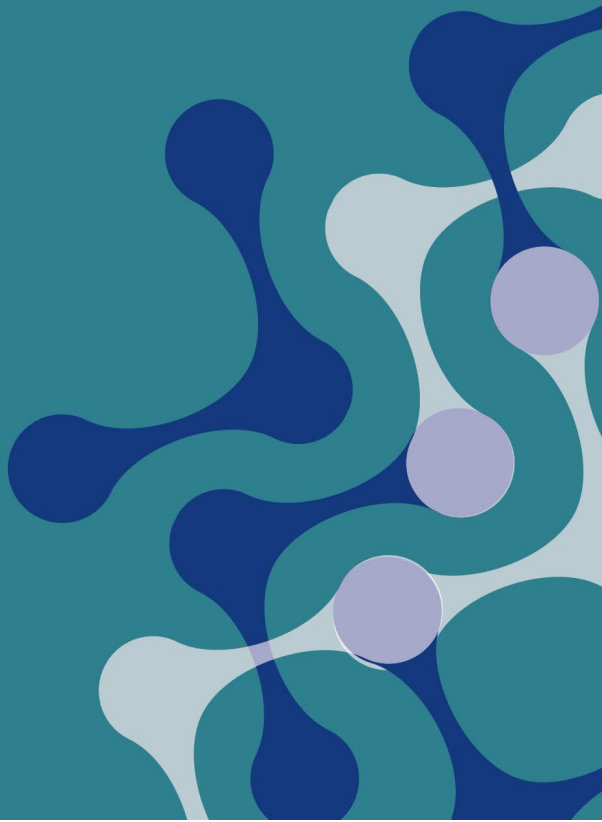
Office for Health and Medical Research

NSW Cardiovascular Research Capacity Program: Interim Evaluation

2025



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NSW Health

1 Reserve Road

St Leonards NSW 2065

(02) 9391 9228

www.health.nsw.gov.au

www.medicalresearch.nsw.gov.au

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Foreword

Cardiovascular disease (CVD) accounts for almost a quarter of deaths in Australia and contributes significantly to the nation's health burden. The NSW Government established the **Cardiovascular Research Capacity Program** in 2018 to drive scientific discovery, support the development of new treatments, develop researcher capacity and capability, and improve health outcomes for patients with cardiovascular disease. The Program provides $150 million in grant funding over ten years, with 112 grants funded in the first five years.

The Office for Health and Medical Research commissioned the NSW Agency for Clinical Innovation to conduct an interim evaluation of the first five years of the Program. This report presents their findings and recommendations of this independent evaluation.

The evaluation aimed to answer ten key evaluation questions:

1. How well does the Program support NSW CVD research priorities and opportunities within the existing CVD funding landscape?
2. How well is the Program being delivered?
3. What has been the reach and uptake of the Program amongst target audiences?
4. What is the evidence of outcomes achieved to date?
5. How successful has the elite grant scheme been in attracting highly talented cardiovascular researchers to NSW?
6. How likely is the Program to achieve intended long-term outcomes?
7. How much of an impact is the Program likely to make for priority populations, including regional, Aboriginal, and culturally and linguistically diverse populations, and comorbidities?
8. What are the total costs of delivering the Program to date?
9. How likely is the Program going to generate a net social benefit for NSW?
10. What is the case for continuation of NSW funding in this space?

The evaluation included process, outcome and economic evaluation. A mixed method approach was taken, using both quantitative and qualitative data. Surveys were used to enhance data collected during the annual progress reporting and from submission of final project reports. Surveys and interviews provided key narrative information that was used to provide context to the numbers and graphs presented. The eight case studies used throughout the report are presented in a separate cohesive document available on the Office's website.

The evaluation report documents significant positive impacts on knowledge, policy, practice, community, and the economy. The findings support that the Program already provides good value to NSW, which is expected to greatly increase by the 10-year evaluation and later years as more research matures and translates into benefits to the health and economy of NSW.

Key findings of the evaluation include:

- 112 research grants were awarded in the first three rounds of the Program, totalling $71.4 million. 52 of those grants were completed as of January 2025.
- the cost to administer the first five years of the program was $3,020,000. At 4.1% of total costs, this is low compared to other grant programs in Australia
- the Program was responsible for attracting more than $159 million in additional grant and fellowship funding; $93 million of which was leveraged from outside NSW.
- at this midpoint, the Program has a benefit-cost ratio of 1.54, meaning the Program is cost effective, with $1.54 return on every dollar spent.
- the net present value of $36.8 million demonstrates that, after adjusting for inflation and other discount methods, the Program brought almost $40 million in benefits into NSW from 2018-19 to 2022-23.

- 71% of projects involved consumers in the design, strategic direction, review or delivery of the research.
- grant recipients produced 867 publications in the first five years. The highest publication rates were for the elite leader grant (29 publications), senior scientist grants (average 14.2 publications), and the clinical scientist grants (average 13.9 publications).
- the Program has supported the education of more than 270 doctoral, masters and honours students so far.
- 82% of grant holders said the grant was the main or major factor in progressing their career.
- after just five years, with more than half of funded grants still in progress, almost a fifth of projects reported contributing to significant policy and clinical practice change.

The evaluation has eight recommendations for the Program and how it can be improved. Some of the recommendations have already been addressed by the Office in subsequent grant rounds and others are already in progress. There are several data and evaluation questions that must be addressed before the summative evaluation is conducted.

The Office's responses to the recommendations in the report are outlined in the table below.

Recommendations from the Report

Theme	Report recommendations	Office for Health and Medical Research response
Overall strategic focus	**Recommendation 1**: Consider developing a business case for further funding beyond 2028.	The Office welcomes the evaluator's conclusions that the Program represents good value to NSW. The Program represents an enormous amount of work from the Grants Team in the Office, supported and informed by stakeholders such as members of the NSW Cardiovascular Research Network, the Cardiovascular Research Advisory Committee, the Aboriginal Heart Health Grants Advisory Group and the many experts who contribute their time and knowledge to reviewing applications. It is also a credit to the researchers and their host institutions, who conceptualise, design, source funding and conduct the science that results in the impacts to knowledge and patient care described in the evaluation report. The findings in this report will contribute to discussions and planning for the remaining years of the Program and what comes after, as part of NSW Health's systematic approach to prioritising focus areas for strategic investment in health research and innovation.
	Recommendation 2: Enhance strategic prioritisation.	The Program uses a broad definition of cardiovascular research and most grant rounds to date have enabled applicants to nominate their specific research focus, supported by evidence of gaps in knowledge, prior work and likely impact. This approach has been accompanied by program-wide strategic priorities including building the capacity of early-mid career researchers and attracting elite researchers from outside NSW. More recently, the Program implemented a targeted call for research to improve the cardiovascular health of Aboriginal peoples – the Aboriginal Heart Health Grants.

Theme	Report recommendations	Office for Health and Medical Research response
		The Office recognises the opportunity for more strategic prioritisation via additional targeted calls, developed in consultation with key stakeholders and in alignment with the NSW Health Research and Innovation Strategy 2025 - 2030. Other programs run by the Office have included greater prioritisation. For example, the Early Mid-Career Grants Program included rounds on gene and cell therapies, microbiomics, and phage therapy. However, this focus was criticised by some researchers in the Early Mid-Career Grants Program evaluation, as it locked them out of applying for these funds. The Office will investigate the potential benefits and implications of this recommendation.
Operational improvement over the remainder of the Program	**Recommendation 3**: Improve grant management systems.	The Office will implement a grant management system across its grant program in 2025-26. The system is already in place in government agencies across NSW and provides a tried and tested solution. The grants management system also supports other recommendations made by the evaluation (recommendations 5, 6 and 8).
	Recommendation 4: Consider how consumers can be involved at all levels of the Program.	The Office will engage with grant-funding organisations that are experienced with including consumers in their work, including the Cancer Institute NSW and the National Health and Medical Research Council.
	Recommendation 5: Improve equity and transparency in grant distribution.	The Program has already made inroads to improving equity in grant distribution. In 2024, the Office established the Aboriginal Heart Health Grants (AHHG), a $5 million targeted call supporting high impact Aboriginal-led research. The outcomes of this round are expected in December 2025. The Office supports the recommendation to improve equity and transparency of grant distribution. In addition to the establishment of the Aboriginal Heart Health Grants it is currently considering other targeted calls to support greater equity. The Office will review best practice in equity implemented by other grant funders, including the National Health and Medical Research Council, who have implemented effective initiatives that reduced disparities in funding. The Office is beginning work to review diversity on its expert review panels and develop strategies to address this in a fair and equitable way. The Office is investigating options regarding the provision of detailed feedback to all applicants. The Office plans to pilot this new approach for the 2025 round of Senior Scientist and Early-Mid Career Researcher Grants.
Preparation of the summative evaluation	**Recommendation 6**: Systematically track progress of individual projects along the research	The Office will investigate how to best track progress of grants along the research translation pathway. This will likely involve several scales to accommodate the complexity of assessing progress across different project

Theme	Report recommendations	Office for Health and Medical Research response
	translation pathway.	types. For example, massive progress is possible just within basic science research, where projects might not transition out of laboratory work for a decade, whereas other projects will rapidly move through multiple phases of clinical trials in the same time. Advancement through commercialisation phases uses another scale that the Office could integrate for systematic tracking of progress. The implementation of the grant management system would greatly support this recommendation.
	Recommendation 7: Examine the appropriateness of 60% funding allocation to basic science.	The Office will investigate ways to evaluate the long term benefits of the Program. This will be essential for robust evaluation of the Program after the original 10 year period has ended. The interim evaluation provides critical insights into the methods and measures needed for that evaluation which, ideally, will also support analysis of the benefits of the 60% funding allocation to basic science research.
	Recommendation 8: Refine economic related data metrics in reporting to enable a robust economic evaluation.	When the new grant management system is introduced, the Office will review annual reporting to align with recommendations from the evaluation. This will include identifying the source of leveraged funds and publications that include economic evaluations. The Office will investigate how to best capture researcher career progression in progress and final reports. Some of these fields may be collected most effectively by surveys or interviews at the end of a grant. As few project commercialise within the lifetime of the grant, it is unlikely that sales and market figures would be collected during the Program. However, the Office will investigate linking data from its own sources (e.g. the Medical Devices Fund) and other sources (e.g. Australian Taxation Office ad hoc collection from medical device businesses) to assess whether commercialisation data can be included in regular monitoring for the 10-year evaluation.

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NSW Cardiovascular Research Capacity Program Interim Evaluation

Evaluation report

September 2025

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Agency for Clinical Innovation

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The information in this resource should not replace a clinician's professional judgement.

The Agency for Clinical Innovation (ACI) works with clinicians, consumers and system leaders to improve the health system in NSW. We design and implement new ways to deliver care for patients.

The ACI partners with the Ministry of Health, pillar organisations, local health districts, specialty networks, clinicians, patients and carers. We work together to achieve better value in healthcare by:

- improving patient and provider experience
- improving patient outcomes
- delivering efficient and sustainable healthcare services.

The ACI is part of the Clinical Innovation and Research Division and works closely with the Office for Health and Medical Research.

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AGENCY FOR CLINICAL INNOVATION

1 Reserve Road St Leonards NSW 2065
Locked Bag 2030, St Leonards NSW 1590
Phone +61 2 9464 4666
Email **aci-info@health.nsw.gov.au** | **aci.health.nsw.gov.au**

Further copies of this publication can be obtained from the Agency for Clinical Innovation website at aci.health.nsw.gov.au

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Achievements and strengths	**Areas for further improvement and/or future focus**
• The Program aligns with NSW Health strategies and national funding schemes. • Grant types are refined over time and support balance between investigator-led research and targeted priorities.	• Continue with majority investigator-led grants but establish additional grant streams focused on health system priorities and targeted investments.
Quality of program delivery	
Achievements and strengths	**Areas for further improvement and/or future focus**
• The Program is delivered as intended in line with the NSW Government's mandatory Grants Administration Guide. There has been flexibility for COVID-19 impacts, and most projects are progressing despite some delays due to pandemic. • Overall application and reporting processes were considered favourable compared to other major grants. • A strong partnership with the NSW Cardiovascular Research Network (CVRN) has supported effective program delivery. • Consumer involvement is limited at Program level but present in some funded projects.	• Implement an online grant management system to streamline and improve application, review, reporting, and monitoring processes. • Consider how consumers can be involved at all levels of the Program, including consultation and co-design. • Consideration should be given to providing all grant applicants with feedback or scores on their applications.
Reach and uptake	
Achievements and strengths	**Areas for further improvement and/or future focus**
• A total of 112 research projects were funded across rounds one to three, with 52 completed as of January 2025. • The Program is effectively reaching its intended audience and supporting projects aligned with its strategic objectives. • The distribution of grant types and research intent is aligned with the Program objectives	• Improve equity, in terms of gender, Aboriginality and geographic location, in grant application review process.
Early evidence of outcomes	**Key findings**
Knowledge advancement	• 867 peer-reviewed publications achieved so far. • The eight case studies included in this report, demonstrate the high-quality research generated from Program grants.

	• Evidence indicates the Program has been effective at advancing knowledge in this field.
Capacity and capability building	• 51 out of 112 research projects are supporting supervision of a total of 276 students. • A strong commitment to early mid-career (EMC) researcher development is demonstrated through the EMC grants (40 awarded across rounds 1-3) and CVRN grant application workshops. • More than half of funded projects advanced along the research translation pathway. • The Elite grant scheme plays a vital role in attracting top cardiovascular researchers to NSW.
Policy and practice	• Even at this halfway point in the Program, there is early evidence of the Program contributing to significant policy and clinical practice change, with 18% of projects reporting practical achievements.
Health and community impact	• Findings show early progress toward improving patient care and reducing the burden of cardiovascular disease. • A fifth of projects focus on a priority population • 19 grant recipient survey respondents reported practical achievements towards new health technology, therapeutics, or commercialisation.
Economic benefits	• Administrative costs are 4.1% of total grant expenditure. • The Program has attracted additional funding of $303 million from other funding sources. • The Program has an early indicative benefit-cost ratio (BCR) of 1.54 and a net present value (NPV) of $36.8 million, indicating a net benefit to NSW over the period 2018-19 to 2022-23.

Background

Cardiovascular disease (CVD) remains a leading cause of illness and death in Australia, accounting for a significant portion of the nation's health burden. Cardiovascular research aims to prevent CVD and develop novel treatment options, and to improve patient care and outcomes. Research grants in this field aim to discover, validate, translate, commercialise, and implement innovations from CVD research.

In 2018, NSW was lagging behind other states in obtaining national major grant funding for cardiovascular research. In response to the NSW funding gap and building on work from a collaborative NSW CVD research network of 13 organisations, the NSW Government announced the Cardiovascular Research Capacity Program (the Program) in May 2018. Funding was secured for $15 million per year over 10 years.

The Program funds high quality cardiovascular research in NSW in order to drive scientific discoveries, support the development of novel and innovative therapies, attract and retain high quality clinicians and researchers to NSW, and improve health outcomes for patients with CVD.

The Program, on the advice of the CVD Research Advisory Committee, has developed several types of grants with different aims, target audiences, eligibility and selection criteria (Table 1).

The interim evaluation

The Agency for Clinical Innovation (ACI) was engaged by the Office for Health and Medical Research (the Office) from early 2024 to undertake the NSW Cardiovascular Research Capacity Program interim evaluation. A summative evaluation will be conducted in 2028.

The purpose of the interim evaluation was to inform continuous improvement over the remainder of the Program, including identifying any area for improvements to best support grant recipients to deliver on intended outcomes (outputs and impacts) during and after their grant; identifying what data is needed for a comprehensive evaluation at the ten-year mark in 2028; and demonstrating progress to date against intended outcomes and accountability with regard to the money invested.

The objectives of the interim evaluation are to assess how well the Program, and its individual grant types, had been implemented to date; assess outcomes of the funded grant research projects based on evidence to date; assess the impact of the Program on the CVD research community to date; and capture the total costs of the Program and generate an early assessment of net social benefit of the Program for NSW.

The interim evaluation used a mix of methods, including analysis of data collected from grant reports (n=112), surveys of grant recipients (n=71; 69% response rate), interviews with elite grant recipients (n=3) and key stakeholders (n=11), case studies (n=8) and economic analyses. Impacts of the funded grant research projects were assessed across the Office's research impact domains of knowledge advancement, capacity and capability building, policy and practice, health and community impact and economic benefits.

Findings

Strategic alignment

How well does the Program support NSW CVD research priorities and opportunities within the existing CVD funding landscape?

The Program aligns with key NSW Health strategies and complements national funding programs such as the MRFF and NHMRC. Grant types have evolved over time based on advice from the Advisory Committee, supporting a balance between investigator-led research and targeted priorities reflecting the Program's principles. However there is an opportunity to explore a more coordinated, needs-driven approach to research prioritisation. The May 2025 final report of the Special Commission of Inquiry into Healthcare Funding, reinforces that while research innovation is essential, it should be guided by priorities that address current cardiovascular disease burden and public health challenges.

Quality of program delivery

How well is the Program being delivered?

The Program has been delivered as intended, with flexibility to accommodate the significant impacts of the COVID-19 pandemic on research processes. Most projects are progressing as planned, with delays mainly due to the pandemic. Delivery complies with grant guidelines, though record-keeping could be improved. Overall, applicants and grant recipients found the application process clear and user-friendly, and favourable compared to similar programs. Annual reporting was also considered favourable compared to similar programs. However the evaluation highlighted the apparent need for an online grant management system to substantially streamline application and grant reporting processes. Grant recipients and unsuccessful applicants also emphasised the need for more feedback from reviewers on their applications. While consumer involvement was limited at the Program level, some engagement existed within individual projects. A strong partnership with the CVRN contributed positively to effective delivery. Information on budget allocations regarding animal research alternatives was reported inconsistently, limiting the ability to conduct a thorough analysis in the evaluation.

Reach and uptake

What has been the reach and uptake of the Program amongst target audiences?

The findings suggest that the grant program is effectively reaching its intended audience and supporting projects aligned with its strategic objectives. A total of 112 research projects were funded across rounds one to three, with 52 completed as of January 2025. The alignment of the distribution of grant types and research intent with Program objectives indicates strong program design and implementation. The Aboriginal Heart Health Grants demonstrate a commitment to inclusive support across the research community, however, further work is needed to improve equity in grant distribution. Overall, the Program shows positive progress in reach, relevance, and equity.

Early evidence of outcomes

The following early evidence of outcomes are assessed by four key domains (Knowledge advancement, capacity and capability building, policy and practice, and health and community impact). The first four domains provide evidence for answering the following key evaluation questions:

What is the evidence of outcomes achieved to date?

How likely is the Program to achieve intended long-term outcomes?

How successful has the Elite grant scheme been in attracting highly talented cardiovascular researchers to NSW?

How much of an impact is the Program likely to make for priority populations, including regional, Aboriginal, and culturally and linguistically diverse populations, and comorbidities?

Knowledge advancement

Funded projects generated a total of 867 peer-reviewed CVD research publications, with two grants yielding 17 publications each, and one publication with 112 citations and a Field-Weighted Citation Impact (FWCI) of 11.88. An online grant management system would improve the quality of publication data, avoiding duplication and allowing for advanced metrics to help monitor research impact. The eight case studies showcased in this report demonstrate that high-quality research was generated from Program grants. This evidence indicates the Program has been effective at advancing knowledge in this field.

Capacity and capability building

Funded projects are generating valuable data for ongoing cardiovascular research while also fostering mentorship and skill development for early mid-career researchers. These efforts contribute to growing CVD research capacity in NSW. More than half of the funded projects advanced along the translation pathway, with the majority of those surveyed reporting that the Program was either the main reason their project progressed or that it contributed ‘a lot’. Seventy-one percent of basic science research reported important progress within the first stage of the research translation pathway, including in-vitro experiments, animal studies and other non-animal studies. The Elite grant scheme plays a vital role in attracting top cardiovascular researchers to NSW, and leading innovative and high-calibre research that is already having strong impact on policy and practice nationally and internationally, as well as health benefits for patients.

Policy and practice

Early signs show the Program is contributing to significant policy and clinical practice change, with 18% of projects reporting practical achievements. Examples include the adoption of initial catheter ablation as best practice for the management of VT storm, and production of new genetic counselling guidelines. There have also been key contributions to national policy, for example, atrial fibrillation screening for Indigenous Australians has led to proposed changes to national guidelines, and research findings are informing the new Hypertension Guidelines for Australia that are currently being developed by Hypertension Australia and the Heart Foundation. There is also evidence of impact on international policy, with researchers sitting on important World Health Organisation (WHO) committees and other international guideline committees. While still emerging, these outcomes highlight the Program’s potential for real-world impact.

Health and community impact

Funded projects are showing early progress toward improving patient care and reducing the burden of cardiovascular disease. A fifth of projects focus on priority populations such as older adults, rural communities, and those with obesity or diabetes, indicating a commitment to addressing key public health challenges. Funded research projects are making early steps towards helping to reduce the cardiovascular disease burden, with seven survey respondents reporting practical achievements towards a reduction in CVD disease burden. Research findings are also yielding improvements in patient care and health outcomes, with 23% of survey respondents providing evidence and examples for their projects creating these benefits. There are promising signs for commercialisation of research outputs, with 19 grant recipient survey respondents reporting their funded research resulted in practical achievements that contributed to new health technology, therapeutics, or commercialisation.

Economic benefits

What are the total costs of delivering the Program to date?

How likely is the Program going to generate a net social benefit for NSW?

What is the case for continuation of NSW funding in this space?

The Program has been delivered efficiently, with total expenditure of $74.6 million from 2019 to 2023. Administrative costs made up 4.1% of this amount, a figure which is lower than most comparable programs. At this halfway point the Program has a benefit-cost ratio (BCR) of 1.54 and a net present value (NPV) of $36.8 million, indicating a net benefit to NSW over the period 2018-19 to 2022-23.

The Program has filled a critical funding gap and significantly strengthened the CVD research landscape in NSW. The Program has attracted additional funding of $303 million from other funding sources to date. It has elevated the state's profile in CVD research nationally, with preliminary evidence suggesting increased national funding success since its launch in 2018. Funded projects not only show potential for reducing unnecessary treatment costs, but also for generating commercial returns, which are evidence of the high calibre of CVD research being undertaken by funded research projects that are attracting future research investment. The consistently high number of quality applications and strong stakeholder support further underscore the case for continued investment.

Recommendations

The following recommendations below are split into three focus areas for the Program.

Overall strategic focus:

1. **Consider developing a business case for further funding beyond 2028:** The program has delivered early achievements in knowledge advancement, policy and practice change, capability building, health and community impacts. The economic benefits demonstrate the Program has delivered good value for NSW which would support a business case for considering further investment beyond 2028. The approach taken to deliver the Program demonstrates sound administration and well considered investments to meet the Program goals. This approach should continue to be applied to existing and new priority areas in the future.

2. **Enhance strategic prioritisation**: Continue with majority investigator-led grants but establish additional grant streams focused on health system priorities (e.g. regional and remote health) and targeted investments via a coordinated research prioritisation approach (e.g., on specific CVD topics).

Operational improvement over the remainder of the Program:

3. **Improve grant management systems**: Implement an online grant management system to automate and improve application, review, reporting, and monitoring processes. This system will help to address data quality issues that may arise in grant management processes due to the manual nature of data entry and analysis, and may also ease the administrative burden for all stakeholders.

4. **Consider how consumers can be involved at all levels of the Program**: It is recommended that the Program considers how consumers can be involved in the Advisory Committee, grant review process and research project monitoring. The Office could consider adopting process used by other NSW Health organisations, particularly the Cancer Institute NSW, which models how to involve consumers in panels, research, and grant review processes.

5. **Improve equity and transparency in grant distribution**: Incorporate considerations of gender, geographic location, and Aboriginality in the grant application review process. Also consider how applicants can receive scores or rankings alongside feedback from the panel, to aid transparency and enable applicants more opportunity to improve future applications.

Preparation of the summative evaluation:

6. **Systematically track progress of individual projects along the research translation pathway**: Integrate the grant recipient survey questions into reporting to more effectively track progress along the research translation pathway, while recognising the long-term nature of basic science. In monitoring outcomes, particularly those ready for translation to the next user or for commercialisation, it is recommended that the Office is guided by the NSW Health Research and Innovation Strategy 2025-2030 released in May 2025 in facilitating further strategic networking for researchers.

7. **Examine the appropriateness of 60% funding allocation to basic science:** The summative evaluation should consider how the evaluation can demonstrate evidence of the longer-term benefits and appropriateness of the Program's original core principle of a broad split in the distribution of funds with approximately 60% of funding being directed toward basic science.

8. **Refine economic related data metrics in reporting to enable a robust economic evaluation:**
    - With regard to funds leveraged, reduce the number of response options to specify whether the funds were derived from 'NSW', 'non-NSW' or 'Australian' (i.e. partial NSW) sources.
    - For projects with commercialisation outputs, capture sales information such as market share.
    - Capture funded researchers career progression more systematically, such as promotions, leadership roles, and further funding, as well as whether they stay in NSW after receiving a CVD grant.
    - Flag publications that have a health economics focus.

- Review grant reporting questions about impact in line with those asked as part of the interim evaluation case studies. This information systematically collected will facilitate generating impact case studies as part of the final evaluation.

1 NSW's Cardiovascular Research Capacity Program

1.1 Background

Cardiovascular disease (CVD) remains a leading cause of illness and death in Australia, accounting for a significant portion of the nation's health burden.[1, 2] According to the Australian Institute of Health and Welfare, CVD was responsible for approximately one in four deaths in 2021, with coronary heart disease and stroke being the most prevalent forms.[1] The burden is particularly high among older adults and disadvantaged populations, including Aboriginal and Torres Strait Islander peoples, who experience higher rates of CVD-related morbidity and mortality.[3] In addition to its human cost, CVD is the third most expensive disease group in terms of healthcare costs and places a substantial economic strain on the healthcare system, totalling $14.3 billion in health spending in 2020-21.[4]

Cardiovascular research aims to prevent CVD and develop novel treatment options, and to improve both patient care and outcomes in CVD. Research grants in this field aim to address gaps in the discovery, validation, translation, commercialisation, and implementation of CVD research. However, historically, CVD research in Australia has been underfunded relative to cost and disease burden. In 2018-19, CVD research spending by the National Health and Medical Research Council (NHMRC) was the fifth highest of all disease groups ($109.6 million), but was eclipsed by spending on neurological ($210.5 million) and cancer ($180.8 million) research.[4] In 2018, NSW was lagging behind other states in obtaining national major grant funding for cardiovascular research.[5]

In response to the NSW funding gap and building on work from a collaborative NSW CVD research network of 13 organisations, in May 2018 the NSW Government announced a CVD capacity-building grant program for $15m per year over 10 years.

1.2 Program objectives

The Cardiovascular Research Capacity Program (the Program) funds high quality cardiovascular research in NSW in order to drive scientific discoveries, support the development of novel and innovative therapies, attract and retain high quality clinicians and researchers to NSW, and improve health outcomes for patients with CVD.

The objectives of the Program are to:

- fund research that generates outputs with potential to prevent CVD and improve health and wellbeing outcomes for people with CVD
- increase the number of outstanding CVD researchers in NSW
- encourage collaboration, leadership, and capacity building in the NSW research environment
- embed high-quality, innovative CVD research in the NSW health system
- bridge the gap between research, policy, and practice, to increase research impact and translation
- support NSW researchers to leverage national funding opportunities to further research and its translation in NSW.

1.3 Program delivery

Key principles to guide the delivery of the Program were approved by the NSW Minister for Health on the advice of the Cardiovascular Research Advisory Committee (the Advisory Committee) in 2018 and include:

- scientific excellence is the overarching criterion against which CVD Research Capacity Program grants will be awarded
- support for recruitment and retention of excellent researchers for NSW
- grants to be assessed on a transparent, peer-reviewed basis
- support for an equitable and sustainable framework of CVD research in NSW
- a broad split in the distribution of funds with approximately 60% of funding to be directed toward basic science and 40% toward other types of research including clinical medicine, health services, data science, and population health research

The Program defines cardiovascular research broadly to include conditions such as coronary heart disease, stroke, heart failure, vascular disease, and related risk factors, including those linked to diabetes and obesity. To date, it has primarily supported investigator-led research, in which a researcher (or a group of researchers) independently designs, initiates, and manages a study.

The Program has developed several types of grants with different aims, target audiences, eligibility and selection criteria. These have been offered at different times over four rounds (Table 1).

