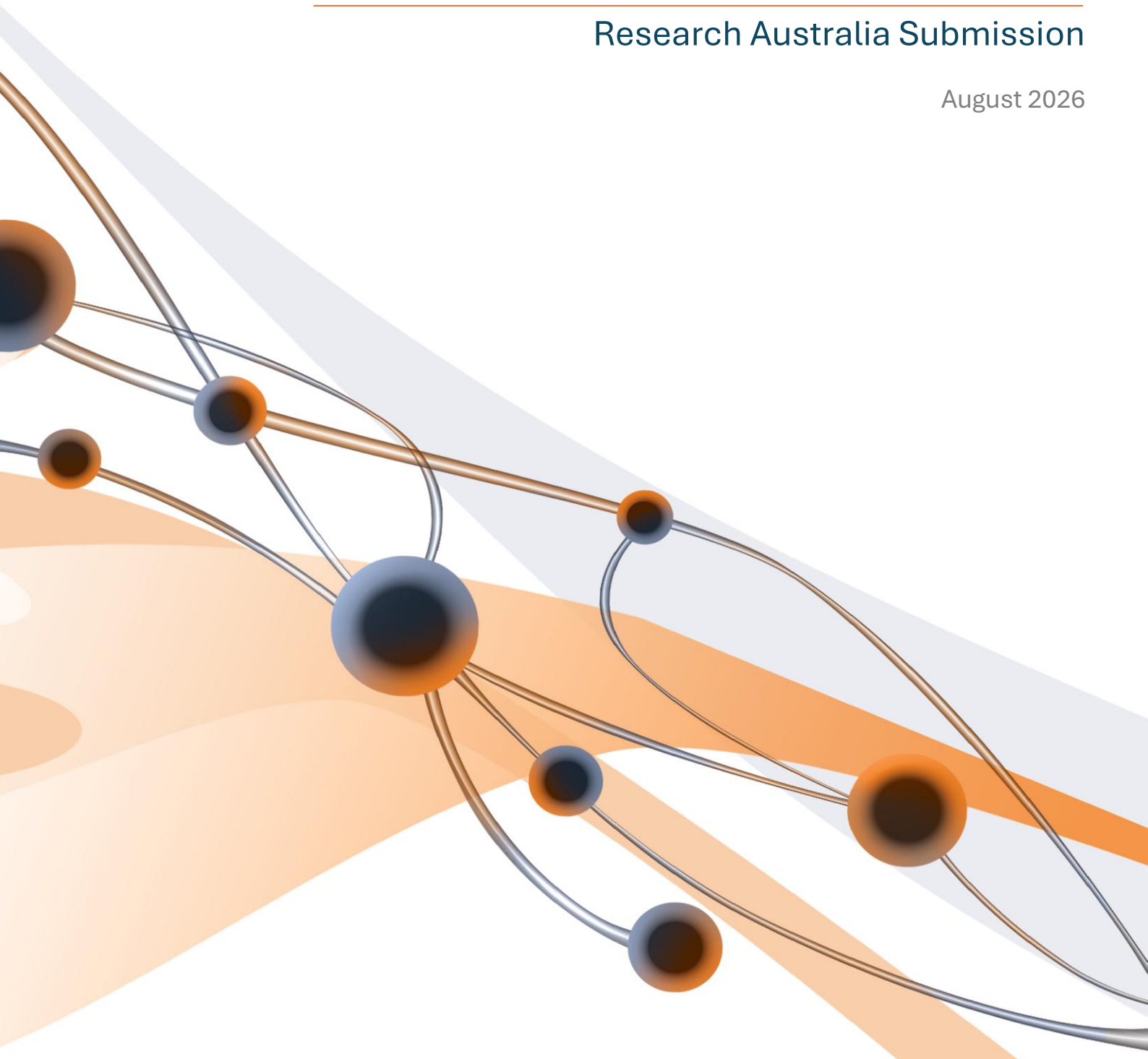
Response to the Medical Research Future Fund (MRFF) Australian Medical Research and Innovation Strategy and Priorities Consultation

Research Australia Submission

August 2026



RESEARCH AUSTRALIA

Championing Australian health & medical research & innovation

1. Introduction

Research Australia is the national peak for the health and medical research and innovation sector. Our membership is drawn from the whole pipeline of HMR, from universities and medical research institutes to charities and patient groups, and health care providers and companies commercialising new health technologies. Our priorities include smarter investment and value realisation for the sector, health innovation, supporting a skilled and enabled research and innovation workforce and advancing health equity.

