



Final Report

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# **Inquiry into Health and Medical Research in South Australia**

13 November 2020



**Government of  
South Australia**

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## About the South Australian Productivity Commission

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The Commission provides the South Australian Government with independent advice on facilitating productivity growth, unlocking new economic opportunities, supporting job creation and removing existing regulatory barriers.

Premier and Cabinet Circular PC046 sets out the objectives and functions of the Commission; how inquiries are referred to the Commission, undertaken and reported on; and how the Commission and public sector agencies work together.

The Commission was established to assist the government to:

- improve the rate of economic growth and the productivity of the South Australian economy in order to achieve higher living standards for South Australians;
- improve the accessibility, efficiency and quality of services delivered or funded by government;
- improve South Australia's competitiveness for private sector investment;
- reduce the cost of regulation;
- facilitate structural economic changes while minimising the social and economic hardship that may result from those changes;
- take into account the interests of industries, employees, consumers and the community;
- increase employment;
- promote regional development; and
- develop South Australia in a way that is ecologically sustainable.

The Commission is supported by the Office of the South Australian Productivity Commission (OSAPC) which is an attached office of the Department of the Premier and Cabinet. The Chair of the Commission also serves as the Chief Executive of the OSAPC.

For more information on the Commission, including circular PC046, visit the website at [www.sapc.sa.gov.au](http://www.sapc.sa.gov.au).

### Disclosure

The Commissioners have declared to the South Australian Government all personal interests that could have a bearing on current and future work. The Commissioners confirm their belief that they have no personal conflicts in regard to this inquiry.

Commissioner Adrian Tembel is the Chief Executive Partner for a firm that has acted for SAHMRI in the past. No work has been accepted from SAHMRI by this firm since the commencement of this inquiry.

# Terms of Reference

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## SOUTH AUSTRALIAN PRODUCTIVITY COMMISSION INQUIRY INTO HEALTH AND MEDICAL RESEARCH

I, Steven Marshall, Premier, hereby request that the South Australian Productivity Commission (the Commission) undertake an inquiry into health and medical research.

### Background

Health and medical research is an important part of South Australia's healthcare system. It:

- Fosters innovation and improvements in health service delivery that lead to improved health outcomes for the community and provide cost savings to the health system
- Attracts investment and funding to South Australia, with economic reports indicating that annual rates of return from health and medical research can be up to \$5 for every \$1 spent
- Encourages staff development that promotes high professional standards, which plays a significant role in attracting and retaining medical and other health professional staff.

Health and medical research is a substantial industry. The peak body, Research Australia, estimates that \$6.5 billion is spent on health and medical research in Australia each year, accounting for 20 per cent of all Research and Development in Australia. The Association of Australian Medical Research Institutes commissioned research in 2018 that indicated a benefit cost ratio of 3.9<sup>1</sup>.

South Australia has a history of excellence health and medical research. South Australia has been able to secure:

- \$48,443,505 in funding through National Health and Medical Research Council (NHMRC) in 2016
- \$8,466,735 in grant funding since 2016-17 through the Australian Government's \$20 billion Medical Research Future Fund
- \$675,000 from the Australian Government for clinical trials
- The establishment of Health Translation SA in 2015 as part of the Australian Health Research Alliance to improve the health of Australians through collaboration for faster, outcome-driven research.

The South Australian Health and Medical Research Institute (SAHMRI) was established in 2009 in response to the *Review of Health and Medical Research in South Australia* conducted by Professor John Shine and Alan Young in 2008. The aim of SAHMRI was to increase South Australia's health and medical research capacity.

In recent years, South Australia's ability to attract investment in health and medical research has been diminishing, most clearly demonstrated by a declining percentage of NHMRC grants being won by South Australian researchers.

Ten years on from the Shine and Young review and SAHMRI's establishment, it is timely to evaluate the health and medical research landscape to ensure the effectiveness and competitiveness of South Australia against other jurisdictions.

<sup>1</sup> <https://aamri.org.au/wp-content/uploads/2018/10/Economic-Impact-of-Medical-Research-full-report.pdf>

The Commission is asked to consider and report on the following matters:

1. Assess the performance of health and medical R&D in South Australia, including a comparative analysis of South Australia's share of national grant funding benchmarked against other jurisdictions, with particular reference to how health and medical R&D in South Australia:
  - a. Fosters innovation and improvements in health care service delivery that lead to improved health outcomes for the community and provide cost savings to the health system
  - b. Encourages staff development that promotes high professional standards and supports recruitment and retention.
2. Identify and assess the key factors influencing the level of public sector (including universities) and private sector health and medical research output and activity in South Australia including:
  - a. Talent and the capacity to attract new talent
  - b. Industry structure and composition
  - c. Funding, including Australian government funding
  - d. Access to data: regulation affecting access to data; and efficiency of collection and acquisition
  - e. Connectivity of the Biomedical Precinct and the planned Flinders precinct
  - f. Potential for greater connectivity between the Local Health Network medical workforce and university recruitment
  - g. Integration of research partners with SA Health.
3. Identify and assess existing collaboration on health and medical research between research organisations (public and private) and linkages between organisations and industry. Identify innovative collaboration models to drive R&D.
4. Identify and assess opportunities for increased commercialisation of health and medical research in South Australia
5. Identify and assess measures of the productivity and impact of research activity (including by key areas of research), South Australia's share of national funding programs such as the Medical Research Future Fund, and the performance of publicly funded research institutions in South Australia compared to other jurisdictions, including overseas.
6. Identify and assess the characteristics of South Australia and its population that may give rise to areas of competitive advantage compared to other jurisdictions in health and medical R&D, and identify methods of maximising these opportunities.
7. Identify industry needs and current barriers to undertaking health and medical R&D in South Australia and identify models to facilitate industry health and medical R&D in South Australia.
8. Recommend action that the South Australian Government might take to:
  - a. Increase the state's share of Australian Government funding for health and medical R&D
  - b. Increase the scale and productivity of publicly funded and public health and medical research institution R&D as well as private sector R&D

- c. Increase the impact of health and medical R&D activity in South Australia on the state's economic growth.
9. Recommend changes to the structure, governance and operation of publicly funded health and medical research and development to increase research output, productivity and translational impact.

### **Scope**

In its consideration of the above matters, the Commission is expected to have regard to the South Australian Government's Growth State initiative and relevant state and national policies.

Note the Department for Health and Wellbeing is implementing recommendations of the 2018 Birch Review to improve SA Health governance and support for clinical trials.

### **Inquiry Process**

The Commission will consult with the SA Chief Scientist, SA agencies, universities, research institutions, industry, relevant peak bodies and other key stakeholders during the inquiry.

The Commission may second and/or engage staff with required analytical expertise and knowledge of health and medical research for the period of the inquiry.

The Commission is to issue an issues paper at the beginning of the inquiry process and to issue a draft report containing recommendations for consultative purposes. A final report is to be provided to me as soon as possible, but not later than eight months after receipt of these terms of reference.



Hon Steven Marshall MP

**PREMIER OF SOUTH AUSTRALIA**

3 / 2 / 2020

## Transmittal letter

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The Hon Steven Marshall MP  
Premier of South Australia  
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Dear Premier

### **Inquiry into Health and Medical Research in South Australia**

In accordance with the terms of reference received by the Commission on 3 February 2020, we are pleased to submit the South Australian Productivity Commission's Final Report on the inquiry into Health and Medical Research in South Australia.

This final report has been prepared after consultation with universities, research institutes, research finding bodies, state government departments, professional bodies and industry as well as careful deliberation of the submissions they made.

We acknowledge and thank them for their support, together with the Office of the South Australian Productivity Commission staff for their contributions in preparing this Final Report.

We note that in accordance with the *Premier and Cabinet Circular PC046* "The Commission must ensure that the report is available on its website within ninety days of delivering the report...", unless you specify a shorter period.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Matthew Butlin'.

Dr Matthew Butlin  
**CHAIR**

A handwritten signature in blue ink, appearing to read 'Adrian Tembel'.

Mr Adrian Tembel  
**COMMISSIONER**

A handwritten signature in blue ink, appearing to read 'Edwina Cornish'.

Professor Edwina Cornish AO  
**COMMISSIONER**

13 / 11 / 2020

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## Key messages

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The Commission was tasked to identify action the South Australian Government might take to increase South Australia's share of Australian Government funding for health and medical research (HMR) and increase the scale, productivity and health and economic impacts of that research.

South Australia's competitiveness in securing national research grant funding has declined over the last two decades. Several factors contributed: state policy and governance changes which reduced priority for HMR in the public health system, loss of HMR workforce capability in public hospitals and universities, investing in buildings rather than research leaders, and a lack of strategic leadership from the state's health department. A regulatory environment and a framework for HMR support services which are complex and inefficient and disruption resulting from the relocation of HMR activity along North Terrace also contributed.

SAHMRI has made a positive contribution to the state's HMR effort despite having a purpose and governance that has raised dissatisfaction and conflict with its university members.

The Commission considers HMR excellence is essential to South Australia being a modern, vibrant and competitive state with South Australians accessing more productive and better health services and reaping the economic benefits of a growing health and medical industries sector. Sustained long term reform is fundamental to the state securing more grant funding and lifting the scale, competitiveness and productivity of research including translational impact.

The Commission presents a pathway for lifting HMR performance as a long term priority and part of a broader approach to raising the contribution of R&D to lifting South Australian living standards. It requires commitment by all HMR institutions to long term state-wide quantitative targets, institutional reform and appropriate resourcing. There are five elements:

- declutter the regulatory framework by streamlining research ethics, data and governance approval processes;
- rebuild HMR workforce capabilities with joint action by public hospitals, universities and research institutes to attract, retain and develop research talent;
- unlock the state's data for HMR by access improvements, building data linkage capabilities and digital enablement;
- strengthen HMR commercialisation and translation capacity in the public health system through efficiencies in HMR support services and enhancing management of intellectual property;
- reform HMR system architecture to better enable excellent clinical research.

