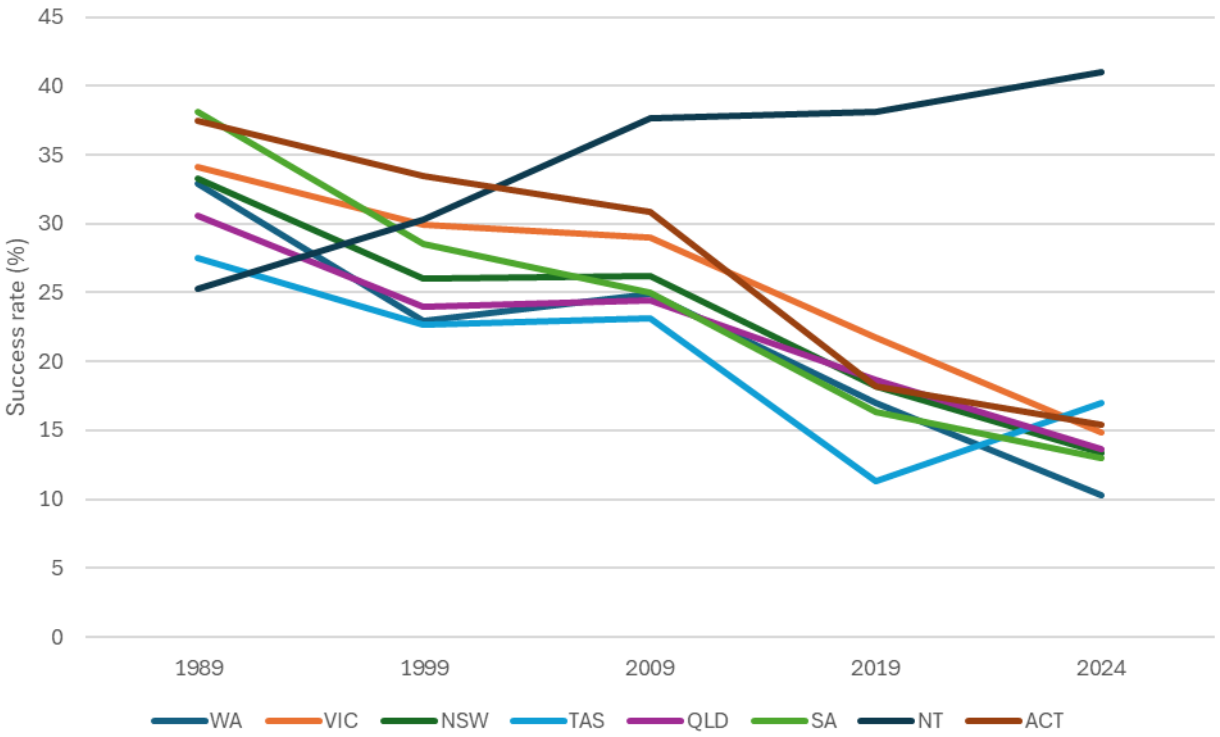
The disparity is certainly connected to application success rate. As shown in Figure 25, over a five-year period the success rate for grant applications from VIC was always 15% or above, while the success rate for grant applications from WA was usually 10% or below.

Figure 25. **Application success rate by state/territory by year (2019-2023)**



That said, and as shown in Figure 26, over time the success rates of grant applications from the different states have tended to converge.

Figure 26. Average success rate for previous decade by state (1980-2024)



Application success rate is itself likely to be a function of other factors, such as investment in research and experimental development (R&D).[30]

The Australian Bureau of Statistics (ABS) publishes statistics on state and territory R&D expenditure, measured by who performs it: businesses (BERD), governments (GovERD), universities (HERD) and private non-profits (PNPERD), together making up total R&D (GERD). This expenditure can vary significantly between states and territories and when measured as a proportion of local gross state product (GSP)[31] can be used as a measure of research intensity in different sectors.

As shown in Figure 27, when adjusted by GSP some states have much larger (or smaller) levels of R&D activity (research intensity) than do others, and the scale of R&D activity in one part of the economy correlates with this scale in other parts.

As shown in Figure 28, the number of NHMRC grants awarded by state positively correlates with state higher education research intensity[32], indicating that locations with a larger university R&D economy receive more NHMRC grants. Notably, and in harmony with Figure 24, VIC sits well above the line in this chart.

[30] Refer Education and Health Standing Committee, Legislative Assembly of Western Australia. *In the test tube: Finding Western Australia's formula for health and medical research success*. Report No. 9. Perth (WA): Parliament of Western Australia; 2024 Nov. pix

31 GSP is the total economic output of a state or territory

[32] As measured by Higher Education Research and Development expenditure (HERD) as a proportion of GSP (%). HERD data are published by the Australian Bureau of Statistics and cover all higher education expenditure on research and development, regardless of the source of income.

Figure 27. Research expenditure as a proportion of GSP by state/territory[33,34]

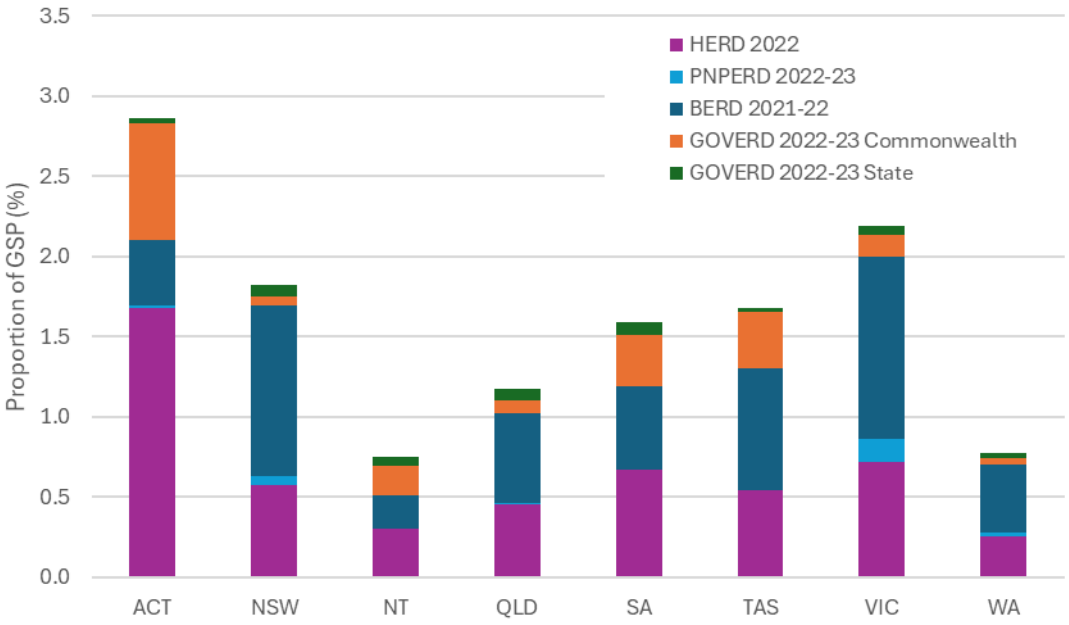
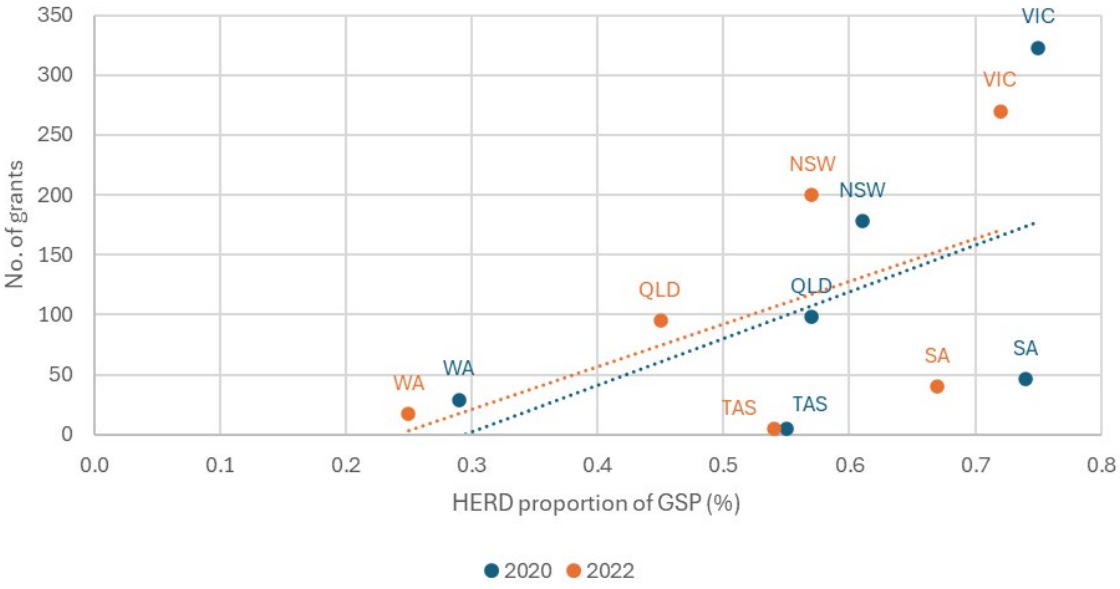


Figure 28. Number of grants by HERD proportion of GSP by state/territory



More detailed discussions of possible reasons for longer-term funding and success-rate disparities between the states/territories are provided within the:

[33] Expenditure on research and development in states and territories is measured relative to GSP to normalise for differences in state/territory economies.