2. Response to survey questions

Vision

Does the proposed Vision best position the MRFF to transform health and medical research and innovation in Australia over the next five years?

Research Australia supports the proposed Vision, "Transforming health through research excellence and lasting impact" as an appropriate evolution of the MRFF's purpose.

However, the Vision does not yet sufficiently articulate equity and the systemic change required to achieve transformational outcomes. Research Australia recommends that the Vision explicitly recognise the need for a collaborative, equitable and impact-focused research ecosystem that addresses structural inequities and supports coordinated national research priorities to be translated into improved health systems and/or commercial opportunities.

To realise the MRFF's full potential, the Vision should explicitly commit to equity Australia's research ecosystem continues to be shaped by structural inequities, including the historical underrepresentation of women, gender-diverse people, First Nations people and regional, rural, remote and very remote communities in research. Without acknowledging these systemic barriers, the Vision risks reinforcing the status quo rather than driving meaningful reform.

The Vision should also recognise that the MRFF's purpose extends beyond generating research outcomes to strengthening Australia's sovereign capability across the entire translation and innovation pipeline—from discovery and clinical trials through to commercialisation, advanced manufacturing and health system implementation. As such, there should be focus on innovation – whether that be translation, or commercialisation.

This is supported by the evidence and role of the health and medical research being a strategic national investment rather than only discretionary expenditure. Evidence demonstrates that every $1 invested in Australian health and medical research returns approximately $4 to the economy through improved health outcomes, workforce participation, productivity gains and industry growth – the MRFF enables and contributes to this.

Strategic Objectives

Do the proposed Strategic Objectives set a clear and appropriate direction for delivering the MRFF Vision 2026-2031?

Yes

The proposed Strategic Objectives provide a strong foundation but should be strengthened to address structural barriers that limit research impact. Research Australia recommends:

Strengthen research translation: Support integrated pathways from discovery through to implementation and adoption in clinical practice. Embed gender-responsive reform: Include an explicit objective on gender equity in research, supported by the National Statement, to address longstanding evidence gaps relating to women, sex and gender.

Expand the RRR and very remote focus: Recognise the distinct strengths, opportunities and challenges of regional, rural, remote and very remote communities to improve research access and equitable health outcomes.

Recognise jurisdictions as key partners: Explicitly acknowledge states and territories as essential stakeholders and partners in health and medical research.

Provide predictable, long-term investment: Ensure stable funding for foundational research, linked to long-term economic growth measures such as GDP rather than CPI alone.

Increase longer-duration grants: Expand grants of five years or more to strengthen workforce stability and enable transformational research and translation.

Bridge the "valley of death": Provide dedicated support for late-stage clinical development, commercialisation and sovereign manufacturing to translate discoveries into market-ready solutions.

Support sustainable clinician-researcher careers: Establish longer funding cycles and clearer career pathways to strengthen workforce capacity and retention.

Build national data infrastructure: Underpin AI and digital health investment with nationally coordinated health data infrastructure that reduces duplication and addresses critical gaps.

Strengthen nationally driven priorities: pending evaluation, consider the mission model which could be used to drive national priorities, including being guided by burden of disease, to build enduring national capability. However, it is critical that Missions have clear, transparent measures focused on outcomes and impact – not outputs alone – including health, translation, clinical, commercial, societal and economic benefits.

Cross-cutting principles

Will the proposed cross-cutting principles support successful delivery of the MRFF Strategy 2026-2031?

Yes

The proposed principles provide a strong foundation but should be strengthened in several critical areas:

Strengthen consumer involvement: Adopt the National Statement on Consumer Engagement in Research and embed genuine partnership, co-design, shared governance and appropriate remuneration across the research lifecycle. Governance should also recognise the distinct but complementary roles of lived-experience contributors and representative, peak and advocacy organizations.