Table 1. Cardiovascular Research Capacity Program Grant Types, funding awarded to 30 June 2023

Grant type	Target group	Eligibility Criteria	Round(s) Offered
Clinician Scientist	Clinicians undertaking CVD research.	Researcher must be actively working in a clinical environment.	1
Senior Scientist	Senior scientists and researchers	Researcher has: • 15 years or more postdoctoral, or • If less than 15 years postdoctoral, has reached full Professor level.	1
Senior Researcher	Senior scientists/ researchers/clinicians undertaking CVD research.	Researcher has: • 15 years or more postdoctoral, or • If less than 15 years postdoctoral, has reached full Professor level. • If a clinician, must be actively working in a clinical environment.	2,3
Early Mid-Career (EMC) Researcher	EMC Researchers	• Researcher has worked less than 15 years postdoctoral and not reached full Professor level • Associate Professors are eligible to apply if less than 15 years post doctorate.	2, 3

Elite Research Leader	Exceptional, internationally-recognised senior CVD research talent, currently living outside of NSW	Grant recipients will be: • World leaders in their research field • Have demonstrated capacity to develop and lead an innovative, high impact research program • Willing to move to NSW.	2, 3
Elite Postdoctoral Researcher	Exceptional postdoctoral researchers, currently living outside of NSW	Researchers who: • Have potential to undertake internationally significant CVD research with high impact results in NSW • Have ten years or less post-doctorate experience • Are willing to move to NSW.	2, 3
Investigator Development	Project that narrowly missed out on NHMRC Investigator Grants and has potential to address weakness and resubmit	Researcher received a score in the fundable range in the most recent round of NHMRC Investigator Grants but did not receive NHMRC funding.	2
Synergy Seeding	Multidisciplinary teams of investigators	• Undertaking preparatory work for an NHMRC Synergy Grant • Applying for the NHMRC Synergy Grant in the following year.	2
Collaborative Grants	NSW-led research teams involving at least three research institutions, who will apply for at least one collaborative NHMRC, Medical Research Future Fund (MRFF) or equivalent national grant scheme within 12 months of the grant finishing and provide evidence of the application scores and outcome to NSW Health.	Each collaboration must: • Be led by a NSW researcher • Include a minimum of two EMC researchers as Chief Investigators • Provide a plan for the development of the EMC researchers' capabilities • Involve a minimum of three research institutions, at least two of which are based in NSW.	3

2 Interim evaluation

2.1 Purpose and scope

The ACI was engaged by the Office for Health and Medical Research (the Office) from early 2024 to evaluate the NSW Cardiovascular Research Capacity Program.

The purpose of the CVD interim evaluation is to inform continuous improvement over the remainder of the Program, including identifying any area for improvements to best support grant recipients to deliver on intended outcomes (outputs and impacts) during and after their grant; identify what data is needed for a comprehensive evaluation at the ten-year mark in 2028; and demonstrate progress to date against intended outcomes and accountability with regard to the money invested.

The evaluation focused on three levels: the Program as a whole, the individual grant types and the funded research projects. The quality of each research project has not been individually assessed in this evaluation.

The scope of the CVD interim evaluation covered grant projects with funds awarded up to 30 June 2023 under rounds 1, 2 and 3. The most recent annual reports for these grant projects were received at the end of 2024. Round 4 was included in the evaluation only with regard to the application process as grants were awarded by 30 June 2024, however research had not commenced and reporting was not available for Round 4 grants. In scope was also the partnership with the NSW Cardiovascular Research Network, however the evaluation did not conduct an evaluation of the Network.

2.2 Objectives and questions

The objectives of the evaluation were to:

- assess how well the Program has been implemented to date, including its individual grant types
- assess outcomes of the funded grant research projects based on evidence to date
- assess the impact of the Program on the CVD research community to date
- capture the total costs of the Program and generate an early assessment of net social benefit of the Program for NSW.

The interim CVD evaluation considered the intended outcomes of the Program as identified in the program logic across the Office domains of impact.

Table 2 describes the evaluation components and key evaluation questions to achieve the objectives of the interim evaluation.

Table 2. CVD interim evaluation components and questions

Evaluation component	Key evaluation questions (KEQs)
Process: strategic alignment, quality of program delivery, and reach and uptake	**1.** How well does the Program support NSW CVD research priorities and opportunities within the existing CVD funding landscape? **2.** How well is the Program being delivered? **3.** What has been the reach and uptake of the Program amongst target audiences?
Outcome: early evidence of outcomes	**4.** What is the evidence of outcomes achieved to date? **5.** How successful has the Elite grant scheme been in attracting highly talented cardiovascular researchers to NSW? **6.** How likely is the Program to achieve intended long-term outcomes? **7.** How much of an impact is the Program likely to make for priority populations, including regional, Aboriginal, and culturally and linguistically diverse populations, and comorbidities?
Economic: early assessment of economic benefits	**8.** What are the total costs of delivering the Program to date? **9.** How likely is the Program going to generate a net social benefit for NSW? **10.** What is the case for continuation of NSW funding in this space?

2.3 Methods and data sources

The methods and data sources used for this evaluation are outlined in Table 3. See Appendix 1 for technical details on specific measurement approaches used for the data analysis.

Table 3. CVD Research Capacity Program interim evaluation methods

Method	Focus	Implementation
Office for Health and Medical Research grant report data analysis 	• Characteristics of grant recipients • Project descriptions & milestones • Compliance • Knowledge advancements • Capability building • Project outcomes • Economic benefits	• The consolidated progress and final reports for all grants awarded in rounds 1 to 3 (n=112) were analysed • After the data was cleaned, descriptive statistics were generated in Excel to describe key data at the grant project level • Open-ended fields which related to focus areas were also analysed in Excel
Office for Health and Medical Research grant applications and review data analysis 	• Trends in volume and quality of grant applications over time • How proposals met criteria such as research strength, rigour, and methodological appropriateness	• Application review reports for rounds 1 to 3 were reviewed • Application volumes were counted and review outcomes were assessed by calculating mean scores over time

Method	Focus	Implementation
Grant recipient survey 	• Experience of application and reporting processes • Experience of additional information about the projects' potential impact	• Designed in REDCap and distributed to grant recipients 18 Nov – 6 Dec 2024 • Two reminders were sent via email. • Round 4 grant recipients were invited to complete questions on the application process only • There was a response rate of 69% (71 out of 103 grant recipients who were invited to participate, representing 87 funded projects) • Descriptive statistics were generated in Excel and thematic analysis of open-ended responses were conducted in Excel • Findings were analysed at the grant recipient level, except for section C (Knowledge advancement, Policy and practice change, and Health and community impact) where findings were analysed at the research project level
Unsuccessful applicants survey 	• Experience of application process	• Designed in REDCap and distributed to unsuccessful applicants from 18 Nov – 6 Dec 2024 • No reminders were sent • There was a response rate of 15% (29 out of 195 applicants) • Descriptive statistics were generated in Excel
Host/admin organisation survey 	• Experience of facilitating the application process (pre award period) • Experience in administrative processes for post award period	• Designed in REDCap and distributed to host and administration institutions from 18 Nov – 6 Dec 2024 • No reminders were sent • There was a response rate of 65% (11 out of 17 organisations) • Descriptive statistics were generated in Excel
Stakeholder interviews 	• Awareness of Program amongst the CVD research community in NSW and beyond • The ability the Program demonstrated to adapt to emerging issues and opportunities for CVD research	• Seven semi-structured group interviews were conducted with 11 key stakeholders via MS Teams from 14 Jan – 6 Feb 2025 • Interviews took an average of 32 minutes and were recorded and automatically transcribed to support analysis and synthesis

Method	Focus	Implementation
	• Attraction and retention of CVD research talent to NSW • CVD research funding needs in NSW	• Thematic analysis captured in Excel • Key stakeholder groups included: NSW Cardiovascular Research Advisory Committee, NSW Cardiovascular Research Network, Victor Chang Cardiac Research Institute, Heart Research Institute, Heart Foundation and Australian Cardiovascular Alliance
Elite grant recipient interviews 	• Experience of nomination process • Contribution of these grants to increasing the profile of NSW in CVD research landscape	• Semi-structured interviews were conducted with two Elite postdoctoral grant recipients and one Elite Research Leader grant recipient via MS Teams from 15 Jan – 22 Jan 2025 • Interviews took an average of 37 minutes and were automatically transcribed to support analysis and synthesis into short vignettes.
Host/admin organisation interviews 	• Experience of grant application process • Management and administration involved for post award	• Semi-structured interviews were conducted with three host/administrative organisations via MS Teams from 29 Jan – 6 Feb 2025 • Interviews took approximately 20 minutes and were recorded and automatically transcribed to support analysis and synthesis • University of Sydney, the University of New South Wales and The Geroge Institute were interviewed
Program team interviews 	• How priority research areas are identified • How emerging needs and opportunities for CVD research within NSW are managed • How the Program has adapted .	• Semi structured interviews were conducted from 14 Jan – 6 Feb 2025 with three grant team members, two evaluation and data team members, and one executive leader • Interviews were conducted via MS Teams, with an average of 28 minutes and were automatically transcribed to support analysis and synthesis
Case studies 	• In-depth evidence in relation to achieved and intended outcomes, presented in alignment to the Office evaluation domains: ○ knowledge advancement, policy and practice, health and community impact, capability building and economic benefits	• Eight grant projects were selected by considering range of grant types and program outcomes • Semi-structured interviews were conducted with each grant recipient • Evidence was brought together from the selected grant final report, grant recipient survey and interviews

Method	Focus	Implementation
		conducted before writing up each case study
Document review 	• Adaptation of priority research areas • Compliance and alignment • Complementarity of the CVD grant program and other major grant programs • Timelines and deliverables • Involvement of consumers	• Documents included: business case, Program website, guidelines, application forms, approval briefs, Advisory Committee documents, grant report templates, application register and process documents, NSW Health strategies • Systematically reviewed in Excel • Findings also further contextualised with insights obtained from the Program team and key stakeholder interviews
NHMRC & MRFF analysis 	• Total NSW research funded ($) by MRFF and NHMRC for CVD research over time and compared to other states • NSW's share (%) of MRFF funding compared to other states	• MRFF data extracted on March 2025 • CVD terms were applied to MRFF funding data to work out total CVD related NSW funding and NSW's share of total funding • NHMRC data taken from the Office's internal dashboard
Cost analysis 	• Total actual costs of delivering Program (including both the funds allocated to grant recipients and costs of the Office running the Program) • Assessment of appropriateness of costs proportionate to size of funding allocated	• Program costs data: program delivery costs estimated based on the grade of the staff involved and allocation of their time to the Program • Grant funds: grant report data
Economic assessment 	• Mapping the different types of economic benefits and capturing early evidence against those benefits • Cost benefit ratio and net present value	• Based on analysis of grant reporting data, survey of grant recipients and case studies

2.4 Limitations

Several data limitations and caveats should be considered when interpreting the findings of this interim evaluation:

- Some long-term outcomes of the Program, such as reductions in disease burden are not quantifiable within the timeframe of this interim evaluation and challenges exist in relation to attribution of some impacts to the Program. However, interim impacts are measured where evidence is available to date and longer term impacts are estimated where assumptions can be made that they will lead to longer term impacts.

- Data from the Office's grant reports and applications is limited and not uniformly reported
- Identifying a counterfactual was not possible so, where appropriate, grant recipients and unsuccessful applicants were asked to consider and comment on attribution.

3 Findings

3.1 Strategic alignment

3.1.1 The Program aligns with existing key NSW Health strategies

The Program commenced in June 2018, aligning with the then NSW State Health Plan: Towards 2021, particularly with regards to supporting and developing the health workforce, and supporting and harnessing research and innovation. Since then, five key NSW Health strategies have been developed: Future Health 2022-2032, NSW Health Workforce Plan 2022-2032, NSW Regional Health Plan 2022-2032, NSW Aboriginal Health Plan 2024–2034, and NSW Health Research and Innovation 2025–2030. Table 4 describes where the Program strategically aligns with each of these strategies.

Table 4. NSW Health key strategies: areas of strategic alignment

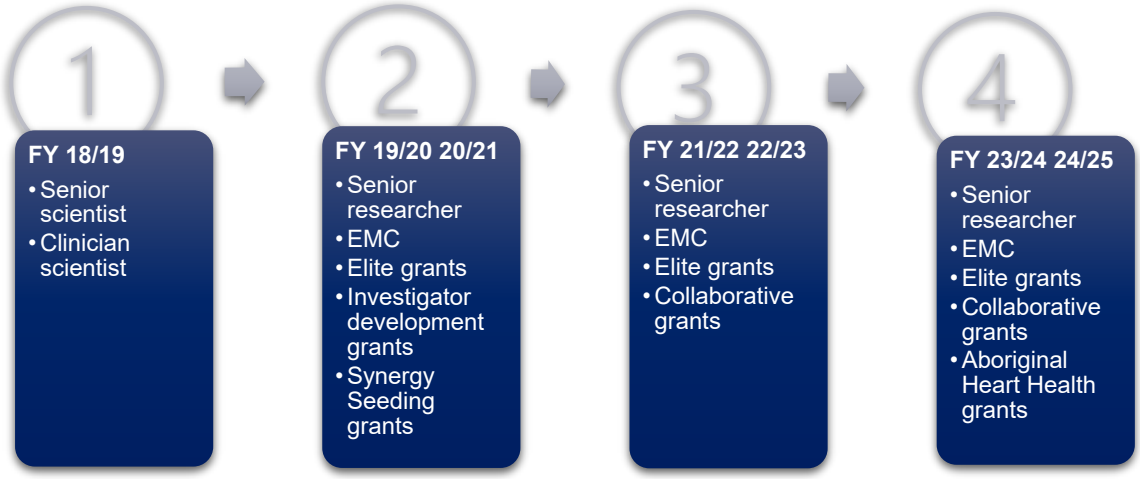
NSW Strategy	Strategic focus area	Program strategic alignment
Future Health	1. Patients and carers have positive experiences and outcomes that matter	The Program is working towards guiding grant recipients in partnering with consumers in co-design and implementation in their projects (e.g. 2022 CVD Collaborative Grant Guidelines; Program logic).
	3. People are healthy and well	The Program funds research projects which aim to prevent CVD and improve wellbeing and health outcomes for patients with CVD (e.g. each grant guideline states health and wellbeing as a key objective of the Program).
	4. Our staff are engaged and well supported	One of the Program's objectives is to increase the number of outstanding CVD researchers in NSW. The grants aim to attract and retain high quality clinician scientists and researchers in NSW (e.g. Elite grant scheme).
	5. Research and innovation, and digital advances inform service delivery	The Program aims to build CVD research capacity in NSW to drive scientific discoveries and support the development of innovative therapies. Funded research should aim to bridge gap between research, policy and practice to increase research impact.
Regional Health Plan	Priority 6.3 Undertake research and evaluation with institutions, industry partners, NGOs, consumers and carers	The Program is working towards guiding grant recipients to consider and respond to the distribution of the burden of disease within the population and the needs of higher risk and priority populations, such as regional/remote (e.g. 2022 Collaborative grant guidelines).
Aboriginal Health Plan	Strengthening monitoring, evaluation, research and knowledge translation	The Program is working towards ensuring equity in awarding grants and embedding more opportunities to partner with Aboriginal communities and stakeholders to build capacity for Aboriginal people to participate in, and lead, research (e.g. Aboriginal Heart Health Grants).

NSW Strategy	Strategic focus area	Program strategic alignment
Research and Innovation Strategy	Strategic outcome 1: A thriving ecosystem	The Program is working towards supporting a coordinated, collaborative and inclusive approach to individually funded research projects. In particular the Collaborative grant aims to support multidisciplinary NSW-led collaborations.
	Strategic outcome 2: Strategic investment	The Program adopts a portfolio approach in funding CVD research, ensuring it maintains a 60% priority for basic science and 40% provision for clinical medicine, public health and health services research.
	Strategic outcome 3: An open assets philosophy	The Program supports grant recipients to focus on the needs of priority populations in their research projects.
	Strategic outcome 5: A pipeline approach	The Program encourages grant recipients to consider how their research will progress along the research translation pathway.
	Strategic outcome 6: Research and innovation for all	The Program aims to build cardiovascular research capacity in NSW, funding clinicians and researchers to drive innovation in CVD research in NSW. Programs such as the Aboriginal Heart Health Grants work to ensure greater equity in awarded grants both in relation to participants and recipients.

3.1.2 The type of grants has evolved over time, in particular as advised by the Advisory Committee

Over time, the types of grants funded under the Program have evolved. Two grant types were initially offered: Clinician Scientist and Senior Scientist. Early Mid-Career Researcher (EMC grants were not included in Round 1 because $6 million had been awarded to 13 early mid-career researcher grants focused on cardiovascular health in May 2018 under a different grant program. Grants such as the Synergy Seeding, Investigator Development and Collaborative grants were developed to specifically support success of NSW researchers in national funding schemes. Elite Grants were developed to attract talented researchers to NSW from interstate and overseas. Figure 1 summarises the evolution of the grant types offered by grant round.

Figure 1. Evolution of grant types by grant round and financial year



In round two, several key changes were made. The EMC grant was introduced and has since become a core part of the Program. The two-stage application process conducted in round 1 was replaced with a single-stage full application. Additionally, the Clinician Scientist and Senior Scientist grants were rolled into the Senior Researcher category. Both full-time researchers and clinicians are eligible to apply for Senior Researcher and EMC grants.

Following recommendations from the Advisory Committee in 2019/20, an Elite grant scheme was introduced in round two to attract high-calibre researchers from overseas and interstate to NSW. The Advisory Committee also proposed two new grants, Synergy Seeding and Investigator Development grants. The former aimed to help researchers build the team, skills and preliminary data needed to secure a Medical Research Future Fund (MRFF) Synergy Grant. The latter awarded funds to researchers who had just missed out on an NHMRC Investigator grant to support success in that scheme the following year.

In round three, rather than targeting specific NHMRC and MRFF schemes, the Collaborative grant was introduced to support teams from multiple institutions in building strong track records and data over a two-year period. This not only improved researcher competitiveness for a national grant of their choice but also promoted collaboration among CVD researchers, and between research institutes, in line with the Office for Health and Medical Research's goal of encouraging collaboration across the research ecosystem in NSW.

In 2022, following analysis of grants funded under the Program to June of that year, the Program team identified the need to align more closely with the NSW Health priority for improved Aboriginal health and subsequently proposed this priority to the Advisory Committee. This insight led to the establishment of the Aboriginal Heart Health Grants, aligning with the new Aboriginal Health Plan 2024-34, ensuring the Program addressed this critical area of focus.

> *"It has involved looking at some of the targeted approaches around emerging health priorities. So, thinking about how we align some of the health strategic priorities with these grants. For*

> *example, the Aboriginal Heart Health grants have been a big part of the conversation, and have been part of the conversation for a few years, about how we have that targeted investment to make sure that we are thinking about those priority areas and not just taking a broad approach." (Office for Health and Medical Research)*

The Advisory Committee is regarded as playing a pivotal role in shaping the structure of the Program and the types of grants offered. The Program team described their relationship with the Advisory Committee as collaborative, noting that they worked diligently to implement the Advisory Committee's recommended changes.

The majority of stakeholders reported that the Office's grant program team were flexible and listened to the CVD research community about needed changes to the Program and new opportunities for CVD research. The grants team have actively listened to, and engaged, senior CVD researchers via the Advisory Committee, the Cardiovascular Research Network and the Australian Cardiovascular Alliance. Some stakeholders felt the Advisory Committee had also actively listened and engaged with the CVD research community.

> *"I think the Advisory Committee has been also good in engaging the senior researchers across the state, such as bringing together the larger group. I think that they've been listened to, in terms of incorporating updates and identifying issues potentially across schemes. I feel there has been more opportunity to input into the process than say, with some of the national schemes." (Stakeholder)*

Stakeholders agreed that the Program had adapted over the five years by making small adjustments to procedures and grants and creating new grants in response to feedback. Examples of new grants that have been created which stakeholders highlighted were the Elite grants, and the Synergy Seeding and Investigator Development grants created in round two, which merged into the Collaborative grants in round three.

> *"Definitely the Program itself has evolved, but I think these have largely been just tweaks and things around the edges and appropriate improvements." (Stakeholder)*

3.1.3 The Program complements other research grant programs appropriately in particular MRFF and NHMRC.

At the national level, the NHMRC and the MRFF are the main funding sources for cardiovascular research in Australia. The NHMRC dedicates $800 million annually to all types of health and medical research. The MRFF aims to advance medical research and innovation through infrastructure grants, and includes the Cardiovascular Health Mission, a $220 million commitment over ten years.

One of the key objectives of the NSW CVD Research Capacity Program is to support NSW researchers to leverage national funding opportunities to further research and its translation in NSW. A key driver of the Program is to better position NSW to receive a larger proportion of national funding. Following the advice of the Advisory Committee, all grant types have included this objective in their individual grant objectives, for example:

> *"The EMC Researcher Grants aim…to support EMC researchers to gain research grants and fellowships from bodies such as the National Health and Medical Research Council, Australian Research Council and Medical Research Future Fund"* (EMC guidelines Round 3).

Specific grant types were created to leverage NHMRC and MRFF grants. In Round two, NHMRC Capacity Building Grants were introduced to support researchers in strengthening their grant competitiveness. Two key grants were created: Investigator Development Grants, offering up to $100,000 for researchers who narrowly missed NHMRC funding, and Synergy Seeding Grants, providing up to $500,000 to help NSW research groups build collaborative experience. In round three, these two NHRMC capacity building grants evolved into Collaborative Grants, which offered up to $1 million over three years to multi-institutional teams (including early- mid-career researchers) to develop strong collaborations and prepare for future NHMRC or MRFF funding

Most stakeholders in the interviews expressed that the Program was complementing major national funding programs well and was resulting in leveraging other major grants. The Program was appropriately acting as seed funding for NSW researchers, resourcing them to leverage national major grants.

> *"So I think [the Program] should be the 'polyfilla', that supplements major international and NHMRC grants because it's there to make NSW more prominent to support cardiovascular research in NSW, make it more nationally and internationally competitive." (Stakeholder)*

3.1.4 The Program is balancing an investigator-led approach with some targeted research priorities, however further strategic prioritisation is needed.

The Program team reflected that, for the most part, the Program has adopted an investigator-led approach to CVD research. The scope of cardiovascular research is defined broadly in program guidelines and applicants choose the focus of their proposed research. This is assessed by an Expert Review Panel against criteria including evidence of the gap in knowledge, a clearly articulated need for the research, why it is important, how it is novel, how it will impact on equity of health outcomes and how it relates to existing research conducted by the host organisation and team.

The majority of stakeholders reported that it was appropriate that the Program remained investigator-led rather than research topic-led. Stakeholders felt an appropriate exception to this was the development of the targeted $5 million Aboriginal Heart Health Grants. These represent one of the few times that a priority research area has been set by NSW Health in the Program, within the broader scope of cardiovascular research applied to the grant rounds.

> *"I think we've done well on the balance. Indigenous cardiovascular research is a priority area from the state that was rightfully addressed, but I think allowing researchers to pursue exciting and promising scientific opportunities is important. Arguably the researcher is at the cutting edge; more attuned to what's hot and topical and high yield research than the government might be. I think [investigator-led] is necessary, with the government directing the field to things that are important for them from time to time, whether it's like, how do we embed AI, or use of data or something like that. I can see a balance in it. And I think we're pretty good at that." (Stakeholder)*

However, a few stakeholders felt the Program should shift to a prioritisation approach whereby research gaps are identified to highlight most important research topics. Those stakeholders emphasised the need

to have a structured and coordinated engagement with end users, such as policy makers, consumers, and industry, in regular, data-informed processes to identify key health system challenges. While supporting basic science, they advocated for a more solution-focused and needs-based research agenda to better align funding with real-world gaps and opportunities.

> *"I think there should be annual prioritisation exercises where you bring all end users together and all the data that you can gather about one of the things that are vexing the health system, one of the opportunities in industry, one for consumers. Saying what they want and what are the policy makers looking for and engage in a structured prioritisation exercise that also includes environmental scanning. But unless you're asking what the actual problems in NSW are and can we address them in a structured way and communicating that to the [CVD research] sector, then it will be driven more by what the [CVD research] sector believes and needs, and sometimes they're right, but not always." (Stakeholder)*

> *"I think [the Program] were very blue sky in their approach to basic science. I think there's an opportunity in terms of pushing towards a more sustainable approach for medical research in Australia, to still consider basic science very highly, but to do it in a coordinated, solution focused way where we're using NSW health data better to identify where the missing gaps are." (Stakeholder)*

The May 2025 Special Commission of Inquiry into Healthcare Funding report reinforces that while research innovation is essential, it should be guided by priorities that address current disease burden and public health challenges.[6]

Overview and interpretation

The Program aligns with key NSW Health strategies and complements national funding programs such as the MRFF and NHMRC. Grant types have evolved over time based on advice from the Advisory Committee, supporting a balance between investigator-led research and targeted priorities reflecting the Program's principles. However, there is opportunity for a more coordinated and needs-driven approach to research prioritisation.

Recommendation

- Consider further targeted strategic investment, for example, to address needs in regional and remote NSW or a particular research mission that might need to be addressed.
- Establish a prioritisation and coordinated approach to create a grant which focuses on strategic, high-value CVD research topics.

3.2 Quality of program delivery

3.2.1 The Program as a whole has been delivered as intended, while allowing for flexibility due to the COVID-19 pandemic

The Office for Health and Medical Research grants team oversees the Program's operations, including designing new grant types, developing guidelines and application forms, managing assessment and awarding processes, negotiating funding agreements and variations, administering project reports, and liaising with grant holders for ongoing monitoring.

In June 2018, the NSW Minister for Health and Minister for Medical Research approved the Program's commitment to $150 million over ten years for cardiovascular disease research. The primary deliverable for the grants team is to award $15 million per annum to the approved suite of grants with input from the Advisory Committee. Table 5 demonstrates the Program's progress in awarding funding across a variety of grant types for the first three rounds of the Program.

Table 5. Program grants awarded to 30 June 2023 by round and financial year

Funding round	FY funds awarded	Budget per grant type	Grant types offered	Funds awarded to 30 Jun 2023
Round 1	FY18-19	$7.5m	Senior Scientist	$7.6m
		$7.5m	Clinician Scientist	$7.3m
Round 2	FY19-20 FY20-21	$10m	Senior Researcher	$9.6m
		$10m	Early Mid-Career Researcher	$11m
		$7.5m	Elite Grants	$3.5m
		$1.5m	Investigator Development Grants	$1.1m
		$1m	Synergy Seeding Grants	$0.5m
Round 3	FY21-22 FY22-23	$7.5m	Senior Researcher	$7.5m
		$10.0m	Early Mid-Career Researcher	$9.6m
		$7.5m	Elite Grants	$4.9m*
		$5.0m	Collaborative Grants	$8.8m*
Total		**$75.0m**		**$71.4m**

*The Office received fewer Elite Grant applications than anticipated and approval was granted to award additional Collaborative Grants

In 2020–21, the Program and individual research projects were significantly affected by COVID-19. Lockdowns and social distancing measures caused delays in research activities, including patient recruitment and laboratory access, while many chief investigators and research staff who were also clinicians or NSW Health employees were redeployed to support the pandemic response.

The Program responded with flexibility by allowing recipients of Round 2 Senior and EMC Grants awarded in 2020 to choose their project start dates within a 12-month window following the award of their funding. In 2020, the Office also redirected staff and resources to support a rapid COVID-19 research funding initiative, which accounts for the frontloading of $26,410 million in Round 2 funding in 2019–20 and the absence of disbursed funds in 2020–21 (see Table 11, Section 3.8.1).

3.2.2 Three quarters of individual projects reported progressing as planned, with the main reason for delay being COVID-19

The grant report analysis of rounds 1 to 3, demonstrates that of the 112 projects funded, 52 had been completed (at time of writing). Of those 52 completed projects, 75% of projects reported in their progress reports that overall, their project milestones had progressed as planned, compared to 65% of all projects (n=112). Grant recipients were asked to provide details of any milestones that had been delayed or changed. Forty-four of the 112 projects mentioned COVID-19 as the reason for a delay or change. These COVID-19 impacts included access to the lab, recruitment of participants, clinicians being redeployed, lockdowns, researcher illness, and supply chain issues for experimental consumables. Other reasons for delays or changes to milestones included: budget releases/ contract negotiations with grant administrative organisations, recruitment of staff, obtaining equipment, obtaining ethics approval, and scope changes.

Grant recipients are also asked in their progress reports whether their project expenditure is compliant with the funding agreement. Seventy-nine percent of completed projects reported being in line with their budget. Some examples of reasons for variations in project expenditure included delays in invoicing or recruitment of staff, COVID-19 impacts, increased research experiment costs and reallocation of savings due to underspends.

The Office provided internal data on grant variation approvals for the Program (Table 6). Among round 3 EMC grants, 52% had an approved variation, compared to 38% for both round 2 EMC and round 2 Senior Researcher grants. The most common type of variation requested was a no-cost extension, meaning more time to complete the project with no additional funding provided. Reasons for no cost extensions included delays in contract variations with other parties, delays in ethics approvals and staff recruitment, parental leave and COVID delays. Other requests for variations included approval for budget changes and also research project modifications resulting in changes to activities and milestones. It is important to note that all Round 2 grants had been granted up to 12 months flexibility in start date in response to COVID-19 impacts.

