THE AAMRI RESEARCH IMPACT PROJECT

The AAMRI Research Impact Framework
Final Report

May 2021

aamri
Association of Australian
Medical Research Institutes

AAMRI RESEARCH IMPACT WORKING GROUP

This project was designed and guided by the AAMRI Research Impact Working Group. The group consists of six medical research institutes that are passionate about understanding the practices and indicators that support continual improvements in research translation and research impact across the medical research sector.

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AN INTRODUCTION FROM THE CHAIRS

It has been a pleasure to work with the AAMRI Research Impact Working Group on this project. The opportunity to help better understand how we capture and communicate the impacts of medical research has been made possible through the direct involvement of both the Working Group members and their organisations, and our research participants. Through an open call from AAMRI, we established the AAMRI Research Impact Working Group in 2018 to share and build on our collective knowledge. As a first step, and through the generous support of the Ian Potter Foundation, we have developed a common impact language in partnership with the Australian medical research sector which is presented in this report as the AAMRI Research Impact Framework.

The work of the AAMRI Research Impact Working Group does not finish with the publishing of the Framework. We will continue to work together, in close collaboration with the Australian medical research sector, to improve the translation of knowledge into meaningful health outcomes for all Australians.

Inaugural and Current Chairs

Tobias Schoep (Inaugural) and Tara McLaren (Current)
AAMRI Research Impact Working Group
April 2021

FOREWORD

Welcome to the report on the AAMRI Research Impact Framework.

Measuring the impact of research is something that all medical research institutes aim to do in some form. After all, undertaking research that has an impact is the very reason medical research institutes exist. Impact can be measured and reported in many ways, from traditional number-based metrics through to translational case studies. All of these measures are important and help institutes to demonstrate how their research makes a difference.

The AAMRI Research Impact project is an important first step towards creating a common language for understanding and communicating the impacts of health and medical research within the Australian research ecosystem.

This project is an Australian first – bringing together medical research institutes from across Australia, with more than half of all medical research institutes participating in the development of this common language for communicating how research contributes to knowledge gain, improved health, a stronger economy, and a more vibrant and cohesive society.

The creation of a research impact framework provides a foundation for developing standardised measures for research impact by identifying a set of agreed indicators for research translation, knowledge mobilisation activities, and practices which support the translation of research.

The AAMRI Research Impact Framework has been developed by the AAMRI Research Impact Working Group, with representatives from a group of medical research institutes that are passionate about improving the translation of research. The Working Group has sought input to the Framework from a wide range of stakeholders – from institutes, funders, government, industry, and the community.

This is important work that is already beginning to shape the medical research sector. We encourage research organisations and funders to continue working in partnership to ensure the delivery of excellent research which makes a positive impact on society.

Professor Jonathan Carapetis (AM)
President of AAMRI

Craig Connelly
CEO The Ian Potter Foundation

DEFINITIONS

The following definitions were used in the AAMRI Research Impact Project.

Research Impact is defined by the NHMRC as the verifiable outcomes that research makes to knowledge, health, the economy and/or society. Impact is the effect of the research after it has been adopted, adapted for use, or used to inform further research [3].

Indicators are quantitative or qualitative factors or variables that provide a simple and reliable means to measure achievement and change, track progress to impact, and feed into organisation reporting systems [4].

Impact Practices promote the translation of research into impacts. These can be present at multiple levels including the individual (e.g. collaborating with community organisations), team (e.g. planning for research impact in projects), and organisation (e.g. professional services supporting the commercialisation of research).

Research Translation and Knowledge Translation are both used in association with achieving research impact. The terms are often used interchangeably in Australia.

Research Translation is the process whereby research findings are translated into practice, policy, or further research to drive real-world change and outcomes.

Knowledge Translation is the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people's health [5].

Frameworks for assessing research impact provide a conceptual framework and methods against which the translation and impact of research can be assessed [6].

Impact Pathway The Australian Research Council defines as impact pathway as 'an analysis or plan which identifies causal links by which research achieves or will achieve its impact. It is used by researchers and research planners to identify hypotheses about the route from research-specific activities, through to uptake and adoption of research outputs, and the realisation of subsequent future intended impact(s). This includes defining the changes and linking processes, and indicators to measure progress towards intended impact(s)' [1].

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Medical research institutes (MRIs) across Australia play a leading role in delivering research that is then translated into health, development and wellbeing impacts. However, there has been limited sector-wide agreement on what are the best approaches to tracking and assessing research impact in Australia, with no common or consistent impact language used by the sector.

The Association of Australian Medical Research Institutes (AAMRI) member MRIs have developed a common impact language in the form of the AAMRI Research Impact Framework to communicate how their work is contributing to knowledge, health, the economy and society.

The AAMRI Research Impact project was coordinated by the AAMRI Research Impact Working Group with the generous support of the Ian Potter Foundation. The AAMRI Research Impact Framework was developed in two phases that are described in the following sections.

DEFINING RESEARCH IMPACTS

Phase 1: the first phase of the project engaged with end-user stakeholders of research. The Australian Research Council (ARC) defines end users as: Individuals, communities or organisations external to academia that will directly use or directly benefit from the output, outcome or result of the research [1]. In this project, end users included health and medical research organisations, funders of research, government, industry and community organisations – to find out what these groups identified as the various impacts of research.

The findings from these consultations, combined with a review of existing research impact framework and research and knowledge translation practices literature, were then used to inform and refine the development of the AAMRI Research Impact Framework. The Framework is based on the Canadian Academy of Health Sciences Preferred Framework and Indicators to Measure Returns on Investment in Health Research [2].

THE AAMRI RESEARCH IMPACT FRAMEWORK

Phase 2: the second phase of the project involved more than half of all AAMRI member MRIs (n=32) participating in a Delphi method-based research process to inform the development of the AAMRI Research Impact Framework. This involved participating in three survey rounds to gain consensus and to build on, and refine, the research and knowledge translation indicators and practices identified during the first phase of the project.

The combined results of the surveys showed that MRIs indicated agreement or strong agreement (≥80%) for the inclusion of the final 87 indicators included in the AAMRI Research Impact Framework.

The Framework is divided into six categories that demonstrate different research impacts. Each category includes a list of indicators that can be used to demonstrate progress towards, or having achieved, research impact (Figure 1).

Figure 1: Summary of the AAMRI Research Impact Framework categories and number of indicators

The Framework also includes a set of 12 research impact practices that can help facilitate research impact at the organisational level within MRIs. The Framework has been designed to be dynamic so it can be used for multiple purposes. The Framework is intended to be used as a guide for MRIs to plan for, track, understand and communicate the impacts of their research. It does not need to be applied in its entirety, and is not intended to be used as a prescriptive set of measures.

While not all the indicators included in the Framework will be applicable to every research organisation, the development of the Framework is an important first step towards creating a common understanding of the impacts of medical research.

Practices within research organisations that enable the translation of research are vital to achieving research impact. The Framework provides research organisations with a range of validated indicators to assess impact progress. This can facilitate further reflection on the support that organisations provide to improve impact literacy, and develop practices and activities that will optimise knowledge translation. We hope that this Framework will be used by many Australian MRIs, and that we can continue to learn more about impact practices and to share these learnings across the sector with each other and our many stakeholders.

INTRODUCTION

THE CHALLENGE

Medical research institutes play a leading role in translating research into health, development and wellbeing impacts. There is a diversity of medical research underway across Australia – from discovery-research to clinical trials, and health policy and health services research. However, this broad scope of research makes it difficult to standardise an approach for understanding research impact. To date, there has been limited sector-wide agreement on the best approaches to improve the translation of research into real-world impact in Australia, with no common language to describe impact used consistently across the sector.

THE AAMRI RESEARCH IMPACT PROJECT

The AAMRI Research Impact Project provided the first step towards creating a common understanding of the impact of medical research by developing a research impact framework for the Australian health and medical research sector.