Embed intersectionality: Explicitly recognise how intersecting factors—including sex, gender, age, disability, cultural background, geography and socioeconomic status—shape health outcomes, research participation, translation and commercialisation. Addressing intersectional experiences of exclusion should be embedded across governance, priorities and workforce development rather than treated as an add-on.

Strengthen the equity focus: The Strategy currently lacks a specific focus on women's health, representing a critical gap that must be addressed to achieve true health equity. Prioritising women's health will ensure research and services are inclusive, responsive to diverse needs, and reduce disparities, ultimately fostering more equitable and effective health outcomes for all. The Strategy also lacks a specific focus on Regional, Rural, Remote and Very Remote communities, representing close to 30% of Australia's population. Explicit approaches designed for and by RRRvR need to be centred, not just access and adaptation to metro research and more broadly health and medical research.

Include and strengthen Australia's national and international obligations and commitments, such as to WHO or the UN: The Strategy lacks any mention of Australia's existing obligations to addressing health inequities that the MRFF could be more closely aligned with. For example, Australia has committed to the WHO goal to eliminate viral hepatitis as a public health threat by 2030.

Broaden partnerships and co-investment: Extend partnership mechanisms to include jurisdictions, industry and philanthropy, helping de-risk early-stage innovation and diversify investment.

Develop a blended capital model: Combine public, philanthropic and private funding with different risk, return and impact expectations to bridge the "valley of death" between discovery and translation.

Embed impact measurement: Establish clear impact measures to assess progress, inform strategic decisions and demonstrate health, societal and economic value.

Shared Enablers

Will the shared enablers support the successful delivery of the MRFF Strategy 2026-2031?

Yes

The proposed shared enablers are essential to a nationally integrated research system but should be strengthened. Research Australia recommends:

Restore ABS R&D data capability: Re-establish timely and comprehensive R&D data collection to address gaps identified by the Innovation Metrics Review and support evidence-based policy.

Develop a nationally coordinated health data framework: Establish a person-centred, privacy-preserving system that enables secure data linkage, interoperability and open science, while strengthening Australia's national data asset.

Establish structured partnership models: Better align MRFF and philanthropic investment to leverage funding, accelerate proof-of-concept research and improve translation.

Recognise clinical trials and research infrastructure as national assets: Embed innovative clinical trial design and delivery, research infrastructure and implementation capability as core components of the research ecosystem.

Support interoperable national research platforms: Enable seamless data sharing and collaboration across institutions, disciplines and jurisdictions.

Invest in implementation and commercialisation: Build capacity to translate discoveries into improved health services and commercial outcomes.

Strengthen Australia's Indo-Pacific leadership: Position Australia as a regional clinical trials and innovation hub through stronger international partnerships, attracting investment and supporting research collaboration.

Further feedback on the MRFF Strategy 2026-2031

Are there any additional issues or feedback on the proposed Strategy that have not been addressed above?

The Strategy would benefit from a whole-of-system approach that extends beyond research funding and aligns researchers, governments, jurisdictions, health services and industry.

Key priorities include:

Strengthen translation: Recognise implementation as a shared responsibility between researchers, jurisdictions and the health system, with clear pathways from research to practice.

Close commercialisation gaps: Build stronger domestic pathways for clinical development, manufacturing and commercialisation to retain more value in Australia.

Integrate HTA and reimbursement early: Embed adoption, reimbursement and market considerations into research design.

Use procurement to support innovation: Position government as a "first customer" for Australian-developed health technologies. Invest in clinical development and manufacturing: Strengthen advanced manufacturing and Phase III clinical trial capability in Australia.

Measure outcomes, not only outputs: Assess MRFF and other investments against health, social, economic, commercial and productivity impacts.

Strengthen strategic infrastructure and pathways: Consider an Australian equivalent of BARDA and leverage the Australian CDC as national research and health data infrastructure.

Expand international collaboration: Use opportunities such as Horizon Europe to diversify funding and strengthen global partnerships.

Reform university IP settings: Improve commercialisation pathways and support retention of Australian-developed innovations.

Develop blended capital models: Combine public, philanthropic and private investment to bridge the "valley of death" and accelerate translation.