Key reforms to HMR architecture include a strengthened accountability and performance framework for SA Health; alignment of priorities and incentives between public hospitals, universities and research institutions to focus HMR on fields of actual or potential strength; a clear enabling, monitoring and evaluation role for the Department for Health and Wellbeing; and reform of the governance of SAHMRI to enable it to become a fully independent medical research institute focussed on HMR excellence.

The Commission recommends that the plan be resourced, in the first instance, by locating and better utilising existing budgets for HMR within SA Health and by directing part of the dividends of continuous improvement in public hospitals to rebuilding HMR capability.

## Executive summary

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### The inquiry

The South Australian Productivity Commission (the Commission) was asked to investigate health and medical research in South Australia and to make recommendations to the South Australian Government in two areas:

- action the government might take to:
  - a) increase the state's share of Australian Government funding for health and medical research and development (R&D);
  - b) increase the scale and productivity of publicly funded and public health and medical research institution R&D as well as private sector R&D;
  - c) increase the impact of health and medical R&D activity in South Australia on the state's economic growth; and
- changes to the structure, governance and operation of publicly funded health and medical research and development to increase research output, productivity and translational impact.

Part of the context is that South Australia's relative success in competitive national grant funding for health and medical research (HMR) has fallen over the past two decades, particularly in the first decade. The Commission was required to have regard to the South Australian Government's Growth State initiative and relevant state and national policies. The Commission notes that the health and medical industries are a strategic sector in the Growth State initiative.

### Conclusions

The Commission sums up the position as follows:

- Notwithstanding recent successes, SA HMR's historical highly competitive position has declined, due to: stronger competition from east coast universities and research institutes and a combination of past state policy decisions.
- A growing South Australian health and medical research effort is critically important to South Australia being a vibrant, modern and competitive state and to building:
  - excellent medical, nursing and allied health staff capability and improving health care for South Australians; and
  - a sustainable local health and medical industries sector.
- Excellent clinical research – medical, nursing and allied health – and translation are a foundation for these aims.
- State government HMR policy over the past five years or more has demonstrated little evidence of effectiveness and no evidence of evaluation of the state's HMR policy or measurement of SA HMR performance and cost.
- Accordingly, the Commission recommends establishing increased volume, value and impact of HMR as a long-term priority area of focus for South Australia. That is achievable with a deliberate state-wide strategy and a long-term plan. Core to this

strategy is increasing the HMR volume, productivity and impact in the public hospital system.

- This strategic effort needs leadership at ministerial level, with explicit commitment to simple, long-term quantitative targets that communicate to all the state's HMR institutions the importance to the state of lifting the volume, productivity and impact of HMR. Progress towards those targets needs to be transparently and regularly reported.
- The Commission notes that such a ministerial role may best be framed to cover the whole of the state's investment in research and development. This matter is being considered in the Commission's concurrent inquiry into research and development.
- Among other elements, the long-term plan needs to ensure all relevant South Australian Government affiliated or associated entities:
  - rebuild, from the grassroots, excellent clinical and translational research in the public hospital system, with efficient and direct interaction between LHN's and South Australian universities and medical research institutes to drive a culture of continuous improvement in the productivity and quality of care. Excellent clinical research leaders are essential to this regeneration;
  - eliminate complexity, inefficiency and duplication in the research support services provided by the Department of Health and Wellbeing (DHW) and local health networks (LHNs);
  - deliver a step change in the volume and capability of the HMR workforce;
  - unlock the state's health and medical data for HMR through better access rules, digital enablement and secure funding for maintenance of key datasets;
  - improve the potential return to South Australians from commercialisation by simplifying and coordinating management of intellectual property (IP) generated by, or in conjunction with, SA Health; and
  - build the capacity to focus on, and execute, these and related tasks by establishing an HMR institutional architecture that aligns the components and incentives of the SA HMR system to these tasks.
- Funding the above changes would come in the first instance, from
  - allocating to HMR in LHN's the funding for research contained in the Australian Government's block funding for public hospitals;
  - making efficiency gains through continuous improvement driven by HMR, simplification and other measures including the elimination of duplication and complexity; and
  - consolidating various sources of state government HMR funding.
- The South Australian Health and Medical Research Institute (SAHMRI) has made a positive contribution to the state's HMR over the past decade despite having a purpose and governance arrangements that raises conflict with its university members.
- As part of the thrust towards improving the HMR institutional architecture, better aligning the incentives for HMR with LHNs and universities and lifting transparency and

accountability, SAHMRI should become a fully independent medical research institute focused on HMR excellence by:

- removing the universities as members;
- establishing affiliation agreements with its collaborators (including the universities); and
- tying state government funding to performance and transparency targets.

It is not clear to the Commission whether additional funding above the budgets to be established from finding existing funding (such as that provided by the Australian Government in its hospital funding), the proceeds of continuous improvement in LHNs, redirecting existing state funds and so on would be needed to achieve the regeneration of HMR. That question would be considered once the actual resources available become clearer.

In the case of HMR in LHNs, catalytic funds would be directed to rebuilding research capability and building a continuous improvement and research culture.

### **The evidence**

The Commission's evidence came from: nearly ninety pieces of correspondence and submissions; consultations and roundtables with stakeholders; information from local health networks (LHNs), universities, SAHMRI, research institutes and the Department for Health and Wellbeing (DHW) among others; commissioned research; and the Commission's own research and analysis.

This evidence is large, yet significantly incomplete with important information gaps, particularly about HMR performance, HMR-related employment, budgets and expenditure in the public health system and some agreed facts among contending stakeholders. The Commission observes the gaps are at variance with the stated high-level commitment to HMR by successive state governments. The commitment has not been carried through into accountability. This is a longstanding matter of more than a decade.

The available evidence was weighed carefully, leading the Commission to conclude South Australian HMR has become less competitive over the past fifteen years (with some noteworthy exceptions) and that the causes are deep-seated.

### **HMR performance in SA**

The Commission reported on South Australia's HMR performance from several perspectives in its draft report:

- success in the National Health and Medical Research Council (NHMRC) grant funding and the more recent Medical Research Future Fund (MRFF);
- numbers and share of national HMR publications;
- evidence on the relationship between HMR effort and health outcomes; and
- HMR workforce numbers and productivity.

While the Commission obtained some additional information following its draft report, its analysis and conclusions were generally considered to be thorough, balanced and fair.

The Commission notes there are very significant data gaps and limitations which prevent a full assessment of HMR activity at both the sectoral and institutional level. There are difficulties in assessing the broader impact of HMR activity due to very long lags between the conduct of research and occurrence of economic or health outcomes.

That said, it summarises South Australia's HMR performance in the following terms:

- **On national funding:** SA's share of NHMRC funding has been in decline for the last 20 years, although the pace of decline has slowed over the last decade. South Australia's NHMRC grant application success rate has declined, consistent with the national trend, from a high of 28 per cent in 2010 to 18 per cent in 2019. South Australia's share of the Medical Research Future Fund (MRFF) for the period 2015–20 (as at October) averaged 3.9 per cent, with the public universities administering close to 60 per cent of the total amount received. The Commission concludes overall that the evidence on performance points to a weakness in national competitive grant funding for HMR in South Australia.
- **On HMR publications:** The number of HMR publications produced across South Australia increased significantly between 2005 and 2019, with state's share of national HMR publications remaining just under 10 per cent during this period. This is slightly higher than the state's share of higher education expenditure on HMR which averaged around 8.5 per cent between 2006 and 2018. The University of Adelaide produced the bulk of HMR publications, while both Flinders University and the University of South Australia (UniSA) steadily increased their research publication output. Based on the category-normalised citation impact, South Australian research institutions perform above the world average and SAHMRI has outperformed the universities by a considerable margin. SAHMRI has a higher share of publications with international or industry collaborations.
- **On the relationship between HMR effort and health outcomes:** While international literature suggests there is an association between R&D, improved health outcomes and economic growth, it is difficult to establish a causal relationship in South Australia. These matters are not unique to South Australia. While a key aim of HMR is to improve health outcomes, it is difficult to establish a direct causal relationship in practice. Selected indicators on the performance of the South Australian public hospital system over time and, in comparison with other jurisdictions, show stable or improving performance moving closer to the national average.
- **On HMR workforce and productivity:** the available HMR workforce data at the state and institutional level, while not suitable for constructing productivity measures, still provide some insights into general trends and size. Data on higher education health teaching and research staff indicate that full-time equivalent numbers in South Australia have been declining in recent years, particularly in the University of Adelaide.

The Commission notes current efforts at the institutional level to improve HMR performance measurement. Suggested performance measures were received from several stakeholders.

Consistent definitions and datasets for inputs, outputs, productivity and impacts are needed to enable evaluation and benchmarking of performance at the institutional level as well as sector-wide inter-jurisdictional comparisons.

The Commission agrees with the widely held view that embedding a research function within public hospitals is fundamental to establishing a culture and capability for continuous improvement to drive increases in the productivity and quality of care.

### **Health and medical research competitiveness: the contributing explanations**

Over the past two decades the competition for national grant funding from universities and MRIs in other jurisdictions became much tougher. This competition reflected significant investments in people (especially world-class research leadership), infrastructure and facilities, especially in Victoria. Those investments in other jurisdictions were made by

universities, state health systems, and state and national governments, among others. South Australian institutions also made significant investments, although not to the same degree and with a focus on buildings not people.

From around 2015, the national objectives for HMR funding (including the creation of the MRFF) gave higher priority to clinical research and health translation. The intention of these changes was to lift the value to Australians from the large national investment in HMR. This shift in turn raised the central importance of clinical research and translation. Some South Australian universities appear to have been slower to respond to the change in national priorities than the competition.