The project was led by the AAMRI Research Impact Working Group, a group of MRIs working with AAMRI to develop a framework of indicators and practices to support improvement in research translation and research impact across the sector. Driven by AAMRI member institutes and a range of stakeholders including MRIs, funders, government, industry, and the community, the project has informed the development of the AAMRI Research Impact Framework.

It is envisaged that the Framework will help medical research institutes identify and demonstrate how their research is making an impact, with a view to maximising the return on investments made by government, industry and philanthropic funders.

The purpose of this report is not to provide a review of current Australian research impact frameworks in the medical research sector. Rather, we anticipate the AAMRI Research Impact Framework will complement and add value to the work of other Australian medical and health-focused research organisations.

A BRIEF WORD ON FRAMEWORKS

Research impact frameworks generally include a list of indicators that can be used to demonstrate progress towards, or having achieved, research impact. In short, a framework is a guide for how an organisation values and measures success in a way that is aligned with the goals of that organisation and its stakeholders. The indicators included in a research impact framework can be used at different stages of an impact pathway. A framework does not need to be applied in its entirety and can be customised as appropriate for the individual needs of institutes and the different types of research they conduct. Frameworks are rarely used in isolation and are often accompanied by qualitative information in the form of narratives and other forms of evaluation.

The AAMRI Research Impact Framework is not intended to be used as a prescriptive set of measures applied to all MRIs. It is a guide to support consistency in language across the sector, and to enable organisations to derive strategic insights and learnings about how to support research translation, to better understand success, and to share this information.

DEVELOPING THE AAMRI RESEARCH IMPACT FRAMEWORK

THE DEVELOPMENT OF THE AAMRI RESEARCH IMPACT FRAMEWORK INVOLVED TWO PHASES: PHASE 1: UNDERSTANDING WHAT IS VALUED AS RESEARCH IMPACT, AND PHASE 2: CO-DEVELOPMENT OF THE AAMRI RESEARCH IMPACT FRAMEWORK.

FULL ETHICAL APPROVAL TO CONDUCT THE STUDY WAS OBTAINED FROM THE UNIVERSITY OF WESTERN AUSTRALIA HUMAN RESEARCH ETHICS COMMITTEE.

PHASE 1: DEVELOPMENT OF A DRAFT FRAMEWORK OF IMPACT PRACTICES AND INDICATORS

The aim of the first phase of the project was to identify existing research and knowledge translation practices and indicators to develop the draft AAMRI Research Impact Framework.

Methods

To identify existing research and knowledge translation practices and indicators, and develop the draft AAMRI Research Impact Framework, the following methods were used:

– A literature review and environmental scan of existing research impact frameworks and research and knowledge translation practices and indicators; and

– An online survey, from September 2019 to January 2020, of the stakeholders involved in research, including: health and medical research organisations.

Based on the literature review and environmental scan, the initial draft AAMRI Research Impact Framework was developed based on the Canadian Academy of Health Sciences Preferred Framework and Indicators to Measure Returns on Investment in Health Research [2].

There are a variety of research impact frameworks used in medical research institutes, based on the needs of the implementing organisation and the purpose of the framework [6]. The Canadian Academy of Health Sciences Research Impact Framework accommodates the diverse research activities within MRIs, and variations of this framework have been adopted in several Australian MRIs.

There are five impact categories within the Canadian Academy of Health Sciences Research Impact Framework which are incorporated into a logic model (see Appendix A for the full Canadian Academy of Health Sciences Research Impact Framework logic model). The Canadian Academy of Health Science (CAHS) identified five broad categories of research activity (referred to as pillars of health research): biomedical, clinical, health services, population and public health, and cross-pillar research. CAHS developed a specialised logic model for each of these five pillars [2].

Figure 2 shows the specialised CAHS framework for the category of 'cross-pillar research', showing a logic model of how research progresses toward impacts, and identifies via coloured coding where the majority of impacts are likely to fall within this pillar.

CAHS framework logic model of health research progression to impacts

Figure 2: Canadian Academy of Health Sciences Research Framework logic model – cross-pillar research
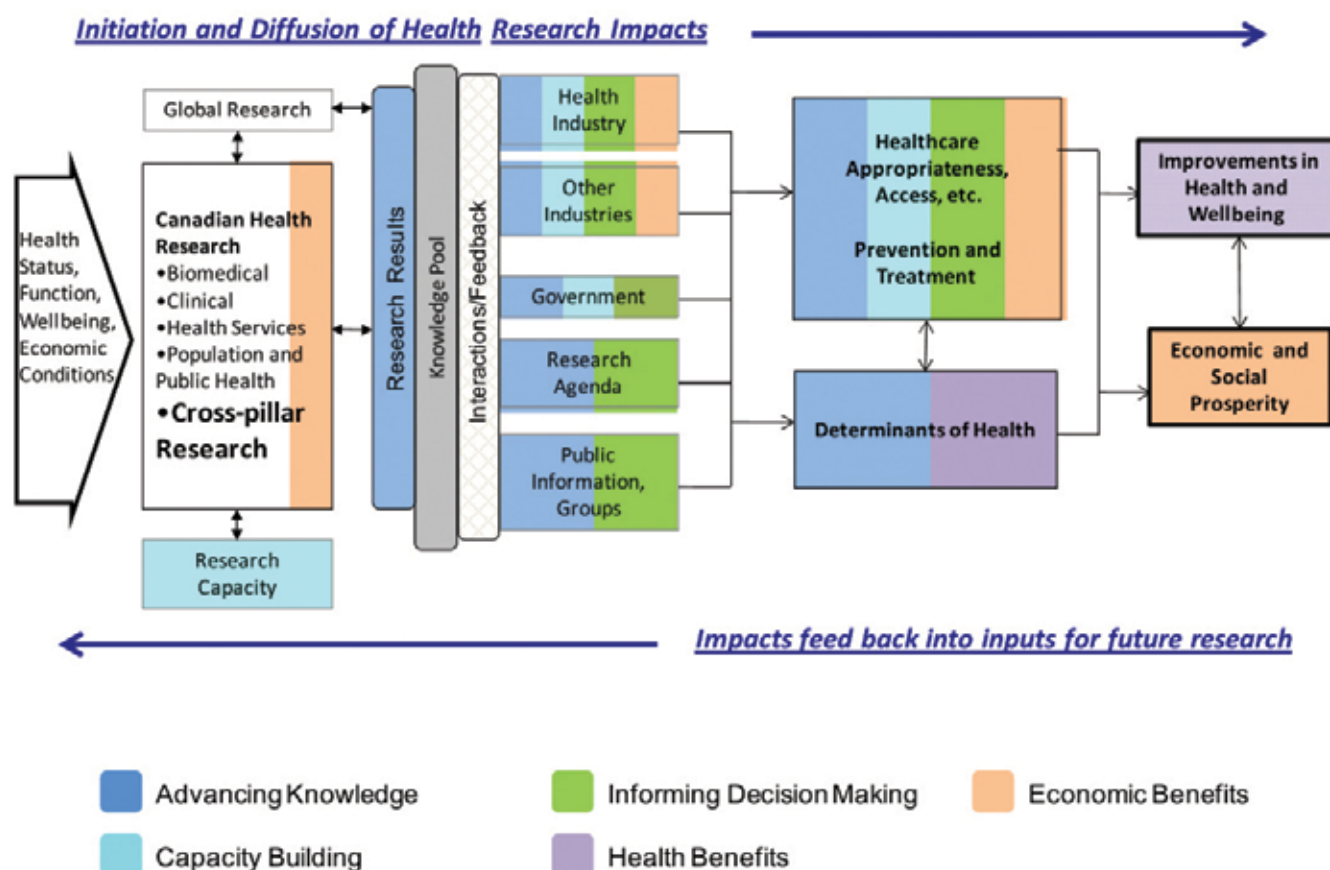
The Phase 1 online survey incorporated the categories for demonstrating impact included in the CAHS Framework (advancing knowledge, research capacity building, informing decision making, health impacts, economic impacts and social impacts) to assess their level of importance among participants.