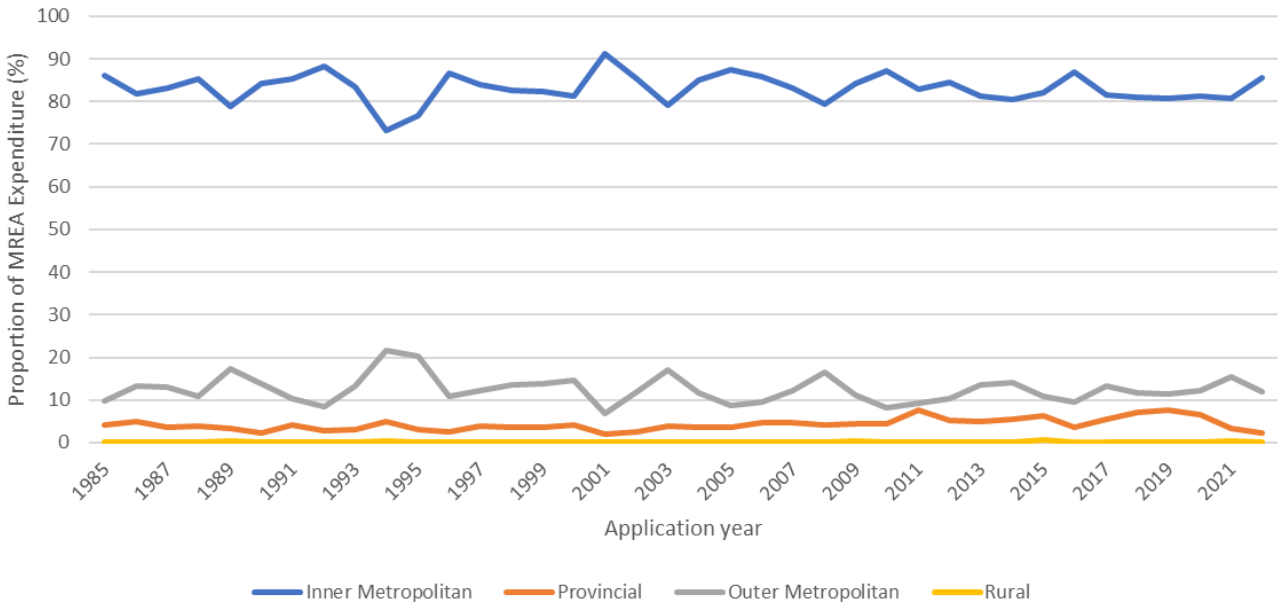
[34] HERD, PNPERD, BERD and GOVERD data sets are collected at different intervals and can cover financial or calendar year reporting. This figure depicts the closest data set available to the 2022 calendar year.

- 2024 report of the Parliament of Western Australia's Inquiry into support for health and medical research funding and priorities
- 2020 report of the Health and Medical Research Inquiry held by the South Australian Productivity Commission.

Shifting focus to 'regionality', and as shown in Figure 29, the majority of MREA funding has been awarded to Administering Institutions with their head office based in Inner Metropolitan areas, with a consistently smaller amount distributed to Outer Metropolitan and Provincial areas.[35] Comparison of this distribution to the distribution of electors in 2021 (Figure 30) shows that inner metropolitan areas are receiving MREA funds above the proportion of the population that they account for. It also shows that this effect is not simply a function of the type of research being undertaken, with each Broad Research Area being about equally represented in each region.

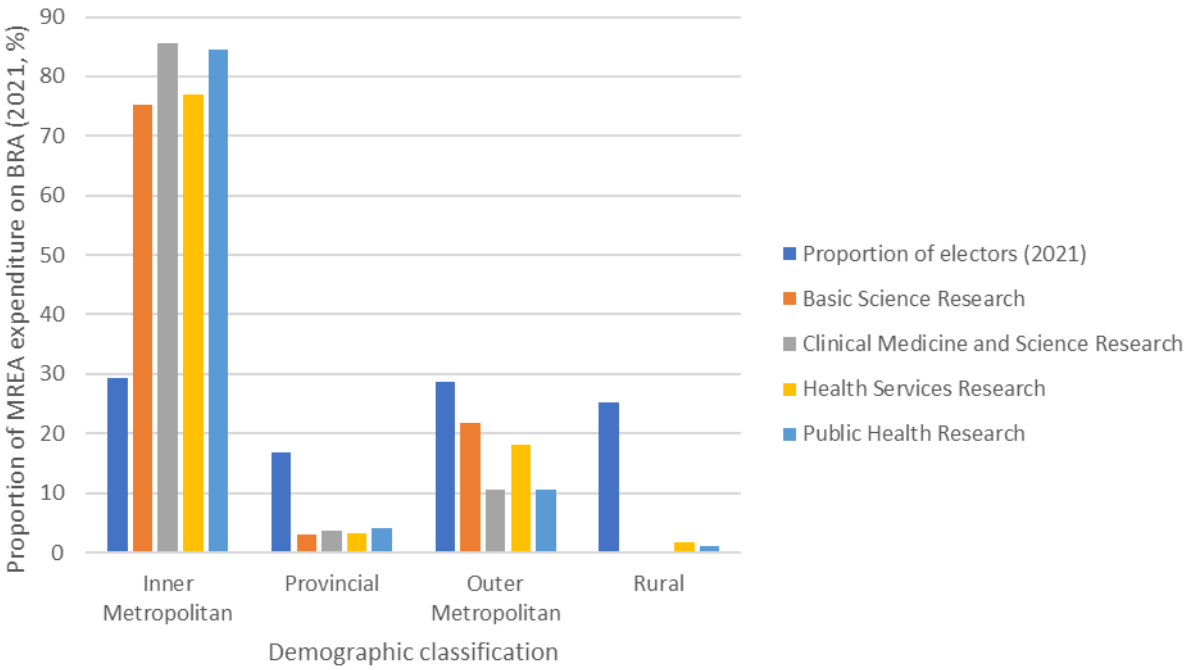
As noted earlier, NHMRC's location data attributes all funding to the physical address of the Administering Institution's Funding Agreement signatory, consequently the above analysis may amplify the concentration of grants and funding within inner metropolitan areas. Gaining a more accurate understanding of this issue will require improvements to how NHMRC collects and updates location data.

Figure 29. Proportion of MREA expenditure by regionality of Administering Institution head office by application year (1985-2022)



[35] These location categories are those used by the Australian Electoral Commission (AEC) to classify federal electorates. AEC data was used as NHMRC's grants dataset includes location by electorate.

Figure 30. Proportion of MREA expenditure on BRA by regionality of Administering Institution head office, 2021[36]



Institution type

Universities have accounted for over 70% of total NHMRC grant funding for most of the past 30 years, with medical research institutes (MRIs) accounting for about 25% and other institution types accounting for almost no funding since the early 2000s (Figure 31). It should be noted that some MRIs submit grants through universities and as such this figure underrepresents funding to MRIs.

However, it is that sub-set of universities belonging to the Group of Eight (Go8) cohort[37] that have been receiving the majority of funding (Figure 32).

[36] Source: AEC Elector count by division, age group and gender https://www.aec.gov.au/enrolling_to_vote/enrolment_stats/elector_count/index.htm

[37] Including Monash University, the Australian National University, The University of Adelaide, The University of Melbourne, The University of Queensland, The University of Sydney and The University of Western Australia and University of New South Wales.