The leading performers in other jurisdictions have clinical research – medical, nursing and allied health - embedded in hospitals whose leadership regard excellent HMR as glue that joins the hospital, universities and other entities for the benefit of the quality of the health system, patient care and productivity. Clinical research is led in the hospital network by top clinical researchers jointly appointed to the hospital and an affiliated university or research institute.

The capacity of South Australian HMR to respond to this increased competition and national policy shift was held back. The Commission concludes:

- The adoption of a centralised governance model for the state’s public hospital system from 2008, combined with health policies, leadership priorities and budgetary pressures, at a practical level resulted in HMR having a reduced priority in the hospital network relative to clinical care and cost containment. These changes made collaborative clinical research more difficult, especially that needed between clinical researchers, hospitals and universities. HMR also became a sub-strategic function in the health department, especially after the establishment of SAHMRI in 2009, notwithstanding HMR being a stated priority for South Australian Governments over the past two decades.
- There has been a progressive loss of key leadership capability in clinical research in hospitals, and reduced numbers of senior clinical academics with joint hospital and university appointments, over the past decade. This may in part be the result of inadequate succession planning by universities and local health networks.
- The South Australian Government and universities have focused on investing in buildings, rather than on key research leaders (and to some extent, facilities), particularly in the North Terrace HMR cluster. While much of the funding for these investments came from the Australian Government, the de-emphasis of HMR in SA Health contributed to an emerging deficit of key HMR talent.
- The transition in the North Terrace HMR cluster in moving from the health precinct centred around the old Royal Adelaide Hospital to the new, state-of-the art precinct centred on the new Royal Adelaide Hospital and SAHMRI has been disruptive.
- SAHMRI has made a positive contribution to the state’s HMR effort over the past decade despite having a purpose and governance that raises friction and conflict with its university members. While it has been criticised by some stakeholders as lacking clear direction and focused research priorities, and as absorbing most or all of the South Australian Government’s funding for HMR, the Commission considers this perception to be a significant overstatement of reality.

- The framework for HMR support services is more complex and inefficient than in other jurisdictions and there are greater barriers to key data for HMR.

In short, the Commission summarises this picture as a combination of these decisions and external events resulting in insufficient investment in, and maintenance of, excellent clinical research capacity and increased barriers to collaboration at a time when other jurisdictions responded to the higher national priority given to collaborative HMR that would deliver translational impact.

The Commission also found:

- South Australia's HMR has achieved international excellence in some areas, largely as measured by publications.
- The nascent establishment of the Adelaide BioMed City (ABMC) precinct offers an opportunity to house world-class clinical research in a very efficient system. A great deal of work is required to realise this ambition.
- Recent changes in South Australian Government policies, programs and the governance of LHNs have increased the focus on, and improved the underlying conditions for, HMR but critical gaps and inefficiencies remain especially in the framework for budgets, resources and performance assessment.

The Commission observed that interstate jurisdictions with the most competitive HMR precincts were built on an LHN and affiliated research collaborators that had:

- a CEO of the LHN who: understood the importance of internationally competitive HMR to quality of care, nurtured a strong research culture throughout the LHN; and drove an internal productivity agenda to free up resources to invest in HMR.
- committed leadership at all relevant levels of the affiliated university (and research institute) to HMR excellence, including to attracting 'star' researchers who were jointly appointed at the university and hospital.
- alignment and deep collaboration between the LHN and an affiliated university (and any collocated medical research institutes) around a joint vision for HMR. This vision translated into joint resourcing of clinical researchers; dedicated time for clinical researchers; building critical mass that defined the LHN's HMR strengths (including related capabilities such as informatics); and specialising on HMR areas where excellence existed, or was reasonably possible with further investment.
- a shared focus by the LHN/university partners on outputs (performance) rather than keeping track of their relative contributions (inputs).

The Commission had regard to these elements in formulating its conclusions and recommendations.

This analysis implies a pathway to restore the competitiveness of the state's HMR and lift its impact on improving the state's health services for South Australians and as the necessary foundation for a sustainable health and medical industries sector in South Australia.

### **The Commission's recommended reform pathway**

The Commission starts from the position that HMR is an essential element of South Australia being a vibrant, modern and competitive state. The direct benefits come from HMR that, across short to long-term timeframes:

- improves the quality and productivity of health care for South Australians; and
- is an essential foundation of a health and medical industry sector.

Moreover, it encourages excellence and growing capability in the state's medical, nursing and allied health workforce beyond the HMR workforce itself. And the recent, and ongoing, experience of the pandemic has amply illustrated, a rapidly deployable HMR capacity and quality health and medical workforce is an enormous asset to the state.

These considerations make the basic case for retrieving the state's former position in HMR and for considering HMR's place in a wider strategy for lifting the contribution of R&D in the state to higher living standards, employment and productivity. The Commission notes this second point is being explored further in its concurrent inquiry into research and development in South Australia and is outside the terms of reference for this inquiry.

The Commission sets out a pathway for restoring the competitive performance of the state's HMR as an element of a broad, long-term approach for raising HMR's contribution to the living standards of South Australians. Rebuilding clinical research – in medicine, nursing and allied health – in the state's hospital system in conjunction with affiliated universities and medical research institutes is a key theme.

The pathway is framed by the South Australian Government committing to lifting HMR performance as a long-term priority area of focus and setting a framework of quantitative goals to guide delivery of the benefits of an improved health system and industry development.

The Commission proposes a 'tight-loose' approach based on the South Australian Government setting a 'tight' overarching framework of goals and targets (such as success in grant funding, impact of HMR, development and performance of the HMR workforce) and enabling a 'loose' devolved, contestable framework within which HMR protagonists identify and pursue HMR excellence that aligns with the state's interests.

The Commission recommends the minister appoints an expert group, including experts from outside South Australia, to provide advice on developing the critical goals and targets for a state-wide strategic framework. The Commission considers one of these overarching goals would be a success rate for SA HMR in Australian Government funding set above the state's share of national population.

There are two principal reasons for such a 'tight-loose' approach. The first is that a set of centrally determined and prescribed specialised areas of HMR is unlikely, in the Commission's view, to be credible with, and accepted by, HMR practitioners and research institutions, including universities, medical research institutes and LHNs. This view partly reflects the reduction in the HMR strategic capability over the past decade. The second is that the HMR practitioners have the capability, judgement and knowledge to decide the priority areas for HMR that are important to them (and to their institutions) and align with the state's interests (particularly where state government funding is increasingly contestable and comes with performance expectations and accountability). That said, consultation and collaboration on these matters are essential to build scale, competitiveness in securing grant funding, and excellence in research outputs and impacts.

Within that framework this report sets out five elements of a long-term plan, noting the Commission's recommendations are necessarily confined to actions available to the South Australian Government:

- declutter the regulatory framework that governs HMR by simplifying, streamlining and clarifying the necessary research ethics, data and governance approvals and

legislative reform to enhance researcher access to data without compromising the public interest of privacy and data protection (see chapter 5);

- build, systematically and purposefully, a step change in the capability of the state's HMR workforce – a task that falls both to DHW, LHNs and their research partners - and includes selective investment in key leaders of clinical research, joint appointments or affiliations between LHNs and research institutions and other joint action to attract, retain and develop researchers(see chapter 6);
- exploit South Australia's comparative advantage in electronic medical records and other relevant datasets by building data linkage capabilities, access improvements and an underpinning digital enablement (see chapter 7);
- strengthen the commercialisation and translation capacity of HMR, as a means of developing a local health and medical industry and driving continuous improvement in public hospitals, with specific attention to the capacity LHNs to perform their role and consistent, balanced management of intellectual property (see chapter 8); and
- develop further the HMR system architecture to better pursue the state's goals by:
  - developing an enabling strategy, by DHW in conjunction with stakeholders, to achieve the state's HMR goals;
  - establishing a clear accountability framework for HMR as a key priority in LHNs including clear expectations in LHNs for budgets, resources and performance targets and measures;
  - aligning incentives for HMR excellence among LHNs and their affiliated research partners;
  - clarifying the role of DHW to include advising the minister on HMR performance, supporting data analytics, HMR performance monitoring, fit-for-purpose HMR policies and support services to LHNs and strengthening relationships with the Australian Government on HMR. A key early task is to establish budgets, headcount and performance measures;
  - making SAHMRI a fully independent research institute focused on HMR excellence, accountable to the South Australian Government for performance through the government's funding and to its affiliated collaborators and resolving the dissatisfaction through governance changes, clarified purpose, transparent reporting and affiliation agreements with research partners including the universities and LHNs;
  - recognising and encouraging the evolution in HMR clusters as reflected in the two established health precincts and the emerging research cluster at NALHN;
  - increasing the contestability of the Health and Medical Research Fund (HMRF), making it available to all eligible state-based HMR institutions and redirecting other funding sources to it. (see chapter 9);
  - increasing accountability and transparency by strengthening public reporting by all HMR institutions on their contribution to state HMR performance.

It is not clear to the Commission whether additional funding above the budgets established from finding existing funding (such as that provided by the Australian Government in its hospital funding), the proceeds of continuous improvement in LHNs, redirecting existing state funds and so on would be needed to achieve this regeneration of HMR. It is likely, depending on the goals the South Australian Government might choose to adopt, that additional funds may be needed. The Commission is not in a position to reach any conclusion on that and suggests any assessment await a clearer picture of existing government resources available for HMR.