We recommend AMRAB consider more explicit recommendations from Research Australia's previous publications and submissions:

- Policy Discussion Paper – Shaping the research workforce for tomorrow
- Policy Discussion Paper – Advancing health and medical research across RRRvR communities
- Shaping the Future of Australian Women's Health Research Roadmap Report
- Recognising Consumer' Contributions to Health Research

MRFF Priorities 2026-2028

Considering the proposed Priority 2026-2028 of AI in research and health systems, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 1:

Research Australia strongly supports this priority but recommends greater emphasis on responsible implementation. Additional elements should include:

Practical ethical governance frameworks for AI implementation transparent and explainable AI mechanisms to build and maintain public trust and social licence, including participatory approaches such as citizens' juries workforce capability to manage ethical, legal and cultural implications of AI evaluation of AI implementation within real-world clinical settings ensuring AI complements, rather than diminishes, the human relationship between clinicians and patients.

Considering the proposed Priority 2026-2028 of Integrated digital health systems, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 2:

Research Australia endorses this Priority and advocates for additional emphasis on the following key areas:

Development of nationally interoperable health data systems: Establishing a unified infrastructure that allows seamless data exchange and communication across all healthcare jurisdictions and institutions, thereby enhancing coordination and efficiency.

Integration of research within routine clinical care: Embedding research activities into everyday clinical practices to facilitate continuous learning, improve patient outcomes, and accelerate the translation of research findings into practice.

Real-time data sharing across jurisdictions: Enabling immediate access to relevant health data across different regions and agencies to support timely decision-making, emergency response, and coordinated care.

Consumer access, trust, and data governance: Prioritising the rights of consumers to access their health information. Strengthening data governance frameworks to ensure privacy, security, and ethical use of health data, thereby fostering public trust. Similar approaches to Indigenous data research methodologies could be adopted more broadly, with First Nations approaches leading the way.

Digital infrastructure supporting learning health systems and implementation research: Investing in robust digital platforms that underpin adaptive learning health systems, facilitating ongoing research, innovation, and the rapid implementation of evidence-based practices.

It is imperative that digital health initiatives transcend mere digitisation, aiming instead for continuous improvement in healthcare delivery. This involves leveraging digital tools to refine processes, enhance patient outcomes, and adapt to evolving healthcare needs.

They must incorporate:

- Consumer-controlled health information: Empowering individuals to manage and control their health data, fostering a sense of ownership and trust.
- Strong data governance and measures to build consumer trust
- Digital inclusion as a priority: Ensuring equitable access to digital health services for marginalised communities, thereby reducing disparities and promoting health equity across all populations.

Considering the proposed Priority 2026-2028 of Aboriginal and Torres Strait Islander community governed and directed research, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 3:

Research Australia strongly supports this priority and the commitment to community-governed and self-determined research and also acknowledges the strengths and expertise within First Nation communities to drive this.

The Priority should place greater emphasis on long-term investment in Aboriginal and Torres Strait Islander research leadership, workforce development and research capability within

communities. This includes sustained support for First Nations' led research organisations, whether they be stand alone, or embedded in other First Nations led organisations.

Furthermore, increased support to Aboriginal Community Controlled Organisations and peaks through dedicated research infrastructure, permanent research coordination positions, and long-term partnerships that extend beyond project-based funding should be prioritised. Investment should focus on building enduring research capability rather than short-term projects.

Additionally, it should strengthen community-controlled research infrastructure and ensure that translation pathways lead to tangible improvements in health outcomes. Indigenous leadership should be embedded across governance, priority setting, implementation and evaluation, with genuine partnerships that enable communities to determine research priorities and measures of success. The Priority should also explicitly recognise Indigenous Data Sovereignty and align with the Closing the Gap Priority Reforms.

Research Australia recommends greater support for place-based research partnerships, culturally safe translation and implementation, and community-led evaluation frameworks. These measures are essential to ensure that research delivers measurable benefits for Aboriginal and Torres Strait Islander communities.

While this Priority focuses on Aboriginal and Torres Strait Islander community-governed research, Research Australia also notes the importance of ensuring equitable implementation of research outcomes to First Nations people who experience more entrenched exclusion, due to intersectional experiences of discrimination within research and across the health system – for example, First Nations women with disability.