Table 6. Approved variations by round and grant type

Round and grant type	Total grants	Number of variations
R1 Clinician Scientist	10	1
R1 Senior Scientist	10	0
R2 Early-Mid Career Researcher	21	8
R2 Elite Postdoctoral	1	2*
R2 Investigator Development	11	0
R2 Elite Research Leader	1	0
R2 Senior Researcher	13	5
R2 Synergy	2	1
R3 Collaborative	9	3
R3 Elite Postdoctoral	5	0
R3 EMC Researcher	19	10
R3 Senior Researcher	10	3

* 1 of the 2 elite postdoctoral awards was fully withdrawn due to COVID-19 difficulties.

3.2.3 The delivery of the Program aligns with requirements in grant administration and reporting, however improvement in record keeping is needed

Grant administration

Grant administration for the Program is required to follow the NSW Government Grants Administration Guide (2022)[7], as well as the Program's own guidelines.

Table 7 summarises an assessment of the Program's grant administration, including probity and transparency. The Program grant eligibility criteria are clearly outlined with appropriate examples or more detailed explanations throughout all Grant Guidelines documents, as required by the NSW Grant Guidelines. The eligibility criteria are clear to allow objective assessment against the criteria. Geographic distribution of applications is not considered in the assessment process. This is because 60% of funding supports basic science, which is concentrated in centres of excellence (which are mostly in Sydney, Newcastle and Wollongong) due to specialised infrastructure. However, future options could include targeted calls to address rural and regional health outcomes. The review of grants follows a 5-step process that includes the assessment and decision-making stages. A substantial proportion of the review team is made up of external reviewers and the review team was not involved in the grant design process, but this could be more clearly documented.

Moving forward, the Office has an opportunity to more comprehensively and consistently record if applications meet the eligibility criteria within the application registers. Scoring of applications against the assessment criteria was clearly documented by members of the Expert Review Panel, including the reason for scoring decisions. This information was collated into one document by the Program team.

Expert Panel meetings provide an opportunity for those members who reviewed an application to share their views on its strengths and weaknesses. Occasionally, a panel member may revise their scores or recommendation about funding in light of this discussion. The Office has an opportunity to document such changes more consistently across grant rounds.

Recommendations were made to the designated decision-maker, and the procedures used to assess applications were also provided. Collated information about performance against the selection criteria was documented but recommendations to the designated decision-maker were not routinely provided prior to the introduction of the NSW Government Grants Administration Guide in September 2022. The Office has since updated its processes to include this information with all briefs seeking approval to award grants. Both successful and unsuccessful applicants were notified of the outcomes of their application.

In earlier grant rounds, the Office explored re-ranking analyses to address variability in reviewer scoring but found limited overall impact, with only one grant outcome changed. Based on a report of NHMRC peer review analyses,[8] the Office has shifted toward increasing the number of reviewers to improve scoring reliability. In addition, following a successful trial of statistical methods with ACI for Round 4 applicants, a case-by-case process is now being developed to identify and manage scoring variability in future rounds.

Table 7. Assessment of compliance with the NSW Grant Administration Guide

Chapter 6: Process of grants administration and Chapter 5.7: Probity and transparency[7]	Details	Findings
Determining selection criteria (eligibility and assessment criteria)	• Grants should have clear, objective eligibility criteria with examples. • Criteria must support fair assessment of applicants. • Assessment criteria should state if geographic distribution is considered.	• All Guidelines clearly outline eligibility criteria for each grant type, including examples (e.g., 2019 Senior Researcher Grants require 15+ years postdoctoral experience or fewer with professional-level attainment). • Criteria are designed to enable objective assessment based on applicant skills, qualifications, research experience, project quality and impact, budget suitability, and potential for skill development. • Budget assessments consider purpose, appropriateness, existing funding, and available support. • Guidelines do not specify whether geographic distribution is factored into assessments.
Selecting an appropriate assessment process	• Allow for a flexible, two-stage assessment and decision-making process. • Written recommendations must be submitted to the final decision-maker. • Assessment teams can include external experts and non-officials and may be split between different groups across review stages (assessment and decision-making). • Weighting criteria can improve transparency. • A conflict of interest (COI) management plan is required.	• All grants follow a 5-step process, separating assessment and decision-making. • Written recommendations are submitted to the final decision-maker. • Reviewer details are not always clear in documents. The Office confirmed that most expert reviewers are researchers and clinicians from NSW and interstate. Some reviewers are cardiologists employed by Local Health Districts • The Office splits the assessment process by having the Grants team assess eligibility of applicants: the expert panels of external reviewers assess selection criteria and make recommendations to NSW Health Executives who make final recommendations to the decision-maker.

Chapter 6: Process of grants administration and Chapter 5.7: Probity and transparency[7]	Details	Findings
		• Expert Review Panel members are referred to NHMRC policy on *Disclosure of interests and management of conflicts of interest.* NHMRC examples of high and low-level COI are provided to reviewers who are required to declare any COI and do not review applications where conflicts exist.

Promotion of the CVD Research Grants	• NSW Grant Guidelines emphasise promoting grants to ensure open, transparent, and equitable access for all potential grantees.
	• Effective promotion includes media, newsletters, social media, workshops, public launches, and local officers.
		• Grants are promoted openly through the following promotional methods:
		  ○ NSW Government Grants and Funding website
		  ○ NSW Health and Medical Research website and Twitter
		  ○ The Office's newsletter
		  ○ Cardiovascular Research Network
		  ○ NSW Health Directors of Research monthly meeting
		  ○ NSW Health Senior Executive Forum.

Receiving and assessing grant applications	• Eligibility cull - Applications are reviewed and removed if they don't meet eligibility criteria. • Assessment - Eligible applications are evaluated against set criteria, with decisions and justifications documented. • Recommendation - The assessment team provides written recommendations to the decision-maker, including assessment results and process details.	**Eligibility Checks:** • NSW Health is responsible for checking applicant eligibility, as stated in the guidelines. This task is performed by the Office. • Grant registers include columns to indicate if criteria are met. This documentation was inconsistent in some cases, comprehensive in others (e.g., Round 2 Investigator Development Grants) but lacking in others (e.g., Synergy Grants). **Assessment Process:** • Applications are assessed against the selection criteria published in grant guidelines by members of the Expert

Chapter 6: Process of grants administration and Chapter 5.7: Probity and transparency[7]	Details	Findings
	• Decision-making - The decision-maker reviews recommendations and records final decisions, noting any deviations. • Announcement - Successful grants are published and announced; unsuccessful applicants are notified after grantees are informed.	Review Panel. Templates guided assessors. Use of a scoring matrix was inconsistent in the early grant rounds but is now standard practice in line with other Office grant programs. • Scoring sheets show scores and written comments per criterion. • Assessment teams (called Expert Review Panels) meet post-scoring to discuss strengths and weaknesses of applications. Reviewers occasionally revise their scores following discussion. The Office could improve consistency of documentation of any revisions • Review panel members agree on the ranking of eligible applications and make recommendations to NSW Health about which applications should be funded. In rare instances where the Panel do not agree about rankings, their views are documented and reported to NSW Health executives. **Decision-makers:** • NSW Health Executives are advised by the Expert Review Panel and make final decisions to the decision maker about which applicants will be recommended for funding. **Recommendations:** • Recommendations are formally made to the decision-maker via NSW Health briefs, outlining procedures followed. • Information about performance against the selection criteria is collected but not routinely provided to the designated decision-maker prior to the introduction of the mandatory NSW Government Grants Administration Guide in

Chapter 6: Process of grants administration and Chapter 5.7: Probity and transparency[7]	Details	Findings
		September 2022. The Office has since updated its processes to include this information within all briefs seeking approval to award grants. However, one round of Collaborative Grants was approved without this detail in April 2023. **Announcements:** • Outcome letters are issued to all applicants. All successful grant recipients are posted on the OHMR website. Evidence found in approval briefs.
Probity and transparency in grants administration	• Decisions relating to grants are impartial, appropriately documented and published, publicly defensible and lawful. • Grants administration incorporates appropriate safeguards against fraud, unlawful activities and other inappropriate conduct.	• Most reviewers are external (as per previous comments). • If a COI arises, that reviewer is moved to another application and is not present during committee discussions of that applicant. • Different officers are responsible for giving financial approval for the expenditure and making the grant decision. • Systematic grant application and selection processes are competitive and merit-based. • Funded projects must be conducted in the NSW Health system or by affiliated organisations (universities and research institutes). • *See earlier sections of table for other relevant findings regarding probity and transparency.*

Animal research

The Program also adheres to ethical standards for animal research, consistent with the national code.[9] One requirement under the national code is that all grants that use animals must consider and, when possible, implement the "3Rs" principles to guide responsible animal use in research:

- Replacement – Use alternatives to animals wherever possible (e.g., cell cultures, computer models).
- Reduction – Use the minimum number of animals necessary to achieve reliable results.
- Refinement – Modify procedures to minimize pain, suffering, or distress and improve animal welfare.

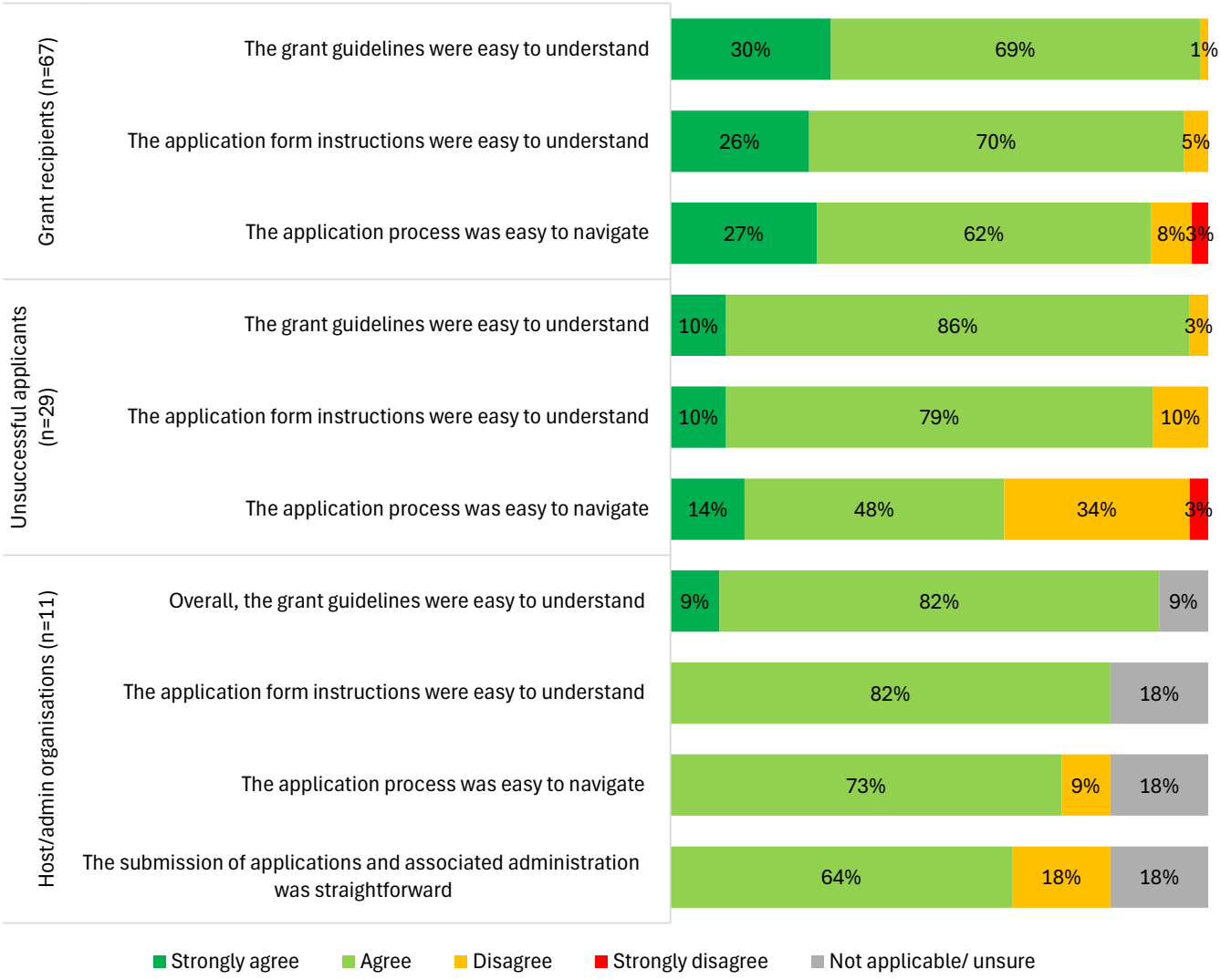
In grant rounds two and three, 24% (27 out of 112) of funded projects involved animal research. (Note: the questions regarding animal research were not asked for round 1 grants.) Twenty-two research projects responded that they were addressing or planned to address the 3Rs. Researchers reported applying the 3Rs to minimise animal use while advancing high-quality cardiovascular research. Replacement strategies included the use of in vitro models (e.g. cardiomyocytes, stem-cell derived tissues, and ex vivo vessels), computational simulations, and organoid technologies, reserving animal models for questions that could not be addressed otherwise. Reduction was achieved by careful experimental design, statistical power calculations, reusing animals across studies, and sharing tissues, thereby limiting animal numbers. Refinement efforts focused on improving animal welfare through anaesthesia, less invasive procedures, humane endpoints, and protocol optimisation.

While an average of 5% of grant funds were allocated to alternative (non-animal) research methods, the accuracy and consistency of financial reporting in this area were limited. Data on budget allocations to 3Rs alternatives were inconsistently provided by researchers, limiting detailed analysis for the evaluation.

3.2.4 The application process compared favourably to similar programs but would benefit from a grant management system.

Overall, the application process, form and guidelines were rated highly (Figure 2) by grant recipients (67 out of 71 participants) and non-successful applicants (who were not awarded funding; 29 out of 29 participants). Recipients found the grant application process and materials clear and easy to understand, though unsuccessful applicants were less likely to find the process easy to navigate. The majority of host/ administrative organisations agreed the application process, instructions, guidelines and associated administration were easy and straightforward (n=11).

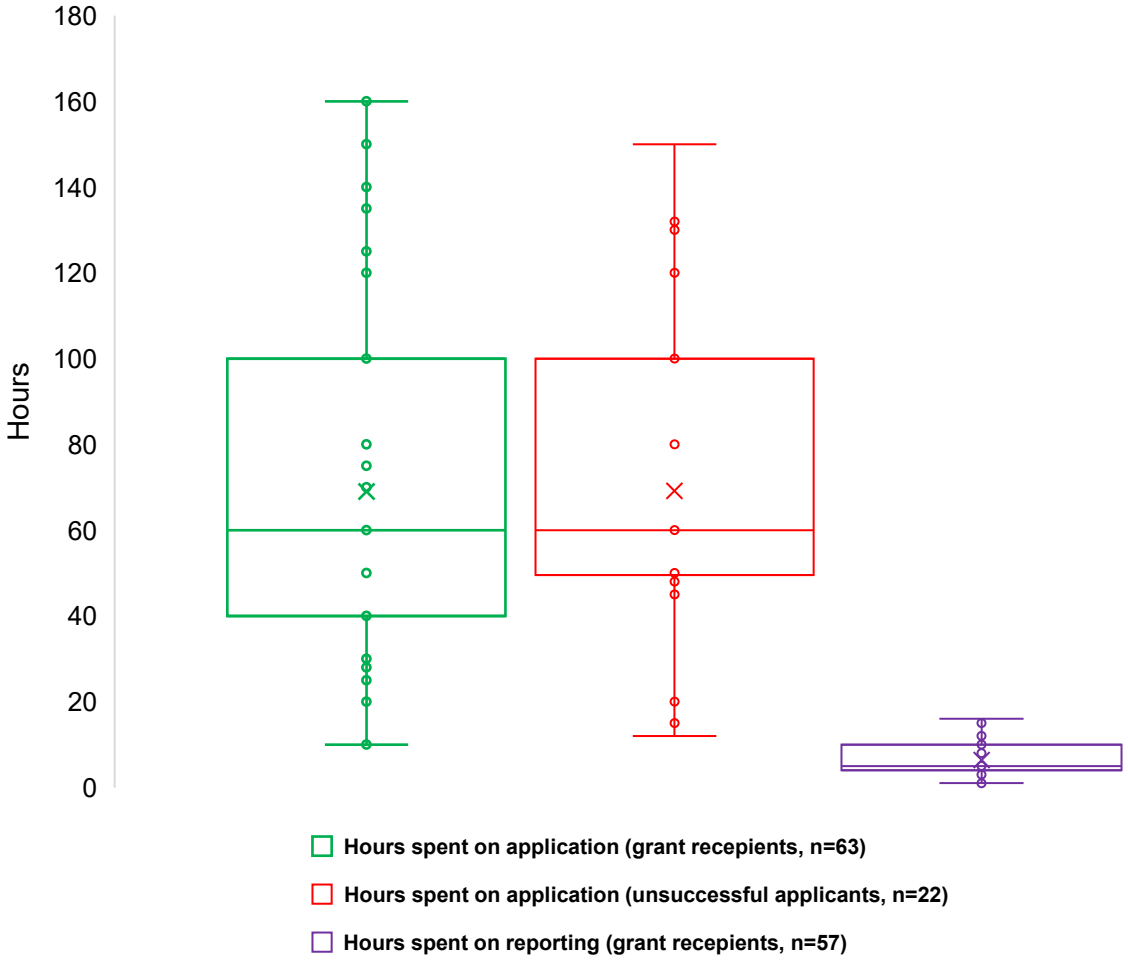
Figure 2. Grant recipients, unsuccessful applicants and host/administrative organisations ratings of the grant application process, guidelines and instructions. (Source: Grant recipient and unsuccessful applicants survey)



Both grant recipients and unsuccessful applicants estimated that they spent an average of 69 hours on their grant application (Figure 3), whilst grant recipients spent an average total of six hours completing their progress and final grant reports for the Program each year.

In the interviews with three universities and research institutes, several areas for improvement in the application process were identified, particularly concerning the perceived administrative burden. The process was seen as especially cumbersome and outdated due to its manual nature, requiring applicants to complete forms in Word format, obtain multiple separate signatures (sometimes from up to four individuals), and, in some cases, provide supporting documentation such as evidence of career disruptions, which other funding bodies typically do not require. Two organisations specifically highlighted these issues. A key recommendation from stakeholders was to implement a grant management system to streamline the process and enhance efficiency.

Figure 3. Hours spent on preparing and submitting application, and on progress and final reports. (Source: Grant recipient and unsuccessful applicants survey)



Grant recipients and host/administrative organisations were asked whether they had sought any clarification from the Office for Health and Medical Research with regards to their application/s. Of the 25 grant recipients who said they had sought clarification, 92% rated the helpfulness of the Office's response as good and 84% rated the timeliness of the Office's response as good. Four out of five host/administrative organisations who had sought clarification rated the Office's helpfulness as good, and three of out of five rated the Office's timeliness of the Office response as good.

In the interviews with host/ administrative organisations, all three organisations reported that the grants team was highly responsive to any queries or issues that arose during the application process. They recalled instances where errors had been made in their applications and noted the team's flexibility in allowing necessary adjustments. Compared to other major grant bodies, this level of support and adaptability was seen as exceptional and was appreciated.

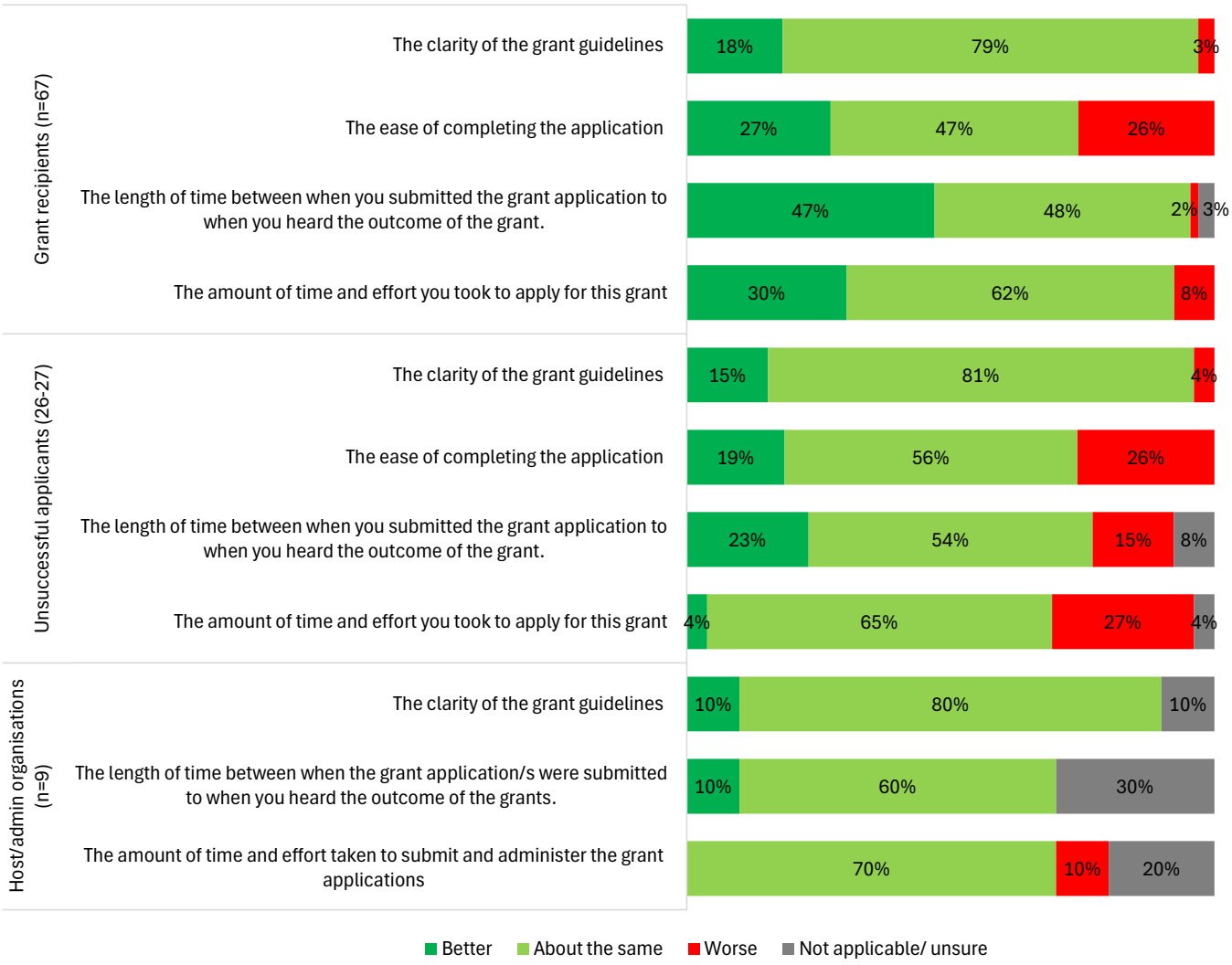
> *"I thought that there was a few times where we missed something in an application and we found that [the Office] would occasionally contact us and say, oh, it looks like you have accidentally forgotten to upload one particular attachment, which was really positive because with other funders we might find that we were immediately ineligible so it's great to have that collaboration between us." (Host/admin organisation)*

Unsuccessful applicants were asked whether they had received feedback from the Office on why they were not successful in being awarded the grant. Of the five applicants who said they had received feedback, two said the feedback provided was useful in helping them to understand the decision not to award them the grant. In the open-text responses of the survey, 13 unsuccessful applicants expressed the need for more specific/in-depth feedback explaining why their application was not successful: some suggested the Office should provide scores, thresholds and rankings; some felt more transparency is needed about the process. Three grant recipients also commented that having further transparency on the assessment criteria for applications would be useful.

> *"Without feedback on the grant, I cannot make a decision about whether or not the project I am proposing is relevant to this funding call. Knowing how close (or not) I am to making it across the funding threshold would inform my decision about whether I should resubmit my application."* (Applicant)

When asked to compare the grant application process with their experience of other similar major grant programs, the majority of grant recipients and unsuccessful applicants rated the Program better or about the same, compared to other major grant programs (Figure 4).

Figure 4. Grant recipients, unsuccessful applicants and host/administrative organisation's ratings of the grant application process compared to other similar major grant programs. (Source: Grant recipient and unsuccessful applicants survey)



In the open-ended survey responses, five unsuccessful applicants and eight grant recipients felt the application form was long, cumbersome and contained difficult formatting.

> *"The word template of the application is very difficult to navigate and too many tables to fill. The format is not easy to work with."* (Applicant)

Similarly raised in the host/administrative organisation interviews, three grant recipients in the survey suggested using an online form to ensure the application form is easier to complete and avoid duplicating information applicants need to provide.

> *"Greater alignment of CV and other requirements with MRFF/NHMRC formats to avoid massive reformatting of basically the same information. Could you use the SAPPHIRE platform perhaps?"* (Grant recipient)

Other feedback regarding the application process included:

- More guidance needed in completing the logic model (n=2 unsuccessful applicants; n=5 grant recipients)
- An initial expression of interest round would be more efficient for applicants and reviewers (n=2 unsuccessful applicants)
- A shorter time between submission and outcome would be helpful (n=2 grant recipients).

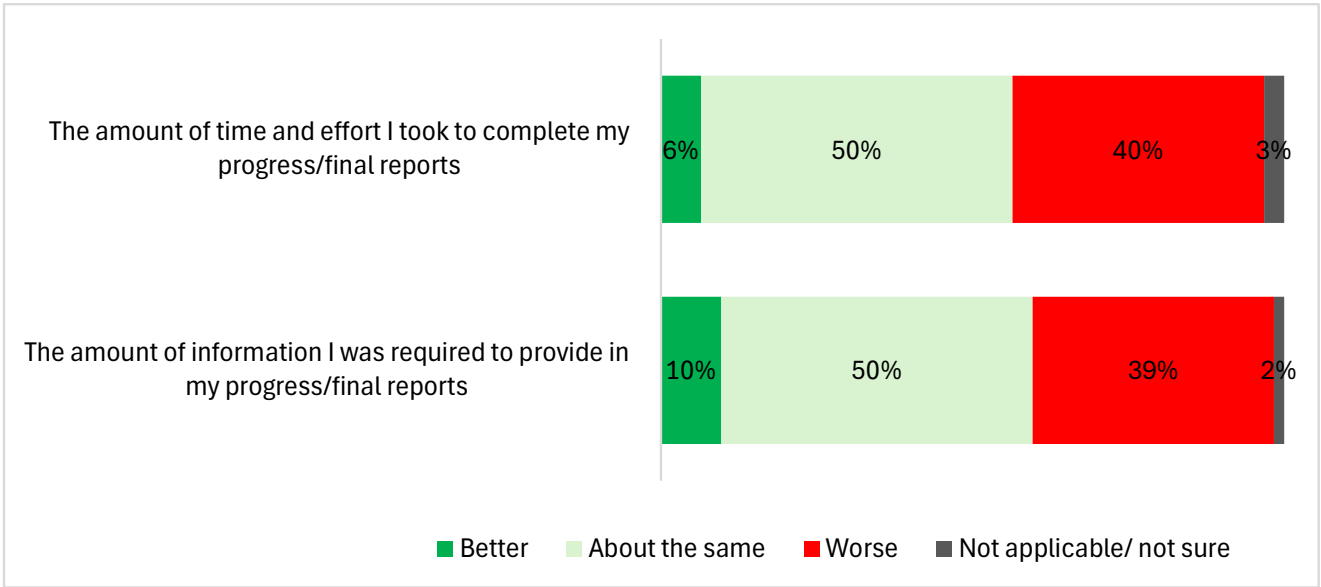
3.2.5 Reporting processes also compared favourably to similar programs however would benefit from a grant management system.

In the survey, grant recipients were asked to compare the reporting process for this Program to that of other major grants they had previously encountered, with some balanced feedback both in terms of time and amount of information required (Figure 5).

Several difficulties were noted with the Excel form, particularly its use of macros, which made it challenging to complete or update - especially for annual progress reports requiring edits to the same document each year. Three respondents recommended switching to an online reporting system, similar to those used by other major grant programs, to address these issues. Additionally, nine respondents felt that the reporting process was lengthy and included repetitive questions. While seven specifically stated that the level of detail required made this program's reporting more burdensome than others, five acknowledged that the detailed reporting was valuable for monitoring and ensuring accountability of project outcomes.