Figure 31. Proportion of total NHMRC grant funding received, by institution type by year[38]

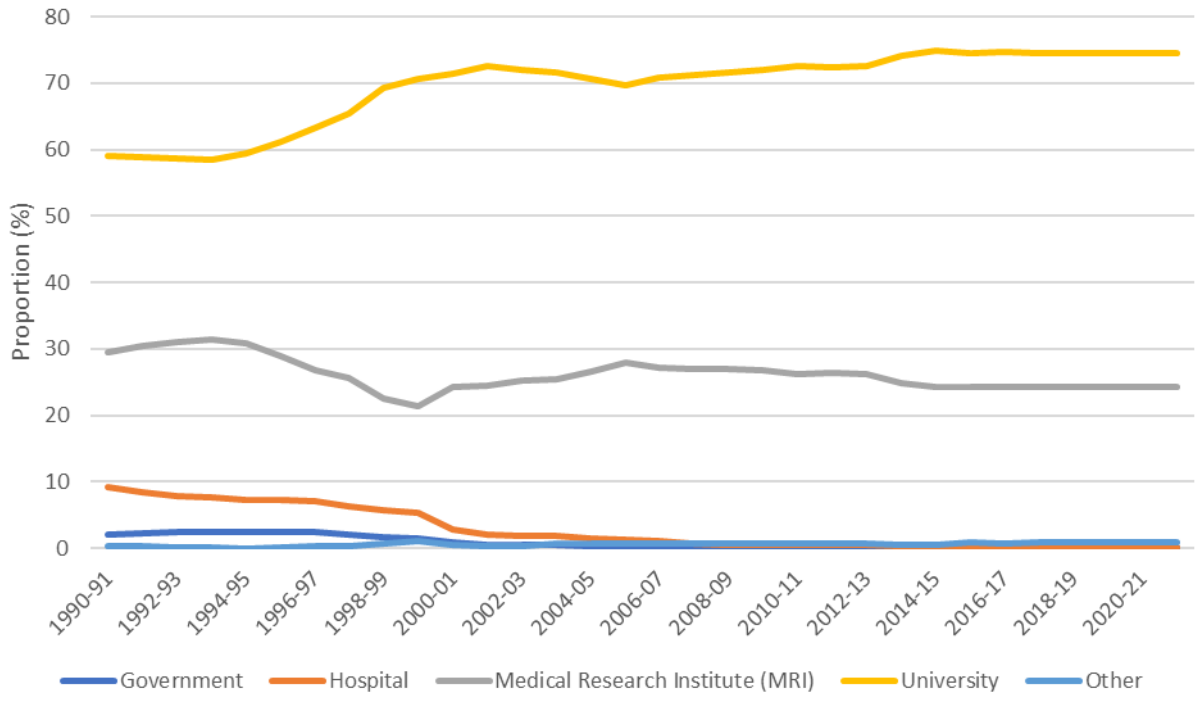
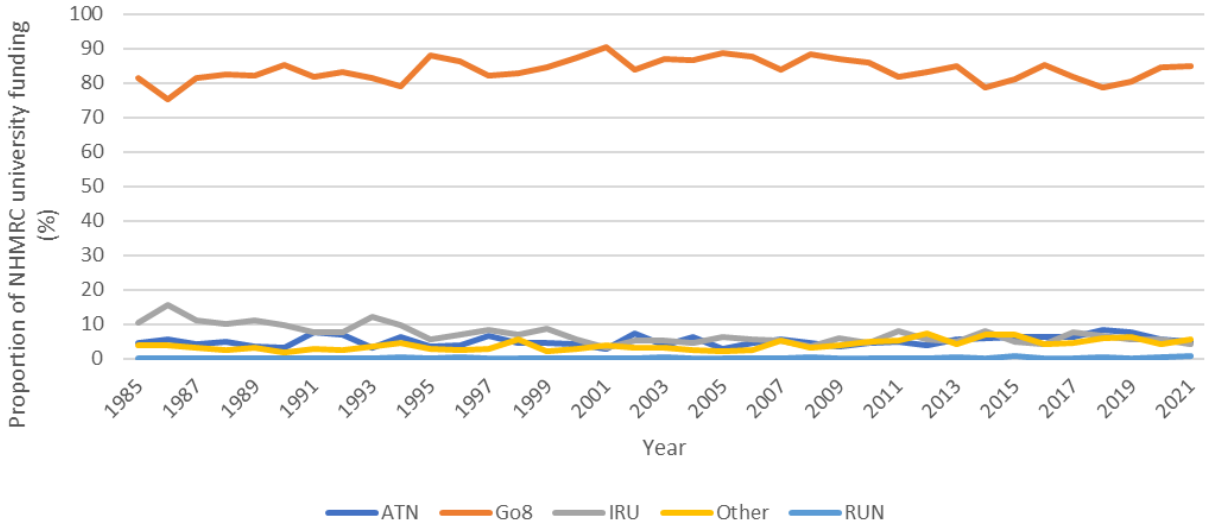


Figure 32. Proportion of NHMRC university funding by year by university cohort



This long-term concentration of NHMRC funding within universities is associated with changes to research capability. As shown in Figure 33, [39] knowledge production in Australia is increasingly

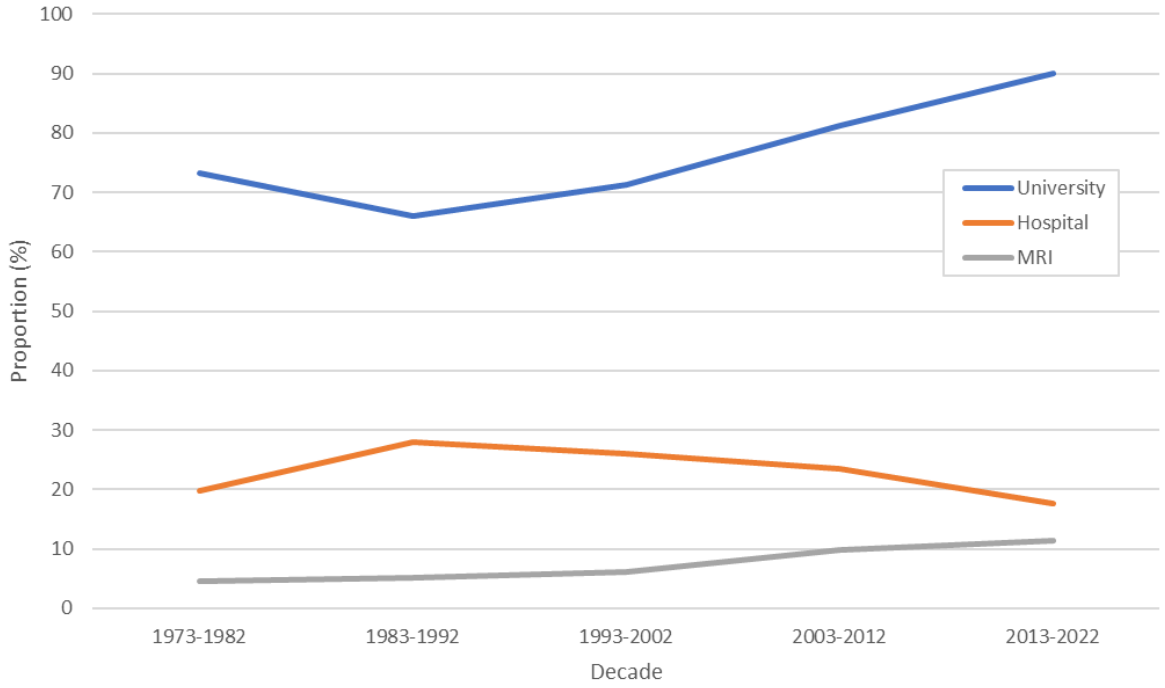
[38] Source: Science, Research and Innovation Budget Tables 2021-22

[39] Subject = General Medicine, Surgery, Public Health, Environmental and Occupational Health, Pharmacology, Psychiatry and Mental health, Cardiology and Cardiovascular Medicine, Oncology, Clinical Neurology, Cancer Research, Immunology, Radiology Nuclear Medicine and

focused within the higher education sector and a decreasing proportion is being undertaken within hospitals.[40]

While NHMRC data does not reveal whether CIs are medical practitioners, the National Health Workforce Dataset (NHWDS), a combination of registration and survey data for health practitioners, shows a decrease in the number of practitioners also identifying as researchers between 2016 and 2022 (Figure 34). This trend occurs despite the increase in the number of total registered and employed practitioners in the same period.