The survey also included a question to identify the importance of the 'six As' as drivers of research impact assessment for different organisations within the Australian medical research sector – Acceleration, Access, Accountability, Advocacy, Allocation and Analysis [6, 7 & 8]:

Acceleration: increase the speed and efficiency of the research

Access: increase the accessibility of research

Accountability: demonstrate responsible and effective use of funding

Advocacy: increase awareness and demonstrate value of research

Allocation: monitor progress and inform the future allocation of resources

Analysis: build understanding of the reasons for the success or failure of research impact

The findings of Phase 1 were then used to further inform and refine the development of the AAMRI Research Impact Framework. The AAMRI Research Impact Working Group, the Contributing Advisory Group and the Technical Experts also provided feedback on the draft Framework.

Results

Sample characteristics

Half of the 74 respondents to the stakeholder survey were from medical research institutes (MRI) (n=38, 51%). The majority responded as an individual (n=55, 74%), as displayed in Table 1. Note: not all respondents completed the full survey.

Table 1: Response rates by organisation type

	n (%)
Funder	17 (23)
MRI	38 (51.4)
Other Research Organisation	11 (14.9)
Other*	8 (10.8)

Other category includes Peak body, Medical/health service provider, Government agency and Community group

The majority of participating funders were from the philanthropy (n=6, 40%) and not-for-profit sectors (n=6, 40%). The remainder were from government (n=2, 13.3%) and 'other' (n=1, 6.7%). The remaining funders (n=2) were re-categorised into the funder category and had not responded to the funder type survey question.

What a framework should provide

When asked what they would expect a research impact framework to provide, most participants selected 'standardised metrics for reporting to external stakeholders including government and funding agencies' (82%). Of those who selected this response option, nearly half were MRIs (47%). This was followed by 'a framework for funders to understand the impact of the research that they support' (79%, with 42% of these MRIs) and 'a framework for researchers to plan engagement and impact activities' (73%, with 37% of these MRIs) (Figure 3).

For funders, the most selected responses were 'a framework for funders to understand the impact of the research that they support' (21%), 'standardised metrics for reporting to external stakeholders including government and funding agencies' (21%) and 'a framework for researchers to plan engagement and impact activities' (19%).

Figure 3: The purpose of a research impact framework for different organisation types

Research Impact Framework Purpose

% of total respondents

Funder | MRI | Other Research Organisation | Other
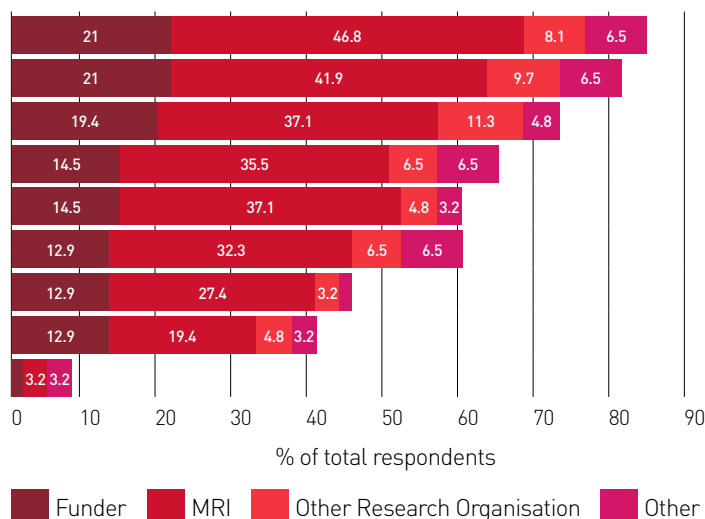
Purpose of measuring and/or evaluating the impact of research at any stage of the research process

Of the 'six As' as drivers of research impact listed below:

Acceleration: increase the speed and efficiency of the research

Access: increase the accessibility of research

Accountability: demonstrate responsible and effective use of funding

Advocacy: increase awareness and demonstrate value of research

Allocation: monitor progress and inform the future allocation of resources

Analysis: build understanding of the reasons for the success or failure of research impact

Figure 4 shows the relative importance of the purpose of a research impact framework for each type of organisation (Funder n=13-14, MRI n=34-35, Other Research Organisation n=9, Other n=7, Total n=63-65*).

- Funders (100%) and MRIs (74%) rated accountability as the most important purpose for measuring and/or evaluating the impact of research
- Other Research Organisations rated advocacy (78%) as most important
- The Other participant category rated analysis (100%) as most important to them

Figure 4: Levels of importance of purposes for measuring and/or evaluating impact framework for different organisation types. Purposes were classified as important; neither important or not important; or not important

Purpose of framework
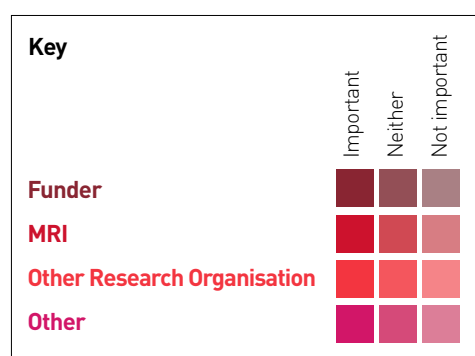
Research impact categories

When asked how important the categories for demonstrating research impact were to participants, the most important to Funders were health, economic and social impacts (all 100%) (Figure 5).

These were also the most important to Other Research Organisations, as was advancing knowledge (all 78%). The most important categories to MRIs were health impacts (94%), social impacts (82%) and informing decision making (85%). (Funder n=13-14, MRI n=34-35, Other Research Organisation n=9, Other n=7, Total n=63-65).

Figure 5: Levels of importance for impact types for different organisation types. Impact types were classified as: important; neither important or not important; not important; or no response
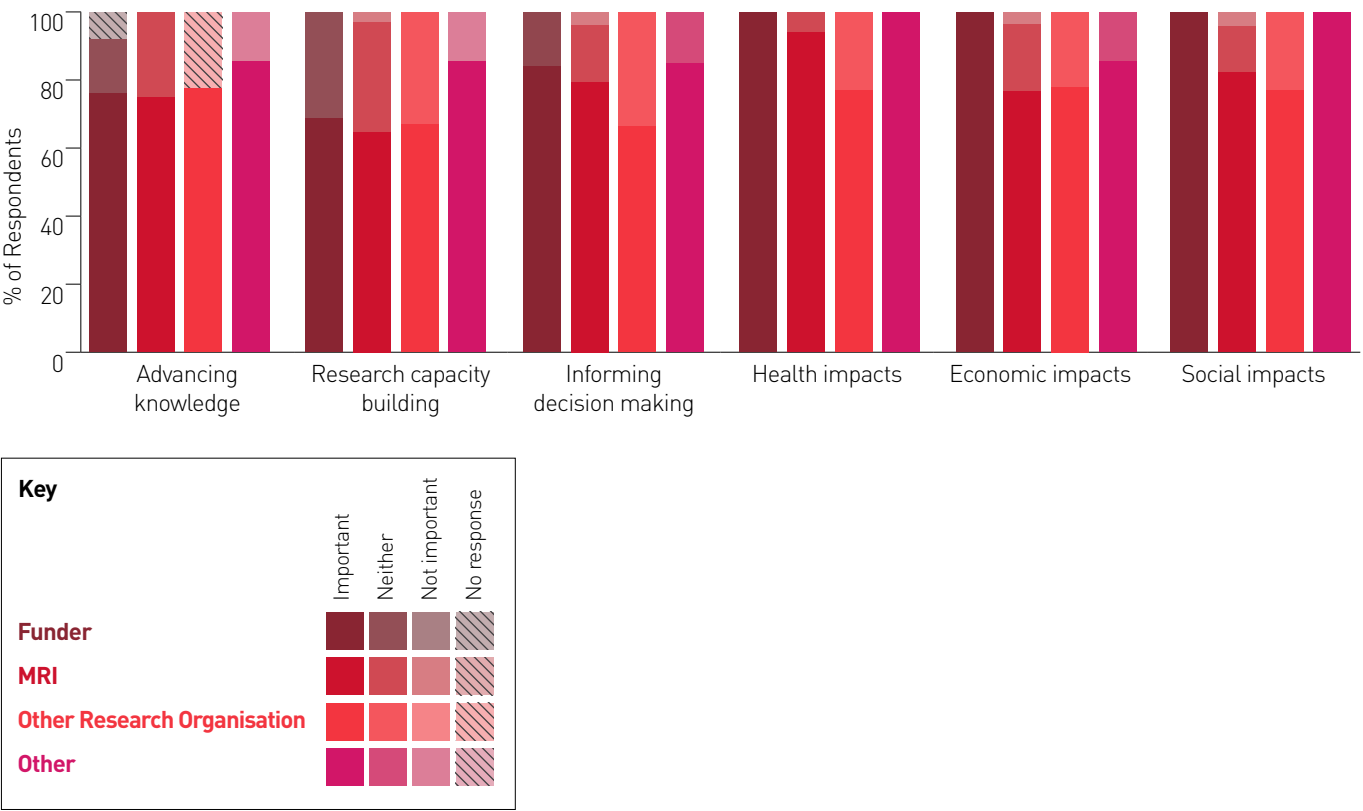
PHASE 2: VALIDATION AND FINALISATION OF THE FRAMEWORK