MRFF Priorities 2026-2028 (Part 2)

Considering the proposed Priority 2026-2028 of Advanced therapeutics and emerging technology, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 4:

Research Australia recommends strengthening this priority by emphasising the critical role of translation within Australia's healthcare system and its broader economic impact. To achieve this, the following elements should be incorporated:

- Development of sovereign manufacturing capabilities to ensure domestic production and supply security.
- Establishment of clear clinical implementation pathways to facilitate the integration of new therapies into routine healthcare practice.
- Advancement of regulatory science to streamline approval processes and support innovation.
- Provision of targeted support for the commercialisation of new therapies, ensuring they reach the market efficiently.

- Ensuring equitable access to advanced therapies across all populations, reducing disparities in healthcare.
- Building workforce capacity to adopt emerging technologies safely, effectively, and sustainably.

Furthermore, this priority should encompass the entire innovation continuum, extending beyond initial discovery to include the full spectrum of development and deployment. Key components include:

- Strengthening Australian manufacturing capacity to support end-to-end production.
- Supporting Phase III clinical development to validate the safety and efficacy of therapies at scale.
- Enhancing regulatory readiness to expedite approval processes.
- Facilitating reimbursement planning to ensure therapies are financially accessible.
- Providing ongoing commercialisation support to transition innovations from research to market.
- Securing sovereign supply chains to mitigate reliance on international sources.
- Developing government procurement mechanisms that accelerate the adoption and integration of Australian-developed therapies into healthcare systems.
- Implementing comprehensive evaluations of the cost-effectiveness and overall value of emerging therapies to inform policy and investment decisions.

This should all be undertaken with a focus on equity, with not only access across Australia, but also prioritising communities and industries that may have traditionally been excluded, for example Femtech.

Considering the proposed Priority 2026-2028 of Health impacts from environmental factors, including climate change, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 5:

These areas are critical to safeguarding Australia's future health resilience. To strengthen this focus, the following priorities should be explicitly recognised:

- The varying impacts of health determinants across different population groups, acknowledging that vulnerabilities and needs differ based on demographic, socio-economic, and geographic factors.
- The specific health and reproductive health impacts on women, ensuring targeted strategies address their unique needs.
- The mental health consequences resulting from climate-related events, such as natural disasters and extreme weather, which can significantly affect community well-being.

- Occupational and community exposures to environmental hazards, recognising the importance of safeguarding workers and communities from health risks associated with environmental and industrial pollutants.
- The particular challenges faced by rural, remote, and very remote communities, including limited access to healthcare services, infrastructure, and resources, which exacerbate health vulnerabilities. Similarly an approach to understanding the particular challenges (and also the strengths that could be utilised) by First Nations communities, people with disability and women, low socio-economic status, will ensure equity is embedded across both the Strategy and Priorities of MRFF.
- The resilience of health services, emphasising the need to strengthen healthcare infrastructure, workforce capacity, and emergency preparedness to ensure continuity of care during crises.
- The adoption of preventative approaches aimed at reducing future health burdens, including health promotion, early intervention, and policies addressing social determinants of health.

Considering the proposed Priority 2026-2028 of Multiomics-informed healthcare, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 6:

Research Australia emphasises the importance of strengthening enabling systems to ensure the successful implementation of precision medicine. These systems form the foundation for translating research into routine clinical practice and require coordinated investment across various sectors, including research, healthcare, and infrastructure. The key components include:

- Development of nationally coordinated biobanks, genomics and data infrastructure to facilitate large-scale research and data sharing. Map and leverage existing jurisdictional and institutional assets before scaling nationally to reduce duplication and identify gaps.
- Ensuring equitable access to precision medicine, allowing all population groups to benefit from advances regardless of socioeconomic status or geographic location.
- Building workforce capability through training and education to develop expertise in precision medicine and genomics.
- Integration of genomic and multiomics data into existing digital health systems to enable seamless clinical application and decision-making.
- Implementation of robust ethical governance frameworks and privacy protections to safeguard individual rights and foster public trust.
- Creation of effective translation pathways that expedite the movement of scientific discoveries from research settings into routine clinical care.