Figure 33. Proportion of Australian co-authored scholarly works by decade by institution type[41]

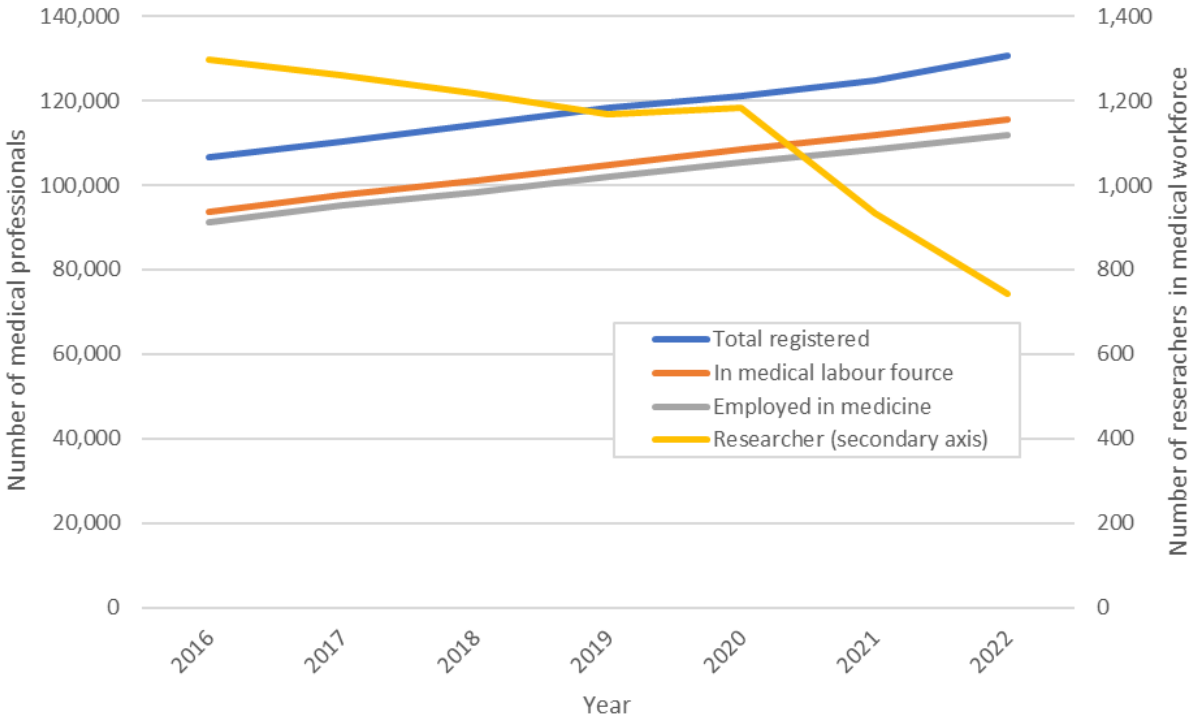


imaging, Neurology (clinical), Pediatrics, Perinatology, and Child Health, Infectious Diseases, Radiology, Nuclear Medicine and imaging, Immunology and Allergy, Pharmacology (medical), Orthopedics and Sports Medicine, Drug Discovery, Obstetrics and Gynaecology, Pediatrics, Perinatology and Child Health, Gastroenterology, Pharmaceutical Science, Hematology, Endocrinology, Diabetes and Metabolism, General Neuroscience, Molecular Medicine, Pulmonary and Respiratory Medicine, Ophthalmology.

[40] Nb. MRI and hospital funding can be 'hidden' within grants to Cis based within universities, where (for example) an MRI as effectively a department within a university.

[41] The data points used in this chart were calculated manually using lens.org. Full details provided in Appendix A.

Figure 34. Number of medical practitioners by year[42]



Capability analysis

The capability analysis section of this report considers Broad Research Area, Fields of Research, disease classification and health populations.

Broad Research Areas

NHMRC grant applicants are required to provide a single Broad Research Area (BRA) that best describes their proposed research.[43] Since 1985, Basic Science Research has consistently received the largest number of grants, followed by Clinical Medicine and Science Research. Public Health Research and Health Services Research both received fewer grants (Figure 35).

MREA expenditure on each BRA follows a similar pattern, with Basic Science Research and Clinical Medicine and Science Research receiving the largest amount of annual funding since 2000 (Figure 36). However, both the proportion of grants and total expenditure on Health Services and Public Health Research have been increasing steadily since 2000, cumulatively approaching similar levels of funding to the other two BRAs in 2021 (28.8% of MREA expenditure).

[42] Source: NHWDS, obtained through Department of Health and Ageing Medical Practitioners Dashboard https://hwd.health.gov.au/mdcl-dashboards/index.html

[43] For more information on BRAs see https://www.nhmrc.gov.au/about-us/resources/australian-standard-research-classifications-and-research-keywords

Figure 35. Proportion of grants awarded by application year by BRA

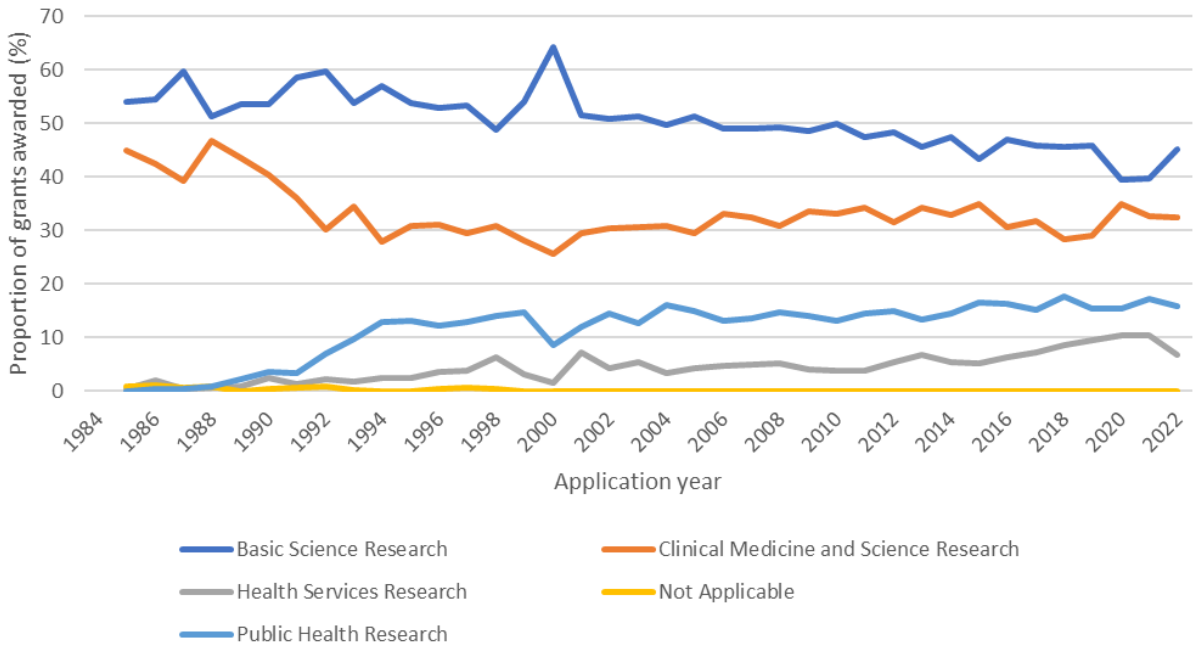
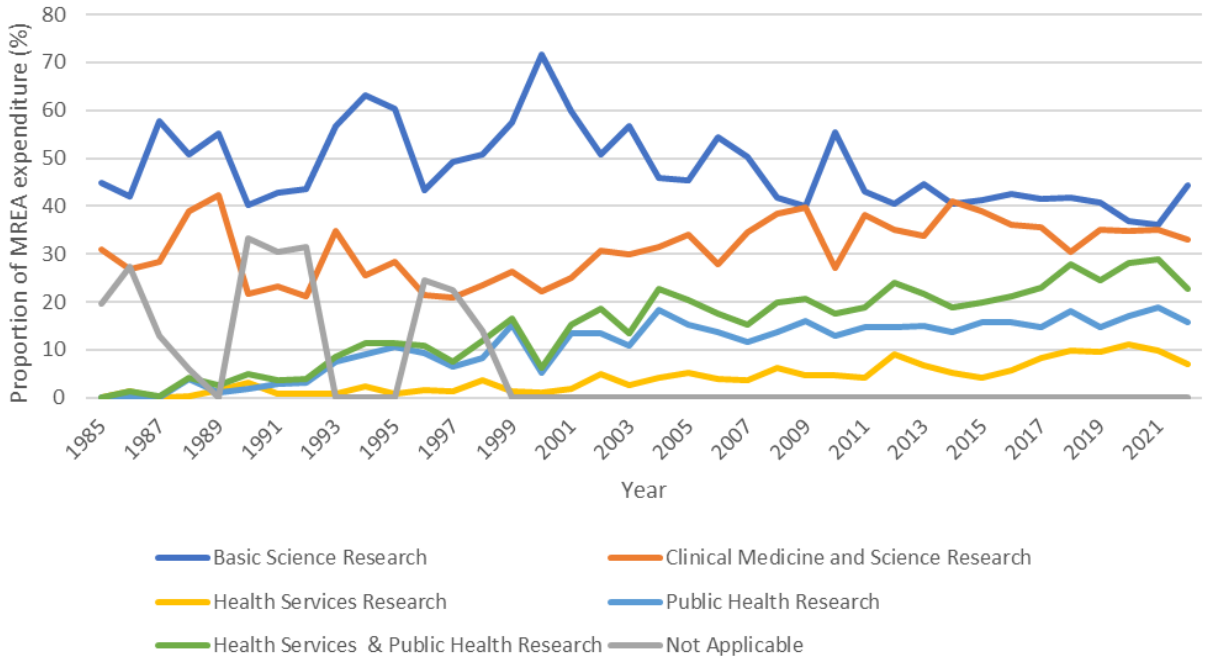