The aim of the second phase of the project was to develop the AAMRI Research Impact Framework in consultation with AAMRI member Medical Research Institutes.

Each category includes a list of indicators that can be used to demonstrate progress towards, or having achieved, research impact. The Framework also includes a set of research impact practices that can help facilitate research impact at the organisational level within medical research institutes.

Methods

AAMRI member MRIs participated in a three-stage Delphi process to arrive at a sector-wide consensus of the Framework. The Delphi method involves a multi-stage process whereby participants are asked to respond to a series of surveys, with each survey building upon the responses of the preceding survey [9]. This process is continued until the desired level of consensus is achieved.

The AAMRI member MRIs participated in three online survey rounds between March and November 2020 to gain consensus and build on the research and knowledge translation practices and indicators identified in Phase 1. Six categories for demonstrating research impact based on the Canadian Academy of Health Sciences Research Impact Framework were included (advancing knowledge, research capacity building, informing decision making, health impact, economic impacts and social impacts). Each category included a list of indicators that can be used to demonstrate progress towards, or having achieved, research impact.

The research and knowledge translation practices and indicators were identified via the literature review, and by the AAMRI Research Impact Working Group, the Contributing Advisory Group and the Technical Experts.

Participants were asked to consider each of the practices and indicators specified in the Framework and decide to what extent they agreed or disagreed with the inclusion of each. In each survey, participants were also provided with the opportunity to expand on their responses as well as suggest amendments to indicators and practices and additional indicators and practices for inclusion in the Framework.

Survey responses were analysed to inform the next survey round. Participants were provided with a summary of the previous survey round's results at the time of receiving the link to complete the subsequent surveys.

Survey items in each round with ≥80% level of agreement (i.e., participants responded agree or strongly agree) were deemed to have reached consensus and were therefore not included in subsequent survey rounds. Survey items with >70- <80% level of agreement were included in subsequent survey rounds for further review and those that did not reach consensus among participants (<70% level of agreement) were excluded from the Framework and subsequent survey rounds. The wording of the research impact indicators and practices was edited based on participant feedback and new additional indicators and practices suggested by participants incorporated into each survey for further review and rating.

It should be noted that one limitation of a Delphi process is that it can be constrained by the current knowledge of the participants. As research impact as a field is relatively young – and particularly in Australia – the AAMRI Research Impact Framework is likely to represent the needs and priorities of the respondents (both individual and organisational) as they stand currently in the sector, and may not reflect good impact practice.

Results

Sample characteristics

All 57 AAMRI member MRIs were invited to participate in the second phase of the project, the Delphi method research process. The Round 1 survey included participation from over half of all AAMRI members (n=29), nearly all of which subsequently participated in the Round 2 survey (n=28), with a smaller number participating in the final Round 3 survey (n=23). MRIs who were unable to participate in Round 1 were invited to participate from Round 2, resulting in a total of 32 MRIs participating across the three survey rounds. The majority of the MRIs were located in New South Wales (37%), were independent institutes (91%) and medium in size (44%) (see Table 2).

Table 2: Characteristics of participating MRIs (n=32)

	n (%)
Geographic location:	
Australian Capital Territory	-
New South Wales	12 (37.5)
Northern Territory	1 (3.1)
Queensland	3 (9.4)
South Australia	3 (9.4)
Tasmania	-
Victoria	10 (31.3)
Western Australia	3 (9.4)
MRI type:	
Hospital-based	-
Hub	1 (3.1)
Independent MRI	29 (90.6)
University-based	2 (6.3)
MRI size:	
Small	7 (21.9)
Medium	14 (43.8)
Large	11 (34.4)

The combined results of the three-round Delphi method research process show that participants indicated agreement or strong agreement (≥80%) for the inclusion of 87 indicators in the AAMRI Research Impact Framework, with 12 impact practices reaching consensus for being effective at facilitating research impact at an organisational level (see Appendix B).

A total of 31 indicators did not reach consensus and have been excluded from the Framework (see Appendix C). One impact practice did not reach consensus among participants.
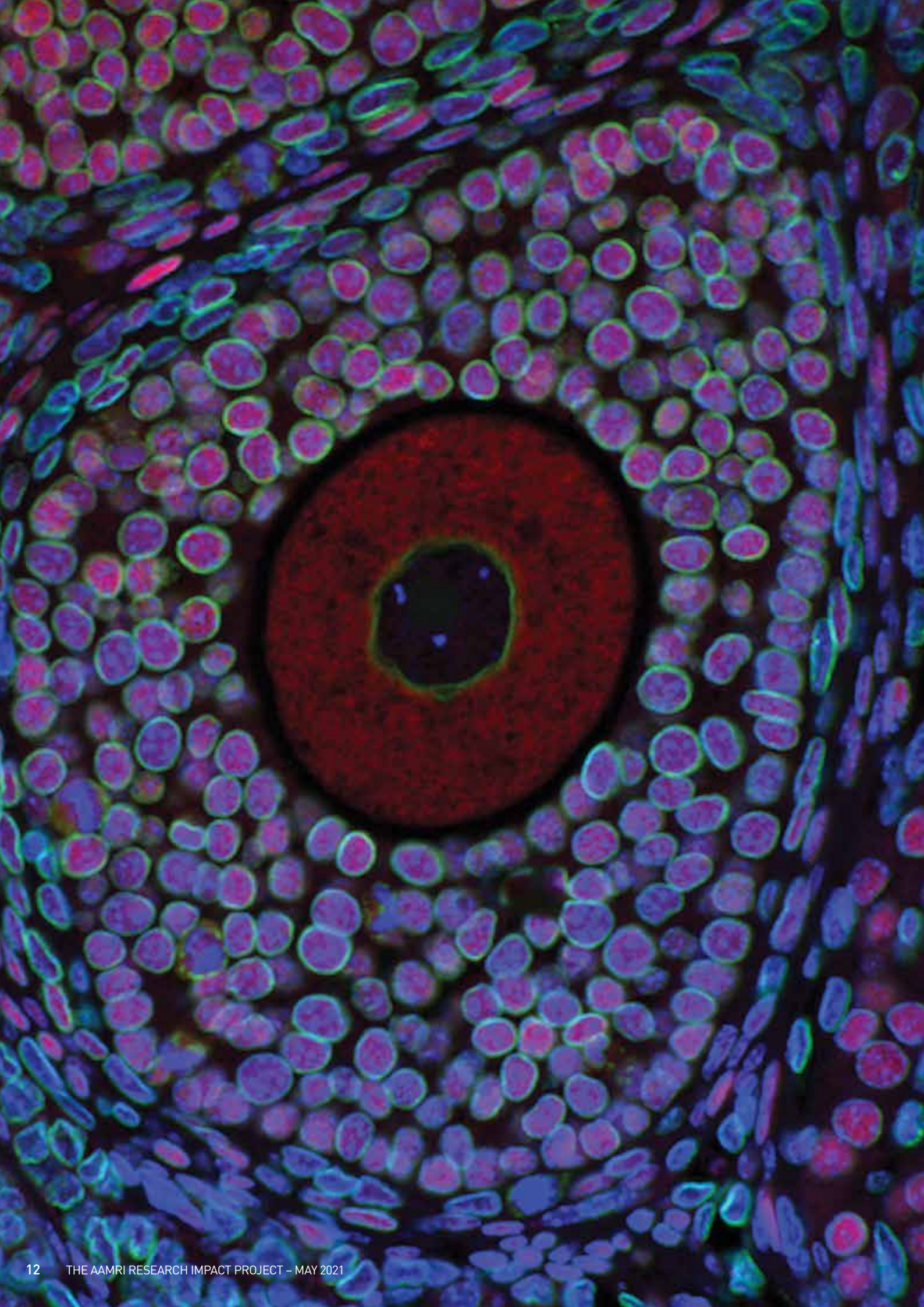
INDICATORS OF IMPACT