Research Australia further recommends that prioritisation should include:

- Expanding equitable access to genomic and multiomics technologies across all population groups.
- Developing diverse and representative reference datasets to improve accuracy and applicability of precision medicine across different demographics.
- Ensuring integration of genomic data within clinical care pathways to facilitate personalised treatment approaches.
- Strengthening ethical governance and data privacy measures to protect individuals and maintain public confidence.
- Fostering effective translation mechanisms to accelerate the adoption of innovations into standard healthcare practice.

MRFF Priorities 2026-2028 (Part 3)

Considering the proposed Priority 2026-2028 of Determinants of health, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 7:

Research Australia supports a broad understanding of the determinants of health. However, the priority should more explicitly recognise:

- social, environmental and commercial determinants of health
- cultural determinants of health and wellbeing
- prevention and early intervention
- health economics and productivity impacts
- community-led approaches
- cross-sector policy research that informs action beyond the health portfolio

Research focusing on determinants of health holds significant potential to enhance health outcomes and bolster national productivity. A life-course approach is essential for improving understanding of health inequities and developing more effective prevention strategies.

Research Australia recommends expanding this priority to explicitly include the following areas:

- Prevention and early intervention strategies to address health issues proactively and reduce long-term burdens.

- Social, environmental, and commercial determinants of health, recognising their influence on health disparities.
- Cultural determinants of health and wellbeing, particularly for First Nations peoples, recognising their influence on strengthening the health and wellbeing of First Nations peoples and communities.
- Health services research to optimise healthcare delivery and patient outcomes.
- The economic impact of chronic diseases on productivity, emphasising the importance of targeted interventions.
- Cross-sector policy research to foster collaboration across different areas influencing health.
- Economic evaluations of interventions aimed at reducing health inequities, ensuring cost-effective allocation of resources.

Considering the proposed Priority 2026-2028 of Embedding research in the health system, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 8:

Research Australia firmly endorses this strategic priority and advocates for the integration of research as a fundamental component of Australia's healthcare system, rather than treating it as a separate or peripheral activity.

Key areas for additional emphasis include:

Learning Health Systems: Developing and implementing systems that continuously generate and apply new knowledge to improve healthcare quality, efficiency, and outcomes.

Clinician-Researcher Career Pathways: Establishing and promoting clear career pathways for clinicians involved in research, to foster a sustainable workforce of clinician-researchers committed to evidence-based practice.

Embedded Research Positions within Health Services: Creating dedicated research roles within healthcare institutions to facilitate ongoing research activities, improve integration, and promote real-world evidence generation.

Evaluation of Health System Impact: Systematically assessing the outcomes and benefits derived from embedded research initiatives to demonstrate value and inform policy and practice improvements.

Incentives for Collaboration: Designing and implementing incentive structures that encourage active collaboration among researchers, health service providers, and industry stakeholders, thereby fostering innovation and translational research.

As noted in question 18, we pointed out that the current framework overly relies on researchers to ensure successful implementation, assuming health systems will automatically adopt research outcomes. It neglects the need for proactive strategies to facilitate translation into practice and overlooks shared responsibility between researchers, the health system and other stakeholders for effective implementation.

Considering the proposed Priority 2026-2028 of Skilled and sustainable health and medical research workforce, are there any important elements not captured in this Priority that should be included?

Additional elements are needed Priority 9:

We emphasise the importance of fostering workforce sustainability across the entire research ecosystem. A sustainable workforce requires predictable career pathways across the entire research ecosystem. Building upon insights from our comprehensive Policy Discussion Paper dedicated to: Workforce – Looking Ahead: Shaping the Research Workforce for Tomorrow, to achieve this, several key priorities have been identified:

Priority Area 1: Addressing job insecurity

Priority Area 2: Defining and measuring the research workforce

Priority Area 3: Taking a pipeline approach to capacity and capability development

Priority Area 4: Addressing systemic barriers for priority workforce cohorts

Priority Area 5: Developing research-active workplaces through organizational change

Priority Area 6: Addressing discrimination and embedding diversity, equity, and inclusion in workforce development

Priority Area 7: Valuing global research talent and collaboration

Specific recommendations include:

- Increase the availability of research grants of five years or longer.
- Establish national workforce planning and oversight. Develop a coordinated national approach to the HMRI workforce, and implement the Health and Medical Research Workforce Plan.
- Undertake a comprehensive annual HMRI Workforce Data Collection, working with agencies such as the ABS and Jobs and Skills Australia to better understand workforce composition, trends, skills needs and career pathways. Implement a biennial national survey of early- and mid-career researchers (EMCRs) to monitor their experiences and challenges.