Figure 36. MREA expenditure by application year by BRA

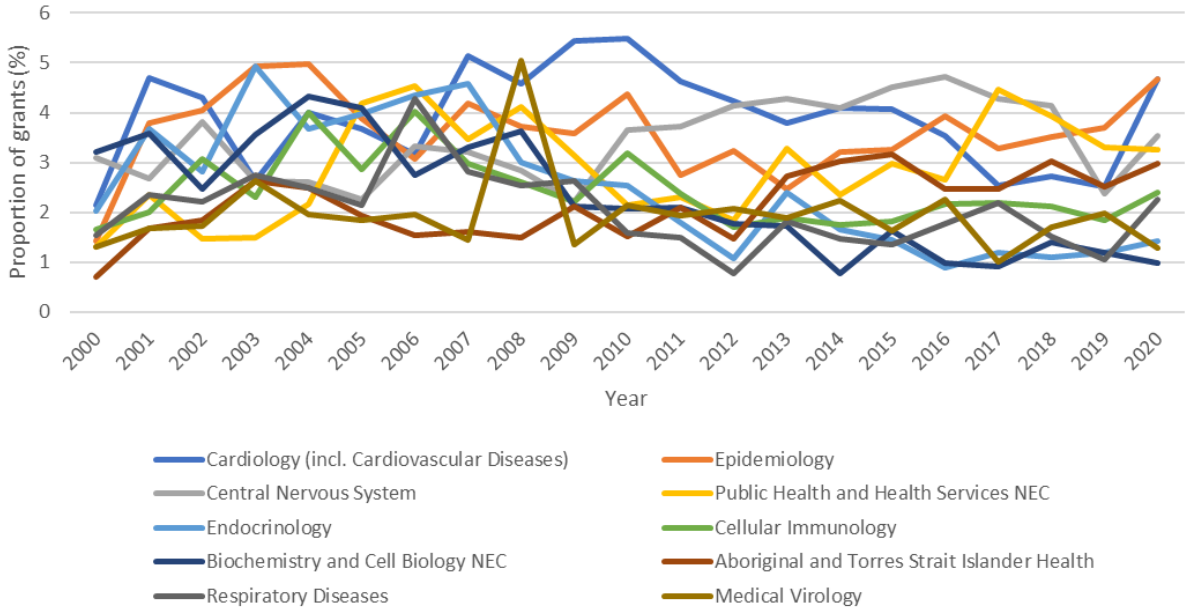


Field of Research

No clear pattern or long-term trends are evident when considering the proportion of MREA grants being allocated to the top 10 four-digit Fields of Research (FoR), with the rank order of the FoRs

constantly changing from 2000 to 2020[44] (refer Figure 37). However, the number of different FoRs being listed in grant applications has been constantly increasing from 106 unique FoRs reported in 2000 to 148 in 2019. As shown in Figure 38 – which depicts each separate FoR with a different colour, there are many FoRs and each claims a very small proportion of the total MREA.

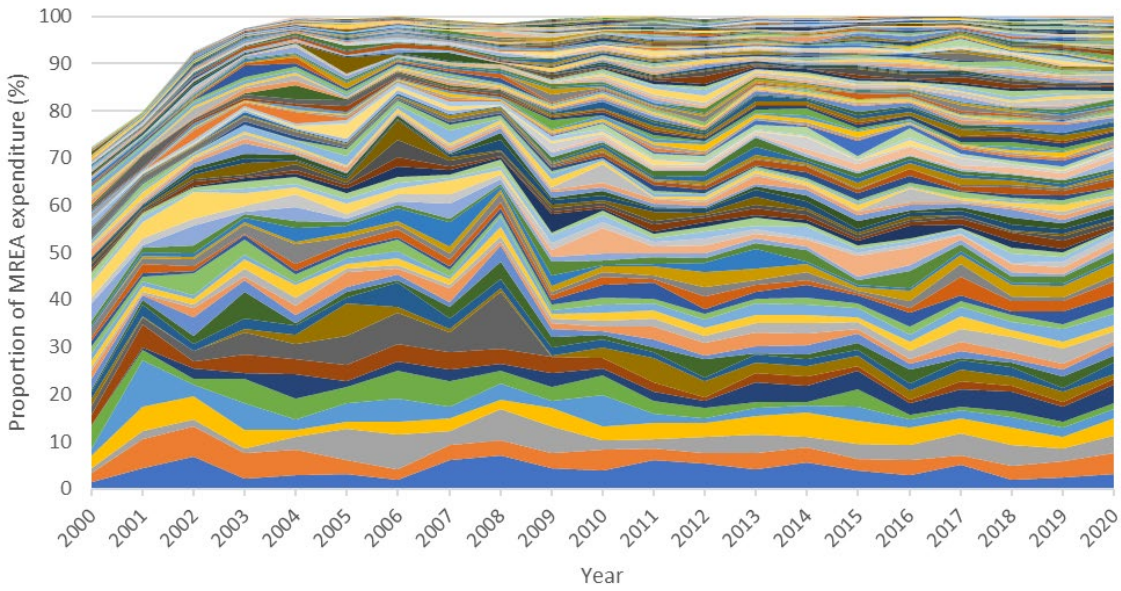
Figure 37. Proportion of MREA grants by year by the top 10 FoRs[45]



[44] NHMRC expanded the range of FORs that it uses in 2020.

[45] Only displaying top 10 (cumulative) FoR codes from 2000-2020 for clarity.

Figure 38. Proportion of MREA funding by year by FoR[46,47]



Disease classification

Between 2013 and 2022, MREA expenditure was greatest in the International Classification of Disease (ICD) area[48] of neurological diseases (Figure 39). This was followed by expenditure on cancer and infectious disease. Skin and orofacial diseases received the least funding.

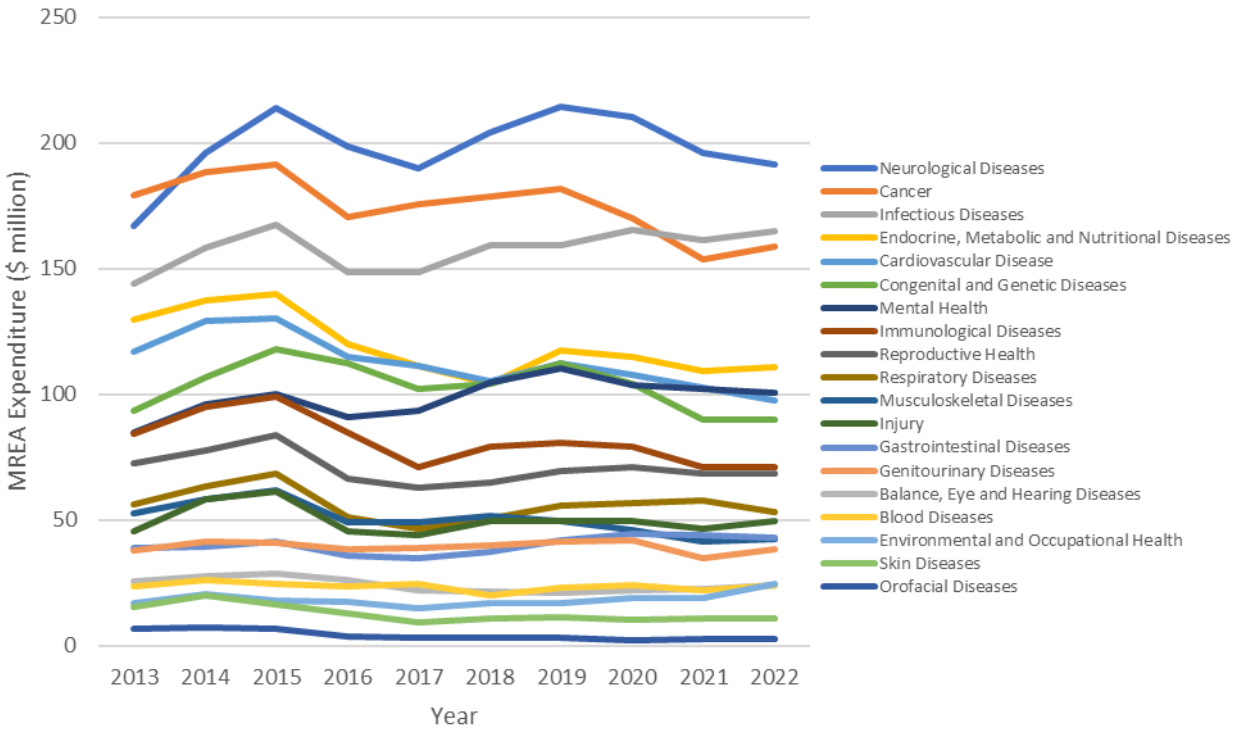
The ranked order of MREA expenditure within the different ICD areas was largely consistent between 2013 and 2022. However, the ICD areas where MREA funding is greatest do not clearly align with the ICD areas where the greatest disease burden in Australia exists. As shown in Figure 40, Disability Adjusted Life Years (DALYs) by disease area have also been generally stable (over the two decades 2003-2022), but, for example, MREA funding for cancer shows a decline while the disease burden is increasing. Neurological diseases rank first among MREA areas but 7th among disease burden areas.