Advancing Knowledge

Advancing knowledge refers to measures of research quality, activity, and outreach. This includes: collaboration with other researchers, consumers and community, clinicians, health services, government, industry and not-for-profit organisations; sharing data and materials; and communicating with different audiences through various channels.

A total of 40 indicators were included in the advancing knowledge category for the Delphi method research process, with 19 of these reaching consensus for inclusion in the Research Impact Framework (see Table 3).

Table 3: Advancing knowledge indicators rated as 'Strongly agree' or 'Agree' for inclusion in the Research Impact Framework by at least 80% of participants

Advancing knowledge
Quality indicators
Citations over 10 years
Editorials by journals and/or publishers which highlight important papers *E.g., Reputable sources such as F100, open access repositories*
Invitation to deliver keynote/plenary lectures
Invitations to write commentaries and reviews
Prizes/awards *E.g., National and international research excellence, innovation, and contribution*
Proportion of peer-reviewed outputs in top 10% of journals in the field
Research cited in textbooks
Total Field Weighted Citation Impacts or equivalent
Activity indicators
Citations of work in research papers from other disciplines *E.g., Allied or relevant discipline outside immediate field as evidence of broader impact of knowledge contribution*
Proportion of publications as first and/or senior author
Reports – commissioned
Outreach indicators
Consumer and community awareness
Grants with research implementation organisation as Chief Investigator / partner organisation
Invited oral presentations to academic audiences
Oral presentations to consumers and community
Presentations to government
Proportion of projects involving consumers and community
Scientific workshops delivered to external parties
Training provided to organisations with the goal of improving health

Research Capacity Building

Research capacity building refers to developing researchers and research infrastructure.

A total of 20 indicators were included in the research capacity building category, with 14 of these reaching consensus for inclusion in the Research Impact Framework (see Table 4).

Table 4: Research capacity building indicators rated as 'Strongly agree' or 'Agree' for inclusion in the Research Impact Framework by at least 80% of participants

Research capacity building
Personnel indicators
Formal mentorship of researchers
Graduated research students in health-related subjects
Leading collaborative networks *E.g., Collaborating with other researchers or industries/organisations to build researcher capacity*
Number of external researchers at institute as part of an exchange or visiting scholar program
Number of research staff that are practising health professionals *E.g., Clinician, allied health professional, community nurse*
Number of research student completions (PhD, Masters, Honours)
Participation in collaborative networks *E.g., Collaborating with other researchers or industries/organisations to build researcher capacity*
Research training for non-researchers *E.g., Clinicians, allied health professionals, community members, consumers*
Staff participating in professional development to improve skills *E.g., Research or research management skills*
Infrastructure indicators
Infrastructure for the sharing of materials *E.g., Biobanks, registries*
Sector building indicators
Engagement with external organisations *E.g., Planned, purposeful and meaningful engagement with external organisations of relevance to MRI's focus with the goal of building research capacity, such as pharmaceutical and biotech industries, government, peak body organisations*
Members on funding review panels
Researchers on external infrastructure committees
Researchers on external scientific committees

Informing Decision Making

Informing decision making refers to decisions about health and healthcare, including public health and social care, decisions about future research investment, and decisions by the public.

A total of 11 indicators were included in the informing decision making category, with all of these reaching consensus for inclusion in the Research Impact Framework (see Table 5).

Table 5: Informing decision making indicators rated as 'Strongly agree' or 'Agree' for inclusion in the Research Impact Framework by at least 80% of participants

Informing decision making
Health and wellbeing indicators
Changes to guidelines and policy outside of health
Clinical practice changes informed by research
Formal partnerships with organisations that action change *E.g., Government, industry, not-for-profit organisations*
Involvement in external decision-making groups (including community groups)
Other practice changes informed by research
Policy changes informed by research
Provided research expertise
Research cited in ongoing health professional education material (health-related education)
Research informed development of and/or changes to guidelines
Research indicators
Consultancies
Journal editorships

Health Impacts

Health impacts refer to improvements in health status, determinants of health including individual risk factors and environmental determinants, and the health system.

A total of 24 indicators were included in the health impacts category, with 21 of these reaching consensus for inclusion in the Research Impact Framework (see Table 6).

Table 6: Health impacts indicators rated as 'Strongly agree' or 'Agree' for inclusion in the Research Impact Framework by at least 80% of participants

Health impacts
Improved health status indicators
Disability-adjusted life years
Improved environmental determinants of health *E.g., Reduction in air or water pollution levels*
Patients upskilled in self-care
Patient-reported outcomes measures
Quality-adjusted life years
Reduction in modifiable risk factors such as smoking and alcohol consumption
Reduced mortality and morbidity
Potential years life lost
Health system improvements indicators
Clinical guideline adopted
Clinical tools developed *E.g., Decision support tools, web-based tools for patients*
Health policy or program adopted
Improved effectiveness and efficiency of services or treatments
Improved patient-reported compliance
Improved patient-reported satisfaction
Activity indicators
Clinical intervention studies *E.g., Trials*
Population-level intervention and implementation studies and trials
Health products indicators
Approved devices
Approved therapeutic, diagnostic or prophylactic product
Certification of products and programs (not just under regulatory approval) *E.g., Therapeutic, diagnostic or prophylactic products; Certification of products and programs*
Software product *E.g., Phone app*
Training and education products delivered *E.g., For researchers, clinicians, health services, Government, industry, not-for-profit organisations, consumers and community with consideration of level of uptake*

Economic Impacts

Economic impacts refer to commercialisation events, reducing healthcare costs and socio-economic benefits.

A total of 13 indicators were included in the economic impact category, with all of these reaching consensus for inclusion in the Research Impact Framework (see Table 7).

Table 7: Economic impacts indicators rated as 'Strongly agree' or 'Agree' for inclusion in the Research Impact Framework by at least 80% of participants:

Economic impacts
Activity indicators
Improved efficiency of health service delivery
Improved productivity due to research innovations *E.g., Reduced illness or injury*
Job creation *E.g., Employment of researchers, health professionals*
Reduced healthcare costs
Commercialisation indicators
Company creation
Contract research
Government grants to aid commercialisation
Income from intellectual property
Investment from an industry partner (excl. contract research)
Licensing income
Patent licences
Product or service sales
Raising funding from venture capital or other commercial sources

Social Impacts

Social impacts refer to improvements in the health of society, including the welfare and wellbeing of the end users of research and the community.

A total of 10 indicators were included in the social impacts category, with nine of these reaching consensus for inclusion in the Research Impact Framework (see Table 8).