## Summary of Recommendations

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### Streamlining approvals and data access

#### Recommendation 5.1

To increase South Australia's share of Australian Government health and medical research funding through improved quality and competitiveness of South Australian research proposals, the Commission recommends that the Department for Health and Wellbeing (DHW), working in conjunction with the local health networks (LHNs), streamline and simplify the current ethics approval process within SA Health, including by:

1. establishing ongoing operating budgets for LHN research offices that are sufficient to ensure that their services to researchers and research committees do not depend on short-term or unstable funding sources, such as fees levied on external research proponents;
2. ensuring any fees charged to applicants for research ethics approval are competitive with other Australian jurisdictions;
3. developing an evaluation framework to enable Health Research Ethics Committees (HRECs) to provide researchers, both within SA Health and in other institutions, with feedback on research proposals submitted for ethics approval, as a way of strengthening the quality of proposals and enhancing the efficiency and time taken for the ethics approval process as a whole;
4. further simplifying, streamlining and connecting the current ethics approval and site specific approval processes, including by proportionate processes having regard to risk and complexity, to create a 'single point of entry' for researchers, and using the new Governance and ethics management system to facilitate process reforms;
5. setting explicit target timeframes for approval of applications and a standard of one resubmission, and reporting performance against those targets;
6. providing a simple map of the streamlined process and advice to researchers on the application process requirements, including the data requirements for complete applications to enable efficient process without rework; and
7. providing temporary staffing to clear any approval backlogs.

#### Recommendation 5.2

To position South Australia to benefit fully from inter-jurisdictional data linkage opportunities and enhance researchers' access to public sector data, whilst ensuring robust privacy protections are guaranteed in statute, the Commission recommends that the South Australian Government develop and enact information privacy legislation that:

1. complements the *Public Sector (Data Sharing) Act 2016*;
2. streamlines and clarifies the current regulatory environment as it relates to the collection, storage, use and disclosure of HMR data, in order to enhance researchers' access to public sector data; and
3. ensures that robust privacy protections are consolidated in statute.

#### Recommendation 5.3

To ensure that complete and representative data sets are available and readily accessible for all SA Health and non-government health and medical researchers in South Australia, the Commission recommends that the DHW:

1. In the absence of South Australian privacy legislation and to address the need for immediate improvement of access to patient related data, by mid-2021:
  - a) develops and implements a standardised system-wide patient pre-consent process in conjunction with LHNs, to assist in the recruitment of research participants; and
  - b) resolves the issue of access to public health system data with LHNs, the university sector and SAHMRI, for those researchers who are not employed directly within SA Health.
2. Enables access to all forms of public health data and patient data by building on-line capability:
  - a) in the electronic medical record (EMR) to facilitate access to patient groups and individual patient records for HMR purposes; and
  - b) to provide access and analytic capability to DHW in the use of administrative and public health data for HMR and quality improvement.
3. Ensures HMR can be undertaken across the whole population by giving effect to the state government commitment to enact the necessary legislative or regulatory changes to allow the collection and use of data from private health care providers by mid-2021.

## Workforce

### Recommendation 6.1

As part of delivering a step change in the capability of SA Health's health and medical research workforce, the Commission recommends that the Department for Health and Wellbeing (DHW) and local health networks (LHNs) develop and implement a multi-year plan to raise the size, proficiency and effectiveness of the HMR workforce and to increase the quantum and quality of the HMR effort in SA Health containing quantitative targets, clear accountabilities for achieving them and ongoing progress reporting. The elements include:

1. DHW and the LHNs to work out the scope and content of the plan, including:
  - a) defining the HMR workforce and clinical researchers including nurses and allied health professionals;
  - b) clearly articulated research expectations and performance outcomes in HMR role statements and employment contracts;
  - c) training and development to address identified skill requirements;
  - d) incentives to encourage a research career by health and medical professionals and promote take-up of joint hospital-university appointments and affiliations;
  - e) succession planning for key HMR leadership roles; and
  - f) an online register of health and medical researchers to support future workforce modelling.
2. As part of this step change in the state's HMR workforce, the LHNs also:
  - a) require LHN management to ensure the roles of clinical researchers incorporate sufficient time to do research effectively;
  - b) increase the number of clinical/academic affiliations and joint appointments between LHNs, universities and other institutions with top priority given to clinical research leaders' roles;
  - c) expect universities and research institutes, as part of the research collaboration with LHNs, to have an active professional development program for HMR researchers which includes:
    - i. facilitating networking between researchers and industry;

- ii. mentoring early and mid-career scientists and researchers across all health and medical professions; and
- iii. reporting on their contribution to HMR workforce development in the state.

## Data

### Recommendation 7.1

To ensure that South Australia remains competitive in its ability to use trusted and accurate data to understand its population and improve their quality of life across the board (including health, education and social support), the Commission recommends that the South Australian Government ensures the ongoing operation of SA NT DataLink with the Department of the Premier and Cabinet (DPC), as a matter of some urgency to:

1. assist SA NT Datalink to develop a business model and business case for securing stable, multi-year funding, including guidance on the performance outcomes it expects;
2. assist stakeholders and joint venture partners establish a new skills based governance model including consumer advocacy and engagement; and
3. work with the NT Government and SA Government agencies that are users or beneficiaries of SA NT Datalink to secure appropriate ongoing core funding from the SA and NT governments together with a simplified joint venture partner funding model and governance process in line with other successful Australian data linkage programs.

## Commercialisation and Translation

### Recommendation 8.1:

To ensure that the South Australian Government's IP policy framework encourages collaborative translational research which leads to improved health and economic outcomes, the Commission recommends that:

1. responsibility for the government's IP policy transfer from the Premier to the Minister for Innovation and Skills;
2. The Department for Innovation and Skills (DIS), in consultation with DHW and other relevant agencies, review the IP policy to clarify arrangements for sharing the benefits of IP development with non-government research partners;
3. DHW, in consultation with DIS, facilitate adoption of the IP policy in SA Health through development of guidance material and training, and monitor and evaluate the policy over time;
4. DHW facilitate development of a 'Community of Practice' on intellectual property development and commercialisation throughout SA Health; and
5. LHNs develop overarching framework agreements with universities and the South Australian Health and Medical Research Institute (SAHMRI) on commercialisation and IP management along the lines of those used by CALHN.

## Recommendation 8.2:

To increase the impact of HMR involving LHNs on the state's economic growth, the Commission recommends that the DHW adopt a more consistent and coordinated approach to commercialisation of HMR across SA Health by establishing a central commercialisation support function to serve all LHNs that includes:

1. a dedicated commercialisation service with a focus on commercial development of HMR goods and services;
2. protection of the intellectual property of LHNs through the provision of advice for IP management in contracts and commercialisation strategies for LHN staff;
3. assistance to LHNs in establishing overarching agreements with universities and research institutes regarding joint management of IP;
4. a business development capability that also serves as a first point of contact for industry and investors; and
5. improvements to capability and commercial skills by sharing best practice and expertise and improving the understanding of relevant government policies including the IP policy.

## Architecture

### Recommendation 9.1

To improve the performance of the public health system and provide an essential foundation for sustainable growth of the health and medical industries, through increased high quality and competitive HMR and translation, the Commission recommends that:

1. The South Australian Government establishes long term state-wide goals for increasing the volume, productivity and health and economic impacts of HMR; sets quantitative targets such as state share of national grant funding and numbers of HMR researchers, to guide progress towards those goals; and transparently and regularly reports performance against those targets.
2. Framed by the foregoing state-wide goals, the South Australian Government make achieving excellent clinically based health and medical research with translation impact a priority for SA Health, backed up by performance measures and clear accountabilities for:
  - a) **The boards and chief executives of local health networks** for
    - i. establishing explicit budgets for HMR in their organisations (links to Recommendation 9.1.3.a);
    - ii. establishing clear accountability for quality, performance, use of resources and measuring performance;
    - iii. doing all things necessary, including with their research collaborators, to deliver excellent research, such as establishing focus and priorities, developing the research workforce and ensuring the translation of the research into local practice;
    - iv. instilling a research-based improvement and innovation culture in their health network and applying part of the dividends from efficiency improvements to increasing resources available for HMR; and

- v. collaborating with research partners including universities, SAHMRI and industry in excellent clinical research and translation and in consolidating support services such as commercialisation.
- b) **Department for Health and Wellbeing (DHW)** for advising the Minister on HMR and for supporting the local health networks in their health and medical research, including by:
- i. measuring and monitoring the resources applied to HMR by the department and the LHNs;
  - ii. providing management information to support accountable HMR leadership, including resources for the development of HMR researchers;
  - iii. tracking the performance of HMR, including HMR inputs and outputs to understand the return to the state from its investment in HMR and advising the minister accordingly;
  - iv. decluttering HMR policies and support services provided by the department to simplify regulatory frameworks (such as data access, approvals and intellectual property), streamlining all essential approvals and unnecessary impediments to achieving excellence in clinician-based research;
  - v. strengthening relationships with the Australian Government on HMR, including promoting South Australia as a location for Australian Government funded HMR; and
  - vi. the minister holding the chief executive of DHW accountable for implementing the department's HMR role in an effective and efficient matter.
3. Noting the current difficulties in obtaining basic information on the resources applied to HMR in the public health system such as expenditure, research budgets, numbers of research staff in LHNs and performance, the DHW immediately:
- a) establish, with each LHN, a specific budget for HMR which includes grant funding from the Australian Government, including the HMR component of the block grant funding for teaching, training and research; any proceeds from HMR commercialisation due to each LHN according to the SA Health IP policy; and all funding from South Australian Government sources (links to Recommendation 9.1.a.i);
  - b) assemble existing information held by the department on the level of its expenditure in HMR, both within SA Health and externally, for which it is accountable;
  - c) identify gaps in that information and address them;
  - d) develop performance measures, in conjunction with LHNs, for the performance of HMR that the state government funds; and
  - e) assist the minister in holding the LHNs accountable for their HMR efforts and outcomes.