[46] New FoR codes were introduced in 2008 and 2020 in the Australian and New Zealand Standard Research Classification (ANZSRC) by the ABS and Stats NZ. This led to an increased number of FoR codes available for researchers to select from following these changes.

[47] Where the proportion of MREA expenditure is less than 100%, grants were awarded to applications where no FoR was allocated.

[48] For reporting purposes, NHMRC classifies applications against disease, health and research topics based on information provided at the time of application including an application's title, keywords, media summaries and other **research classifications** where appropriate.

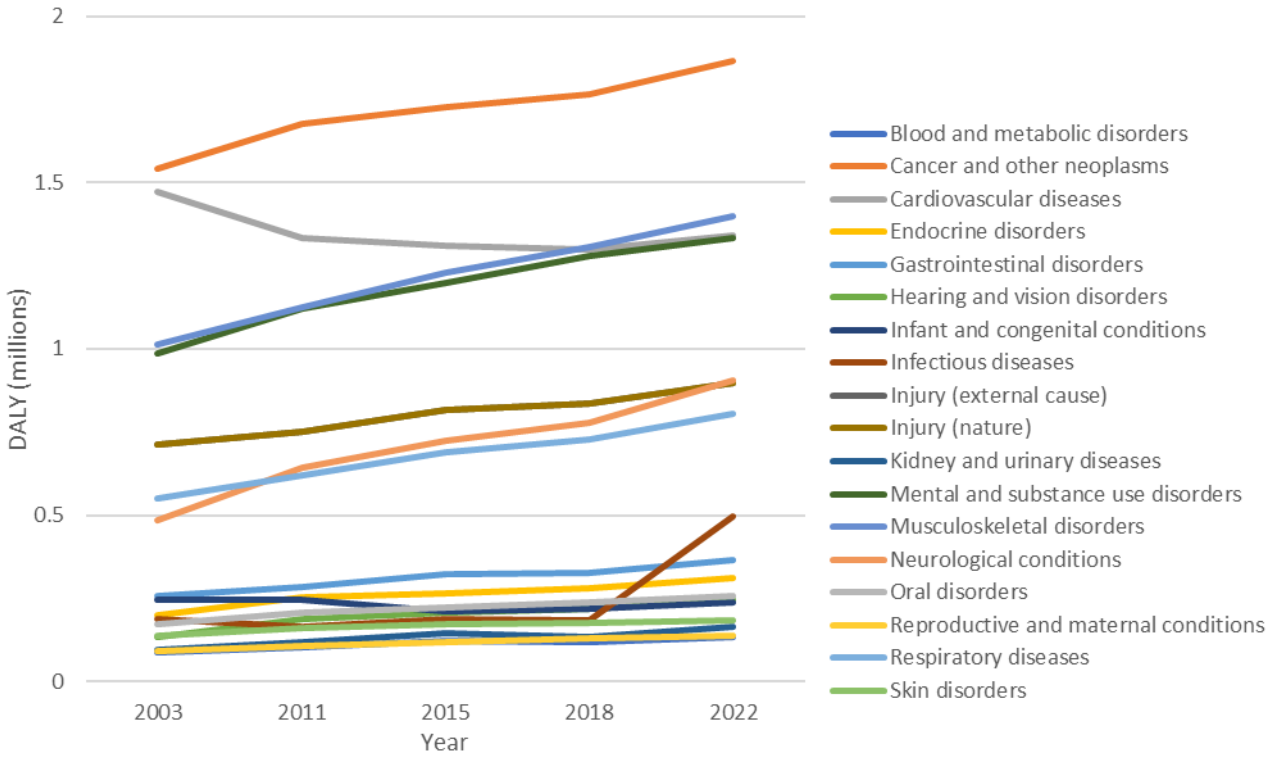
Figure 39. MREA expenditure by year by disease and health areas[49,50]



[49] These disease, health and research topics are based on the International Classification of Disease (ICD) produced by the World Health Organisation. For further information about these Disease, Health or Research Topics The figures in the table above for Immunological Diseases have been modified to exclude immunological research specifically related to cancer. These figures relate to research relevant to allergy, autoimmune diseases, and immunodeficiency. Mental health Includes research into addiction.

[50] Research funding statistics and data | NHMRC

Figure 40. Disability Adjusted Life Years (DALY) by year (2003-2022) by ICD



Health population

Most NHMRC grant schemes follow an 'investigator-led' model, where the research topics and health populations studied are selected by applicants.[51] The distribution of NHMRC funding to research relevant to different health populations can be estimated based on application information including application titles, keywords, media summaries and research classifications.[52] Not all applications specify a particular population, or specify general human health and as such remain unassigned.

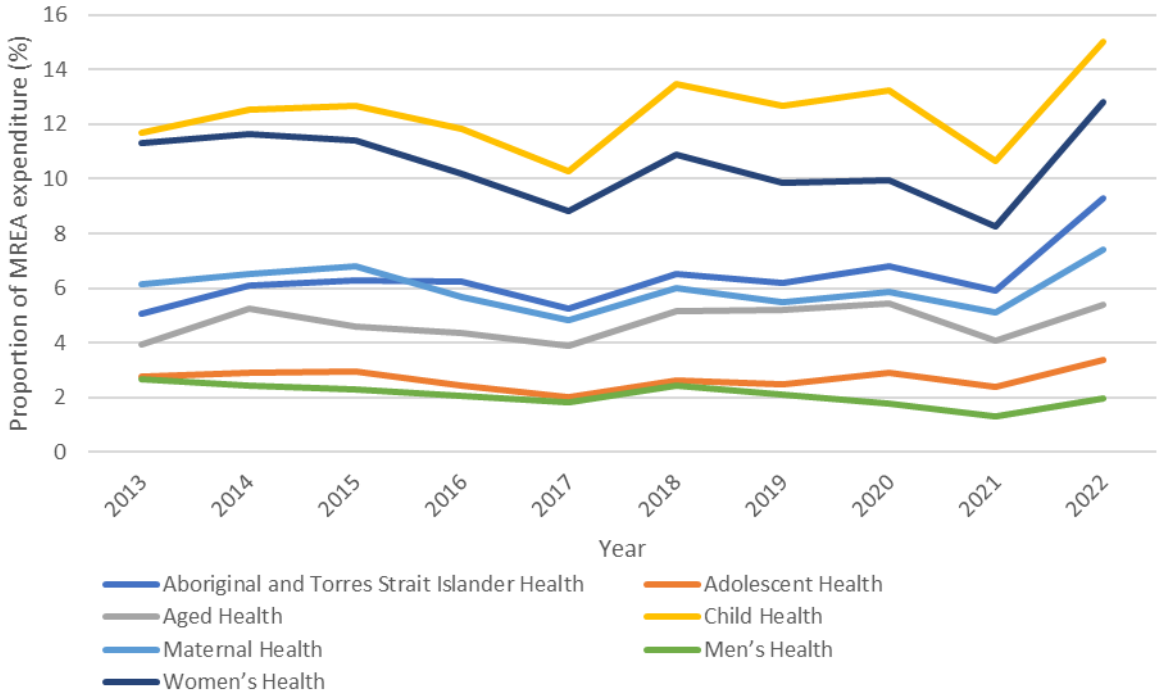
As shown in Figure 41, MREA expenditure between 2013 and 2022 on research relevant to child health was greater than on any other specific population, where a specific population could be defined.[53] This was closely followed by expenditure on women's health. First Nations and maternal health received similar amounts of funding, both slightly above that of aged health. Both men's health and adolescent health each received approximately one fifth of the funding received by research on child health. The rank ordering of these funding allocations has remained mostly stable over the past decade.