Table 8: Social impacts indicators rated as 'Strongly agree' or 'Agree' for inclusion in the Research Impact Framework by at least 80% of participants:

Social impacts
Indicators
Changes in behaviours and attitudes
Improved ability to access healthcare services
Improved ability to participate in paid or unpaid occupations
Improved ability to participate socially
Improved health literacy among the community
Improved linkage with peer support organisations *E.g., Advocacy groups*
Improved social determinants of health *E.g., New public health education campaigns, improved social support networks*
Improved social equity, inclusion or cohesion
Reductions in stigma *E.g., Related to mental health, sexuality, race/ethnicity etc.*

Impact Practices

Impact practices promote the translation of research into impacts. These can be present at multiple levels including individual (e.g., collaborating with community organisations), team (e.g., planning for research impact in projects) and organisation (e.g., professional services providing support and training to teams and individual researchers around planning for their research impact).

A total of 12 impact practices were included in the Delphi research method surveys, with 11 of these reaching consensus as activities considered effective in facilitating research impact at an organisational level in the health and medical research sector (see Table 9).

Table 9: Impact practices rated as 'Strongly agree' or 'Agree' for effectiveness in facilitating research impact at an organisational level in the health and medical research sector by at least 80% of participants:

Impact practices
Functional structures within MRIs that drive commercial and non-commercial/public good translation
Funding for discovery research *E.g., Innovative/new research ideas with no supporting data that don't fit traditional grant schemes, basic research*
Initiatives for improving engagement *E.g., With end users of research and the community*
Initiatives for improving research collaboration
Internal professional services for core research activities *E.g., Clinical trials, commercialisation, grants administration, communications*
Linking impact activity to researcher Key Performance Indicators
Research impact-focused organisational culture
Research translation-specific funding
Support for collaborating with organisations that action change *E.g., Government, industry, not-for-profit*
Training and access to resources for research impact assessment
Training and professional development *E.g., Knowledge translation training, communicating your research findings*
Training and support programs for Aboriginal and Torres Strait Islander health research

The excluded indicators that did not reach consensus among participants are included in Appendix C: AAMRI Research Impact Framework – excluded indicators.

CONCLUSIONS

THE AAMRI RESEARCH IMPACT FRAMEWORK PROVIDES THE FIRST AGREED SET OF INDICATORS AND PRACTICES FOR USE IN THE AUSTRALIAN HEALTH AND MEDICAL RESEARCH SECTOR, AND IS THE FIRST STEP IN ESTABLISHING A COMMON LANGUAGE TO DESCRIBE THE CONTRIBUTIONS THAT RESEARCH AND RESEARCHERS MAKE TO A WIDE RANGE OF IMPACTS.

The AAMRI Research Impact Framework creates a common language for understanding and communicating the impacts of health and medical research. It was developed with input from Australian medical research institutes using a Delphi process, and in consultation with key stakeholders from health and medical research organisations, funders of research, government, industry and community organisations.

This study affirms that medical research institutes across Australia and their stakeholders value the diverse indicators of impact that give value to all parts of the research journey, from advancing knowledge to social impacts.

Results from Phase 1 of the project showed that organisations highly value assessing the impact of research at any stage of the research process for accountability and advocacy, and that there is good alignment of these expectations across organisation types, including research organisations and their funders. The majority of respondents agreed that the main purpose of a framework is to identify 'standardised metrics for reporting to external stakeholders including government and funding agencies'.

The AAMRI Research Impact Framework was developed based on the Canadian Academy of Health Sciences Research Impact Framework, and includes 87 indicators that nearly half of the medical research institutes in AAMRI agree are relevant indicators of impact.

The Framework is divided into six categories for demonstrating research impact:
• Advancing knowledge
• Research capacity building
• Informing decision making
• Health impacts
• Economic impacts
• Social impacts

Each category includes a list of indicators that can be used to demonstrate progress towards, or having achieved, research impact. Suggested indicator units and data sources are included for each of the indicators provided.

The indicators included in the Framework have reached a high level of consensus across the sector; however, the Framework does not need to be used in its entirety by an organisation - not all the indicators included in the Framework will be applicable to all research organisations, with different indicators suiting different organisations and different purposes. For example, traditional academic quality and activity indicators of advancing knowledge may be appropriate for one research organisation, while outreach indicators, such as media mentions and number of implementation projects, may be more appropriate for others.

A further 31 indicators did not reach consensus in the Delphi process and were excluded from the Framework. However, it should be noted that these indicators may be relevant for some organisations or some research programs and should not be completely disregarded. Almost all MRIs agreed on the inclusion of all the practices proposed to improve the progress of research towards impact, with the exception of incentivising impact through awards and prizes. We anticipate that as the sector increases its knowledge and understanding of what constitutes good impact practices that the Framework will be reviewed and refined accordingly.

Practices within research organisations that enable research impact are vital to achieving research impact and should be considered when developing and implementing an organisational research impact strategy or assessment methodology. We look forward to working with the sector to further explore these practices and how they can be supported within organisations and across the medical research community.

The AAMRI Research Impact Framework provides the first agreed set of indicators and practices for use in the Australian health and medical research sector, and is the first step in establishing a common language to describe the contributions that research and researchers make to a wide range of impacts.

CONCLUDING COMMENTS FROM THE PROJECT TEAM

We are thrilled that so many individuals and organisations contributed to the success of this project. We hope that the AAMRI Research Impact Framework will provide a solid foundation for productive conversations within research organisations, and with external stakeholders, about how to best support the translation of research towards impact.

Our engagement across the sector during the project delivery phase gave us confidence that medical research institutes are keen to continue the conversation about how to understand the success of medical research in a way that is aligned with the expectations of stakeholders and partners. As the Framework is applied and evolves to represent the different interests of organisations, we anticipate that the sector will learn more about the effectiveness of practices that promote the translation of research into impact.

We warmly invite you to stay involved – the AAMRI Research Impact Working Group is growing a community of practice through the AAMRI network, and will share knowledge and resources to help the sector achieve and understand its impact, and improve how we communicate our achievements with clarity and purpose.

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APPENDIX A: THE CANADIAN ACADEMY OF HEALTH SCIENCES (CAHS) RESEARCH FRAMEWORK LOGIC MODEL OF HEALTH RESEARCH PROGRESSION TO IMPACTS

https://cahs-acss.ca/wp-content/uploads/2011/09/ROI_FullReport.pdf
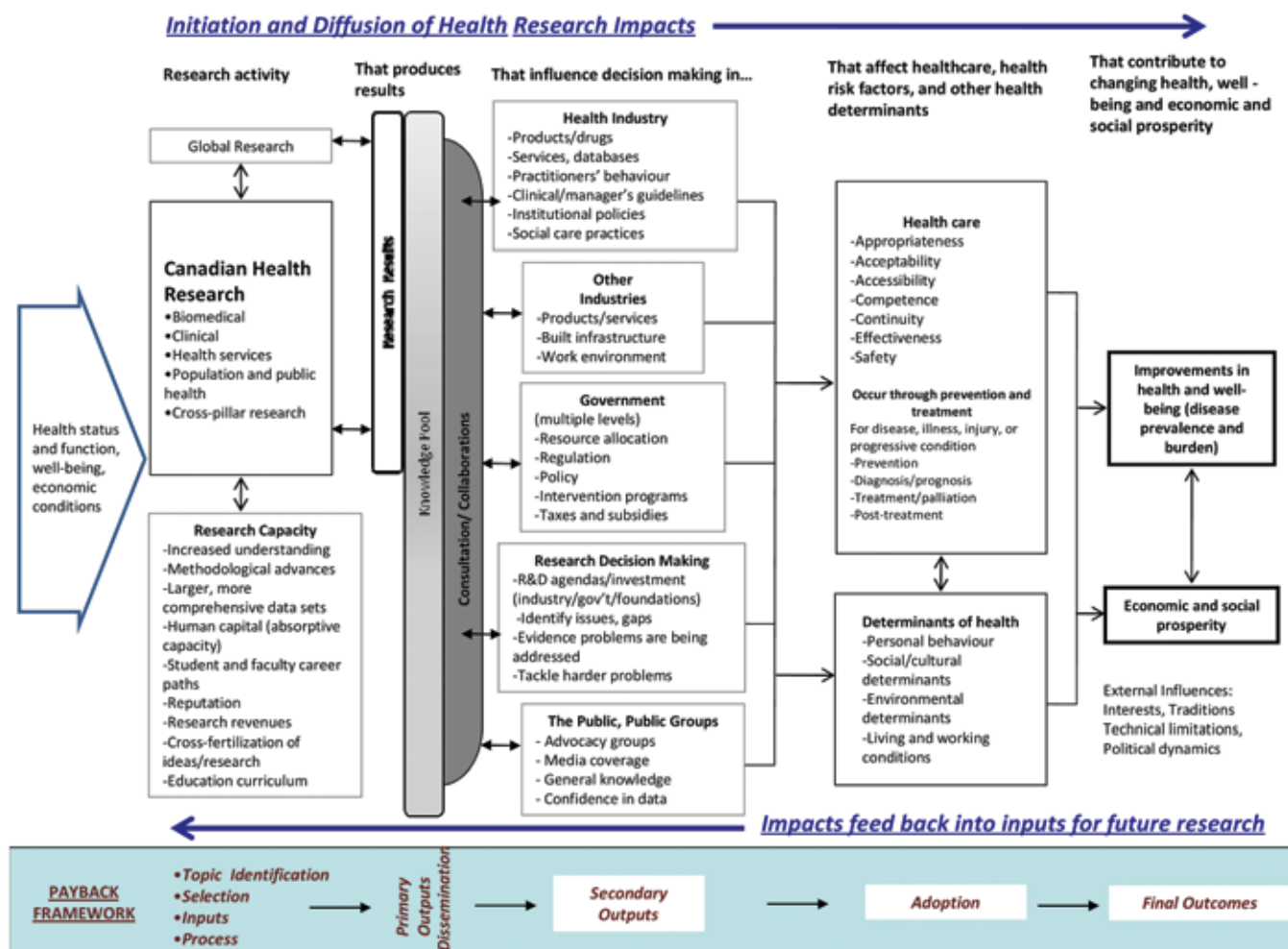
APPENDIX B: THE AAMRI RESEARCH IMPACT FRAMEWORK