## **Recommendation 9.2**

To provide state-wide strategic direction and an enabling framework to support the state's health and medical research (HMR) institutions to excel in their areas of competitive HMR advantage and achieve greater success in national competitive grant funding, the Commission recommends that:

1. The minister appoint an expert group, including experts from outside South Australia, to provide advice on developing the critical goals and targets for a state-wide strategic framework, put forward in recommendation 9.1.1;
2. DHW, in conjunction with stakeholders including LHNs, universities and medical research institutes, develop a state-wide HMR enabling strategy to achieve these goals and targets and raise the volume and quality of HMR in the state's public health system. The enabling strategy would:
  - a) be based on local decision-making on research priorities by LHNs, universities and research institutions to shape HMR in South Australia consistent with the government's objectives;
  - b) build scale, productivity and excellence of HMR through collaborative and complementary, rather than duplicative and competitive, approaches to HMR; and
  - c) guide, and increase, the allocation of the South Australian Government's contestable HMR funding.

Key elements of the enabling strategy would include:

- a) reforming the policy and regulatory environment for HMR;
  - b) maintaining and making accessible to researchers SA Health data resources;
  - c) monitoring state-wide HMR key performance measures (KPIs) developed consistent with the goals and targets recommended in 9.1.1 and 9.2.1;
  - d) regular systematic evaluation South Australian HMR policies and programs; and
  - e) building a high performing HMR workforce in SA Health, including through attracting, retaining and developing HMR talent.
3. The functions and resources of the Commission for Excellence and Innovation in Health, the Health Performance Council and the DHW Office for Research be merged and augmented to strengthen DHW's capability to develop, implement, assess and advise on the strategy.
  4. After one year, review the adequacy of the identified funding and budgets for HMR to achieve the South Australian Government's goals for HMR as developed from Recommendations 9.1.1 and 9.2.1.

### **Recommendation 9.3**

To support the implementation of the state-wide HMR strategy, the Commission recommends that:

1. The minister reform the operation of the Health and Medical Research Fund (HMRF) to support the achievement of the state's health and medical research (HMR) strategic goals as set out in Recommendations 9.1 and 9.2 by:
  - a) making it fully contestable and available to all eligible state-based HMR institutions, including public universities, research institutes and LHNs, in the state;
  - b) developing a robust and transparent process and guidelines for the administration and regular evaluation of the HMRF; and
  - c) directing the operating surplus of AusHealth into the HMRF.

2. The South Australian Government incentivise both re-building research capability and the search for efficiencies to fund HMR funding in the LHNs by allowing the LHNs to retain part of the dividends from efficiency improvements to fund their HMR.
3. The South Australian Government amend the deed for the SAHMRI operating grant to require the recommended change in focus and behaviour of SAHMRI as a condition of the grant and to provide for ongoing public reporting by SAHMRI against appropriate KPI's.

#### **Recommendation 9.4**

To enhance the contribution, accountability and transparency of key partners in the state's HMR architecture, the Commission recommends the South Australian Government:

1. strongly encourage the leadership of the respective member institutions of the Adelaide BioMed City (ABMC) to incentivise their representative executives involved in ABMC to search for and deliver precinct synergies, efficiencies and general value. This may start with regular reporting by the ABMC Board of its tangible and verifiable achievements; and
2. require the local health networks, SAHMRI and the state's universities to commit to public reporting on key aspects of their HMR performance consistent with Recommendations 6.1 and 9.2, including research funding and outputs and HMR workforce development, in their annual reports.

#### **Recommendation 9.5**

To lift the contribution of SAHMRI to the state's health and medical research strength, the Commission recommends:

1. the South Australian Government, through its membership of SAHMRI, work collaboratively with the existing members of SAHMRI to establish a streamlined and consolidated membership structure to enhance SAHMRI's capacity to achieve research excellence through the resignation of the state's three public universities from membership of the company;
2. to maximise SAHMRI's contribution to research output, productivity and translational impact throughout South Australia, the South Australian Government members of SAHMRI encourage SAHMRI's board to complete the following tasks by December 2021:
  - a) adopt research excellence, consistent with the state's purpose and directions for HMR set out in Recommendation 9.1 and 9.2, as the principal purpose of SAHMRI;
  - b) establish a skills-based board, including representatives from key LHNs;
  - c) develop a long-term research strategy for SAHMRI focussed on a targeted number of actual or emerging research strengths based on an assessment of capabilities residing in SAHMRI, the three public universities and all LHNs, in consultation with those institutions;
  - d) increase the transparency of SAHMRI's operations as an MRI, distinct from its "research hotel" role, to its stakeholders including on funding sources, staff allocation, research performance and translation impact incorporating appropriate KPIs, and provide more transparent public reporting on these matters;

- e) agree overarching affiliation agreements between SAHMRI, the public universities and LHNs which cover joint staffing arrangements, cost sharing, use of grant funding, attribution of research publications and grant success, signage and acknowledgement at SAHMRI and sharing of any income from commercialisation;
- f) agree appropriate changes to the constitution; and
- g) establish a business model to support research excellence as SAHMRI's core business, including divestment of any extraneous activities.

## Acronyms

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AAMRI	Association of Australian Medical Research Institutes
ABMC	Adelaide BioMed City
ABS	Australian Bureau of Statistics
AC	Accelerating Commercialisation
AHRTC	Advanced Health Research Translation Centre
AIHW	Australian Institute of Health and Welfare
AIML	Australian Institute for Machine Learning
AMRAB	Australian Medical Research Advisory Board
ANZCTR	Australia-New Zealand Clinical Trials Register
ARC	Australian Research Council
ASMR	Australian Society for Medical Research
BHI	Basil Hetzel Institute
BTF	Biomedical Translation Fund
CALHN	Central Adelaide Local Health Network
CEIH	Commission on Excellence and Innovation in Health
CRO	Clinical research organisation
CT	Clinical trial
DHW	Department for Health and Wellbeing
DIS	Department for Innovation and Skills
DPC	Department of the Premier and Cabinet
DTI	Department for Trade and Investment
EA	Enterprise agreement
EMR	Electronic medical record
FIXE	Future Industries Exchange for Entrepreneurship
FMC	Flinders Medical Centre
FTE	Fulltime equivalent
GEMS	Governance and Ethics Management System
HARC	Health Analytics Research Collaborative
HERD	Higher Education Expenditure on Research and Development
HERDC	Higher Education Research Data Collection

## Acronyms

HMR	Health and medical research
HMRF	Health and Medical Research Fund
HPC	Health Performance Council
HREA	Human research ethics application
HREC	Human Research Ethics Committee
HSCGB	Health Services Charitable Gifts Board
HTSA	Health Translation South Australia
ICP	Innovation and Commercial Partnerships
IHPA	Independent Hospital Pricing Authority
IMVS	Institute of Medical and Veterinary Science
IPP	Intellectual Property Policy
IPP	Information Privacy Principles
KPI	Key performance indicator
LHN	Local health network
MDPP	Medical Device Partnering Program
MDRI	Medical Devices Research Institute
MRFF	Medical Research Future Fund
MRI	Medical research institute
NIF	National Imaging Facility
NALHN	Northern Adelaide Local Health Network
NCRIS	National Collaborative Research Infrastructure Strategy
NCVER	National Centre for Vocational Education Research
NHMRC	National Health and Medical Research Council
NHRA	National Health Reform Agreement
NISA	National Innovation and Science Agenda
NMA	National Mutual Acceptance
NVI	New Ventures Institute
ODA	Office of Data Analytics
OECD	Organisation for Economic Co-operation and Development
OFR	Office for Research
PFROs	Publicly funded research organisations

## Acronyms

PHRN	Population Health Research Network
PPH	Precision public health
PPSPF	Private Practice Special Purposes Fund
PSIC	Premier's Science and Innovation Council
QEH	Queen Elizabeth Hospital
QUP	Quality Use of Pathology
RAH	Royal Adelaide Hospital
RCSF	Research Commercialisation and Startup Fund
REDI	Researcher Exchange and Development within Industry
RRI	Robinson Research Institute
RSO	Research Service Office
SAAMB	South Australian Ambulance Service
SAHMRI	South Australian Health and Medical Research Institute
SALHN	Southern Adelaide Local Health Network
SAVCF	South Australian Venture Capital Fund
SERM	Single ethical review model
SHRP	Strategic Health Research Program
SLA	Service level agreement
SSA	Site specific assessment
STEMM	Science, Technology, Engineering, Mathematics and Medicine
TGA	Therapeutic Goods Administration
THRF	The Hospital Research Foundation
WCHN	Women's and Children's Health Network

## Definitions

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The following list of definitions apply for the purposes of this inquiry.

### **Clinical academic**

Qualified medical specialist who combines research and teaching responsibilities with clinical activities.

### **Clinical research**

Clinical research is research to find new or improved ways for diagnosing, treating and preventing disease, including medications, devices, diagnostic products and treatment regimens intended for human use. These may be used for prevention, treatment, diagnosis or for relieving symptoms of a disease. It can involve doctors, nurses, allied health professionals, pharmacists, psychologists, biostatisticians, medical device engineers and other professional researchers seeking to improve the performance of the health system.

### **Clinical researcher**

Health professional who both conducts research and provides direct healthcare services.

### **Clinical trial**

Any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes.<sup>1</sup>

### **Commercialisation**

The means of delivering research benefits to the community and creating economic benefits through the commercial process of converting science and technology, new research or an invention into a marketable product.<sup>2</sup>

### **Data registry**

A clinical data registry is an interactive database that records information about the health status of patients and the health care they receive over varying periods of time. Data registries typically focus on patients who share a common reason for needing health care. They hold data about patients with similar characteristics such as age, disease, condition, or implant and transplant recipients.

### **Health and medical research (HMR)**

Human research which involves people taking part in surveys and medical or psychological testing/treatment, being observed, or researchers collecting and accessing specimens, personal information and other materials. An additional consideration in defining HMR relates to ethical review procedures, which provide guidelines on distinguishing health research from service and practice.

### **HMR architecture**

The Commission uses the term 'HMR architecture' as shorthand for the structured relationship of governance, accountability framework, roles, relationships, and capability between and within the key organisations involved in doing, framing or governing HMR.

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<sup>1</sup> For more Information, see <<https://www.who.int/ictrp/glossary/en/>>.