[51] Overview | NHMRC

[52] Research funding statistics and data | NHMRC

[53] Annually approximately 44-63% of MREA expenditure was on grants which were defined as not relevant to any specific health population.

Figure 41. Proportion of MREA expenditure by year (2013–2022) by relevance to specific population groups[54]



Findings

The analyses above underpin the following key findings:

Capacity analysis

Distinct researchers

- Although absolute levels of funding for the MREA have increased, in real terms, so too has the average funding amount for grants, with grants more than doubling in value, while applicant success rates have dropped.
- The number of distinct CIAs being funded each year reached a peak about 2010 and has since declined to not far above its 1990 level. However, the average amount of grant funding per unique CIA has more than doubled since 1990.

New researchers

- The number of new (first-time) CIAs being funded each year is about the same now as it was in 1990, but from the mid-1990s to the early 2010s it was about double the current level.
- As a proportion of total funded grants, new CIAs have generally been declining.

[54] Research funding statistics and data | NHMRC

Career stage

- While the number of CIAs at all career stages has been declining over the past two decades, ECR numbers have declined the most.
- As a proportion of all funded researchers, ECRs have been in almost continual decline since 2000.

First Nations

- The number of First Nations CIs and CIAs receiving grants each year has increased steadily since 2000 and reached the percentage of the Australian population identifying as First Nations in 2021

Gender

- The proportions of grantees identifying as women and men have been gradually approaching each other over the past two decades such that there is now only a negligible difference at all levels besides L3.

Institution location

- As a proportion of state/territory population, there have been consistently more grantees from Victoria than other states, and the success rate of applicants from Victoria is consistently higher than for applicants from most other states.
- However, over the past five decades, the application success rates for all states besides NT have been converging.

Institution type

- Go8 universities have been receiving the majority of MREA funding over the past two decades.

Capability analysis

Broad Research Areas

- Over the past three decades, the proportion of grants awarded to support basic science research has been higher than for health services, public health or clinical medicine research.
- That said, these latter research areas have been gradually increasing their share over this time.

Field of Research

- Over the past two decades, the number of FoRs being funded has increased, with no particular FoR being consistently funded ahead of the others.

Disease classification

- Funding for various disease areas has generally been stable over the past two decades, with cancer and cardiovascular diseases generally receiving the most.

Health population

- Funding across all NHMRC grants schemes for various specific health populations has generally been stable over the past two decades.

Next steps

The evaluation has identified several opportunities to enhance understanding of NHMRC's grant program outcomes and strengthen the evidence base for future policy, program and evaluation activities. The following next steps are intended to build on these findings and support evidence-informed decision-making and ongoing grant program improvement:

- undertake further analysis of the trends identified to better understand their underlying drivers and assess whether there are implications for existing policy settings, future policy development, or program design
- consult NHMRC Council and Principal Committees and the broader sector on the development of future evaluation questions, methodologies and data collection approaches, ensuring evaluations remain relevant, evidence-based and aligned with strategic priorities
- investigate opportunities to incorporate external data sources to complement NHMRC's existing data holdings. This could include sources such as OpenAlex, which may provide additional insights into observed trends and strengthen the evidence base for future evaluations
- assess performance against the remaining grant program objectives (addressing current and future health challenges, supporting research of unique importance to Australia) by undertaking targeted analysis to determine the extent to which the program is achieving its intended outcomes and to identify areas requiring further attention.

Going forward NHMRC will work to ensure our data collection and evaluation activities align with and support the goals, focus areas and outcomes of the National Health and Medical Research Strategy, working with partners across government and the research ecosystem.

About this document

This document was developed within NHMRC's Research Policy and Evaluation Section.

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Appendix A – Data notes and calculations

Data sources

The data used in the analyses were sourced from the NHMRC grants dataset.

For funding amount analyses, the grants dataset provides information on the amount of funding allocated out from the MREA by NHMRC. These numbers will be different to those listed in the Australian Government's Science, Research and Innovation Budget Tables (refer below), which specify the amount of total MREA funding received by NHMRC from the government during any given financial year.

First Nations population data were sourced from the Australian Bureau of Statistics. *Estimates of Aboriginal and Torres Strait Islander Australians methodology*. Available from: https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/estimates-aboriginal-and-torres-strait-islander-australians

Population data sourced from ABS 3101.0 National, state and territory population TABLE 4. Estimated Resident Population, States and Territories (Number) https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release#data-downloads

HERD data sourced from Australian Bureau of Statistics. *Research and Experimental Development, Higher Education Organisations, Australia* Available from: https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-higher-education-organisations-australia/latest-release.

Elector data were sourced from the Australian Electoral Commission. *Elector count by division, age group and gender*. Available from: https://www.aec.gov.au/enrolling_to_vote/enrolment_stats/elector_count/index.htm

Science, research and innovation (SRI) budget data were sourced from the Department of Science, Industry and Resources. S*cience, research and innovation (SRI) budget tables. Available from:* https://www.industry.gov.au/publications/science-research-and-innovation-sri-budget-tables

Medical practitioner data were sourced from the Department of Health, Disability and Ageing. *National Health Workforce Dataset*. Available through the Department of Health and Ageing Medical Practitioners Dashboard https://hwd.health.gov.au/mdcl-dashboards/index.html

Data quality and interpretation

Best efforts have been made to ensure all data are accurate, however small variations in numbers and values of grants awarded may be possible due to updates to historical grant records and other factors.

NHMRC grants data is available over nine decades. As such, when interpreting these data it is important to consider the changes to grant program over this time. Some key changes are noted below.

Block funding

When Professor Gustav Nossal became WEHI Director in 1965 he requested that, rather than submitting individual applications, all WEHI staff should be funded through a single process. This process came to take the form of a triennial (then quinquennial or five yearly) Research Institute or 'block' Grant to WEHI. Such grants were later extended to a number of other MRIs including the Garvan Research Institute, The Florey institute and the Murdoch Children's Research Institute.

Because the block grants were 'one line' grants applied for by each Institute's Director, NHMRC's grants dataset shows large amounts of funding being directed to a small number of individuals, despite this funding actually supporting the work of many others.

Following a review in 1998-1999, the block grants began to be phased out, a process which was completed by about 2006. As a consequence, at around this time a large number of 'new' CIAs appear in the grant dataset, being staff at these MRIs who were previously funded through the block grant.

New grants program

The suite of grant schemes that NHMRC uses to provide funding to researchers was substantially revised commencing in 2019. The previously existing Project Grants, Program Grants and a range of fellowships were replaced with Ideas Grants and Investigator Grants. This major revision creates a discontinuity in time series data related to the grant program and is the reason why some of the charts in this report either end or begin in 2019.

General policy changes

Over time, NHMRC policy and eligibility criteria have changed in response to a variety of factors. These changes have included (amongst others) limiting the number of grants an applicant can be included on, setting targets for First Nations research and changes career disruption/eligibility criteria.

Institution type calculation

In Figure 33, which shows the number of different types of institutions (university, hospital and medical research institute) that were the home institutions of authors publishing articles related to health and medicine, the following methodology was used to obtain the data.

1. The data was obtained from https://www.lens.org
2. The date range was set for each decadal 'bin'
3. The Institution Country/Region was filtered to 'Australia'
4. The Subject Matter was set to 'Field of Study – Medicine'
5. The Institution field was filtered by the words (respectively): 'hospital', 'institute' or 'university'.
6. These searches yielded a collection of named institutions. All those located in Australia were used to filter the search.
7. The total number of scholarly articles returned was added to a spreadsheet, for each year bin and for each institution type.

Career Stage calculation

This section details how the career stages of CIAs, discussed in the Career Stage section, were determined.

Career stages of CIAs were determined by calculating the duration (in years) from when a CIA was awarded their PhD to when they made their grant application. These values were then assigned into ranges and career stages, based upon the leadership levels from the Investigator Grants 2025 Guidelines:

- ECRs were defined as those with less than or equal to 5 years of post-PhD experience, including PhD candidates.
- Mid-career researchers were defined as those with more than 5 years to less than or equal to 15 years of experience.
- Late-career researchers were defined as those with more than 15 years of experience.