Each of the six research impact categories include a list of indicators that can be used to demonstrate progress towards, or having achieved, research impact. Suggested indicator units and data sources are included for each of the indicators provided.

Advancing Knowledge

Advancing knowledge refers to measures of research quality, activity, and outreach. This includes collaboration with other researchers, consumers and community, clinicians, health services, government, industry and not-for-profit organisations; sharing data and materials; and communicating with different audiences through various channels.

Advancing knowledge		
Quality indicators	**Indicator unit**	**Data source**
Citations over 10 years	#	Analytics provider
Editorials by journals and/or publishers which highlight important papers *E.g., Reputable sources such as F100, open access repositories*	#	Researcher
Invitations to deliver keynote/plenary lectures	# and/or Descriptor	Researcher
Invitations to write commentaries and reviews	#	Researcher
Prizes/awards *E.g., National and international research excellence, innovation, and contribution*	# and/or Descriptor	Researcher
Proportion of peer-reviewed outputs in top 10% of journals in the field	% and/or #	Analytics provider
Research cited in textbooks	#	Publication/institutional database
Total Field Weighted Citation Impacts or equivalent	#	Analytics provider
Activity indicators	**Indicator unit**	**Data source**
Citations of work in research papers from other disciplines *E.g., Allied or relevant discipline outside immediate field as evidence of broader impact of knowledge contribution*	#	Researcher and/or institutional database
Proportion of publications as first and/or senior author	#	Publication database and/or Researcher
Reports – commissioned	#	Researcher
Outreach indicators	**Indicator unit**	**Data source**
Consumer and community awareness	%	Analysis
Grants with research implementation organisation as CI / partner organisation	#	Researcher
Invited oral presentations to academic audiences	#	Researcher
Oral presentations to consumers and community	# and/or Descriptor	Researcher
Presentations to government	#	Researcher
Proportion of projects involving consumers and community	%	Researcher
Scientific workshops delivered to external parties	#	Researcher
Training provided to organisations with the goal of improving health	# and/or Descriptor	Researcher and/or HR

Research Capacity Building

Research capacity building refers to developing researchers and research infrastructure.

Research capacity building		
Personnel indicators	**Indicator unit**	**Data source**
Formal mentorship of researchers	# and/or Descriptor	Researcher and/or HR
Graduated research students in health-related subjects	#	Student Services
Leading collaborative networks *E.g., Collaborating with other researchers or industries/organisations to build researcher capacity*	# and/or Descriptor	Researcher
Number of external researchers at institute as part of an exchange or visiting scholar program	#	Researcher and/or HR
Number of research staff that are practising health professionals. Health professionals are those individuals that in addition to their research roles, work directly with patients or community to improve their health or wellbeing *E.g., Clinician, allied health professional, community nurse*	#	Researcher and/or HR
Number of research student completions (PhD, Masters, Honours)	#	Student Services
Participation in collaborative networks *E.g., Collaborating with other researchers or industries/organisations to build researcher capacity*	# and/or Descriptor	Researcher
Research training for non-researchers *E.g., Clinicians, allied health professionals, community members, consumers*	# and/or Descriptor	Researcher and/or HR
Staff participating in professional development to improve skills *E.g., Research or research management skills*	%	Researcher
Infrastructure indicators	**Indicator unit**	**Data source**
Infrastructure for the sharing of materials *E.g., Biobanks, registries*	Descriptor	Researcher
Sector building indicators	**Indicator unit**	**Data source**
Engagement with external organisations *E.g., Planned, purposeful and meaningful engagement with external organisations of relevance to MRI's focus with the goal of building research capacity, such as pharmaceutical and biotech industries, government, peak body organisations*	# and/or Descriptor	Researcher
Members on funding review panels	#	Researcher
Researchers on external infrastructure committees	#	Researcher
Researchers on external scientific committees	#	Researcher

Informing Decision Making

Informing decision making refers to decisions about health and healthcare, including public health and social care, decisions about future research investment, and decisions by the public.

Informing decision making		
Health and wellbeing indicators	**Indicator unit**	**Data source**
Changes to guidelines and policy outside of health	# and/or Descriptor	Researcher
Clinical practice changes informed by research	# and/or Descriptor	Researcher and/or institutional data
Formal partnerships with organisations that action change *E.g., Government, industry, not-for-profit organisations*	# and/or Descriptor	Researcher
Involvement in external decision-making groups (including community groups)	#	Researcher
Other practice changes informed by research	# and/or Descriptor	Researcher and/or institutional data
Policy changes informed by research	# and/or Descriptor	Researcher and/or institutional data
Provided research expertise	# and/or Descriptor	Researcher
Research cited in ongoing health professional education material (health-related education)	#	Researcher
Research informed development of and/or changes to guidelines	# and/or Descriptor	Researcher and/or institutional data
Research indicators	**Indicator unit**	**Data source**
Consultancies	# and/or Descriptor	Researcher
Journal editorships	#	Researcher

Health Impacts

Health impacts refer to improvements in health status, determinants of health including individual risk factors and environmental determinants, and the health system.