> *"Although the extent of information required was greater than with other major grants, the information requested was reasonable and useful to properly reflect on the outcomes of the grant."* (Grant recipient)

Figure 5. Grant recipient's rating of the time, effort and amount of information needed for progress and final reports compared to other major grants (n=62) (Source: Grant recipient survey)



Overall, the post-award experience of the Program was viewed positively and considered relatively smooth for host/administrative organisations interviewed. One organisation said the reporting process was straightforward and easy to handle. However, one organisation noted that the perception of an outdated application system extended into the grant reporting process. They described the Excel-based reporting template as clunky and overly restrictive, particularly due to its cumulative format and embedded macros, which limited text input and made annual progress updates challenging. Additionally, two organisations recommended streamlining the financial reporting sections. They highlighted that some elements, such as the financial breakdown, were duplicative of the acquittals already submitted, and the GST requirements, especially regarding salaries, added unnecessary confusion. Automating these components was suggested to improve efficiency and ease for grant recipients. Two grant recipients suggested streamlining the financial reporting requirements, noting that the current process demands official statements from the organisation's accounting office. They highlighted that obtaining these documents is time-consuming and not required for comparable grants, such as those from NHMRC or MRFF.

The Program grants team also reported that in the future implementing a dedicated grant management system will significantly enhance efficiency, streamline reporting, and centralise data. As one team member noted,

> *"I think you know the next quantum, if you think about the first quantum leap was that initial process of improving the data and reporting template. The next one, which will be even bigger, will be the implementation of the grant management system." (The Office)*

The Office emphasised that, in addition to investing in a grant management system, reducing the amount of information required from grant recipients could also significantly streamline data collection. They stressed the importance of only collecting data that serves a clear purpose.

The team reflected that while the Program does well in tracking traditional translational outputs such as publications, funding, clinical trials, patents, and commercialisation, it could improve monitoring the development of new technologies and techniques, especially those emerging from basic science research. These basic science innovations, often created to measure or implement novel ideas, are highly valuable but not adequately documented or recognised. The team emphasised the importance of engaging more directly with both researchers and end users such as policymakers and health system executives, when defining what meaningful outcomes look like. Rather than the Ministry alone determining success metrics, they suggested consulting scientists, and the broader research ecosystem about which outputs truly matter to them.

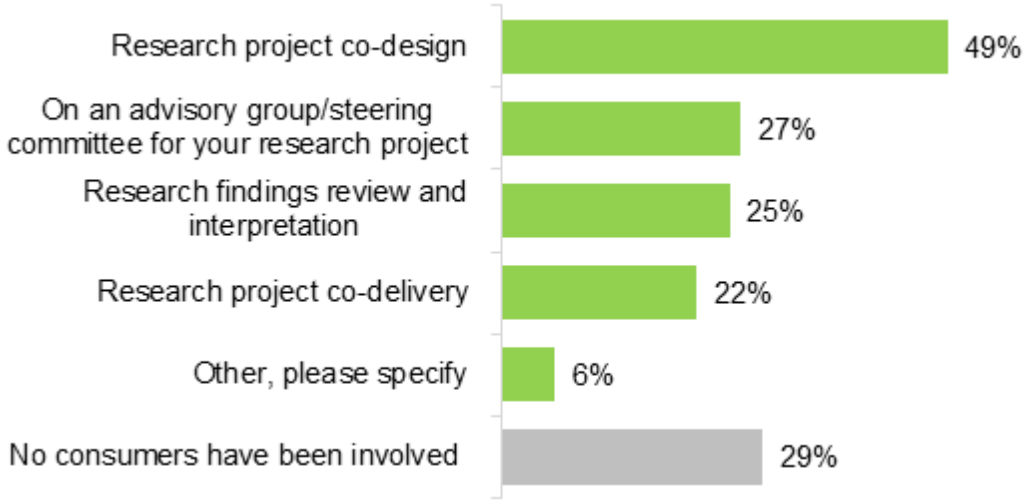
3.2.6 Consumers are not yet involved in the delivery of the Program, however, there is some involvement in individual funded projects.

Consumers are not currently involved in the Program as a whole, at the strategic level, the committee level, during grant reviews, nor in research project monitoring. However, since 2023, grant guidelines have been encouraging applicants to, "identify and engage relevant stakeholders, partners and networks who will provide a meaningful contribution to delivery of the research project and implementation of outcomes". Consumers and patients are included as a possible stakeholder.

Increasing consumer involvement has been highlighted within the Advisory Committee and the Office, as an important area for the Program to consider. However, the grants team noted current capacity constraints as a challenge to implementing these initiatives in a meaningful way.

Grant recipients were asked a multiple-choice question of how consumers had been involved in their research projects (Figure 6). Almost half of funded projects involved consumers in the research co-design. Involving consumers in an advisory/steering committee, in research findings review and interpretation, and in research project co-delivery were also selected. Almost 30% of research projects had no consumer involvement. For those who selected 'other', suggestions included the involvement of consumers as research subjects, and in advocacy and publicising research outcomes.

Figure 6. How consumers have been involved in individual research projects (n= 83) (Source: Grant recipient survey)



3.2.7 Partnership with the Cardiovascular Research Network effectively supports the delivery of the Program

This partnership between the Program and Cardiovascular Research Network (CVRN) was considered so effective by stakeholders that it was reported that CVRNs were now being developed in every state, with the intent of replicating the Program and partnership with their state health departments.

> *"We're actually seeing CVRNs being formed with the intention of developing the same collaboration with state governments. So almost every state has a CVRN now and when we meet with them for overall research strategy and other projects, they're always asking about [this Program]. So it really has captured the imagination of the of the country."* (Stakeholder)

Grant recipients were asked in the survey to rate the helpfulness of the CVRN and the Office's grant support services offered to grant applicants. Overall, the grant application workshop, pitches and the Office website education resources were rated highly (Figure 7).

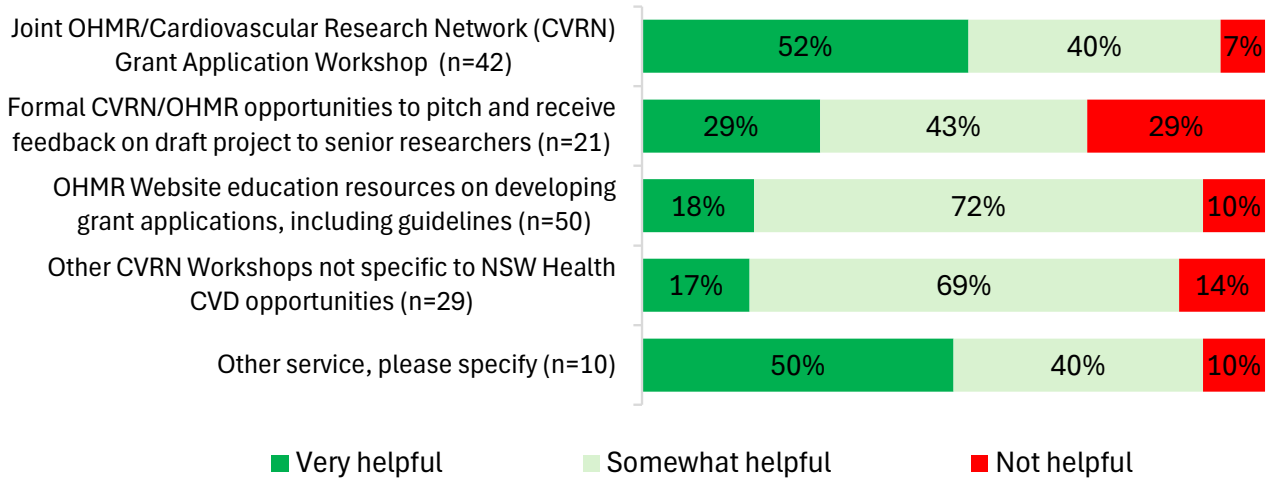
Applicants generally found grant application services offered by the CVRN and the Office helpful, especially for clarifying requirements and asking questions, with some suggesting that recorded presentations and more detailed online resources, particularly for less familiar components like logic

models, would enhance support. One respondent also highlighted the need for workshops to provide broader inclusivity beyond biomedical research, and more tailored support to reflect the full spectrum of health and translational research.

> *"I found the workshop very helpful to understand the requirements and also to ask questions. I actually attended the workshop again in subsequent rounds" (Grant recipient)*

Other services which respondents reported as helpful included institutional support, supervisor support, getting advice from a previously successful grant recipient, and meeting with the Office staff to get advice.

Figure 7. Grant recipients' ratings on the helpfulness of CVRN and OHMR grant support services (n=67) (Source: Grant recipient survey; multiple choice question)



Overview and interpretation

The Program has been delivered as intended, with flexibility to accommodate the impacts of the COVID-19 pandemic. Most projects are progressing as planned, with delays mainly due to the pandemic. Delivery complies with grant guidelines, though record-keeping could be improved. Overall, applicants, grant recipients and host/admin organisations found the application and reporting processes clear and user-friendly, and confirmed that they compared favourably to similar programs. However there is a need for an online grant management system to automate processes, avoiding manual data entry. Grant recipients and unsuccessful applicants emphasised the need for feedback from reviewers on applications. While consumer involvement is limited at the Program level, some engagement exists within individual projects. A strong partnership with the CVRN has contributed positively to effective delivery. Information on budget allocations for 3Rs alternatives was reported inconsistently by researchers, limiting the ability to conduct a thorough analysis in the evaluation.

Recommendation

- An online grant management system is needed to improve efficiency of grant application, review and reporting processes as well as monitoring and evaluation capabilities.

- Consideration should be given to working with researchers to fully complete all grant report fields. This will enhance the Program's ability to monitor compliance with funding agreements, ethics approval and other government standards.
- Consideration should be given to providing all grant applicants with feedback or scores on their applications.
- Consideration should be given for how consumers can be involved at the Program level.

3.3 Reach and uptake

3.3.1 The number and distribution of grant recipients per grant type is in line with the Program target audiences.

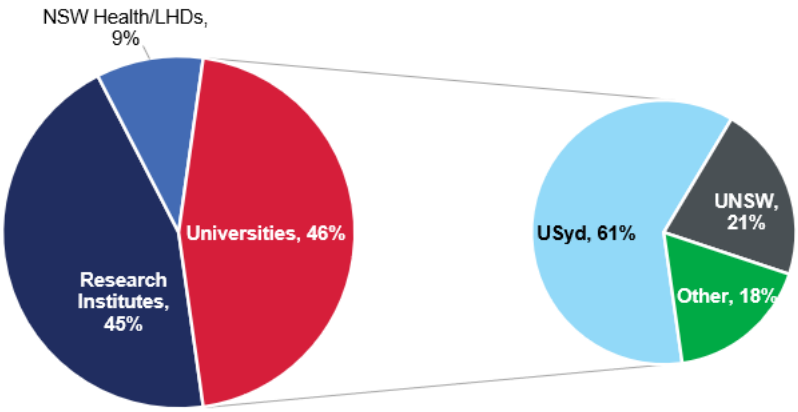
Across rounds one to three, a total of 112 research projects have been funded, with 52 completed by January 2025. A range of grant types has been offered for each grant round, with Senior Researcher and Early-Mid Career Researcher grants being the most commonly awarded overall (Table 8), reflecting the fact that all of the Program target audiences have been reached: clinician scientists, senior researchers/scientists, early mid-career researchers, seeding/collaborative grants and an elite grant scheme.

Table 8. Number and distribution of funded projects, by grant type and round (Source: Grant report analysis)

Grant type	Round 1	Round 2	Round 3	Total
Clinician Scientist	10	-	-	10
Senior Scientist	10	-	-	10
Senior Researcher	-	13	10	23
Early Mid-Career Researcher	-	21	19	40
Elite Grant Post Doc	-	1	5	6
Elite Research Leader	-	1	-	1
Investigator Development Grants	-	11	-	11
Synergy Seeding Grants	-	2	-	2
Collaborative	-	-	9	9
Total	**20**	**49**	**43**	**112**

Grant recipients' host organisations (where the research is being conducted) are almost evenly split between universities (46%) and research institutes (45%), with the remaining 9% based in NSW Health facilities or local health districts (Figure 8). The University of Sydney accounts for the largest share of grant recipients amongst the universities, followed by the University of New South Wales.

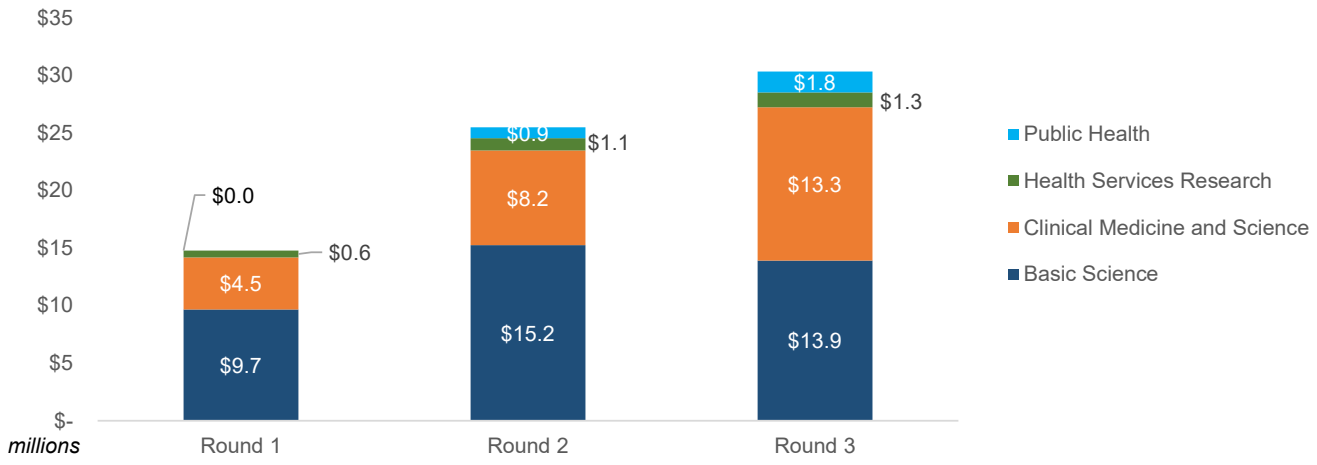
Figure 8. Distribution of organisations hosting Program grant recipients (Source: Grant report analysis)



3.3.2 Research intent from funded projects is relevant and aligned with the objectives of the Program.

At the launch of the Program, the Minister for Health approved that 60% of total Program funding would be allocated to basic science research projects, and the remaining 40% would be distributed to clinical medicine and science research, health services research, data science and public health research. Figure 9 illustrates funding allocations across the first three rounds for four research categories: Basic Science, Clinical Medicine and Science, Health Services Research, and Public Health. Funding is shown in millions of dollars, with Basic Science consistently receiving the highest allocation across all rounds. The total funding allocated to Basic Science across all rounds is approximately $38.8 million out of $70.7 million, which equates to about 55%. This is close to the Minister's stated target of 60% funding towards Basic Science.

Figure 9. Funding allocated by type of science and grant round* (n=112) (Source: grant report analysis)



* Value of funds for grants that report more than one type of science are evenly split across nominated categories.

Overall, funded projects cover wide and broad topic areas in CVD research demonstrating the breadth of basic science, clinical medicine and science, health services research, and public health, meeting the Program's objectives (Table 9).

Table 9. Examples of projects' research intent against Program objectives

Program objectives	Example of project research intent
Fund research that generates outputs with potential to prevent CVD and improve health and wellbeing outcomes for people with CVD	*Case study: "Developing novel treatments to improve heart failure and myocardial infarction outcomes"* (Associate Professor James Chong, Clinician Scientist Grant, Round 1; Appendix 2). The project aimed to develop novel therapies to reduce the costs associated with death and illness from heart attacks and resulting scarring. Two novel therapies for heart attacks have been tested in pig models and are progressing toward clinical trials, with potential to lead to improvement in patient care and reduce burden of disease.
Increase the number of outstanding CVD researchers in NSW	*Elite Research Leader: "Understanding the role of PHACTR1 in vascular disease"* (See Section 3.5.6). Professor Kovacic, an internationally recognised leading authority on PHACTR1 returned to NSW from the United States through the Elite grant scheme. He is spearheading a comprehensive and systematic research program aimed at uncovering the gene's causative mechanisms, being committed to establishing a world-class research initiative within NSW.
Encourage collaboration, leadership, and capacity building in the NSW research environment	*Case study: "Implementing novel approaches to transform blood pressure control"* (Dr Aletta Schutte, Collaborative Grant, Round 3; Appendix 2) The research is being undertaken by a multidisciplinary research team embedded within the National Hypertension Taskforce, a collaborative cross-sector group working to reduce the burden of high blood pressure in Australia. The project has contributed to building the capability of numerous researchers involved.
Embed high-quality, innovative CVD research in the NSW health system	*Case study:* "Code STORM: standard care or a rapid early invasive management approach to patients with life-threatening heart rhythm disorders" (A/Prof Saurabh Kumar, Early Mid-Career Researcher Grant, Round 2; Appendix 2). The research has contributed to establishing initial catheter ablation as best practice for the management of VT storm. Western Sydney Local Health District has been established as 24/7 referral centre for VT storm, with improved referral pathways to improve access for patients from other local health districts.
Bridge the gap between research, policy, and practice to increase research impact and translation	*Elite Postdoctoral: "3D Bioprinted Multi-Functional Wound Dressings for Diabetic Foot Ulcers".* A/Professor Khoon Lim's research is developing new strategies to restore blood supply to the wound area while preventing infection using biomaterials and bioprinting technologies. The Elite researcher has been on a WHO panel for their research and is on Standards Australia under the International Organization for Standardization committee, focusing on surgical and personalised implants.
Support NSW researchers to leverage national funding opportunities to further research and its translation in NSW	*Case study: "Working towards a genetic diagnosis for the majority and identifying the benefits"* (Professor Sally Dunwoodie, Senior Scientist Grant, Round 1; Appendix 2). Through this research, additional genes have been identified that cause CHD. This knowledge is used globally to increase the genetic diagnostic rate for CHD. Additional funding leveraged through the research totals over $15.5 million for NSW based researchers.

3.3.3 The Program is working towards having a distribution of grant recipients and reviewers that is reflective of equity objectives

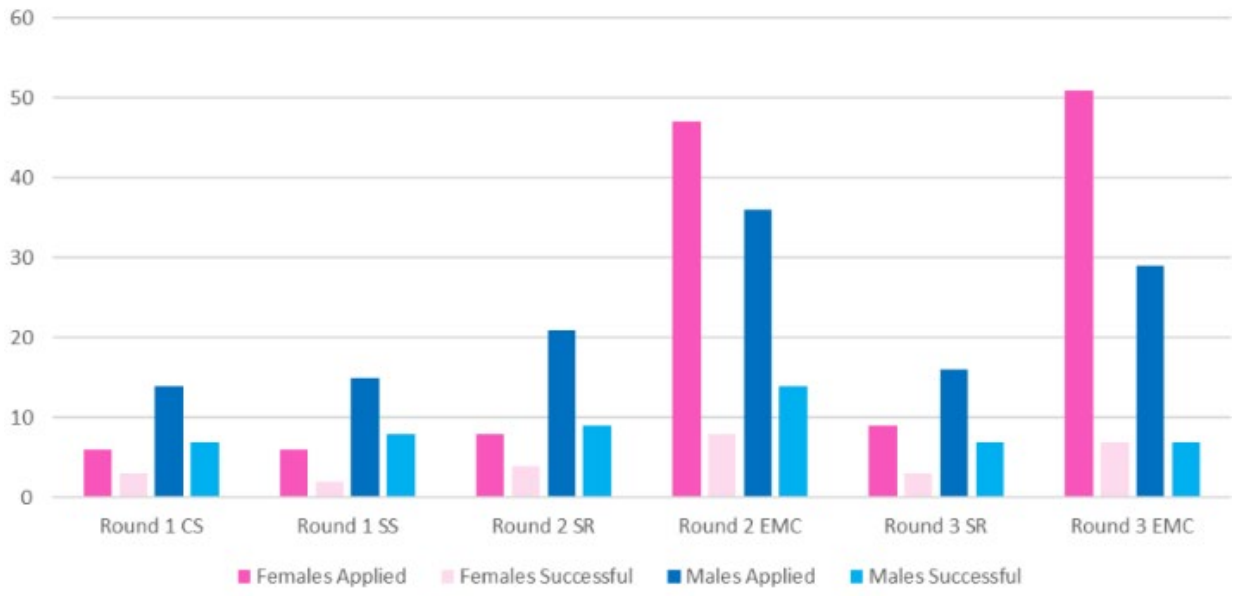
The Office for Health and Medical Research collects and records grant recipients' demographic characteristics, namely gender, Aboriginal status and whether the host organisation or chief investigator are located in a rural location. Thirty-seven percent of chief investigators from rounds 1 to 3 identified as female. No chief investigators identified as Aboriginal and/or Torres Strait Islander and two chief investigators are recorded as working in a rural or remote location.

Grant applicants' gender is collected in the application form but to date, it has not been a factor considered in the application review process in any Office for Health and Medical Research grant program. In comparison, the NHMRC has implemented additional funding measures to support women across all research, aiming to reduce disparities in grant success rates between male and female lead investigators.[10] Since 2017, these initiatives have helped maintain a gender funding gap of less than 1% nationally, including within NSW.

In 2022, the Office conducted a manual analysis of the gender success rate from their application data and presented this to the Advisory Committee (Figure 10). The data shows that the gender balance improved over time, and that by round 3, there was a 50-50 split between male and female researchers who received an EMC grant. However, there is an apparent significant difference in the success rate of male and female applicants, with male applicants being more successful particularly in round 2 and 3 EMC grants.

Further analysis of application data by gender was out of scope for this evaluation due to the significant work required to populate gender for all successful and unsuccessful applicants, and merging all the review data for all grant types and rounds, pointing to the important need for robust and quality data.

Figure 10. Number of successful applications by gender, round and grant type (Source: Office for Health and Medical Research analysis, Cardiovascular Research Advisory Committee presentation, 2022)*



* Round 1 had an EOI stage, data shown is full applications only.

For round 4, the Program has launched Aboriginal Heart Health Grants which will address the lack of representation of Aboriginal researchers in the Program. The $5 million in funding is part of the Program's total $150 million. It aims to improve cardiovascular health outcomes for Aboriginal peoples by increasing targeted research initiatives in NSW and strengthening the capacity of Aboriginal communities and researchers in cardiovascular research.

Furthermore, consideration should be given to the mix of reviewers (review panels) to also ensure there is diversity, not only in terms of gender and background, but also tenure, which can also support the equity of grant allocation.

Overview and interpretation

A total of 112 research projects were funded across rounds one to three, with 52 completed as of January 2025. The grant program is effectively reaching its intended audience and supporting projects aligned with its strategic objectives. The alignment of the distribution of grant types and research intent with the Program objectives indicates strong program design and implementation. The Aboriginal Heart Health Grants demonstrates a commitment to inclusive support across the research community, however, further work is needed to improve equity in grant distribution and also in the diversity of the review panel. Overall, the Program shows positive progress in reach, relevance, and equity.

Recommendation

- The Office should consider including gender, geographic location and Aboriginality in the grant application review process.

3.4 Early evidence of outcomes – Knowledge advancement

3.4.1 Knowledge advancement: funded projects contribute to an increase in CVD research publication, however, improvement in record keeping is needed.

For research projects funded in rounds one to three, including those not completed yet, there were a total of 867 peer-reviewed publications. Overall, there has been a steady increase in the number of publications since 2018. Further analysis of the publication data to assess impact factors of journals and other key publication indicators was limited by the quality of the grant report data (Publication references were not recorded consistently or in a format suitable for analysis).

The average number of publications per completed project was 12 (range 1-81) noting that not all research projects have produced a publication yet.

As a measure of the potential impact of publications on building research capacity and collaborations, author job roles and geographic location were examined. Almost half of publications included authors employed by NSW Health, 55% included authors within NSW but external to the grant recipients' institute, 33% included authors outside of NSW and 44% included authors outside of Australia. Figure 11 shows the total number of publications by grant type. The two highest yielding grant types in terms of

publications were the Senior Researcher and Early Mid-Career grants. This is in part due to the high number of these grants awarded compared to the other grant types (23 and 40 respectively).

Figure 11. Total number of peer-reviewed journal publications by grant type (Source: grant reporting data)

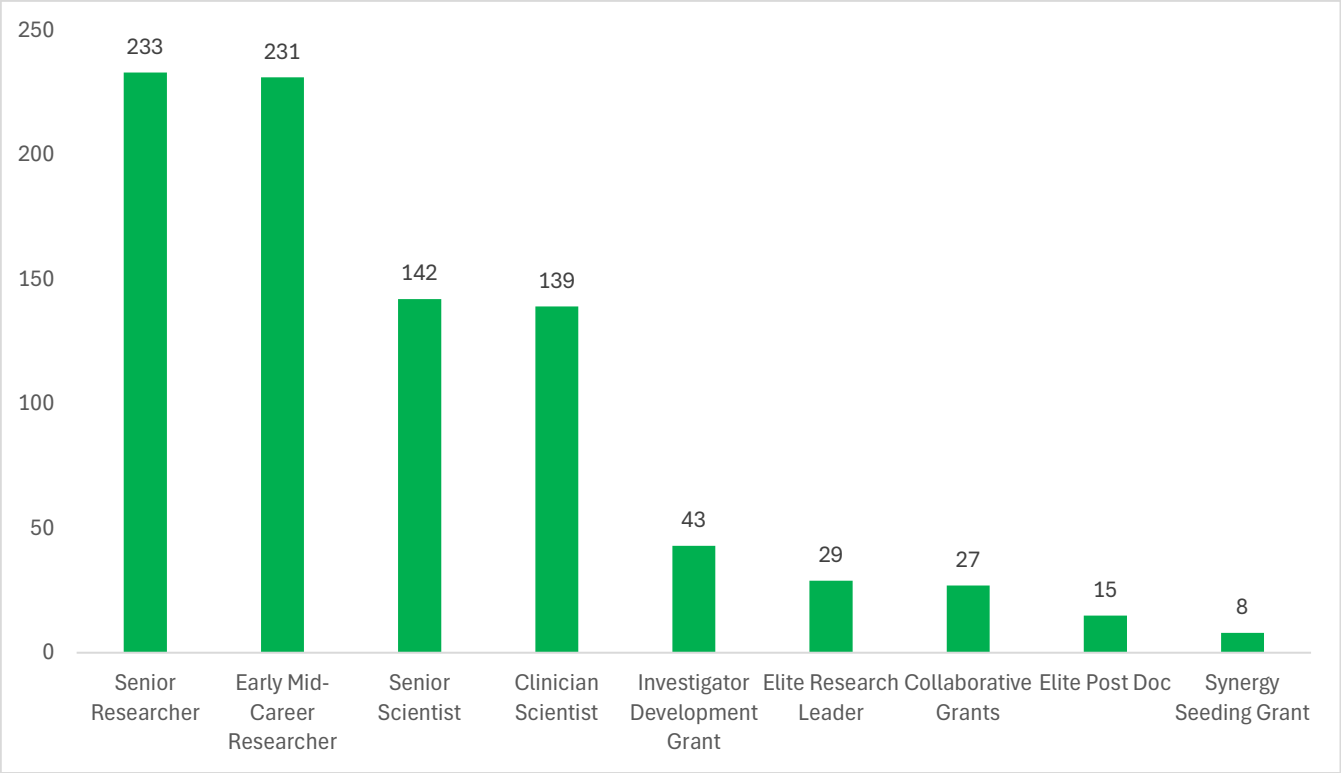
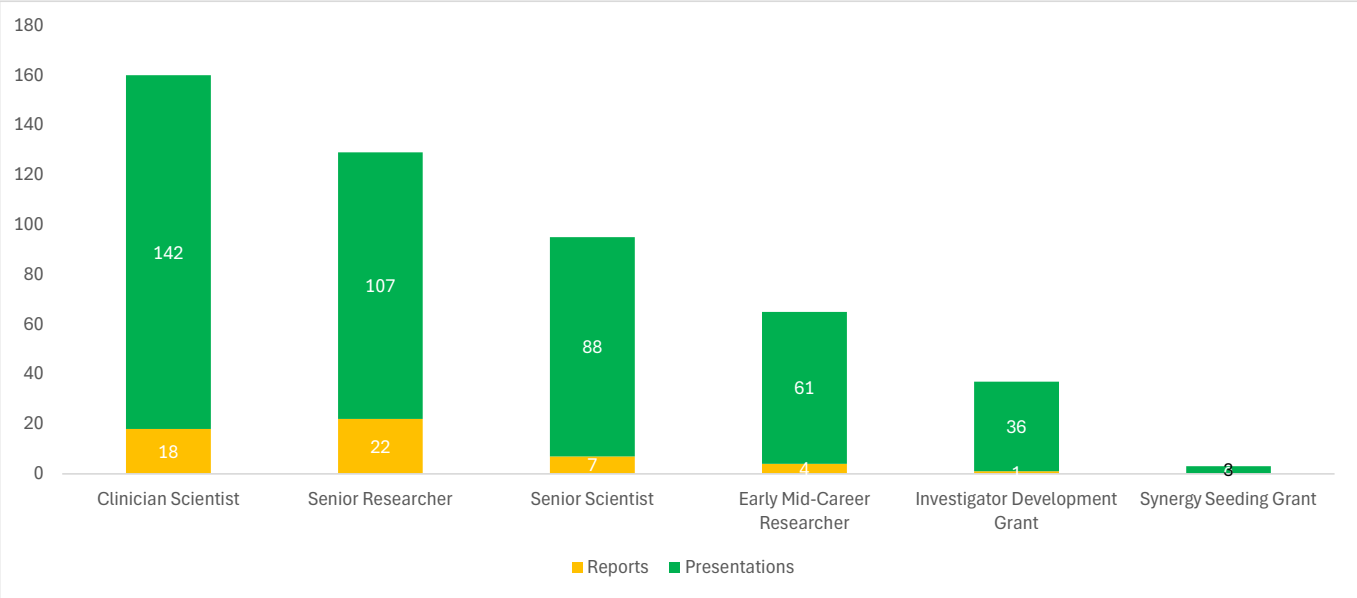


Figure 12 shows the number of non-peer reviewed reports (e.g. executive summaries, local health district reports, media) and presentations (e.g. conferences, stakeholder meetings, education sessions) by grant type. The highest amount is being generated from the senior research/clinician grants which may reflect the seniority of the grant recipients.