- Establish centrally funded national professional development, mentoring and networking programs, alongside opportunities for industry and community secondments.
- Fund dedicated pathways to increase representation of priority populations throughout the research workforce.
- Implement a Consumer Recognition Framework that appropriately recognises and values the contribution of people with lived experience. Support clinician-researcher careers to provide more sustainable pathways for health professionals combining clinical practice and research.

Priority Populations

Are the proposed Priority Populations appropriate for guiding equity considerations across the proposed MRFF Priority 2026-2028?

No

Research Australia and its members are deeply concerned by the lack of mention or focus on girls and women (and gender diverse people) in both the Strategy and MRFF Priority 2026-2028. Without explicit mention, the sector will not be required to address historical and entrenched absences of research to address the inequities experienced due to women's health, which will ultimately enhance Australia's research excellence for all Australians.

Research Australia's report "Shaping the Future of Australian Women's Health Research Roadmap" could guide the MRFF Strategy and Priorities and include:

- Building the systems, infrastructure, and partnerships needed to connect research, practice and policy for consistent, high-quality outcomes.
- (Re)defining women's health so that we have a shared understanding of the broad scope of women's health.
- (Re)-empowering the community to ensure research is shaped by the voices and lived experiences of women.
- Recognising and prioritising areas of need so that research is targeted and relevant.

In addition, Research Australia suggests the following:

Embedding equity systemically: Cross-cutting approaches such as "priority populations" are important, but equity must be integrated across governance, workforce, funding, implementation and evaluation.

Applying equity by design: Research should proactively address populations experiencing systemic barriers to participation and healthcare. Building community capacity and leadership: Investment should strengthen research capability and infrastructure within priority communities, with communities as partners in co-design and decision-making.

Adopting a life-course approach: Address key transition points, such as paediatric-to-adult care, where research participation and continuity can decline. Embedding intersectionality: Recognise how intersecting characteristics and circumstances shape research participation, health needs and outcomes Attention to intersectionality is vital.

Further feedback on MRFF Priorities 2026-2028

Is there any additional feedback on the proposed Priorities you would like to provide that has not been addressed above? (Optional)

Research Australia regards the proposed priorities as providing a robust framework to guide future investments by the Medical Research Future Fund (MRFF). However, the success of this framework will depend on the adoption of a genuinely integrated national approach, emphasising collaboration across multiple sectors.

Key recommendations include:

Promotion of Cross-Sector Collaboration: The MRFF should explicitly foster partnerships among government agencies (including jurisdictions), industry stakeholders, philanthropic organizations, health services, consumers, and academia. Such collaboration is essential to maximise the translation of research into practical health solutions and to enhance the overall impact of investments.

Strengthening National Coordination: There is a need to enhance coordination of research infrastructure and health data at the national level. This includes supporting sustainable funding models that extend beyond individual funding cycles and ensuring alignment with broader strategic initiatives, such as the National Health and Medical Research Strategy, Ambitious Australia, and the National Research Infrastructure Roadmap.

Recognition of Health Data as a Strategic Asset: Treat health data as a vital national resource by strengthening data infrastructure, promoting interoperability, and supporting evidence-based decision-making.

Enhancement of Translation and/or Commercialisation Pathways: Improve pathways for translating research into practice through strategic government procurement, philanthropy, industry partnerships, and commercialisation initiatives.

Robust Monitoring and Evaluation: Develop comprehensive frameworks to monitor and evaluate progress. Success should not be measured solely by research outputs. Instead, evaluation should also encompass tangible improvements in health outcomes, health system performance, productivity, economic growth, and Australia's sovereign capability in health and medical research.