<sup>2</sup> For more information, see <<https://www.health.gov.au/initiatives-and-programs/medical-research-future-fund/about-the-mrff/mrff-strategy-and-priorities>>.

## **Intellectual property**

Intellectual property is the result of someone, or an entity (for example, a company), using their individual or collective minds and intellect to create an invention, design, method or process that is deemed to be novel or original.<sup>3</sup>

## **Linked data**

Linked data registries are specialist units that link health and other related data at the person level. Data linkage techniques allow statistically significant connections to be drawn between different sources of information which relate to the same place, event, person or family.

## **Patent**

A patent is a right that is granted for any device, substance, method or process that is new, inventive and useful. It is a legally enforceable right to commercially exploit the invention for the life of the patent.

## **Translation**

Translation is the process of moving research ideas from laboratories to clinics. As defined by the Australian Government Department of Health, it describes the process whereby new medical discoveries become part of the clinical practice of GPs, other specialists and hospitals.<sup>4</sup>

## **SA Health**

The South Australian public health system is generally referred to by the overarching brand and portfolio name 'SA Health', and includes a number of agencies, business units and statutory authorities. It includes the Department for Health and Wellbeing (DHW) and South Australia's 10 local health networks (LHNs).

LHNs are incorporated under the *Health Care Act 2008* and exercise primary responsibility for the delivery of health services within their geographical areas.

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<sup>3</sup> For more information, see <https://www.turnbullhill.com.au/articles/intellectual-property-in-australia-explained/>.

<sup>4</sup> For more information, see <https://www.health.gov.au/initiatives-and-programs/medical-research-future-fund/mrff-research-themes/research-translation>.

# 1. Introduction

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## 1.1 The inquiry

The terms of reference (see pp.4-6) task the South Australian Productivity Commission (the Commission) to investigate health and medical research in South Australia and to make recommendations to the South Australian Government in two areas:

- action the government might take to:
  - a) increase the state's share of Australian Government funding for health and medical research and development (R&D);
  - b) increase the scale and productivity of publicly funded and public health and medical research institution R&D as well as private sector R&D;
  - c) increase the impact of health and medical R&D activity in South Australia on the state's economic growth; and
- changes to the structure, governance and operation of publicly funded health and medical research and development to increase research output, productivity and translational impact.

Part of the remit for the inquiry is that over the last two decades, South Australia's relative success in competitive national grant funding for health and medical research (HMR) has fallen, particularly in the earlier decade. The Commission is required to have regard to the South Australian Government's Growth State initiative and relevant state and national policies. The Commission notes, in that respect, that the health and medical industries have been identified as a strategic sector for the state's economic development.

The Commission notes the wide ambit of the detailed terms of reference. To make the task manageable, it has focussed attention on actions the state government can take. The importance of other non-government actors, such as the universities, is acknowledged throughout this draft report, without whom excellent health and medical research in South Australia cannot be achieved. But the state government has little or no influence over them.

While the Commission has gathered a great deal of evidence and looked widely in responding to the terms of reference it has been essential to exercise its judgement on priorities to be addressed in this report. For example, while the terms of reference ask the Commission to examine opportunities for increased commercialisation of HMR, this is an enormous subject in its own right. Accordingly, the Commission has limited its investigation in this area.

The terms of reference also require the Commission to consult with key stakeholders with an interest in the health and medical research sector.

## 1.2 Health and medical research is an important activity

The Commission considers health and medical research is an important activity for South Australia. Excellent clinical research is a foundation for attracting excellent medical staff, improving health care for South Australians and for improving the performance and productivity of a large part of the South Australian economy. For the purpose of this inquiry, the Commission defines clinical research as research to find new or improved ways for diagnosing, treating and preventing disease including medications, devices, diagnostic products and treatment regimens intended for human use. These may be used for prevention,

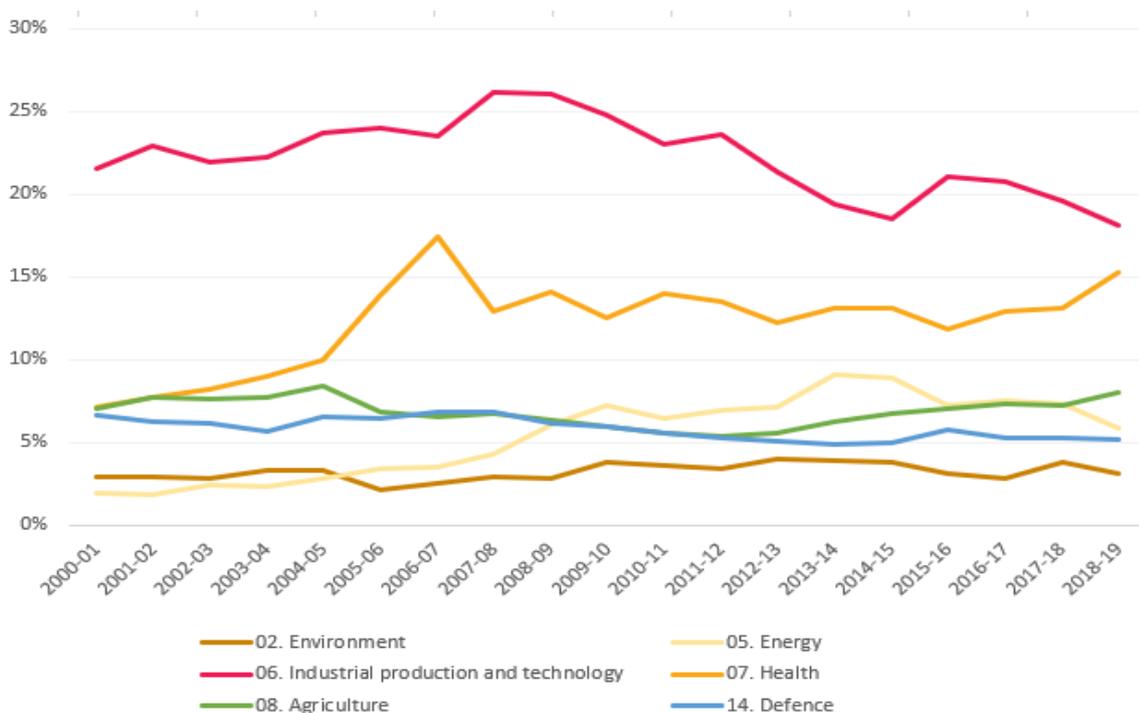
treatment, diagnosis or for relieving symptoms of a disease. It can involve doctors, nurses, allied health professionals, pharmacists, psychologists, biostatisticians, medical device engineers and other professional researchers seeking to improve the performance of the health system.

In addition, noting the state government has identified health and medical industries as a strategic sector, its sustained success can only be built with a powerful engine room of excellent HMR. For these reasons the Commission considers there is a good case for regarding excellent HMR as an element of South Australia becoming a vibrant, modern and competitive state.

The Australian Government is the single largest source of funding for HMR. Since 2000, health has received a large and growing proportion of Australian Government R&D funding. Figure 1.1 shows that health has been the second largest category of Australian Government R&D funding for many years.

This expenditure has contributed to the Australian healthcare system being regarded as amongst the best in the world. Australia ranked 8th out of 36 OECD+ countries in its contribution to the top 1 per cent of highly cited publications per million population.<sup>1</sup>

Figure 1.1 Australian Government funding of R&D by selected socio – economic category 2000-01 to 2018-19.



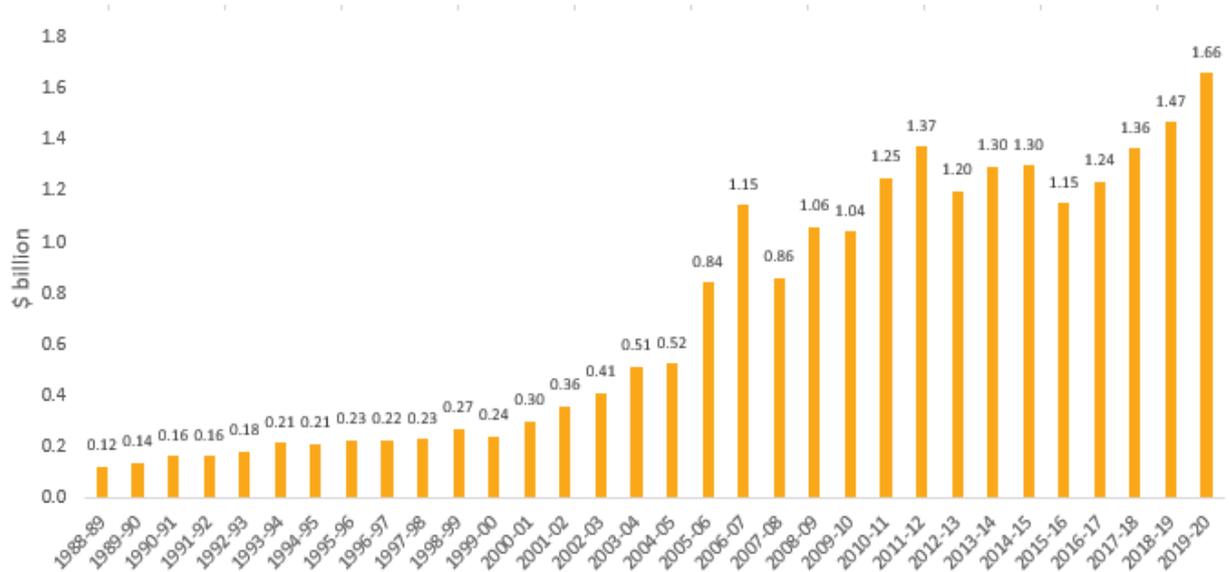
Source: 2018-19 Science, Research and Innovation Budget Tables. Selected categories only.