Figure 12. Number of funded research related grey literature by grant type



The first case study below highlights the substantial publication impact of a single research project, which produced 17 publications, including one with a notably high Field-Weighted Citation Impact (FWCI) of 11.88. The second case study highlights how the funded research projects are advancing new knowledge in the cardiovascular research community nationally and internationally, even when that finding is a robust negative.

CASE STUDY- TRANSLATING GENOMICS TO CLINICAL CARE OF PATIENTS WITH INHERITED HEART DISEASE

A/Professor Richard Bagnall was awarded a Senior Scientist Grant in round 1 for a clinical medicine and science research project that aimed to improve genetic testing outcomes for patients with inherited heart diseases. The research found additional genetic causes of inherited heart disease were identified in non-coding regions of DNA, identified suspected variants using RNA sequencing, and demonstrated how functional assessment of suspected variants can help determine their pathogenicity.

New knowledge generated by the funded project: A new diagnostic method was established. The research has tested and provided evidence to support genetic testing in non-coding regions of DNA and using RNA analysis. Patient-specific cell models of heart disease were developed from blood cells, enabling “disease-in-a-dish” research to study heart function and drug responses.

Increased publication reach and quality: 17 publications have been published from this research and the research has been presented at eight national and international conferences. The top two publications by FWCI are:

- “Recommendations for clinical interpretation of variants found in non-coding regions of the genome”, Genome Medicine, 2022 has received 112 citations and a FWCI of 11.88.
- “Concealed Cardiomyopathy in Autopsy-Inconclusive Cases of Sudden Cardiac Death and Implications for Families”, Journal American College of Cardiology, 2022 has received 33 citations and a FWCI of 4.32.

CASE STUDY – CARDIOPROTECTIVE EFFECTS OF THE PNEUMOCOCCAL POLYSACCHARIDE VACCINE

Laureate Professor John Attia was awarded a Collaborative Grant in round 3 for a public health / clinical medicine and science research study. The funded project was a national, multicentre, randomised controlled trial to test the cardioprotective effect of the pneumococcal Pneumovax vaccine in humans. The research found that the cardioprotective effect of the pneumococcal vaccine seen in mice did not translate to humans.

Knowledge advancement

While the result was negative, it was a robust negative. The research was the first and only test of the cardioprotective effect of the vaccine in humans internationally, and as such, has provided a clear answer to this long unanswered question.

Four publications with an average FWCI of 1.04 have been published. Findings have also been shared at multiple conferences.

3.4.2 Funded projects contribute to quality CVD research

The quality of the research of the funded projects is evidenced by the number of peer-reviewed publications, knowledge advancement, policy and clinical practice outcomes and economic benefits.

The eight case studies conducted as part of the evaluation highlight the broad scope and innovative nature of cardiovascular research being undertaken by the Program funded projects, spanning prevention, diagnosis, treatment, and long-term care.

Professor Sally Dunwoodie's grant project illustrates the quality of the research as evidenced by the number of peer-reviewed publications generated (17 publications from this research, with an average FWCI of 1.52), funding leveraged (over $15.5m) and awards received.

CASE STUDY - WORKING TOWARDS A GENETIC DIAGNOSIS FOR THE MAJORITY AND IDENTIFYING THE BENEFITS

Professor Sally Dunwoodie, a recipient of the 2025 CVRN Ministers Award, received a Senior Scientist Grant in round 1 for a basic science research project. Though congenital health disease (CHD) is common and its impacts can be severe, there have been knowledge gaps regarding its causes and prevalence. Professor Dunwoodie's research responded to the need for further knowledge about the causes and prevalence of CHD, specifically regarding genetic causes of CHD, and CHD incidence across NSW.

The research was able to genetically diagnose CHD in patients by identifying mutations in genes 'known' to cause CHD. Additional genetic causes of CHD were identified. This new information has resulted in an expanded number of genetic variants that can be used in genetic diagnosis for CHD. Methods were established to effectively quantify nicotinamide adenine dinucleotide (NAD) and related metabolites in humans and mouse models. The incidence of CHD in NSW was also established (by region and severity).

Key outcomes generated:

Publication metrics - There have been 17 publications from this research, with an average FWCI of 1.52. Research findings have been shared at 15 national and seven international presentations.

Economic benefits - Additional funding leveraged through the research totalled over $15.5 million for NSW based researchers. Four researchers involved in the funded project received six fellowships, and two researchers were able to go on to build independent research careers.

Knowledge advancement - Additional genetic causes of congenital heart disease (CHD) were identified, and establishment of linked data to establish CHD incidence in NSW was established.

Policy and practice - The identification of new genetic causes of CHD has added to the evidence base supporting these genes as variants, including via inclusion on PanelApp Australia which is an open, online platform enabling the recording and sharing of genes known to cause disease. Increased knowledge of these variants and support for their validity means more patients are likely to be tested for them, providing important information to inform patient care.

Overview and interpretation

Funded projects are contributing to an increase in CVD research publications with a total of 867 peer-reviewed publications achieved so far, with two grants yielding 17 publications each to date and one publication with 112 citations and a Field-Weighted Citation Impact (FWCI) of 11.88. An online grant management system would improve the quality of publication data, avoiding duplications and allowing for advanced metrics to monitor research impact. The eight case studies demonstrate the high-quality research generated from the Program grants. This evidence indicates the Program has been effective at advancing knowledge in this field.

Recommendation

- An online grant management system would improve the quality of publication data, avoiding duplications and allowing for advanced metrics to monitor research impact.

3.5 Early evidence of outcomes – Capacity and capability building

3.5.1 Data generated by just over half of funded projects has already or will be made available for further cardiovascular research.

Fifty-eight percent of grants (35 out of 86) responded in the survey that they had made data available to other health or medical researchers outside their research group for further cardiovascular disease research. Some examples are provided below to illustrate how respondent data is being used:

- Global access has been provided to large-scale datasets (e.g., BioHEART) to support discovery of biomarkers and therapeutic targets, enabling academic and industry collaborations (Professor Gemma Figtree, Clinician Scientist Grant, Round 1).

- Research data has been shared nationally through direct partnerships and the Australian Cardiovascular Data Commons, including with commercial partners (Professor Stuart Grieve, Senior Researcher Grant, Round 2).

These responses demonstrate early evidence of data sharing, with researchers enabling national and international collaboration, supporting clinical translation, and advancing cardiovascular research through academic, clinical, and industry partnerships.

CASE STUDY – IMPLEMENTING GENOMIC MEDICINE IN INHERITED CARDIOMYOPATHIES

Professor Diane Fatkin was awarded an Investigator Development Grant in round 2 for a basic science research study examining the genetic causes of atrial fibrillation (AF) and cardiomyopathies. The research identified genetic causes of familial AF. A CMR-based imaging protocol for the assessment of atrial structure and function was also developed. Novel aspects included 3D whole heart angiography and aspects that quantify atrial fibrosis and estimate 5D whole heart flow.

Data made available for further CVD research

Though the research under this grant hasn't directly developed new treatments, it has generated data that are being used by other researchers to improve treatments. For example, the CMR data generated are being used nationally and internationally by three groups of researchers. This includes a collaboration with researchers at the Imperial College London to develop patient-specific computational atrial electromechanical models to examine how atrial parameters can predict AF. This research has potential to inform improvements in ablation as a treatment for AF.

Similarly, a collaboration with Melbourne University is utilising the data generated from the familial AF genetic studies to understand how ablation with either single or extensive focus might impact differently on patients with genetic risk for AF.

3.5.2 Funded projects provide opportunities for mentorship and capability building for early career researchers and clinicians

Grant report data indicates that, out of 112 research projects funded across rounds 1 to 3, 51 grants are supporting the supervision of a total of 276 students (including Doctoral, Honours, and Masters levels). Additionally, 38 grants involve mentoring a total of 232 individuals, while 15 grant recipients reported receiving mentorship themselves.

The following case study, from an EMC Grant recipient, highlights the impact of the funding in advancing their own career progression and in building the research skills and capacity of the students and staff involved in their project.

CASE STUDY - IMPROVING WOMEN'S CARDIOVASCULAR HEALTH AFTER HYPERTENSIVE PREGNANCY

Associate Professor Amanda Henry was awarded an Early Mid-Career Researcher Grant in round 3 for a clinical medicine & science research study. Emerging findings from A/Professor Henry's funded research have shown that women experienced trauma and mental health challenges following hypertensive pregnancy, with

difficulty maintaining a healthy lifestyle. Preliminary results suggest the intervention improved health understanding but had limited impact on behaviour change and cardiovascular risk reduction. Final health outcome data is still pending for both research aims.

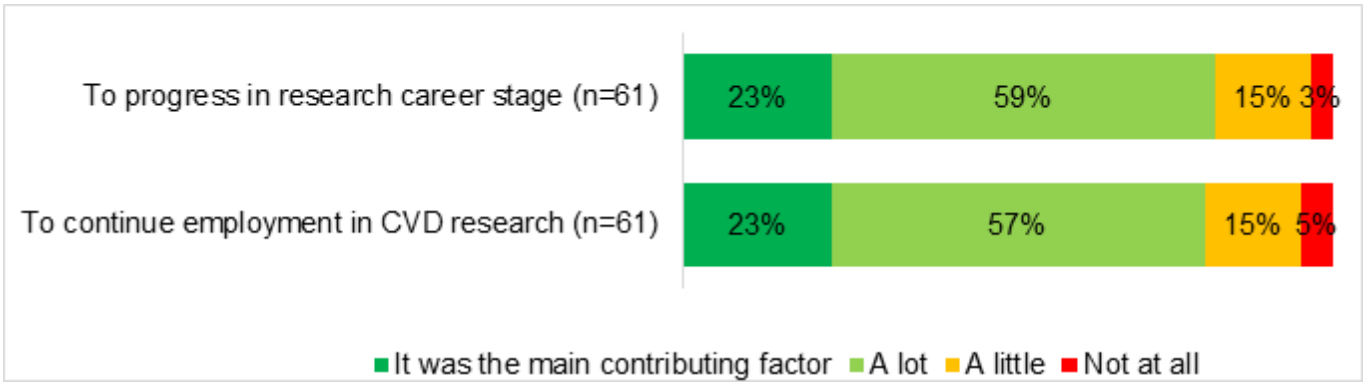
Capability building

The grant significantly supported the recipient's career progression, aiding their advancement from Associate Professor to Professor. It also sustained momentum for the St George Hospital Obstetric Medicine Research Group by enabling continued research based on existing cohorts and previously gathered data.

The funding is also supporting the research capability among midwifery staff and researchers by supporting fractional staff positions across multiple hospitals. It enabled career development, with one midwife advancing to a clinical midwifery consultant role and another securing an academic position. Undergraduate and PhD students also gained research experience through involvement in the project.

In the grant recipient survey (Figure 13), the majority of survey respondents reported that the Program was either the main contributing factor or a substantial contributing factor to both progressing in their research career stage and continuing employment in CVD research in NSW. Other contributing factors for career stage progression that were reported included other grant funding awarded, strategic collaborations and institutional support. Additional contributing factors for continuing employment in CVD research were also reported and mostly related to family members living in NSW and an established career in NSW.

Figure 13. Overall, how much would you say the CVD grant helped you progress in your research career stage and helped towards your continued employment in cardiovascular research in NSW? (Source: Grant recipient survey)



All stakeholders expressed the important impact the Program was having in fast tracking early researchers' career progression. The Program is seen as a vital pipeline for young researchers in NSW, in providing three years of funding to get them started in their CVD research. The Program is considered to be successful in targeting early researchers through the EMC grants. Another benefit is that it allows early researchers to be included in the Collaborative grants, whereby each collaboration must include a minimum of two EMCs as Chief Investigators. And even for more senior researchers, stakeholders reported how they have witnessed many who had become associate professors and professors during their funded research projects.

> *"And at the end of the day, if you don't have young scientists coming through the system you don't have a research pipeline. The most rewarding thing is actually seeing some of the younger scientists now getting NHMRC grants on the back of the fact that they were funded through [the Program], which was the original intent here."(Stakeholder)*

However a few stakeholders reported that further refinement and review of some grants could be made to support and encourage clinician researchers. It was felt that they were at a disadvantage compared to fulltime researchers due to juggling clinical work and research – this particularly applied to junior clinician researchers.

> *"I mean, it's always a challenge for basic scientists or all scientists, but these [clinician] guys are trying to commit half of their time. They're basically turning down clinical work left, right and centre to do basic science and then they're not succeeding in these fellowships. And I think it's very hard for them to be judged against the other researchers […] and so I think just whether or not there's an ability to go back and review the success rate of the clinician researchers across the board. And what could be done to support them differently [...] particularly in their junior years is when it's really difficult for them."(Stakeholder)*

3.5.3 Funded projects contribute to a steady increase in CVD research capacity in NSW.

Round 1 and 2 grant recipients were asked in their final report to list all staff who were employed using their grant funds (this was not asked of grant recipients in round three). Staff roles were labelled as: administrative and management, technical and research support, research employees, research assistants and research leaders. There was a steady increase in the number of staff employed using grant funds, with 44 commencing in 2018-19; 48 in 2019-20 and 53 in 2020-21. Of the total staff employed for round 1 and 2, 12 were clinicians, 7 were NSW Health staff and 13 were both NSW Health staff and clinicians.

3.5.4 Seventy-one percent of survey respondents report progress within basic science

The Research Translation Framework (Figure 14) was included in the grant recipient survey, which asked respondents to report how each of their grants progressed along this pathway. The survey acknowledged that not all projects are expected to progress on the research translation pathway within the project's duration. For example, early-stage basic science research (T0) may remain within that stage for years, often requiring a decade or more before reaching human trials (T1 and beyond). The survey questions about research translation were intended to capture the extent of translation achieved across the Program to date, including progress within a single stage, such as T0. Broader outcomes and impacts across all stages of the translation pathway were also explored.

Figure 14. Biomedical Research Translation Framework (Source: Office for Health and Medical Research Grant Guidelines citing the University of Arkansas for Medical Sciences Translational Research Institute (https://tri.uams.edu/about-tri/what-is-translational-research))

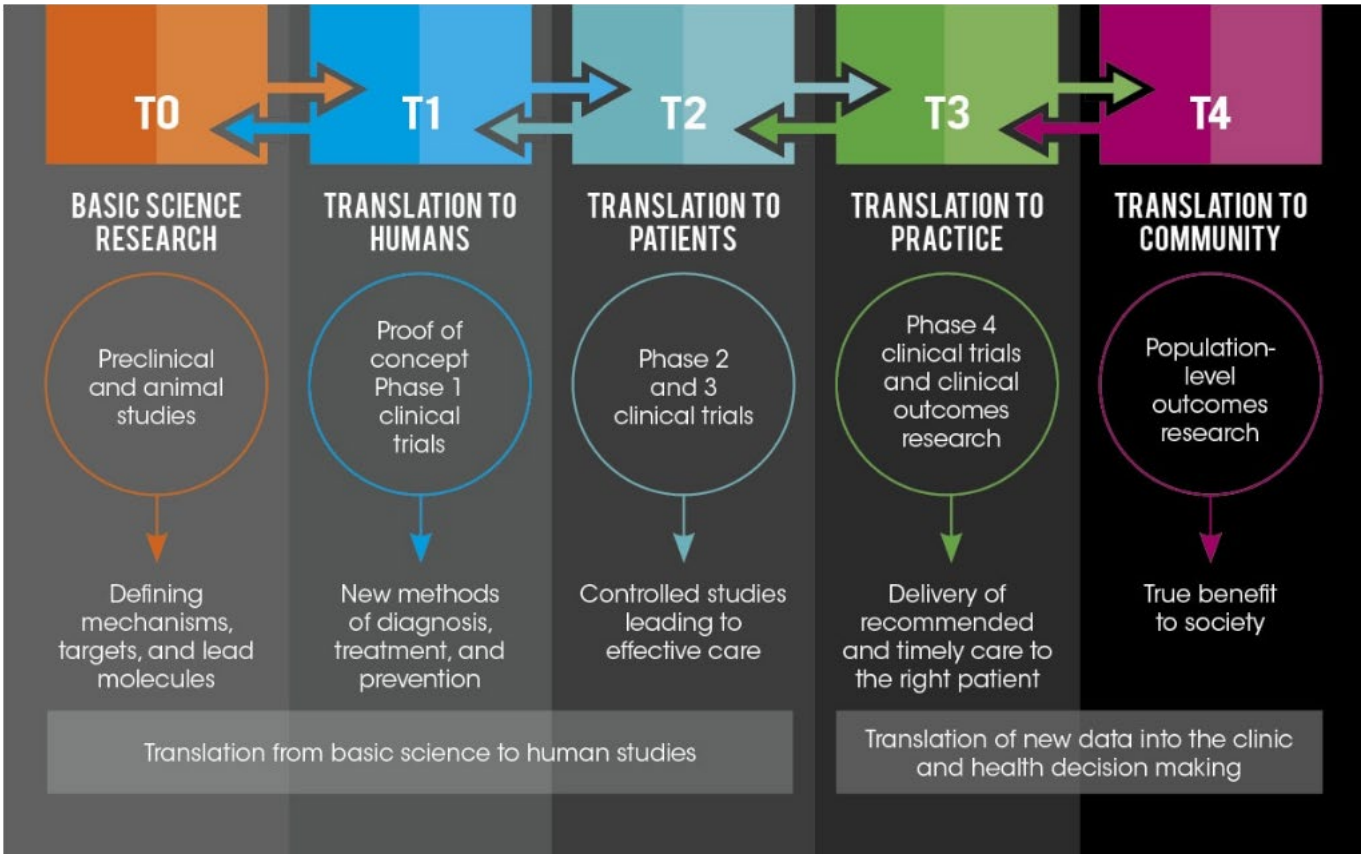
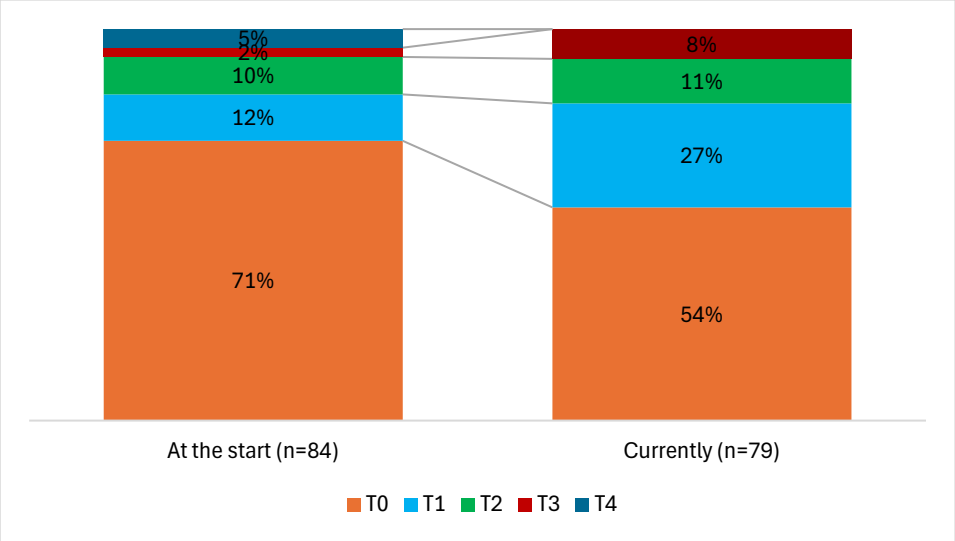


Figure 15 demonstrates where on the research translation pathway grant recipients reported their project was at the start of the grant funding and where it is currently (Figure 15). Seventy-one percent (n=60) of funded grants from rounds 1 to 3 reported they were at the basic science stage (T0). Twenty-nine percent reported their projects were either at translation to humans, patients, practice or community (T1-T4). When considering where research grants are currently, we see a reduction in T0 and an increase in T1 and T3, which may indicate some projects progressing along the research translation pathway. (Note: Survey respondents who reported their project was at T4 at the start of the project (n=4) were not asked if their research project had progressed along the pathway, given that their project was at the end of the research translation pathway already).

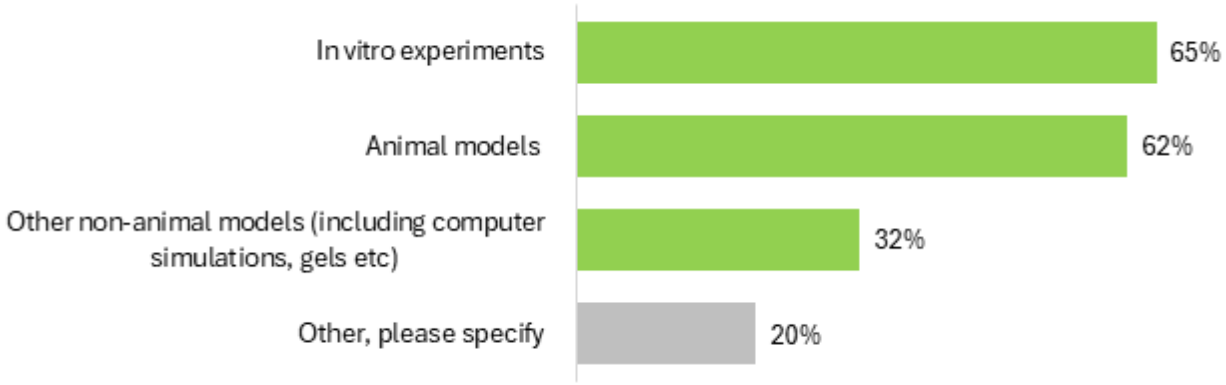
Figure 15. Position of funded projects on the research translation pathway at commencement of grant and currently (Source: Grant recipient survey)



Seventy-one percent of respondents (60 out of 86) reported progress within basic science (T0) (Figure 16). Sixty-five percent selected in vitro experiments, 62% selected animal models, 32% selected other non-animal models (including computer simulations, gels etc) and 20% selected 'other'.

- **Example of progress in vitro experiments:** A research project to develop a bioengineered vascularised cardiac patch, resulted in the progression of developed novel wound dressing materials; and correlated material morphology with tissue responses (Professor Jelena Rnjak-Kovacina, Investigator Development Grant, Round 2).
- **Example of progress in animal models:** A research project aimed at identifying new ways to treat aortic aneurysms through chemical modification of aneurysm-regulated genes, has been testing new RNA-targeting inhibitors in mouse models of aneurysm (Dr Justin Wong, Early Mid-Career Researcher Grant, Round 3).
- **Example of progress for other non-animal models:** A research project examining elucidation of clotting mechanisms that cause CVD disease and discovery of new more effective and safer drugs to prevent and treat CVD has established ex-vivo blood flow system. This has been used to study blood clot formation, NETosis, red cell and white cell role in blood clotting (Professor Beng Chong, Senior Researcher Grant, Round 2).

Figure 16. Progress within basic science or preclinical phases (n=60) (Source: Grant recipient survey; multiple choice question)

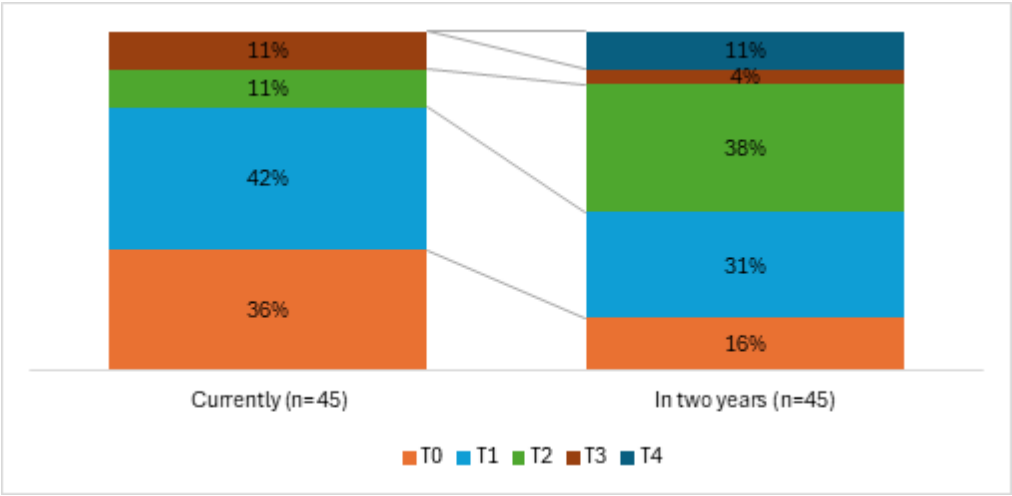


3.5.5 Over half of surveyed research projects reported that they have moved to the next phase on the translation pathway

Grant recipient survey respondents who reported they were at T0-T3 at the commencement of their project were asked if their research projects had progressed along the pathway, of which 58% said yes (46 of 80 who responded).

Respondents who indicated their research had progressed along the translation pathway, were asked to identify their current stage and where they expected their research to be in two years (Figure 17). The chart indicates a projected progression along the research translation pathway for many research projects within two years' time.

Figure 17. Location on research translation pathway currently and in two years' time (rounds 1-3) (Source: Grant recipient survey)



Of the respondents who stated their research had moved along the research translation pathway, 43% (n=20) of respondents reported that the Program grant was the main reason the research progressed, 52% (n=24) reported the Program contributed a lot and 4% (n=2) reported it contributed a little.

When asked what were the other major contributing factors that allowed their project to progress along the translation pathway, most replied that other major funding grants had contributed. The other common reason provided for translation progression was the opportunity for collaborations with other researchers such as between hospitals, local health districts and research institutes, with other researchers or clinicians, commercial partners, and international collaboration.

All respondents were asked what planned activities they were considering to further their progress along the translation pathway. Responses highlight a strong emphasis on building networks, securing resources and preparing for the next phases of translational research. For example, many projects were actively leading to the formation of new collaborations with clinicians, researchers (nationally and internationally), and industry to strengthen research translation efforts. A large number of respondents are seeking further grant funding to sustain or scale up their research and translation activities. Numerous projects are progressing toward or conducting, preclinical studies, clinical trials, or planning for first-in-human studies. Lastly, many researchers are focused on publishing results, engaging stakeholders (including policymakers and professional bodies), and advocating for implementation into practice.

Several open-ended responses highlighted the slow nature of translation from basic science and concerns about limited support for early-stage discovery, which is essential for future innovation.

3.5.6 The Elite grant scheme has a vital role in attracting highly talented cardiovascular researchers to NSW

The Elite Research Leader and Elite Postdoctoral Researcher Grants aim to establish New South Wales (NSW) as a global leader in cardiovascular research. These programs attract internationally recognised experts and exceptional early-career researchers to relocate to NSW, enhancing the state's research capability and competitiveness in securing federal funding. By supporting these top-tier researchers, there is early evidence that these grants bolster NSW's strategic advantage in cardiovascular research and innovation. The Elite grant nomination process identified and awarded seven Elite grants to highly talented cardiovascular researchers across rounds two and three. Table 10 details the seven grant recipients and their research topics.