DATA FILE

Note that the below information includes data from 2023. However, the analysis and discussion in the Career Stage section excludes 2023 from the time series for the sake of consistency and comparability, as other sections in the report include data until 2022.

Data containing date of PhD completion was requested from the NHMRC Statistics team. The file they provided contained 24,860 rows (or records) for the period 2010 to 2023. The data file included the following columns: grant_id, application_year, scheme, round, grant_payment, title, broad_research_area, researcher_sk, investigator_role_code, full_name, **phd_awarded_flag, phd_awarded_year**.

The *phd_awarded_flag* and *phd_awarded_year* columns provided the foundation for determining career stages. These two columns contained a combination of values within them, shown in Table 1.1.

Table 1.1. ***phd_awarded_flag*** **and** ***phd_awarded_year*** **cross-table**

		PHD_AWARDED_YEAR			
PHD_AWARDED_FLAG		Year provided*	Not available	NULL	Total
	Yes	20,295	15	13	20,323
	No	70	0	3,692	3,762
	Null	0	0	775	775
	Total	20,365	15	4,480	**24,860**

*A legitimate year was provided.

There were 4,495 rows (18%) with a *phd_awarded_year* of "Not Available" or "NULL" Of these:

- 33% (1,466 rows) had a Postgraduate scholarships scheme type.
- 22% (989 rows) had a Project Grants scheme type.
- 21% (954 rows) had an Equipment Grants scheme type.

- 6% (277 rows) had an Independent Research Institutes Infrastructure Support Scheme type.
- 6% (255 rows) and 2% (110 rows) had an Early Career Fellowships and Research Fellowships scheme type, respectively.
- The remaining 10% (444) had a mix of other scheme types.

Data cleaning: step 1

Researchers undertaking their postgraduate education at the time of grant application will likely not have a *phd_awarded_year* noted (unless backdated). Therefore, all rows with Postgraduate Scholarships scheme type had their *phd_awarded_year* value changed to "PhD candidate".

Note that this is likely to result in a slight overestimation of ECR numbers, as it is assuming all researchers receiving a Postgraduate Scholarships grant are ECRs. In reality, researchers can be eligible for NHMRC grants without a postgraduate qualification at any career stage, given they hold an equivalent research experience and/or qualification. This is often applicable to health care practitioners. Hence, some researchers in this data file may be much further into their research/professional career, and received multiple NHMRC grants, before beginning a PhD program. They would not usually be considered ECRs in other contexts.

After the change was applied, 3,029 rows remained with a "Not available" or "NULL" *phd_awarded_year* value. Of these:

- 3,044 rows had "No" or "NULL" for *phd_awarded_flag*.
- 25 rows had "Yes" for *phd_awarded_flag*.

These rows were missing a legitimate *phd_awarded_year* value and would not be able to provide the necessary information required. Therefore, they were removed from the data file.

After the completion of step 1 data cleaning, the resultant working file contained 21,831 rows, all of which had a legitimate *phd_awarded_year* value.

Data cleaning: step 2

For the next step of data cleaning, a *years_post_phd* column was created.

The *years_post_phd* value was calculated by subtracting the *phd_awarded_year* from the *application_year*, except for PhD candidates whose *years_post_phd* value remained the same (i.e., PhD candidate). A few examples are listed in Table 1.2 below to illustrate this process. Note that researcher names are pseudonyms.

As shown in the third row of the table, if a CIA applied for an NHMRC grant in the same year as they were awarded their PhD, the *years_post_phd* output was "0".

Table 1.2. Years post PhD Calculation Examples

Grant ID	Application Year	Scheme	Name	phd_awarded_year	years_post_phd
1011	2001	Postgraduate scholarship	Josh T	2001	PhD candidate
1021	2001	Project Grant	Paul Yu	2020	-19
1022	2004	Early Career Fellowships	Meryl Hung	2004	0
1013	2007	Development Grants	Simon Jet	1994	13
1035	2013	Centres of Research Excellence	Kate Miller	1990	23

In the first data cleaning steps, all researchers receiving a Postgraduate Scholarship were noted as being a PhD candidate in the *phd_awarded_year* column. Hence, any rows in the second step of data cleaning where the *years_post_phd* were less than zero indicated that the researcher was not a PhD candidate and was receiving a grant usually catered towards a different career stage.

While *years_post_phd* can act as a reasonable predictor for a researcher's career stage, it is not applicable in all circumstances, as stated in the previous section. This is the case for Paul Yu in Table 1.2, an orthopaedic surgeon who received an NHMRC grant almost two decades prior to obtaining their PhD in the year 2020.

Automatically assigning these CIAs to the ECR category, based on them receiving the grant before their PhD completion, would falsely inflate numbers for these categories. Therefore, a third data cleaning step was taken to assess if the researcher's *years_post_phd* value aligns with the eligibility requirements for the grant scheme type they received.

Data cleaning: step 3

Simple data checks were performed to assess where the majority of negative *years_post_phd* values were occurring. These values ranged from 1 to 19 years before the PhD awarded date, with the majority of records (66%) being one year before the PhD awarded date.

Of all the records with a negative *years_post_phd* value, more than three-quarters related to Early Career Fellowships (61%) and Project Grants (17%) (see Table 1.3).

Table 1.3. Negative *years_post_phd* values by scheme type

Scheme Type	2 to 19 years before PhD awarded year	1 year before PhD awarded year	All years before PhD awarded year
Early Career Fellowships	17	285	302
Project Grants	67	19	86
Equipment Grants	34	3	37
Strategic Awards	15	4	19
Practitioner Fellowships	9	2	11
Other Schemes	26	14	40
All schemes	**168**	**327**	**495**

More than half of the records were researchers who received an Early Career Fellowship one year before their PhD awarded year.

The Early Career Fellowships Scheme-Specific Funding Rules state that to qualify for this grant, researchers must hold a PhD for no more than two years (four for those with a medical qualification), or must submit their thesis by 31 December in the year of application. The closing date for applications is in the first half of the year. Hence, researchers who applied for this Fellowship prior to submitting their thesis at the end of the year (and awarded their PhD in the following year) would be flagged in the data file as applying for the grant one year before their PhD awarded year. These records were treated as legitimate and were amended to a value of "0" for their *years_post_phd* value.

The remaining 210 records had a *years_post_phd* value of -1 to -19 years (or -2 to -19 for Early Career Fellowships) could not be validated against funding rules. Most of the grant scheme types did not have a specific cut-off eligibility rule based around a researchers PhD date. For example, Project Grants can be awarded to a researcher at any career stage. Validating these records against other sources, such as through the CIA's career history, would require extensive work beyond the available resources and timeframe. Hence, these records were removed from the data file.

An additional 278 records with scheme types "Practitioner Fellowships" and "Translating Research into Practice Fellowships" were also removed from the data file. Both of these scheme types are aimed at health care professionals and do not require a postgraduate qualification, and their *years_post_phd* value would not be an accurate representation of their career stage.

Final Data File (Unique CIAs)

At the end of all three data cleaning steps, a total of 14% of records were removed from the original file provided by the NHMRC Statistics team. The final data file contained 21,343 records/rows (86% of the original records).

The "years_post_phd" values were used to categorise CIAs into ECR, mid-career researcher, or late-career researcher groups. This was based on Investigator Grants 2025 Guidelines.

To analyse unique CIAs by year, the final data file was amended to ensure a CIA was counted only once per application year, regardless of the number of grants they received during that year. This removed an additional 1,951 records from the 21,343 records of the final file. This presents a more accurate representation of the number of individual CIAs throughout the time-series.

DATA LIMITATIONS

Data quality assurance processes were undertaken where possible through data cleaning steps and validation against external resources. While measures were undertaken to ensure accurate linking of PhD awarded dates to career stages, certain limitations in the data were unavoidable due to unavailable or missing information.

CIAs with a negative *years_post_phd* value were easily identifiable in the data as potential errors requiring further checks. However, records with a positive *years_post_phd* value could not be flagged for additional validation and were finalised as is. For instance, a CIA applying for a grant in 2015, with a *phd_awarded_year* of 2005, would have a *years_post_phd* value of 10 years, classifying them as a mid-career researcher. However, this CIA could in reality be a practitioner involved in research since 1990 and would more accurately represent a late-career researcher. The source data file lacks an indicator for health practitioners and does not contain further information about the career histories of CIAs. Hence, any analysis extracted from this data might contain some underestimations or overestimations in the number of CIAs in each career stage.