Australian Government spending on grants for health and medical research has risen from less than \$0.2 billion in 1990-91 to over \$1.3 billion in 2011-12, as shown in Figure 1.2. Growth has since tapered off and annual expenditure has fluctuated between \$1.2 and \$1.4 billion.

<sup>1</sup> B Palmer and V Kishore, *When Australia innovates, the world of healthcare changes* (Medtech Actuator, 2017) 2 <[http://medtechactuator.com/wp-content/uploads/2017/11/MedTech-Paper\\_When-Australia-Innovates-The-World-of-Healthcare-Changes\\_.pdf](http://medtechactuator.com/wp-content/uploads/2017/11/MedTech-Paper_When-Australia-Innovates-The-World-of-Healthcare-Changes_.pdf)>.

National grant funding awarded to South Australia has grown at a slower pace, with a resulting decline in South Australia’s share of national grant funding since around 2000. The apparent decline in SA’s competitiveness has prompted this inquiry by the Commission to identify and assess factors that have affected the state’s capacity to secure HMR funding and identify opportunities to improve South Australia’s capability to attract investment in HMR and translate HMR into improved health and economic outcomes.

Figure 1.2: Total Australian Government HMR expenditure 1990-91 to 2017-18.



Source: 2017-18 Science, Research and Innovation Budget Tables.

Common themes have emerged from engagement with universities, hospitals, medical research institutes (MRI) and business regarding the impediments to HMR. They include a complex regulatory environment administered by both the Australian and South Australian Governments, exacerbated by the absence of South Australian privacy legislation and unhelpful complexity regarding intellectual property (IP) management. Investment in HMR in South Australia has constructed buildings (and facilities to a lesser extent), rather than the critical leadership talent, especially for clinical research. A combination of policy choices and external developments also contributed to an apparent decline in clinical research in the public hospital system. While South Australia has benefited from significant recent investment in buildings and facilities, it appears that HMR workforce development has not received appropriate levels of investment.

Recent challenges brought about by the COVID-19 virus are a reminder of the importance of HMR, and the necessity for a flexible and responsive HMR sector able to provide evidence based public health policy advice and preventative research. The Commission deeply appreciates the efforts of the many participants in the inquiry process, many of whom have played a major part in the State’s response to the crisis. The Commission also notes the economic impact of COVID-19 on the university research funding model.

### 1.3 Commission’s approach

The Commission is required to take a broad perspective in developing advice for the South Australian Government. It must consider the broad interests and experience of state government agencies, universities, research institutions, industry, relevant peak bodies and other stakeholders.

Consultation and respectful engagement with stakeholders are an essential part of our work and, together with robust research and analysis, is the foundation for quality advice and recommendations to government. Transparency, including publication of the submissions received by the Commission, is an important part of this process.

The Commission invited submissions on the draft report that addressed any of the issues covered in that report, and any other matters relevant to the terms of reference where the Commission's understanding was imperfect. Twenty-three submissions and eleven items of correspondence from state government bodies and other information were received in response to the draft report. This information coupled with the responses received on the issues paper (36 submissions and 17 seventeen items of correspondence from state government bodies) greatly assisted the Commission's understanding of all aspects of its task. The submissions on the draft report are listed in Appendix 1. In addition, the Commission undertook a wide consultation approach including 78 meetings of Commissioners with various stakeholders. Due to the coronavirus pandemic restrictions, 67% were virtual meetings.

As part of the inquiry and systematic approach to engagement, the Commission also held six roundtable discussions with key stakeholders. At each roundtable Commissioners heard views and evidence relating to specific topics including access to data, competitive grant performance, workforce capability, translation and commercialisation as well as the institutional framework for HMR in the state.

The Commission acknowledges with thanks the assistance from local health networks, state government departments, universities, research institutions, industry, relevant peak bodies and other stakeholders.

## **1.4 Structure of the report**

The report is structured as follows:

- chapter 2 presents an overview of the policy and regulatory environment for HMR in SA;
- chapter 3 provides a historical and comparative overview of SA's share of national HMR grant funding and summarises views on factors affecting this funding share;
- chapter 4 discusses alternative measures of HMR activity and presents indicators at both the state and institutional levels;
- chapter 5 discusses the regulatory and governance environment and identifies opportunities for reform;
- chapter 6 identifies the key workforce factors affecting HMR performance;
- chapter 7 examines data access issues including the impact of the current Australian and South Australian Government legislative frameworks;
- chapter 8 identifies barriers and opportunities to translation and commercialisation as key to the realisation of economic and health benefits from research; and
- chapter 9 discusses the state's HMR architecture including the roles and relationships between the state's publicly funded institutions with key roles in HMR.

## 2. Policy environment

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### 2.1 Introduction

The inquiry's terms of reference require the Commission to examine and report on the following matters regarding health and medical research (HMR) in South Australia:

- increase the state's share of Australian Government funding for health and medical research and development (R&D);
- increase the scale and productivity of publicly funded and public health and medical research institution R&D as well as private sector R&D;
- increase the impact of health and medical R&D activity in SA on the state's economic growth. (TOR 8); and
- recommend changes to the structure, governance and operation of publicly funded health and medical research and development to increase research output, productivity and translational impact (TOR 9).

National and state policy, regulatory and administrative frameworks influence what and how HMR is done in South Australia. The elements include competitive funding programs, research strategies and regulation, including intellectual property, ethics approvals and access to data. This landscape is complex.

This chapter describes the current frameworks and their relevance to HMR in South Australia. It also provides an abbreviated history of the evolution of the South Australian policy and institutional arrangements that has led to the current arrangements (see Figure 2.1). There are some particularly significant milestones for this inquiry.

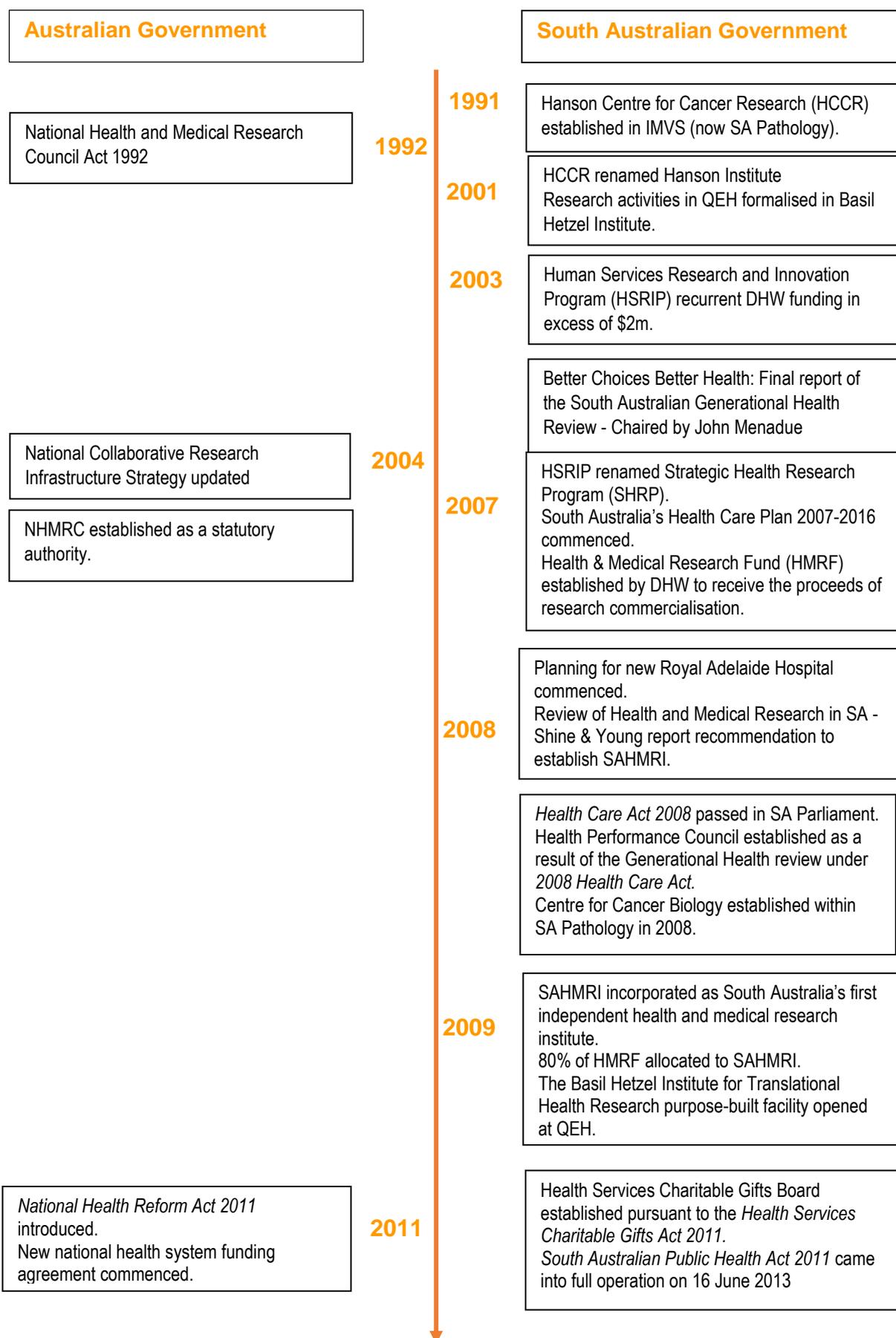
At the national level:

- establishment of the National Health and Medical Research Council (NHMRC) as a statutory authority (2006);
- new national health system funding agreement commenced (2011);
- establishment of the Australian Medical Research Futures Fund (MRFF) (2015); and
- significant changes to the structure and eligibility criteria of the NHMRC grant scheme (2018).