Table 10. Round two and three successful Elite grant recipients (Source: Grant reporting)

No.	Elite grant type	Round	Host organisation/administering organisation	Science type	Research topic
1	Elite Research Leader	2	Victor Chang Cardiac Research Institute/University of New South Wales	Basic science	Understanding the role of PHACTR1 in vascular disease
2	Elite Postdoctoral	2	Western Sydney Local Health District/ University of Sydney	Clinical medicine & science	Women and heart disease
3	Elite Postdoctoral	3	University of Sydney	Basic science	3D Bioprinted Multi-Functional Wound Dressings for Diabetic Foot Ulcers

No.	Elite grant type	Round	Host organisation/administering organisation	Science type	Research topic
4	Elite Postdoctoral	3	Nepean Blue Mountains Local Health District/ University of Sydney	Basic science	Novel therapeutic application of ultrasound and microbubble to treat heart attack
5	Elite Postdoctoral	3	The George Institute for Global Health/ University of New South Wales	Clinical medicine & science	Evaluating covert cerebrovascular changes to improve thrombolysis or antithrombotic safety
6	Elite Postdoctoral	3	Western Sydney Local Health District/University of Sydney	Clinical medicine & science	Optimising Cardiovascular Care in Cancer Patients
7	Elite Postdoctoral	3	University of Sydney	Clinical medicine & science	Optimising methods of blood pressure measurement

The three Elite grant recipients interviewed for this interim evaluation described the nomination process as fairly seamless. Each noted being approached or recommended for the Elite scheme by an academic or clinician and receiving institutional or individual support throughout the nomination process.

Associate Professor Sarah Zaman, a postdoctoral elite grant holder, was based interstate and was approached early on by a well-known NSW cardiologist professor who the nominee had worked with previously. The nominee wrote the proposal, with the professor providing valuable oversight and feedback. Additionally, the nominee needed approval for a position at the NSW hospital, which involved discussions with the head of the Cardiology Department. Overall, the referring professor played a pivotal role in ensuring the application was strong and had a high chance of success, which was crucial for the nominee's career and institutional standing.

Associate Professor Sarah Zaman, an interventional cardiologist, was awarded an Elite Postdoctoral Grant in round 2. Her program of research, at the Westmead Applied Research Centre at the University of Sydney, aims to improve outcomes for women with heart disease in a socioeconomically disadvantaged area with a culturally linguistically diverse population. It particularly focuses on women with atherosclerotic heart disease and aims to improve the care for female predominant cardiac conditions including heart attacks in younger women and spontaneous coronary artery dissection (SCAD).

Before receiving the Elite Grant, A/Professor Zaman had already established a strong national reputation in women's cardiovascular research, despite being in the early stages of her career, about five years post-PhD, including maternity leave. She had published several well-regarded papers on care delays for women with SCAD and myocardial infarction, which laid the foundation for further research. Until receiving the Elite grant, she had begun moving beyond observational studies into clinical trials, launching a women's heart clinic intervention to directly address identified care gaps, positioning herself as a niche expert in this area.

After receiving the Elite Grant, A/Professor Zaman established Westmead Applied Research Centre's first ever women's heart disease/health equity program. Several of her research projects have improved knowledge in women's heart disease, including that women of lower socioeconomic status have a high incidence of severe

cardiovascular conditions during pregnancy and that these cardiovascular conditions (including pre-eclampsia, gestational diabetes) confer a three-fold higher risk for severe cardiac outcomes in the mother.

She has established the first Australian and New Zealand SCAD registry, now comparable in size to leading global registries, and is involved in planning the first international SCAD randomised controlled trial. Her research that has arisen from this grant has allowed her to supervise three PhD students and lead 20 publications. It has also garnered significant national and international media attention, and informed national guidelines such as the Australian Therapeutic Guidelines and Heart Foundation/ CSANZ Acute Coronary Syndrome guidelines.

The Elite Grant was pivotal in securing further significant funding, including a $1 million Heart Foundation grant and additional national and international grants. Her growing international profile is reflected in frequent invitations to major global conferences and membership in prestigious initiatives, such as the World Heart Federation and WHO's global acute coronary syndrome framework, where she is contributing to the universal definition of myocardial infarction. A peer reviewed publication regarding the SCAD registry due to be released soon is also expected to influence international clinical guidelines.

A/Professor Zaman believed the Elite Grant has been crucial to her career progression and to her relocation to NSW. She is enjoying the role and is pleased with what the research is achieving.

> *"The Elite Grant was instrumental to my move to the University of Sydney and Westmead Hospital. I wouldn't have moved without the grant because as a researcher moving institutions, you have to completely start again in regards to building and setting up my team, and taking on students - which is imperative for the research that I run in clinical trials and cohort studies."*

Associate Professor Khoon Lim, an Elite Postdoctoral research grant holder, had a slightly different nomination experience. A/Professor Lim was based overseas and was looking to relocate back to NSW. He found out through a previous NSW colleague about the Elite Grant scheme and it was suggested that he would be a strong candidate. He went through a two-stage application process at the University of Sydney, which included submitting an expression of interest, presenting his research plan to a panel of faculty deans, and being selected as one of the two nominees put forward by the University to the Office.

Associate Professor Khoon Lim, a biomedical engineer with specialisation in polymer chemistry, was awarded an Elite Postdoctoral Grant in round 3. A/Professor Lim has a strong background in biomaterials and platform technologies for tissue regeneration, including hydrogels used in applications like liver regeneration, skin engineering, and 3D-printed blood vessels. His elite funded research, based at the School of Medical Sciences in the University of Sydney, focuses on 3D bio-printed multi-functional wound dressings for diabetic foot ulcers. His research is developing new strategies to restore blood supply to the wound area while preventing infection using biomaterials and bioprinting technologies. His previous work has resulted in significant intellectual property, some of which has been licensed to industry, and he's now seeing promising opportunities in wound healing within the cardiovascular space.

After receiving the Elite Grant, A/Professor Lim was able to strategically channel his multidisciplinary expertise, spanning materials science, cell biology, and chemistry, into cardiovascular research. Over the past two years, there have been significant research achievements, including successful publications, grants, and recruitment of PhD students and postdocs. A key highlight has been obtaining a prestigious Australian Research Council Future Fellowship and Discovery Project, which enabled further research. Two other major accomplishments during A/Professor Lim's elite grant-funded research are the launch of a new 3D bioprinting-focused research centre

called the Biomanufacturing Incubator which aims to bridge the gap between bioengineers, medical scientists and industry partners, to develop prototypes for preclinical testing.

A/Professor Lim recently completed his term as President of the Australasian Society for Biomaterials and Tissue Engineering, a role reflecting his research excellence and leadership. He currently serves on the Board of Directors for the International Society for Biofabrication, contributing to strategic planning and 3D bioprinting standards. He was also appointed to a WHO panel to explore the global impact of 3D bioprinting, particularly in low- and middle-income countries, resulting in a published steering guide. Additionally, he joined Standards Australia under the International Organization for Standardization committee, focusing on surgical and personalised implants.

A/Professor Lim reported that his funded research contributed to these leadership opportunities, fund leveraging and achievements,

"I think one of the important things about the Elite Grant is enabling me to leverage additional support from the university to get started with my research. I got a lot of infrastructure support at the same time as the Elite Grant which without that, I won't have all of the required instruments for my research…[also] without this grant, I probably won't have a job and without having a job, I probably can't do all of this different leadership positions too".

Professor Jason Kovacic, an Elite Research Leader Grant holder, shared his experience of being approached by the Victor Chang Cardiac Research Institute, which meant he moved from his role in a well-funded, successful lab in the United States. Initially hesitant due to the more challenging funding landscape in Australia, he was encouraged to apply for NSW Health's Elite Research Leader Grant. This funding, which included significant financial support and matched dollar for dollar funding from the Institute, was a key factor in his decision to move. After being successful in the application, he returned to Australia and was able to rapidly build a team of six, something that he felt would not have been possible without the grant. As he explained, "Without that, I would have had a start-up package to bring one or two people... but this funding enabled me to rapidly build a team of five or six and hit the ground running." He also became the new Director and CEO of the Institute.

Professor Jason Kovacic, Director and CEO of the Victor Chang Cardiac Research Institute, Chair and Professor of Medicine at University of NSW, was awarded the Elite Research Leader Grant in Round two in 2020. Professor Kovacic is internationally recognized as a leading authority on PHACTR1, a gene increasingly implicated in a range of vascular diseases, including fibromuscular dysplasia (FMD), spontaneous coronary artery dissection (SCAD), and coronary artery disease (CAD). Despite its critical importance, the complexity of PHACTR1 has posed significant challenges to previous research efforts. In response, Professor Kovacic is spearheading a comprehensive and systematic research program aimed at uncovering the gene's causative mechanisms. He is committed to establishing a world-class research initiative within NSW to advance understanding and ultimately improve outcomes for patients affected by these conditions.

Professor Kovacic reflected on the success of the PHACTR1 project, which overcame delays due to COVID-19 and has produced several key research papers, including one that is now being revised for resubmission at one of the Nature family of journals. Professor Kovacic has been able to leverage additional funding from sources including Snow Medical, philanthropic foundations, and prestigious awards such as the Agilent Thought Leader

Award (which alone amounted to $1million in funding). These new funding streams have helped sustain and expand the research program significantly.

As the Director of the Victor Chang Cardiac Research Institute, Professor Kovacic highlights the remarkable growth of the institute since 2020, expanding from a single location in Darlinghurst to national hubs in Melbourne, Western Australia, and Southwest Sydney. This growth underscores the leadership role New South Wales has taken in cardiovascular research in Australia, surpassing other fields like cancer and immunology. Professor Kovacic also emphasized his collaboration in national initiatives like ASHRA (Australian Stroke and Heart Research Accelerator), which brings together top NSW and Victorian institutions and researchers, further demonstrating the strength and impact of NSW's growing influence on Australia's cardiovascular research ecosystem. Professor Kovacic is also the President of the Australian Cardiovascular Alliance, on the board of the Association of Australian Medical Research Institutes (AAMRI) and co-chair of AAMRI NSW.

Professor Kovacic's leadership and work has brought significant value particularly in creating international connections. Despite relocating, he continues to hold a Professorship at the Mount Sinai School of Medicine, leads a small research team in New York, and continues to serve on several American Heart Association committees. These ongoing ties have greatly benefited the Victor Chang Cardiac Research Institute and the broader NSW cardiovascular research community in that his dual academic presence has facilitated international collaborations, including postdoctoral and fellowship exchanges. One notable example is a fellowship program established between St Vincent's Hospital and Mount Sinai, with a fellow currently participating in the exchange.

Professor Kovacic noted the success of the Elite Research Leader Grant in attracting him back to NSW,

"It's important to say that I probably wouldn't have ever left the USA if it wasn't for this award, because I was well funded by the US National Institutes of Health. In the USA I had multiple grants, multiple projects, and a team of 12 people. I was not going to walk away from all of that to move to NSW with no funding – that would be a silly thing to do. So getting this award was the thing that got me out of New York. And I wouldn't have come back without it."

Overview and interpretation

Funded projects are generating valuable data for ongoing cardiovascular research and fostering mentorship and skill development for early mid-career researchers. These efforts contribute to growing CVD research capacity in NSW. Over half of funded projects are advancing along the translation pathway; the majority reported that the Program was either the main reason their project progressed or that it contributed a lot. Seventy-one percent of basic science research projects were reported to have important progress within the first stage of the research translation pathway, for in-vitro experiments, animal studies and other non-animal studies. The Elite grant scheme plays a vital role in attracting top cardiovascular researchers to NSW, and leading innovative and high-calibre research which in turn is already having strong impact on policy and practice change, and health benefits for patients.

Recommendation

- Incorporate the grant recipient survey questions regarding research translation, to better monitor and record progress of research projects along the pathway, whilst still acknowledging the time and investment needed in basic science.

3.6 Early evidence of outcomes – Policy and practice

3.6.1 Funded projects identify achievements towards policy and clinical practice change

Eighteen percent (n=15) of survey respondents reported that their research project had practical achievements towards policy and clinical practice changes (Figure 18).

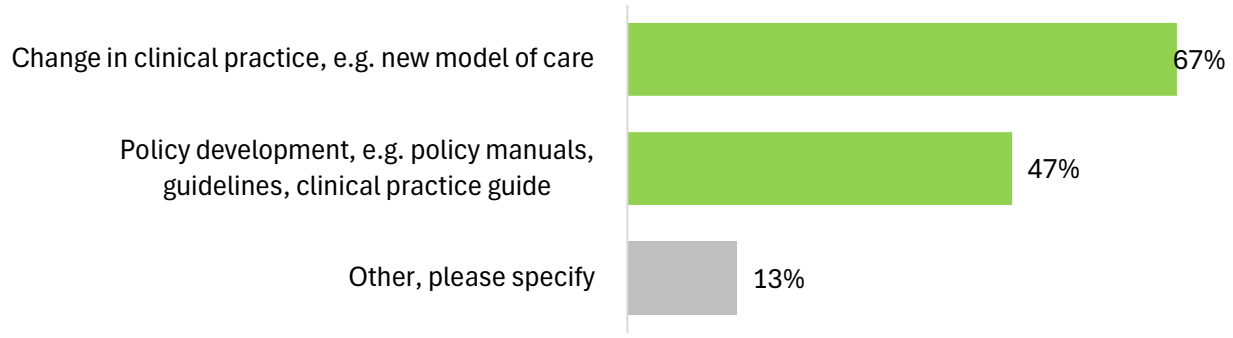
Of the 15 survey respondents, ten reported their research project had practical achievements towards a change in clinical practice. Selected examples include the following:

- Many patients now receive a cardiac magnetic resonance study as a safe, non-invasive alternative, offered at St Vincent's Hospital, Sydney. Previously endomyocardial biopsy was the only established way of diagnosing cardiac allograft rejection (Associate Professor Andrew Jabbour, Early Mid-Career Researcher Grant, Round 3).
- Implementation of new genetic counsellors guidelines for incorporation of functional genomics assays into gene variant interpretation (Professor Jamie Vandenberg, Senior Scientist Grant, Round 1)

Seven reported achievements towards policy development. Selected examples include:

- Atrial Fibrillation screening for Indigenous Australians has led to proposed changes to national guidelines.(Professor Ben Freedman, Senior Researcher Grant, Round 3)
- Findings from a funded research study led to a regulatory submission to the United States government Food and Drug Administration (FDA) advocating for CT angiography as a valid surrogate endpoint in CAD drug trials. This resulted in a new international consortium and continued FDA engagement. (Professor Gemma Figtree, Clinician Scientist Grant, Round 1)

Figure 18. Achievements towards policy and clinical practice (n=15) (Source: Grant recipient survey; multiple choice question)



CASE STUDY – IMPLEMENTING NOVEL APPROACHES TO TRANSFORM BLOOD PRESSURE CONTROL

Dr Aletta Schutte was awarded a Collaborative Grant in round 3 for a public health / clinical medicine & science research study. The research is being undertaken by a multidisciplinary research team embedded within the National Hypertension Taskforce, a collaborative cross-sector group working to reduce the burden of high blood pressure in Australia. The research includes a Shop-to-Stop Hypertension clinical trial which placed screening kiosks at 30 Bunnings stores for customers to test their blood pressure and their knowledge on hypertension and treatment. Participants are then randomly selected to receive a follow-up text reminder to visit their GP for management. The research also includes optimising hypertension monitoring and adherence using digital health tools via a new clinical trial and a systematic review to explore the use of artificial intelligence and machine learning in care for hypertension.

Policy and clinical practice outcomes

- Over 40,000 people have been screened for hypertension through this study.
- Research findings are informing the new Hypertension Guidelines for Australia that are currently being developed by Hypertension Australia and the Heart Foundation.
- The World Health Organisation (WHO) has released a statement on low sodium salt substitutes based on this research. The recommendation has been made that drug labels allow for single pill combination therapy as first-line treatment.

CASE STUDY - CODE STORM: STANDARD CARE OR A RAPID EARLY INVASIVE MANAGEMENT APPROACH TO PATIENTS WITH LIFE-THREATENING HEART RHYTHM DISORDERS

A/Prof Saurabh Kumar was awarded an Early Mid-Career Researcher Grant in round 2 for a clinical medicine and science research study. The research showed that initial catheter ablation is more effective than medical therapy for managing ventricular tachycardia (VT) storm, leading to fewer hospitalisations, arrhythmias, recurrences, deaths, and heart transplants. The procedure had fewer complications and no procedure-related deaths. Prior to this study, the effectiveness of initial catheter ablation compared to medical therapy was unknown, despite advances in ablation technology.

Clinical practice outcomes

The research has contributed to establishing initial catheter ablation as best practice for the management of VT storm. Western Sydney Local Health District has been established as a 24/7 referral centre for VT storm, with improved referral pathways to improve access for patients from other local health districts.

Overview and interpretation

Early evidence shows that the Program is contributing to policy and clinical practice change, with 18% of projects reporting practical achievements. Examples include the adoption of initial catheter ablation as best practice for the management of VT storm, new genetic counselling guidelines, and

contributions to national and international policy. While still emerging, these outcomes highlight the Program's potential for real-world impact.

3.7 Early evidence of outcomes – Health and community impact

3.7.1 Funded projects identify achievements towards improvements in patient care and health outcomes.

Twenty-three percent (n=19) of survey respondents reported their projects were already resulting in practical achievements towards improvements in patient care or health outcomes (Figure 19). Ten projects were reported to have achievements and results that would lead to improvements in CVD patient care. Examples included more accurate genetic diagnosis to facilitate family screening to identify other patients at risk, identification of CVD patients who benefit from anti-inflammatory treatment, and patients being more likely to be offered a genetic test to help detect any genetic cause of their CHD.

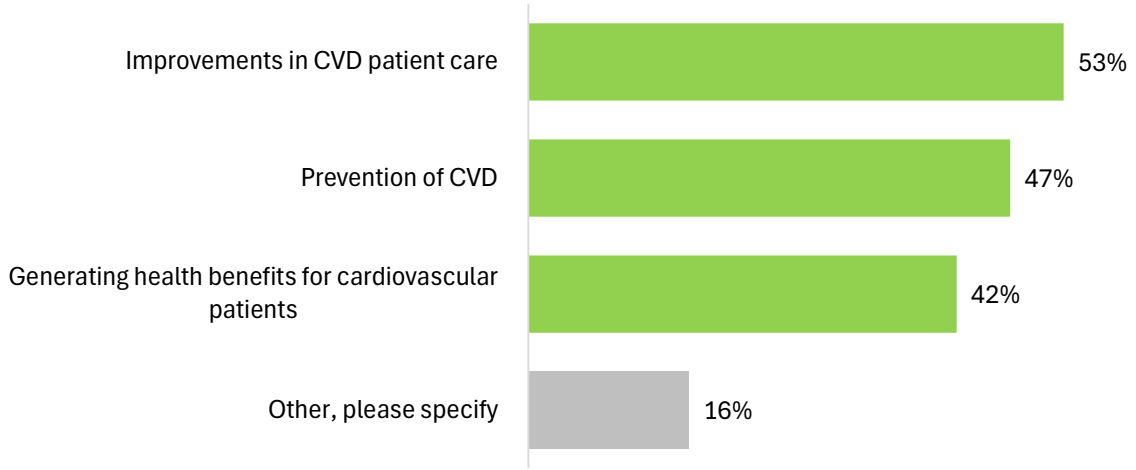
Nine projects were reported to have achievements which will assist prevention of CVD. Selected examples include:

- In a research project examining pathophysiology of a life-threatening coronary artery disease of women, the team are examining tight blood pressure control and beta-blockade to prevent SCAD recurrences (Professor Robert Graham, Clinician Scientist Grant, Round 1).
- A research project examining the prevention of obesity in adolescents using a co-designed and interactive text message program has resulted in the development of a universal program for adolescent CVD prevention - “Health4Me” (Dr Stephanie Partridge, Early Mid-Career Researcher Grant, Round 2).

Eight reported health benefits for cardiovascular patients. Selected examples include:

- If the identified genetic cause of CHD also predisposes patients to other cardiac or non-cardiac diseases, then they can be monitored for these (Case study - Professor Sally Dunwoodie, Senior Scientist Grant, Round 1)
- Better management and prevention of ischemic brain injury which can lead to dementia (Professor Ben Freedman, Senior Researcher Grant, Round 3).

Figure 19. Funded projects with practical achievements towards improvements in patient care or health outcomes (n=19). (Source: Grant recipient survey; multiple choice question)



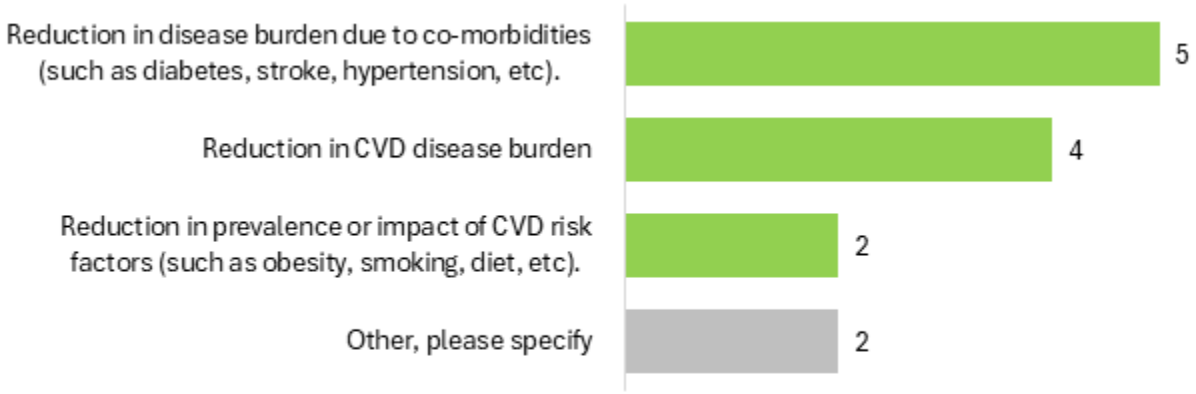
3.7.2 Funded research projects are making early steps towards helping to reduce the cardiovascular disease burden

Eight percent (n=7) of survey respondents reported practical achievements towards a reduction in CVD disease burden. Five respondents reported their research project had achievements towards a reduction in disease burden due to co-morbidities (Figure 20).

The following is an example of a research project working towards a reduction in disease burden due to co-morbidities:

- The aim of a randomised controlled trial is to test the hypothesis that a lower carbohydrate Mediterranean diet will improve the risk factors for the metabolic syndrome when compared to a traditional Mediterranean or lower carbohydrate diets. The findings hope to see a reduction in medication use for diabetes and lipids (Dr Monique Francois, Early Mid-Career Researcher Grant, Round 2).

Figure 20. Funded projects with practical achievements towards reduction in CVD disease burden (n=7). (Source: Grant recipient survey; multiple choice question)

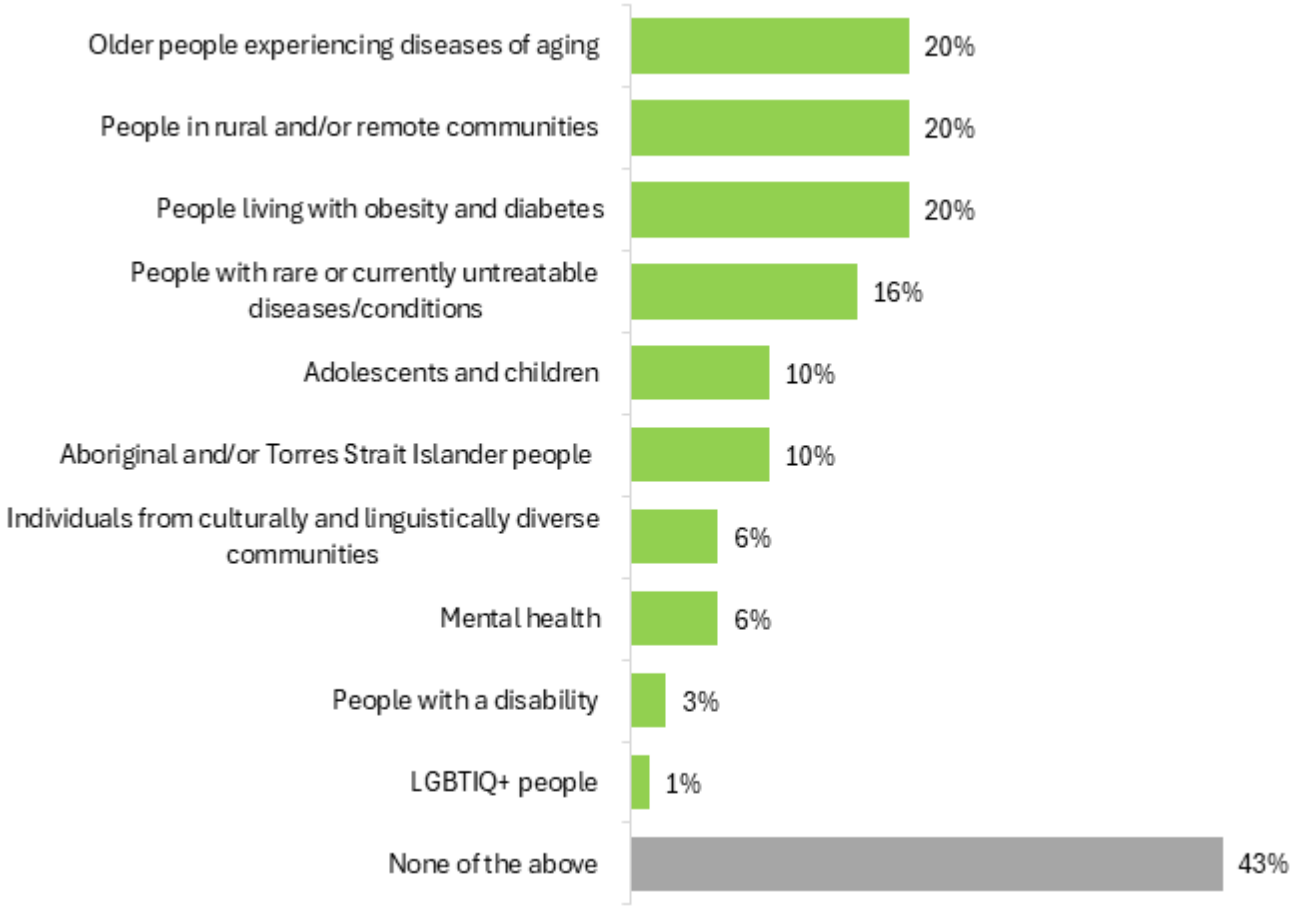


3.7.3 One-fifth of funded projects target ageing, rural, and obesity and diabetes populations

Grant recipients were asked in the survey whether their funded research project targeted priority populations compared to the general population (Figure 21). Funded projects most commonly target older adults with aging-related diseases, rural or remote populations, and those with obesity or diabetes (each 20%). Less frequently targeted groups include children, Aboriginal and Torres Strait Islander peoples, and those with rare diseases (10% each), with lower representation for culturally diverse communities, mental health, disability, and LGBTQI+ populations.

Just under half of funded projects reported that their research study did not target a priority population. When filtered by type of science, most (67%, 22 out of 33 respondents) were basic science research projects which is appropriate considering that basic science research is not population specific by nature.

Figure 21. Did individual funded projects target priority populations compared to the general population (n=79) (Source: Grant recipient survey. Multiple choice question)



Examples of how funded projects have targeted a priority population are:

- **Rural and remote communities:** Actively recruited participants from rural and remote areas by collaborating with outreach clinics and offering support for travel and interpretation. This approach resulted in strong engagement from these communities. By informing policy change, the research aims to improve access to specialised care for rural patients with congenital heart disease (Professor David Celermajer, Senior Researcher Grant, Round 2).
- **Elderly patients:** The research aims to treat cardiomyopathies which primarily impacts elderly patients and often lead to poor and currently unmodifiable outcomes. Improved therapeutics could change the course of this disease for these patients (Dr Daniel Hesselson, Collaborative Grant, Round 3).

Overview and interpretation

Funded projects are showing early progress toward improving patient care and reducing the burden of cardiovascular disease. A fifth of projects focus on priority populations such as older adults, rural communities, and those with obesity or diabetes, indicating a commitment to addressing key public

health challenges. Funded research projects are making early steps towards helping to reduce the cardiovascular disease burden, with seven survey respondents reporting practical achievements towards a reduction in CVD disease burden. Research findings are also yielding improvements in patient care and health outcomes, with 23% of survey respondents providing evidence and examples for their projects creating these benefits. There are promising signs for commercialisation of research outputs, with nineteen grant recipient survey respondents reporting their funded research resulted in practical achievements towards new health technology, therapeutics, or commercialisation.

Recommendation

- Research prioritisation processes which lead to more targeted CVD research topics could help more non-basic science research to focus on priority populations.

3.8 Early assessment of economic benefits

3.8.1 The cost of delivering the Program is 4% of the program costs which is on the lower end of the government grant management benchmarks

The total cost of delivering the Program over 2018-19 to 2022-23 was $74.4 million at mid-point from the $150 million program budget over 2018-2028. This figure is inclusive of grant funding, wage and administrative costs.