Health impacts		
Improved health status indicators	**Indicator unit**	**Data source**
Disability-adjusted life years	Case study/analyses	Health economist, researcher and/or evaluation
Improved environmental determinants of health *E.g., Reduction in air or water pollution levels*	Case study/analyses	Health economist, researcher and/or evaluation
Patients upskilled in self-care	Case study/analyses	Health economist, researcher and/or evaluation
Patient-reported outcomes measures	Case study/analyses	Health economist, researcher and/or evaluation
Quality-adjusted life years	Case study/analyses	Health economist, researcher and/or evaluation
Reduction in modifiable risk factors such as smoking and alcohol consumption	Case study/analyses	Researcher and/or evaluation
Reduced mortality and morbidity	Case study/analyses	Researcher and/or evaluation
Potential years life lost	Case study/analyses	Health economist, researcher and/or evaluation
Health system improvements indicators	**Indicator unit**	**Data source**
Clinical guideline adopted	Descriptor	Researcher
Clinical tools developed *E.g., Decision support tools, web-based tools for patients*	# and/or Descriptor	Researcher
Health policy or program adopted	Case study/analyses	Researcher
Improved effectiveness and efficiency of services or treatments	Case study/analyses	Health economist, researcher and/or evaluation
Improved patient-reported compliance	Case study/analyses	Health economist, researcher and/or evaluation
Improved patient-reported satisfaction	Case study/analyses	Researcher and/or evaluation
Activity indicators	**Indicator unit**	**Data source**
Clinical intervention studies *E.g., trials*	# and/or Descriptor	Researcher
Population-level intervention and implementation studies and trials	# and/or Descriptor	Researcher

Health impacts		
Health products indicators	**Indicator unit**	**Indicator unit**
Approved devices	# and/or Descriptor	Researcher
Approved therapeutic, diagnostic or prophylactic product	# and/or Descriptor	Researcher
Certification of products and programs (not just under regulatory approval) *E.g., Therapeutic, diagnostic or prophylactic products*	# and/or Descriptor	Researcher
Software product *E.g., phone app*	# and/or Descriptor	Researcher
Training and education products delivered *E.g., For researchers, clinicians, health services, government, industry, not-for-profit organisations, consumers and community with consideration of level of uptake*	# and/or Descriptor	Researcher

Economic Impacts

Economic impacts refer to commercialisation, reducing healthcare costs and socio-economic benefits.

Economic impacts		
Activity indicators	**Indicator unit**	**Data source**
Improved efficiency of health service delivery	Analyses $	Health economist, researcher and/or evaluation
Improved productivity due to research innovations *E.g., Reduced illness or injury*	Analyses $	Health economist, researcher and/or evaluation
Job creation *E.g., Employment of researchers, health professionals*	Analyses $	Health economist, researcher and/or evaluation
Reduced healthcare costs	Analyses $	Health economist, researcher and/or evaluation
Commercialisation indicators	**Indicator unit**	**Data source**
Company creation	# startups # employees Case study	Institutional data
Contract research	$	Finance
Government grants to aid commercialisation	$	Grants Management System and/or Finance
Income from intellectual property	$	Finance
Investment from an industry partner (excl. contract research)	$	Finance
Licensing income	$	Finance
Patent licences	#	Institutional data
Product or service sales	$	Finance
Raising funding from venture capital or other commercial sources	$	Research Development and/or Finance

Social Impacts

Social impacts refer to improvements in the health of society, including the welfare and wellbeing of the end users of research and the community.

Social impacts	Indicator unit	Data source
Changes in behaviours and attitudes	Case study/analyses	Researcher and/or social research evaluation
Improved ability to access healthcare services	Case study/analyses	Researcher and/or social research evaluation
Improved ability to participate in paid or unpaid occupations	Case study/analyses	Researcher and/or social research evaluation
Improved ability to participate socially	Case study/analyses	Researcher and/or social research evaluation
Improved health literacy among the community	Case study/analyses	Researcher and/or social research evaluation
Improved linkage with peer support organisations *E.g., Advocacy groups*	Case study/analyses	Researcher and/or social research evaluation
Improved social determinants of health *E.g., New public health education campaigns, improved social support networks*	Case study/analyses	Researcher and/or social research evaluation
Improved social equity, inclusion or cohesion	Case study/analyses	Researcher and/or social research evaluation
Reductions in stigma *E.g., Related to mental health, sexuality, race/ethnicity etc.*	Case study/analyses	Researcher and/or social research evaluation

Impact Practices

Impact practices promote the translation of research into impacts. These can be present at multiple levels including individual (e.g., collaborating with community organisations), team (e.g., planning for research impact in projects) and organisation (e.g., professional services providing support and training to teams and individual researchers around planning for their research impact).

Impact practices
Funding for discovery research *E.g., Innovative/new research ideas with no supporting data that don't fit traditional grant schemes, basic research*
Functional structures within MRIs that drive commercial and non-commercial/public good translation
Initiatives for improving engagement *E.g., With end users of research and the community*
Initiatives for improving research collaboration
Internal professional services for core research activities *E.g., Clinical trials, commercialisation, grants administration, communications*
Linking impact activity to researcher Key Performance Indicators
Research impact-focused organisational culture
Research translation-specific funding
Support for collaborating with organisations that action change *E.g., Government, industry, not-for-profit*
Training and access to resources for understanding research impact
Training and support programs for Aboriginal and Torres Strait Islander health research
Training and professional development *E.g., Knowledge translation training, communicating your research findings*

APPENDIX C: AAMRI RESEARCH IMPACT FRAMEWORK – EXCLUDED INDICATORS

Advancing knowledge		
Quality indicators	**Indicator unit**	**Data source**
Book chapters published	#	Publication/institutional database
Greater than 100 citations over 10 years	#	Analytics provider
Textbooks published	#	Publication/institutional database
Activity indicators	**Indicator unit**	**Data source**
Citations in patents	#	Researcher and/or institutional database
Expenditure on Direct Research Costs	$	Financial data
Proportion of publications with industry/end users of research	#	Publication database and/or researcher
Proportion of publications with international collaborators	#	Researcher
Publication counts	#	Publication database and/or researcher
Reports – uncommissioned	#	Researcher
Research projects with external collaborators *E.g., International and national researchers, consumers, clinicians, health services, government, industry, not-for-profit organisations*	%	Researcher
Sharing data *E.g., Data sets including clinical research data; population-level health data; government data linkage; genome sequences; sharing data for use in other studies, publishing purposes, secondary analyses*	Descriptor	Researcher
Outreach indicators	**Indicator unit**	**Data source**
Grey literature for consumers and community	#	Researcher
Hits on websites providing health and medical information (non-academic)	#	Communications and/or database
Media mentions of research in newsprint (incl. digital version of newsprint)	#	Communications and/or researcher
Media mentions of research on TV	#	Communications and/or researcher
Number of implementation projects *E.g., Application of research findings and other evidence-based practices into practice*	#	Researcher and/or grants management database
Number of intervention projects *E.g., Clinical, public health, health promotion/education*	#	Researcher and/or grants management database
Open access journal publications	#	Publications provider
Proportion of publications with Altmetric score >10 *E.g., Number of times a research output gets cited, tweeted about, liked, shared, bookmarked, viewed, downloaded, mentioned, favourited, reviewed, or discussed*	%	Communications team, researcher, and/ or databases
Social media mentions	#	Communications team and/or researcher
Use of resources shared *E.g., Tools, products, services*	Testimonial	Researcher

Research capacity building		
Personnel indicators	**Indicator unit**	**Data source**
Number of PhD student scholarships on grant applications	#	Researcher
Number of research staff	#/FTE	HR
Number of research staff embedded (permanently or temporarily) with health organisations	# and/or Descriptor	Researcher and/or HR
Number of research staff that are community practitioners	# and/or Descriptor	Researcher and/or HR
Infrastructure indicators	**Indicator unit**	**Data source**
Infrastructure funding	$	Finance
Provision of services or technology to external organisations	# external users	Researcher and/or institutional database
Sector building indicators		
N/A		

Informing decision making		
Health and wellbeing indicators		
N/A		
Research indicators		
N/A		

Health impacts		
Improved health status indicators	**Indicator unit**	**Data source**
Multi-disciplinary engagement or activity	Descriptor	Researcher
Health system improvements indicators	**Indicator unit**	**Data source**
Reduced waiting times	Case study/analyses	Health economist, researcher and/or evaluation
Activity indicators		
N/A		
Health products indicators	**Indicator unit**	**Data source**
Services provided *E.g., health/clinical services – in-kind or paid*	# and/or Descriptor	Researcher

Economic impacts		
Activity indicators		
N/A		
Commercialisation indicators		
N/A		

Social impacts indicators	Indicator unit	Data source
Improved help-seeking among the community *E.g., Accessing mental health support*	Case study/analyses	Researcher and/or social research evaluation

Impact practices		
Incentives *E.g., Awards and prizes for high-quality publications and reports, consumer and community involvement in research*		

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