The proportional cost of wages and other administrative costs for the CVD Program over 2018-19 to 2022-23 was calculated as being 4.1% of the Program budget, which is on the lower end of the benchmark range. Program administration costs for government grant management in Australia are reported as typically being between 3% and 10% of a program's budget.[11]

Table 11. Program Costs ($000's) - Historical (undiscounted)

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Grant funding	14,173	26,410	-	17,147	13,674	**71,405**
Wage costs*	238.2	238.5	266.8	357.2	363.6	**1,464**
Admin costs**	300	314.1	314.1	314.1	314.1	**1,556**
Total Costs	14,712	26,963	516.8	17,754.5	13,188.1	**74,426.1**
Admin and wages as % of total costs						**4.1%**

*wage costs are based on staff FTE count provided by the Office. 2024 NSW Health award salary rates have been used to estimate staff costs, which have been indexed back using ABS wage CPI to estimate previous year costs.

**admin costs refers to combined annual CVRN funding and external reviewer costs. External reviewer costs were unreported for after 2019-20, though are assumed to continue annually at $64,100 per year.

An online search was undertaken to check if the 3-10% range for grant administration and overhead costs is reasonable. The search used Google, with two sets of terms:

- grant program administration costs
- grant program overhead costs.

The search found 249 results for the first term and 329 for the second. After reviewing titles and summaries, three useful findings emerged:

- Myers and Newcomer found 7-10% of grant funding goes to administration in the US, with some variation.[12]
- Stony Brook Research and Innovation suggests 15% of total costs should cover facilities and administrative costs.[13]
- Marcus Coetzee notes a 10% rate but suggests this is too low for grants or philanthropy.[14]

The limited available information on the percentage of grant program costs spent on administration and overheads indicates that around 10% may be a reasonable benchmark.

3.8.2 There is early evidence to indicate a potential net social benefit for NSW

A preliminary cost benefit analysis has been conducted to provide an indication of whether the Program has resulted in a net social benefit. The initial business case for the Program had estimated a conservative return on investment from a $250 million investment to be $270.9 million (or 108%).[5] This approach used alternative assumptions, timeframes and methods for the costs and benefits quantified.

To calculate the net social benefit for NSW over the analysis period 2018-19 to 2022-23, it is necessary to estimate both the total costs and the total benefits of the Program over this period. If the total benefits exceed the total costs, a net social benefit can be stated. This preliminary economic assessment quantifies a range of economic benefits and presents evidence for these benefits.

Cardiovascular disease is a major driver of healthcare costs, including hospitalisation, medication, and long-term care.[4] Program application guidelines indicate likely benefits from the Program to include patents and commercialisation, value of leveraged research funding, reductions in cost of delivering care and the creation and retention of research jobs. The guidelines discuss qualitative impacts which include savings to the Government from avoided costs and health benefits to patients. Whilst these are not quantified, attempts to quantify these would result in a higher stated net social benefit for NSW. Currently, the quantified benefits in this economic evaluation are limited to:

- Attracting increased research investment into NSW
- Value of research
- Employment benefits.

Program funding supports increased research investment into NSW.

The Program has attracted additional funding of $303 million from other funding sources across the 2018-19 to 2022-23 period assessed (Table 12). Applicants were asked in their progress report to advise how much (0-100%) the Program was responsible in gaining any additional funding. The average

proportion across all responses was 59%[1]. For each funded project, the advised proportion was applied to the additional funding amount to derive the 'attributable to Program' value. On this basis, the Program was directly responsible for an additional $158.8 million in funding.

ACI has reviewed the funding sources and attributed each entity as being either NSW based, non-NSW based or Australia based. The latter has been treated as 68% external non-NSW funding based on the NSW population[2]. Only non-NSW based funding is considered as a benefit within CBA analysis, as internal NSW based funding is considered only to be a transfer, and therefore not a benefit to the NSW referent group. On this basis, the Program is directly responsible for attracting external (non-NSW) funding of $92.7 million.

Table 12. Funding ($000's) leveraged from the Program (undiscounted)

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Funding leveraged - Total	89,362	146,332	0	58,345	8,962	303,001
Funding leveraged - attributable to CVD Program	50,302	78,062	0	25,078	5,414	158,856
Funding leveraged attributable to CVD Program and not NSW based	27,028	47,062	0	14,956	3,681	92,727

Considering that total Program funding was $70.3 million over the same period, the Program is responsible for attracting $1.33 of additional funds per every dollar provided.

Value of research - Publications generated by CVD grant funding

Peer reviewed publications generated over time due to the Program grant funding were monetised into a benefits stream. Valuation of publications were derived from a study conducted by Rousseau and colleagues.[15] Rousseau provided an overview of different methods to value scientific publications; for the present analysis the most conservative method (i.e., the method with the lowest monetary value per publication) was used. The market-based approach used existing prices of publication to value such output – which amounted to an average value per publication of €2,250 (2021 value, converted to Australian dollars and inflated to a 2024 value of $4,100 AUD).

This cost was explained by Rousseau as the average price to publish an article as open access (where the authors pay money to a journal for publication, so that access fees are not charged to the readership). Note that this approach assumes that the scientific publishing market is a perfectly competitive market. This approach excludes externalities and also excludes research and altruistic flow-on effects from scientific publications. The benefits stream resulting from publications is displayed in the table below. The approach taken also assumes that a pre-print article has the same value as a peer-reviewed article. As shown in Table 13, the value of publications over the evaluation period is $2.0 million.

[1] Some respondents did not indicate a proportion. To estimate a total amount leveraged, the average rate (59%) has been attributed to non-respondents.

[2] This assumption is based on NSW taking up 32% of Australia's population

Table 13. Benefits stream of publications (undiscounted)

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Publications	1	45	88	140	211	485
Value of publications ($000, 2024 values)	$4.1	$186.4	$364.5	$579.8	$873.9	$2,008.6

Employment benefits – Increased jobs and wages associated with Program

The Program has supported the creation of research jobs, including for research assistants, postdoctoral fellows, and other research personnel. The number of jobs created is detailed in Table 14 below. The cumulative number of FTE positions created over 2018-19 to 2022-23 was 277.9.

The Office grants team have surveyed grant recipients regarding job creation and wages resulting from the Program. Indicatively, the Program has been responsible for paying $14.9 million in wages employing 93.9 FTE's. This would indicate an average wage of $158,600 per year. To calculate the economic benefit from the wage uplift:

1. **Job Creation**: 93.9 new jobs are created, resulting in total wages of $14.9 million for the workers.
2. **Counterfactual Wages**: The counterfactual wages represent what the workers would have earned otherwise, which is $12.4 million. This is based on the reservation wage, which is the minimum wage the workers would accept for employment.
3. **Additional Wage Calculation**: To determine the economic benefit, focus is placed on the additional wage, which is the difference between the total wages from the new jobs and the counterfactual wages.

   Additional Wage = Total Wages − Counterfactual Wages

   Additional Wage = $14.9 million − $12.6 million = $2.3 million
4. **Cost-Benefit Analysis (CBA)**: In the CBA, only the additional wage of $2.3 million is included as the economic benefit. This represents the net gain in wages due to the creation of the new jobs, after accounting for what the workers would have earned otherwise

By focusing on the additional wage, the CBA captures the true economic benefit of the job creation, reflecting the net increase in income for the workers.

The Program is associated with the following profile of FTEs generated over the life of the project (based on annual reporting). It is assumed that the jobs created in each year are permanent, i.e., a job created in Year 1 remains in place for the analysis period of the cost-benefit projection (hence the cumulative profile of FTEs).

Table 14. Direct jobs and wage uplift created from the Program (undiscounted)

FTE positions	2018-19	2019-20	2020-21	2021-22	2022-23
Direct jobs (per grant report responses)	76.5	110.7	67.2	22.3	1.2
Cumulative	76.5	187.2	254.4	276.7	277.9
Wage uplift ($000)	$1,247	$3,051	$4,146	$4,509	$4,529

N.B. the approach above disregards the reservation wage (or the minimum monetary amount that a member of the labour force would be willing to accept for a new role) and any potential differences in willingness-to-accept a job offer that may exist between unemployed and employed people in the medical research sector, as a simplification (but limitation). Alternatively, this approach assumes full employment in the medical research sector.

The value of the employment (over the Business as Usual / counterfactual) was calculated based on the assumption that an 11% wages uplift plus $2,000 per worker would be required to attract workers from their existing medical researcher roles. Wages uplift is designed to measure the challenges in recruitment that may be faced for workers who may be reluctant to change jobs.[3] The wages uplift factor of $2000 per worker and 11% of the previous wage per worker was derived from 'Principles and Standard Parameters for Cost-Benefit Analysis of Investment Attraction Proposals.'[4]

The medical researcher salary was input as $130,000 per annum.[5] Therefore, each job created by the Program was associated with $16,300 in benefits per annum (or 11% of $130,000 plus $2,000). The profile of monetary benefits associated with the Program (employment / wage uplift related) is shown in the table below. The total value of the employment 'uplift' over the ten-year time horizon of the cost-benefit analysis is $40.1 million (undiscounted).

Summary

This provides the quantified measures and indicates that over the analysis period and discounted at 5%, the Program has a benefit-cost ratio (BCR) of 1.54 and a net present value (NPV) of $36.8 million, indicating a net benefit to the State of NSW over the period 2018-19 to 2022-23. This report serves as an interim evaluation, so the results should be treated only as indicative, and not final.

The benefit/cost ratio (BCR) is a measure of the quantum of the proposal's benefits relative to its costs in present value terms. A BCR of 1 indicates that the proposal's costs and benefits are equal in present value terms. The net present value (NPV) is the central measure of the proposal's total benefits less total costs in present value terms. An NPV of 0 indicates that the proposal's costs and benefits are equal in present value terms.

[3] For example, to overcome administrative burden and/or the uncertainty associated with a worker accepting a new role (e.g., probationary period).

[4] NSW Treasury and the Department of Trade, Investment, Regional Infrastructure and Services to support practitioners in undertaking analyses under the framework and consistent with the NSW Government Guide to Cost-Benefit Analysis (TPP17-03) https://www.treasury.nsw.gov.au/sites/default/files/2025-02/202501_Investment-Attraction-CBA-Framework.pdf..

[5] Available from URL: https://www.salaryexpert.com/salary/job/medical-research-scientist/australia. Accessed on 24th February 2025.

Table 15. Cost benefit analysis (discounted at 5%)

	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Non-NSW funding attraction	27,028.2	44,821.1	0.0	12,919.4	3,028.6	87,797.3
Value of research	4.1	177.5	330.6	500.9	718.9	1,732.0
Wage uplift from additional FTE's	1,246.8	2,905.3	3,760.5	3,895.4	3,726.0	15,533.9
Total Benefits	28,279.2	47,903.9	4,091.0	17,315.6	7,473.5	105,063.2
Total Costs***	14,760.6	25,711.9	555.7	15,417.5	11,820	68,266.2
NPV						36,797.0
BCR						1.54

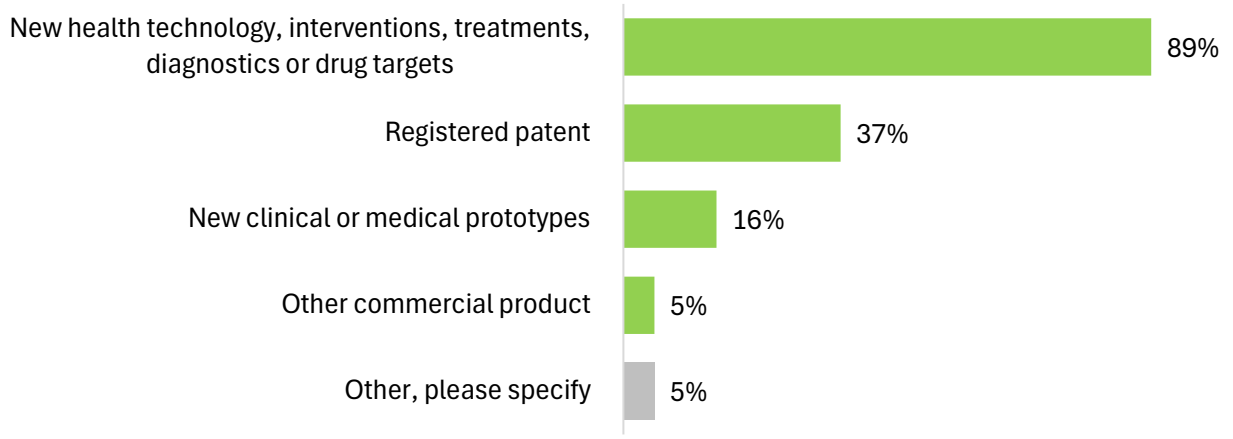
****Costs as provided in Table 11. These are discounted at 5% above.*

3.8.3 Funded projects led or have the potential to lead to monetisable commercialisation of research outputs

Nineteen grant recipient survey respondents reported their funded research had practical achievements towards new health technology, therapeutics, or commercialisation (Figure 22). Seventeen projects are reported to have achievements towards new health technology, interventions, treatments, diagnostics or drug targets. Selected examples include:

- A research project has led to the development of a cloud-based software for safety pharmacology for predicting proarrhythmic risk. This software is being marketed to the pharmaceutical industry for incorporation into their drug development pipelines (Dr Adam Hill, Senior Scientist Grant, Round 1).
- A research study which aims to build a new device intervention for peripheral arterial disease with improved long-term effectiveness and safety has led to the creation of an injectable nanomedicine formulation (Dr Richard Tan, Early Mid-Career Researcher Grant, Round 3).

Figure 22. Funded projects with practical achievements towards new health technology, therapeutics, or commercialisation (n=19). (Source: Grant recipient survey; multiple choice question)



In the survey, seven projects were reported to have demonstrated achievements towards a registered patent. Selected examples include:

- Development of novel drugs (HRU2&4) were effective in inhibiting immune thrombosis. Patent applications for these drugs have reached national/final stage in Australia, USA and China after successful PCT application (Professor Beng Chong, Senior Researcher Grant, Round 2).
- A study which demonstrates promising evidence of Olaparib as a potential cardioprotective agent against Doxorubicin-induced cardiotoxicity, which now can be tested in humans, has a registered patent for some of their findings (Professor Aaron Sverdlov, Early Mid-Career Researcher Grant, Round 2).

In reviewing the grant report data, many of the projects showed promise for future commercialisation though are still in pre-clinical or early clinical stages. Selected examples with strong commercialisation potential include:

- Improved tools for diastolic dysfunction: This project has spun off a startup company, Advanced ECG Systems Pty Ltd, to commercialise its advanced ECG analysis software. The software has regulatory approval and clinical reimbursement in New Zealand, suggesting a tangible commercial product (Professor Martin Ugander, Senior Scientist Grant, Round 2).
- Text message support program: This project secured $3 million in MRFF funding for a multi-site implementation and evaluation of its HeartHealth DHI program. This suggests strong potential for wider adoption and potential commercialisation of the program as a service or licensed product (Professor Clara Chow, Clinician Scientist Grant, Round 1).
- Mu microwave catheter system: This project has six patents in the national phase for its microwave catheter technology for renal denervation. The team are actively seeking further funding for clinical trials and commercialisation, indicating a clear path towards a commercial medical device (Dr Pierre Qian, Early Mid-Career Researcher Grant, Round 2).

3.8.4 Available data suggests potential future savings to the NSW Health system

Some projects funded by the CVD Program have the potential to contribute to cost savings by reducing unwarranted care, improving treatment efficacy, and enabling earlier intervention and prevention. While

further economic analysis would be needed to quantify these savings, the available data suggests a strong likelihood of positive economic impact.

Eight grant recipient survey respondents reported their projects had practical achievements towards reducing unwarranted care for CVD patients. Examples included one research project that led to improved family screening which has allowed for gene-negative patients to be released from routine screening programs (as they can be confident they do not have the disease), and another research project has led to many patients receiving a CMR study to diagnose cardiac allograft rejection as a safe non-invasive alternative to endomyocardial biopsy.

Three survey respondents reported practical achievements towards CVD related wasteful practices however no details were provided.

Other selected examples of funded projects showing potential for cost savings sourced from the grant report data include:

- Investigating novel therapies for heart failure with preserved ejection fraction: This project demonstrated the safety and efficacy of SGLT2 inhibitors in various patient populations, potentially leading to wider appropriate use of these medications. This could reduce the need for more expensive or less effective treatments and prevent costly complications (Associate Professor Clare Arnott, Early Mid-Career Researcher Grant, Round 2).
- Analysis of data from the 45 and Up Study and linked administrative health data: This project developed CVD risk prediction models using self-reported questionnaire data. This approach could potentially reduce the need for expensive blood tests and imaging studies, leading to cost savings in population-wide screening (Dr Kwok Leung Ong, Investigator Development Grant, Round 2).

3.8.5 There is a positive economic case for considering further funding in this space

<u>The Program is filling an important funding gap</u>

Many stakeholders interviewed were involved in the original business case presented to the then NSW Minister for Health for the creation of the Program in 2018. They recalled that before the Program was created, NSW historically was not doing well in funding CVD basic science research and was lagging behind other states in being awarded national funding for CVD research. Due to the lack of funding and support available in NSW, the state was at great risk of continuing to lose research talent to other states and internationally. All stakeholders felt the creation of the Program was successfully meeting this important funding gap and attracting and retaining CVD research talent to NSW.

> *"And that's become even more dramatic because NHMRC is funding less and less biomedical discovery and cardiovascular disease. The Heart Foundation has virtually left it to a large degree, MRFF doesn't really cover it. So without that, I think we would have had a flailing sector, which [due to the Program] is now vibrant and well connected to the clinical sector and clinical research. That's been my observation as a result of the investment." (Stakeholder)*

<u>The Program has substantially improved the CVD research environment</u>

Grant recipients were asked in the survey to identify any major changes they have observed in the CVD research environment in NSW since the Program started in 2018. Respondents were unanimous in

reporting that the CVD research environment in NSW has certainly improved. They described how the Program had helped many researchers progress their careers, improve collaborations and leverage further, larger grants. Funded researchers were more competitive at the national and international level. It was felt by many that the Program was making a substantial difference for basic science in particular and had become vitally important given that many felt that major federal funding was no longer prioritising this work.

> *"It is a positive change and we would like to see it continue and grow, especially given that unfortunately, the burden of heart disease continues to grow and funding opportunities nationally become less and less." (Grant recipient)*

> *"Yes, I do feel more positive about the future of CVD research since the Program started. Without the continuation and expansion of this Program, CVD research will decline, and NSW will not be the envy of other states in Australia as one that supports CVD research and as the state that is having a big impact of basic and clinical CVD research." (Grant recipient)*

The Program is lifting the profile of NSW for CVD research

All stakeholders interviewed expressed that the Program is well known and accepted amongst cardiovascular researchers in NSW. The majority felt that the Program is becoming well known across Australia as well.

> *"There's awareness in the cardiovascular community, definitely in NSW and I think very much more so across Australia. I think increasingly that it's being put up as a program that people like to copy, which is always a good thing. That copy is a compliment." (Stakeholder)*

All stakeholders felt the Program has created awareness across NSW by encouraging collaboration between researchers and disciplines. This collaboration has also spread interstate and some reported it is establishing NSW as the premier state for CVD research in Australia.

> *"NSW is the premier state for cardiovascular research in the country now, which it clearly wasn't at the outset of all this, and I think the other states are now looking at us and thinking hard about this. We've really taken a jump now and it's across the quality of research, the scale and the interconnectedness of research. So it's incredibly important that we don't give up this real edge that we've got now." (Stakeholder)*

Despite some stakeholders reporting that it was largely an unknown program internationally, there was agreement amongst many that there was growing awareness internationally of the Program through attracting research talent back to the country, the quality research being conducted, and collaborations.

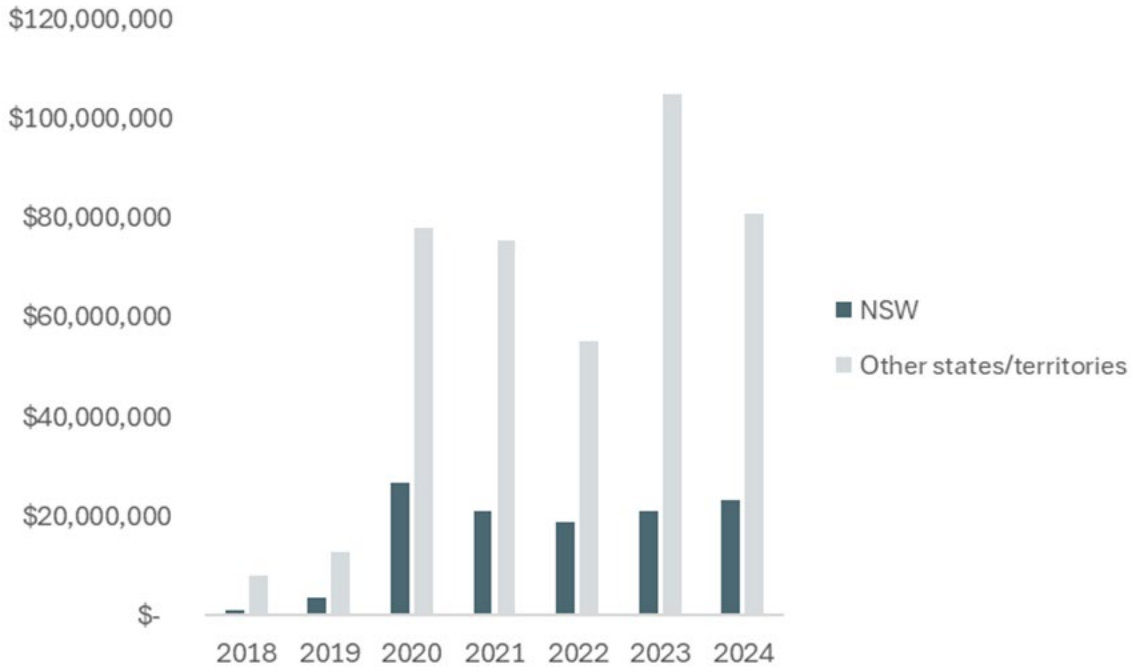
> *"And it also enabled NSW to lead on some collaborative pieces, nationally and internationally, because it already had kind of the startup support from NSW through a grant and that impetus to start that collaboration" (Stakeholder)*

There is a preliminary indication that the value of NSW CVD related research from national funding has increased since the introduction of the Program in 2018

As a proxy indicator of the Program's success, the value of NSW CVD related research funded via MRFF and NHMRC grants was observed over time. Figure 23 shows the value of NSW funding via

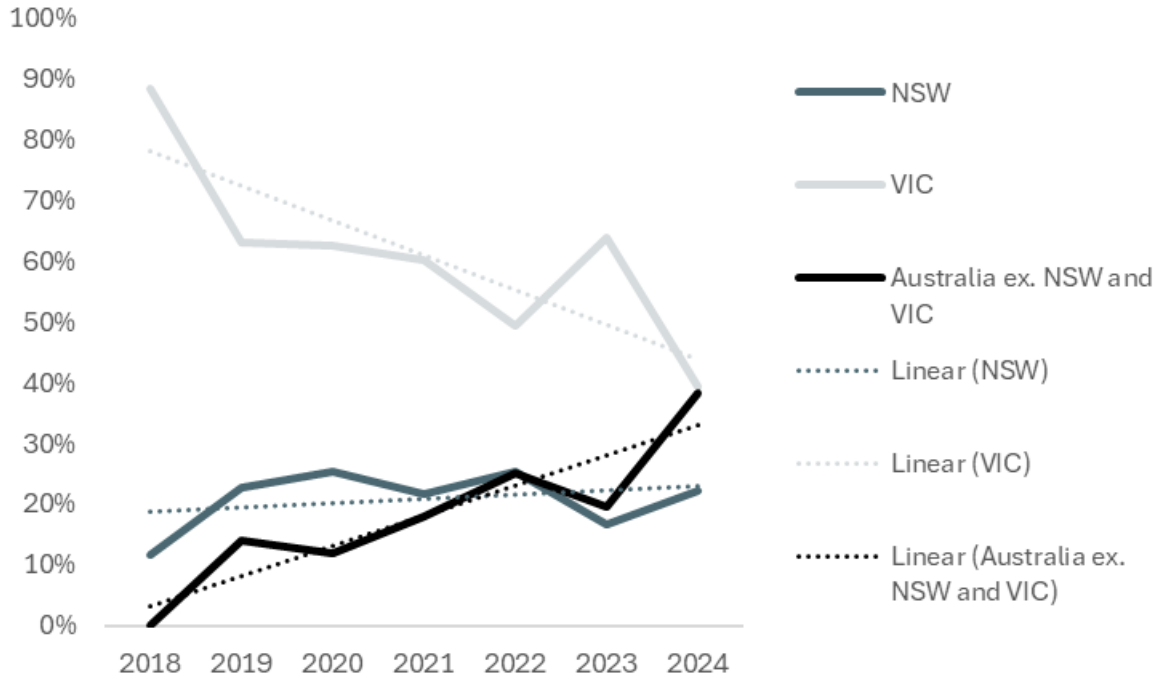
MRFF has increased since 2018. The share of MRFF CVD-related grants for NSW steadily increased up to 2022, experienced a dip in 2023, and appears to be rising again in 2024, suggesting the Program has likely contributed to increased external funding success. In comparison, Figure 24 shows a marked decrease in Victoria's share of CVD-related MRFF funding over time, which is consistent with the fact that there has been a marked decrease in Victorian state funding to medical research, where total output spend on medical research decreased from $108.1 million in 2022-23 to $57.3 million in the 2024-25 budget.[6] However, the NSW total share of MRFF CVD grant funding still remains below that of Victoria (Figure 24).

Figure 23. CVD-related MRFF total grant value awarded – NSW compared to other states/territories, 2018-24 (Source: MRFF funding).



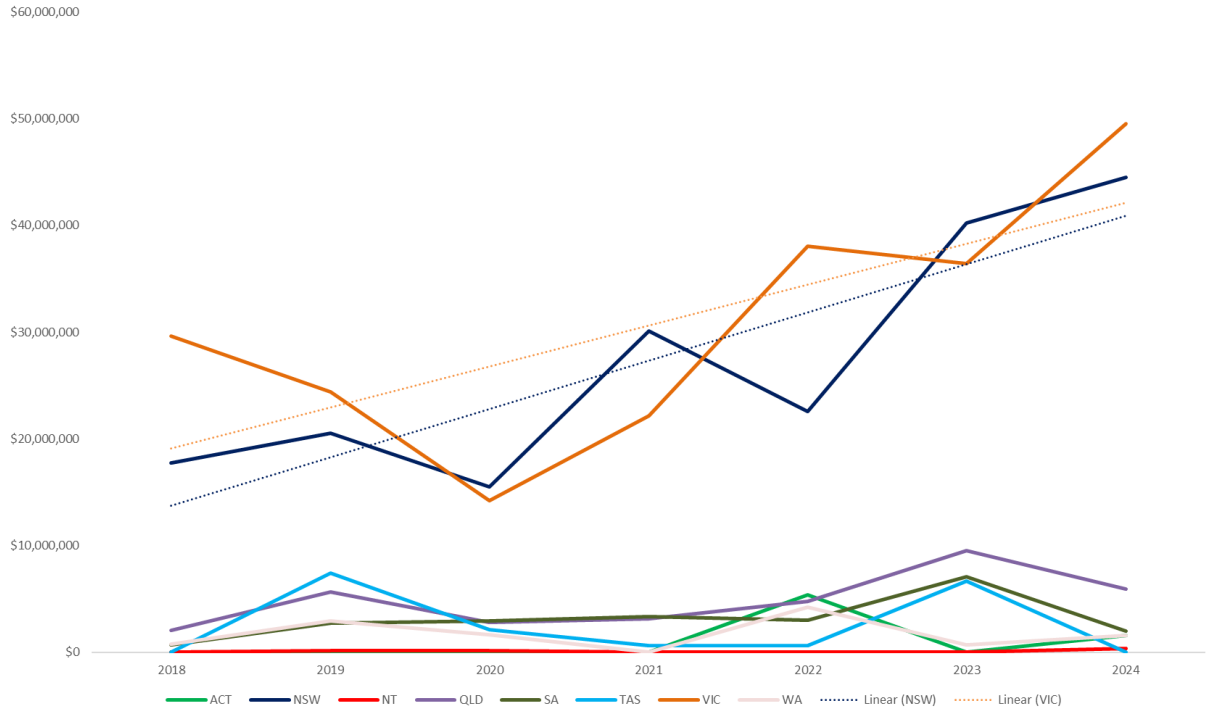
[6] https://aamri.org.au/state-chapters/aamri-vic/victorian-2024-25-state-budget-recap/#:~:text=Total%20Victorian%20Government%20output%20costs,the%20Melbourne%20Genomics%20Health%20Alliance.

Figure 24. State/territory shares of MRFF CVD-related grants, 2018-24 (Source: MRFF funding).



Similarly, the value of NSW cardiovascular disease related research funded via NHMRC grants has increased over time, with a sharp rise from around 2020, in both absolute and relative terms (Figure 25).

Figure 25. NHMRC Grant Outcomes by State or Territory: total grant value awarded, 2018-24 (Source: NHMRC grant outcome data)



The Program has received a high number of quality applications

The Program has received a high number of quality grant applications with a selection process where a minority of applications are awarded a grant (Table 16). Where the grant type was offered over all rounds, i.e. for Senior Scientist / Researcher grants, the proportion of successful applications remained relatively similar across the three rounds.

Table 16. Number of grant applications, number of awarded grants and proportion of awarded grants by round and grant type

Grant type	Round 1			Round 2			Round 3		
	Applications (n)	Granted awarded (n)	Grants awarded (%)	Applications (n)	Granted awarded (n)	Grants awarded (%)	Applications (n)	Granted awarded (n)	Grants awarded (%)
EMC	n/a	n/a	n/a	86	21	24%	80	19	24%
Clinician Scientist	20	10	50%	n/a	n/a	n/a	n/a	n/a	n/a
Senior Scientist/ Researcher	21	10	48%	27	13	48%	25	10	40%
Investigator development	n/a	n/a	n/a	20	11	55%	n/a	n/a	n/a
Synergy	n/a	n/a	n/a	8	2	25%	n/a	n/a	n/a
Collaborative	n/a	n/a	n/a	n/a	n/a	n/a	28	9	32%
Elite Leadership	n/a	n/a	n/a	5	2*	40%	n/a	n/a	n/a
Elite Postdoctoral	n/a	n/a	n/a	5	2*	40%	6	5	83%

*Although two grants were awarded each for Elite Leadership and Postdoctoral funding, only one took up the award for each due to COVID-19 impacting their ability to move internationally or interstate.

With regard to the mean score of reviewers as a reflection of the quality of applications received, although the findings are mixed across rounds and grant types, scores are high overall (Table 17).

Table 17. Mean scores from reviewers by round for each grant type

Grant type	Round 1 (out of 30)	Round 2 (out of 50)	Round 3 (out of 50)
EMC	n/a	42.88	36.67
Clinician Scientist	22.54	n/a	n/a
Senior Scientist/Researcher	22.89	45.55	39
Investigator development	n/a	26.43	n/a
Synergy	n/a	27.56	n/a
Collaborative	n/a	n/a	36.57

Stakeholders report a need for continuity of funding

Most stakeholders, during the interviews, expressed the need for continuity of funding for CVD research in NSW. It was felt the NSW Government needed to continue to support CVD research in NSW, to secure its competitiveness, to ensure ongoing young researchers continue to come through and to continue innovation.

> *“There has been somewhat of a perception that we may have been able to build capacity in CVD research for a decade and then move on to the next thing. But I think that is a fallacy. If you don't continue to invest, continue to support, continue to grow those careers, and continue to bring on the next generation, then eventually the capacity you've built dwindles away. It’s so critical that we continue to strongly support CVD research in NSW.” (Stakeholder)*

The longevity and consistency of the Program was perceived as good by many of the stakeholders, allowing basic science researchers to feel supported and confident to continue to “punch through walls” in discovery science.

> *"I think the strength is the longevity of it but a lot of the discoveries only happen because you've got individuals who are willing to punch through walls. And so the fact that this is a long term program means that for someone who doesn't get a grant or whatever, they don't give up. They basically say, OK well I'm going to go again. So I think that's really important. We need young scientists to come through the cardiovascular research pipeline. We need that consistency."(Stakeholder)*

A number of suggestions around how funds are allocated were expressed by individual stakeholders, namely, splitting Early Mid-Career grant funds into more small funds so that more young researchers received funding to get their research of the ground; and awarding grants to less well-known researchers, as it was felt that most grants go to already more senior funded researchers.

Overview and interpretation

The Program has been delivered efficiently, with total expenditure of $74.6 million from 2019 to 2023 of which 4.1% is comprised of administrative costs, which is a lower amount than the benchmarks for government grant management programs. At this halfway point, the Program has an indicative benefit-cost ratio (BCR) of 1.54 and a net present value (NPV) of 36.8 million, indicating a net benefit to NSW over the period 2018-19 to 2022-23. The Program has filled a critical funding gap and significantly strengthened the CVD research landscape in NSW. The Program has attracted additional funding of $303 million from other funding sources to date. It has elevated the state's profile in CVD research nationally, with preliminary evidence suggesting increased national funding success since its launch in 2018. Funded projects not only show potential for reducing unnecessary treatment costs, but also for generating commercial returns. The consistently high number of quality applications and strong stakeholder support further underscore the case for continued investment.

Recommendation

- The program has delivered early achievements in knowledge advancement, policy and practice change, capability building, health and community impacts. The economic benefits demonstrate the Program has delivered good value for NSW which would support a business case for considering further investment beyond 2028. The approach taken to deliver the Program demonstrates sound administration and well considered investments to meet the Program goals. This approach should continue to be applied to existing and new priority areas in the future.

4 Conclusions and recommendations

4.1 Conclusion

The evaluation found that the Program has been effectively implemented, with grant types delivered as intended and adapted over time in response to strategic advice and external factors such as the COVID-19 pandemic. Early outcomes demonstrate strong progress, with funded projects contributing to knowledge advancement, research translation, policy and practice change, and early signs of health and community impact. The Program has strengthened the cardiovascular research community by supporting capacity and capability building, particularly for early and mid-career researchers, and attracting high-calibre talent to NSW. Financial analysis shows the Program has been delivered efficiently, with relatively low administrative costs, and an early indicative benefit-cost ratio of 1.54 and net present value of $36.8 million, indicating a positive net social benefit for NSW.

Ongoing strategic refinement, improved administrative infrastructure, and greater focus on equity and priority populations will help to maximise outcomes. Continued investment, including a commitment beyond 2028, will be essential to consolidating current achievements and ensuring the long-term success of cardiovascular research in NSW.

4.2 Recommendations

The following recommendations below are split into three focus areas for the Program.

Overall strategic focus:

1. **Consider developing a business case for further funding beyond 2028:** The program has delivered early achievements in knowledge advancement, policy and practice change, capability building, health and community impacts. The economic benefits demonstrate the Program has delivered good value for NSW which would support a business case for considering further investment beyond 2028. The approach taken to deliver the Program demonstrates sound administration and well considered investments to meet the Program goals. This approach should continue to be applied to existing and new priority areas in the future.

2. **Enhance strategic prioritisation**: Continue with majority investigator-led grants but establish additional grant streams focused on health system priorities (e.g. regional and remote health) and targeted investments via a coordinated research prioritisation approach (e.g., on specific CVD topics).

Operational improvement over the remainder of the Program:

3. **Improve grant management systems**: Implement an online grant management system to automate and improve application, review, reporting, and monitoring processes. This system will help to address data quality issues that may arise in grant management processes due to the manual nature of data entry and analysis, and may also ease the administrative burden for all stakeholders.

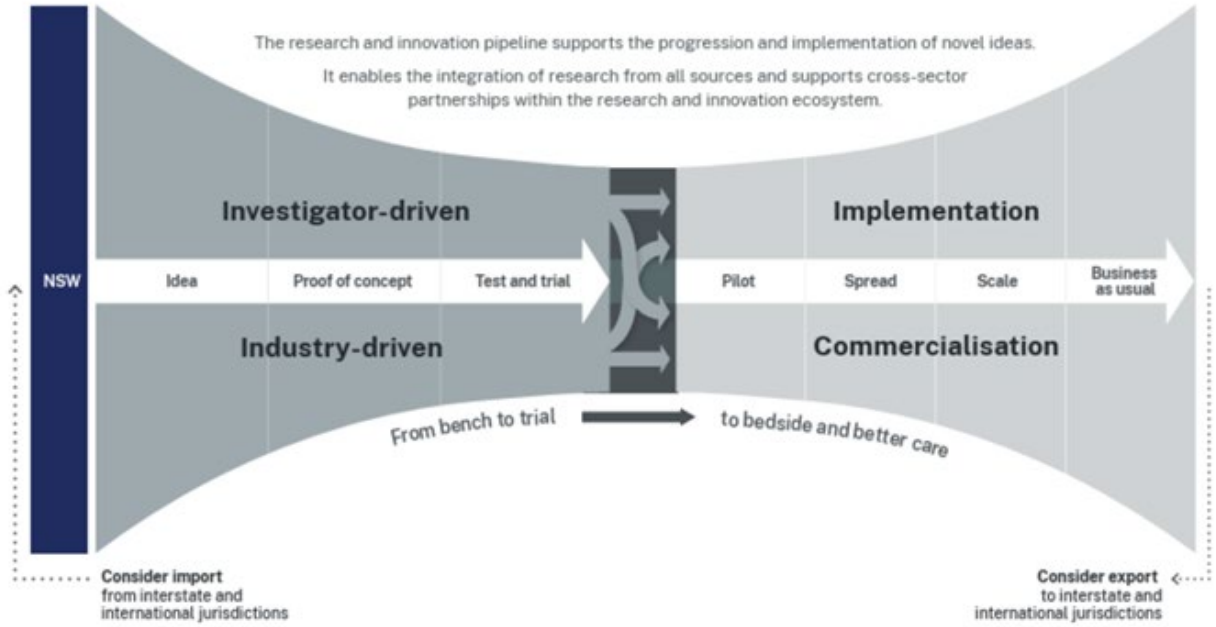
4. **Consider how consumers can be involved at all levels of the Program**: It is recommended that the Program considers how consumers can be involved in the Advisory Committee, grant review process and research project monitoring. The Office could consider adopting process used by other NSW Health organisations, particularly the Cancer Institute NSW, which models how to involve consumers in panels, research, and grant review processes.

5. **Improve equity and transparency in grant distribution**: Incorporate considerations of gender, geographic location, and Aboriginality in the grant application review process. Also consider how applicants can receive scores or rankings alongside feedback from the panel, to aid transparency and enable applicants more opportunity to improve future applications.

Preparation of the summative evaluation:

6. **Systematically track progress of individual projects along the research translation pathway**: Integrate the grant recipient survey questions into reporting to more effectively track progress along the research translation pathway, while recognising the long-term nature of basic science. In monitoring outcomes, particularly those ready for translation to the next user or for commercialisation, it is recommended that the Office is guided by the NSW Health Research and Innovation Strategy 2025-2030 (Figure 26) released in May 2025 in facilitating further strategic networking for researchers.

Figure 26. NSW Health research and innovation strategy pipeline (Source: Research & Innovation Strategy 2025-2030)



7. **Examine the appropriateness of 60% funding allocation to basic science:** The summative evaluation should consider how the evaluation can demonstrate evidence of the longer-term benefits and appropriateness of the Program's original core principle of a broad split in the distribution of funds with approximately 60% of funding being directed toward basic science.

8. **Refine economic related data metrics in reporting to enable a robust economic evaluation:**
    - With regard to funds leveraged, reduce the number of response options to specify whether the funds were derived from ‘NSW’, ‘non-NSW’ or ‘Australian’ (i.e. partial NSW) sources.
    - For projects with commercialisation outputs, capture sales information such as market share.
    - Capture funded researchers career progression more systematically, such as promotions, leadership roles, and further funding, as well as whether they stay in NSW after receiving a CVD grant.
    - Flag publications that have a health economics focus.
    - Review grant reporting questions about impact in line with those asked as part of the interim evaluation case studies. This information systematically collected will facilitate generating impact case studies as part of the final evaluation.

Appendix 1. Technical details

Grant report analysis

One hundred and sixteen grants were awarded in rounds 1-3. Four were cancelled – two Elite Grants cancelled due to COVID-19 preventing people from moving; one was declined by researcher after award for personal reasons; one was relinquished after two of three years due to interstate move and remaining funds were returned to the Office.

A descriptive analysis of CVD grants was conducted, focusing on key factors related to recipient characteristics - such as gender, Indigenous status, host organisation, and whether the CI or host organisation is located in a rural area. The analysis also examined any emphasis on priority areas or populations, as well as research outputs, including publications, seminars, reports, partnerships, research student supervision, and the impact on policy or practice changes. Only research grants from rounds one to three are included in this report. Duplicated records in publications and seminars were removed. If a publication was referenced by multiple grants, it was counted individually for each grant but was recorded only once at the NSW level. Given variations in data collection methods across rounds, caution is advised when interpreting trends or making comparisons between rounds.

Surveys

Grant recipients, applicants and host/ administrative organisations were asked in separate surveys about their experience with the application process, estimated time spent on the application, the quality of clarifications and feedback received from the Office, and how the application process compared to other similar major grants.

A targeted survey was designed and distributed to grant recipients via REDCap. Elite grant recipients were interviewed separately but still included in the survey so that feedback could be aggregated across all grant recipients. Elite grant recipients were not asked questions relating to the application process considering the nomination-based nature of these grants. On the contrary, Round 4 grant applicants were only asked about the application process as research would not have commenced. The table below describes the structure of the survey and the target audiences.

Appendix Table 1: Survey structures

Type of Survey	Survey section				
	1. Application process	2. Grant reporting process	3. Knowledge advancement, Policy and practice change, and Health and community impact	4. Capability building	5. Update research outputs
Grant recipients	✓ Except for elite	✓ Except for round 4	✓ Except for round 4 Repeated for multiple grant holders	✓ Except for round 4	✓ Completed projects only
Applicants - unsuccessful	✓	-	-	-	-
Host/admin organisations	✓	✓	-	-	-

The survey was administered in November-December 2024 to allow for potentially conflicting priorities for grant recipients, the timeline for reporting requirements and applications to NHMRC and MRFF grants. The survey was in the field for two weeks, with an additional week extension.

Interviews

Semi-structured interviews were conducted with the Office grant program team, key stakeholders, Elite grant holders and host/administrative organisations to gain their perspectives on the delivery and impact of the Program. The Program team selected a sample of six stakeholder groups, three elite grant holders, and three grant admin/host organisations. An invitation email was sent to interviewees explaining the purpose of the interviews.

Sixteen interviews were conducted via TEAMS and were automatically transcribed and recorded to facilitate analysis.

The stakeholder interviews included six cardiovascular research organisations/committees, namely, the NSW Cardiovascular Research Advisory Committee (n=4), the NSW Cardiovascular Research Network (CVRN) (n=1), the CVRN Rising Stars Sub-Committee (n=2), the Heart Foundation (n=1), the Heart Research Institute (n=1) and the Australian Cardiovascular Alliance (n=1). The interviews focused on the participants' views on the impact of the Program so far on the NSW CVD research community and the broader situation of CVD research needs, with questions relating to:

- the awareness of the Program amongst the CVD research community in NSW and beyond
- the ability the Program demonstrated in adapting to emerging issues and opportunities for CVD research
- the attraction and retention of CVD research talent to NSW
- CVD research funding needs in NSW.

The elite grant holder interviews included one elite leader grant holder and two elite postdoctoral grant holders. The interviews focused on experience of the nomination process and the contribution of these grants in increasing the profile of NSW in CVD research landscape.

The Program team interviews included three members of the Office grants team, two members from the evaluation and data team and one executive leader. The interviews focused on how the Office identified priority research areas, emerging needs and opportunities for CVD research within NSW and how the grant program was adapted accordingly. Data and reporting for the Program was also discussed.

Representatives from three administrative and/or host organisations were also included for interview, namely University of Sydney (n=3), University of New South Wales (n=1) and the George Institute (n=1). The interviews aimed to capture further information about the grant application process, and the management and administration involved for the CVD grants.

Data from each interview summary was coded under themes aligning with the focus areas identified in the evaluation plan. Additional themes that emerged during the discussions were also thematically coded. Each coded theme was exported to a central document to allow for direct comparison of themes between interview groups (stakeholder, program team, elite grant holders and admin/host organisations). Data from the interviews was interwoven into the evaluation results which provide supportive and additional views.

Case studies methodology

Eight case studies were conducted which included two Senior Scientist grants, two Early-Mid Career grants, two Clinician Scientist grants, one Investigator grant and one Collaborative grant. Four were

clinical medicine and science research projects, three basic science and one health services research project (full case studies can be accessed in the separate case study report).

The case studies employed a mixed-methods approach to collect and triangulate evidence. The case studies are informed by the following key data sources.

Data source and timing	Details
Document and data review March 2025	Urbis conducted a rapid review for each grant project using grant report data and survey responses. This data was analysed and used to inform the development of the discussion guides tailored to each grant project. Urbis also conducted a rapid review of other relevant program documentation (such as evaluation and grant guidelines) to inform discussion guide development and case study structure.
Interviews with grant recipients March 2025	Urbis conducted eight interviews with grant recipients (n=8). Interviews were one hour and held online over Microsoft Teams. Following each interview, Urbis analysed the data collected in the discussion along with the data analysed in the document and data review, to develop findings for the case studies.

Limitations

The following limitations should be taken into consideration when reading the case studies:

- As some of the research discussed is basic science, and some projects are still being undertaken, recipients were not always able to identify outcomes that have occurred to date, particularly outcomes further along the research translation pathway (translation to practice). As such, recipients at times hypothesised on potential outcomes that could be generated in the future. These have been included and indicated.
- These case studies reflect outcomes as at the time this report was written (May 2025). For many projects the outcomes will increase over time. For example, economic benefits via additional grants may increase, or treatment or savings or guideline changes may be yet to emerge. Citations will also increase over time- as such Field Weighted Citation Impact is a reflection of citation impact as of May 2025. Outcomes should be understood in this context.
- Each case study represents a unique piece of research. As such, case studies are not intended to be comparable. Outcomes differ between case studies, and not all case studies will show outcomes in each outcome area. This does not indicate a research project's level of success, rather, it indicates where outcomes are relevant or not.

Economic evaluation

An ex-post cost-benefit analysis of the CVD grant program was performed. The base year for the analysis was Financial Year 2018-19. Net present value (the 2018-19 value of the project in monetary terms) and benefit-cost ratio (the 2018-19 value of benefits divided by the 2018-19 value of costs) were calculated. The share of administrative and wages costs as a share of total grant funding were also

calculated. Additional benefits were also described qualitatively (e.g., career progression of grant applicants, health benefits for patients).

Costs comprised grant money paid and administration costs, directly measured from Office data. Benefits included the value of publications generated, employment benefits based on full-time equivalent statistics (wages uplift, or the benefit to CVD medical researchers in NSW from changing jobs), and funding leveraged from non-NSW sources.

CVD Program Funding Attribution:

- Overall funding sources were categorized as NSW-based, non-NSW-based, or Australia-based, with only non-NSW funding considered a benefit in the cost-benefit analysis.
- Costs incurred and benefits in the analysis period (five years; 2018-19 – 2022-23), reported in Australian dollars, were discounted to 2018-19 values using a discount rate of five percent per annum.
- The Program attracted an additional $303.0 million in funding from various sources between 2018-19 and 2022-23.
  Applicants reported the proportion of additional funding attributable to the Program grant funding, averaging 59% which resulted in $158.9 million being directly attributed to the Program.
- The Program was responsible for attracting $92.7 million in external (non-NSW) funding into NSW.

Value of Research - Publications:

- Peer-reviewed publications generated by Program grant funding were monetised using a market-based approach.
- The wages of a medical researcher, for input into the benefits calculation, was estimated as $130,000 per annum.
- The average value per publication was derived from Rousseau et al. (2021), estimated at €2,250 (adjusted to 2024 AUD values).
- Using the number of publications generated and applying the above value, the total value of publications over the period was $1.73 million (in Australian dollars).

Employment Benefits - Increased Jobs and Wages:

- The Program created 93.9 FTE positions over 2018-19 – 2022-23.
- The Program paid $14.9 million in wages, with an average wage of $158,600 per year.
- A wage uplift factor of $2000 and 11% of the previous wage per worker was derived from ‘Principles and Standard Parameters for Cost-Benefit Analysis of Investment Attraction Proposals.’
- The economic benefit was calculated by comparing total wages to counterfactual wages, resulting in an additional wage benefit of $2.3 million.
- The total value of employment benefits over the five-year CBA period was $15.5 million.

Appendix 2. Case studies report summaries

The full case studies report can be accessed in the separate case study report.

Case study 1 - Cardioprotective effects of the pneumococcal polysaccharide vaccine

Project summary

Grant recipient: Professor John Attia	**Grant type:** Clinician Scientist Grant; Round 1; Health services research
Funding received: $600,000 (May 2019 – December 2023)	**Other CVD Research Capacity Program grants received by recipient:** Investigator Development Grant (2020-2022)
Key outcomes generated: Publication metrics – Four publications with an average FWCI of 1.04 have been published.[7] Findings have been shared at multiple conferences (number not known). Economic benefit – $100,000 in additional funding leveraged. Knowledge advancement – The research provided a robust result demonstrating the pneumococcal vaccine does not contribute a cardioprotective effect in humans, closing this knowledge gap. Capability building – Two researchers involved on the project have gone on to become university faculty staff through their contributions and experience gained.	

Case study 2 – Developing novel treatments to improve heart failure and myocardial infarction outcomes

Project summary

Grant recipient: Associate Professor James Chong	**Grant type:** Clinician Scientist Grant; Round 1; Basic science
Funding received: $750,000 (May 2019- June 2022)	**Other CVD Research Capacity Program grants received by recipient:** Investigator Development Grant (2020-2021); Early Mid-Career Researcher (Round 4)

[7] Average FWCI for the four publications calculated by averaging FWCI scores as given by Scopus.

Key outcomes generated:

Publication metrics – 47 publications have been published from this research with average impact factor of 6.658.[8] Findings were shared at 13 national and international conferences.

Economic benefits – Additional funding leveraged off this research is over $7 million. The research has contributed to Westmead's growth into a heart research hub.

Knowledge advancement – Two novel therapies for heart attacks have been tested in pig models and are progressing toward clinical trials.

Case study 3 - Translating genomics to clinical care of patients with inherited heart disease

Project summary

Grant recipient: A/Professor Richard Bagnall	**Grant type:** Senior Scientist Grant; Round 1; Clinical medicine & science
Funding received: $750,000 (May 2019 - June 2022)	**Other CVD Research Capacity Program grants received by recipient:** Investigator Development Grant (2020-2021); Senior Researcher (2022-2025)

Key outcomes generated:

Publication metrics – 17 publications have been published from this research with an average FWCI of 2.17.[9] The research has been presented at eight national and international conferences.

Economic benefits – Additional funding leveraged from this research totals over $3 million. The grant recipient has established themselves as an expert in their field through this research, and since progressed significantly in their career to Associate Professor and head of CVD Research at the Centenary Institute.

Knowledge advancement – Methods by which to improve genetic testing for heart disease have been identified and shared.

Clinical practice – Newly identified variants are now included on genetic testing panels.

[8] Average impact factor calculated from the average of Impact factors for the 47 publications as provided by grant recipient in their CV.

[9] Average FWCI calculated by averaging the FWCI of each of the 17 publications as given by Scopus.

Case study 4 - Working towards a genetic diagnosis for the majority and identifying the benefits

Project summary

Grant recipient: Professor Sally Dunwoodie	**Grant type:** Senior Scientist Grant; Round 1; Basic science
Funding received: $750,000 (July 2020 - June 2022)	**Other CVD grants received by recipient:** Senior Researcher (2022-2025)
Key outcomes generated: Publication metrics – There have been 17 publications from this research, with an average FWCI of 1.52.[10] Research findings have been shared at 15 national and 7 international presentations. Economic benefits - Additional funding leveraged through the research totals over $15.5 million for NSW based researchers. Four researchers involved in the funded project received six fellowships, and two researchers were able to go on to build independent research careers. The grant recipient received the 2025 CVRN Ministers Award. Knowledge advancement - Additional genetic causes of congenital heart disease (CHD) were identified, and establishment of linked data allowed CHD incidence in NSW to be estimated. Policy and practice - The identification of new genetic causes of CHD has added to the evidence base supporting these genes as variants, including via inclusion on PanelApp Australia. Increased knowledge of these variants and support for their validity means more patients are likely to be tested for them, providing important information to inform patient care.	

Case study 5 - Improving women's cardiovascular health after hypertensive pregnancy

Project summary

Grant recipient: Associate Professor Amanda Henry	**Grant type:** Early Mid-Career Researcher Grant; Round 3; Clinical medicine & science
Funding received: $449,562 (February 2022 – February 2026)	**Other CVD Research Capacity Program grants received:** None
Key outcomes generated: Publication metrics – One publication has been published, with one citation and FWCI of 9.36. More publications are expected to follow once research findings are finalised. The research has been shared at four conferences.	

[10] Average FWCI for the 17 publications calculated by averaging FWCI as given by Scopus.

Economic benefits - The research has led to further collaborations worth over $3 million in additional grant funding. Policy and practice - The research has contributed to the grant recipient's expertise as a researcher working in women's health after hypertensive pregnancy. Their expertise has been sought out to inform several national and international guidelines and resources on this topic. Capability building - The funding to employ midwifery staff in research roles (total 0.8 FTE) brought research capability into involved hospitals and supported one midwife to progress to a clinical midwifery consultant role. The capability of several undergraduate and post-graduate students has been built through their involvement in this research.

Case study 6 - Code STORM: Standard care or a Rapid early invasive Management approach to patients with life-threatening heart rhythm disorders

Project summary

Grant recipient: A/Prof Saurabh Kumar	**Grant type:** Early Mid-Career Researcher Grant; Round 2; Clinical medicine & science
Funding received: $450,000 (July 2020 - June 2023)	**Other CVD grants received by recipient:** None
Key outcomes achieved: Publication metrics – Two publications have been published from this research, and one is additionally under peer review. There have been no conference presentations. Economic benefits – Additional grants won leveraging this research have totalled approximately $10 million. Knowledge advancement – Clear evidence was provided that initial catheter ablation was superior to medical therapy for the management of VT storm. Policy and clinical practice – The research has contributed to establishing initial catheter ablation as best practice for the management of VT storm. Western Sydney Local Health District has been established as 24/7 referral centre for VT storm, with improved referral pathways to improve access for patients from other local health districts.	

Case study 7 - Implementing genomic medicine in inherited cardiomyopathies

Project summary

Grant recipient: Professor Diane Fatkin	**Grant type:** Investigator Development Grant; Round 2; Basic science
Funding received: $100,000 (February 2020 - December 2022)	**Other CVD Research Capacity Program grants received by recipient:** Senior Researcher (2020-2023); Senior Researcher (2024-2026)
Key outcomes generated: Publication metrics – One publication has been published from this research with 9 citations and field weighted citation impact (FWCI) of 1.01 (Scopus). More papers are expected to be published in the coming year, expected to be high impact papers. Findings have been shared at three conferences. Economic benefits – Additional funding leveraged (through grants and philanthropy) is worth over $3 million. The grant has led to further funding leveraged to progress the research program and build the recipient's career. Knowledge advancement - A cardiac magnetic resonance (CMR) based imaging protocol for the assessment of atrial structure and function was developed, with data made available to inform further research, such as in collaboration with Imperial College London to explore how atrial parameters can predict fibrosis in the atrium.	

Case study 8 - Implementing novel approaches to transform blood pressure control

Project summary

Grant recipient: Dr Aletta Schutte	**Grant type:** Collaborative Grant; Round 3; Public health/ Clinical medicine & science
Funding received: $981,000 (July 2023- June 2025)	**Other CVD Research Capacity Program grants received by recipient:** None

Key outcomes generated:

Publication metrics – Seven publications have been published with an average FWCI of 2.14[11] and two are under review. The research has been shared at eight conferences.

Economic benefit – Additional funding leveraged through this multidisciplinary research totals over $17 million.

The grant has enabled four multidisciplinary research streams the capacity to come together and establish implementation goals and share knowledge under the National Hypertension Taskforce and its guiding Roadmap.

Policy and practice - Over 40,000 people have been screened for hypertension. The World Health Organisation (WHO) has released a statement on low sodium salt substitutes based on this research. The recommendation has been made that drug labels allow for single pill combination therapy as first-line treatment.

[11] Average FWCI for the seven publications calculated by averaging FWCI as given by Scopus.

Glossary

Please list in alphabetical order.

Term, acronym or abbreviation	Definition
ACI	Agency for Clinical Innovation
AF	Atrial fibrillation
BCR	Benefit cost ratio
CHD	Congenital heart disease
CMR	Cardiac Magnetic resonance
CVD	Cardiovascular disease
CVRN	NSW Cardiovascular Research Network
EMC	Early mid-career researcher
FWCI	Field Weighted Citation Impact
MRFF	Medical Research Future Fund
NAD	Nicotinamide adenine dinucleotide
NHMRC	National Health and Medical Research Council
NPV	Net present value
OHMR	Office for Health and Medical Research
PDGF	Platelet Derived Growth Factor
PSC-CM	Pluripotent stem cell derived cardiomyocytes
the Office	Office for Health and Medical Research
the Program	Cardiovascular Research Capacity Program
VT	Ventricular tachycardia
WHO	World Health Organisation

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