In South Australia:

- health department funding for the Human Services Research and Innovation Program commenced (2002);
- South Australian *Health Care Act 2008* enacted, resulting in greater centralisation of the SA public hospital system. The Shine and Young Review of Health and Medical Research in South Australia recommended the establishment of SAHMRI (2008).
- major planning of the restructuring of the public health system (2014–2017);
- MOU signed between CALHN, SAHMRI, University of Adelaide and UniSA for collaboration at the Adelaide Biomedical precinct (2013) later replaced by a collaboration agreement between these partners, Flinders University and Renewal SA (2018);
- new governing boards for ten local health networks and six regional local health networks commenced operation and the Commission on Excellence and Innovation in Health (CEIH) was established (2019).

Figure 2.1: Key event timeline 1991 - 2020



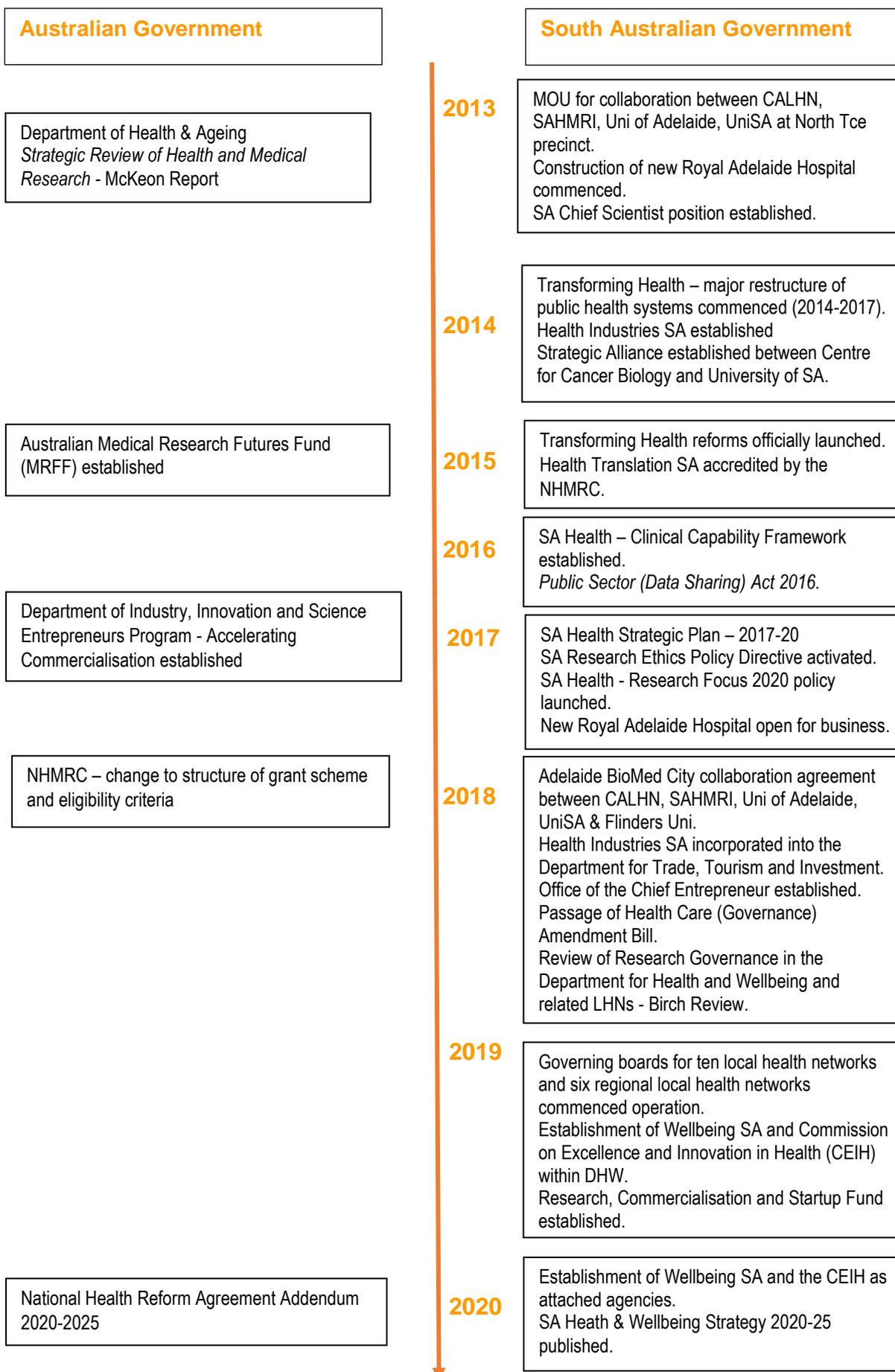
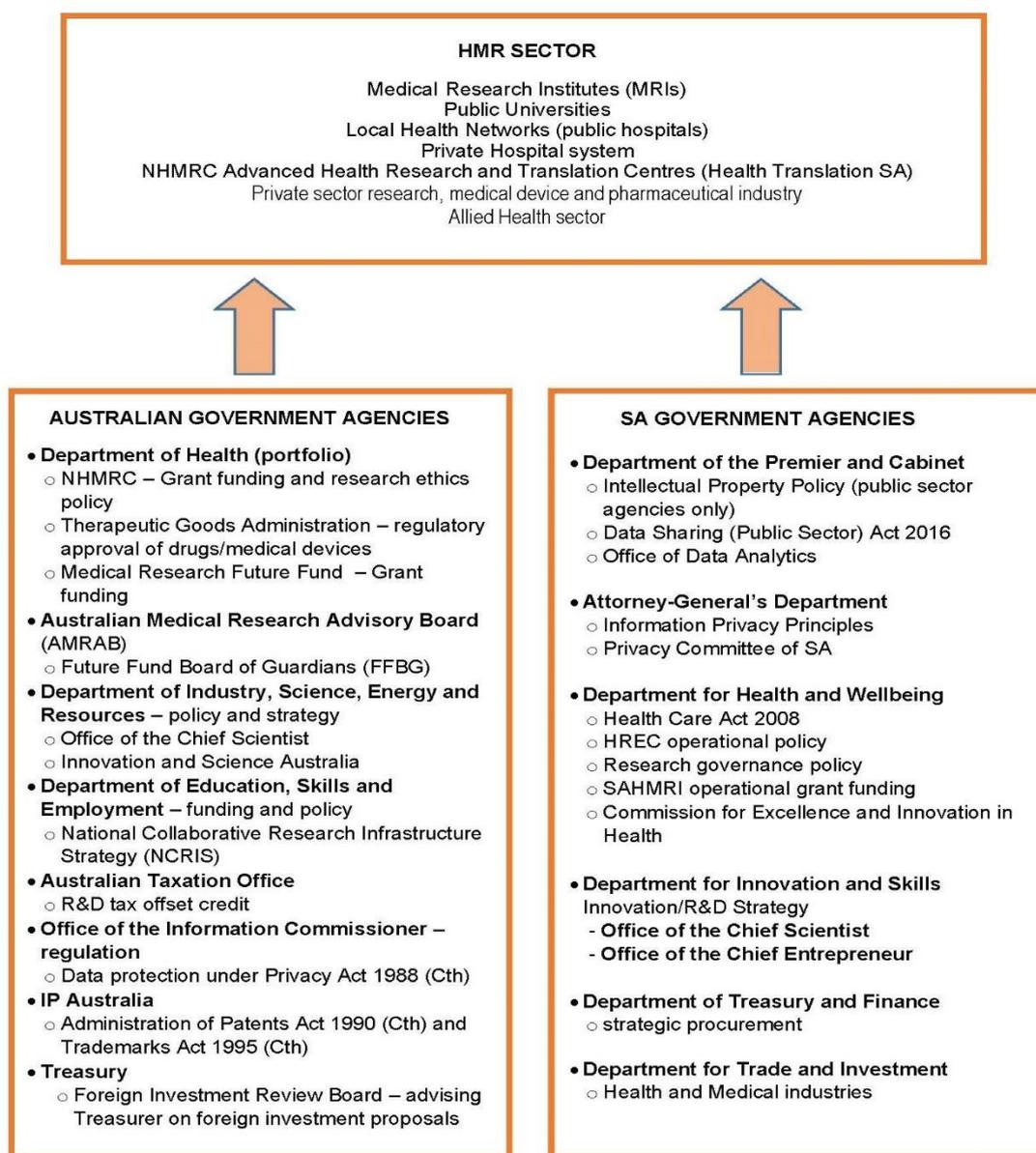


Figure 2.2. depicts the plethora of Australian and South Australian Government agencies that are either directly involved in HMR, set policy, regulate aspects of HMR or fund HMR. In several cases the connection to HMR is incidental to economy-wide activities (such as the Australian Tax Office in relation to the R&D tax concession), the Australian Office of the Information Commissioner (data protection), the South Australian Department of the Premier and Cabinet (DPC) (intellectual property policy and data sharing) and the South Australian Department of Treasury and Finance (strategic procurement). Two key points are that there are many players and that the national policies and priorities shape (but do not determine) HMR in South Australia.

Figure 2.2: HMR Australian and state government regulatory and funding environment.



Source: The Office of the South Australian Productivity Commission.

The remainder of this chapter is organised as follows: section 2.2 summarises Australian Government policy; section 2.3 covers South Australian policy; Section 2.4 considers HMR support in other jurisdictions; section 2.5 addresses the regulatory framework; and section 2.6 provides a brief conclusion.

## 2.2 Australian Government policy

The Australian Government's funding objectives for R&D and innovation, including HMR, are contained in several strategic plans and statements. The *National Innovation and Science Agenda* (NISA) 2015 is one of the most important overarching statements of the government's strategic priorities in all areas of R&D and innovation, including HMR. It presents a comprehensive strategic policy statement in the overlapping areas of research, development and innovation. Other related statements of the government's overarching policy objectives include the *National Science Statement* and the government's response to the recent *Australia 2030: Prosperity Through Innovation* report.<sup>1</sup>

NISA explicitly seeks to harness research, science and innovation as drivers of economic growth. It is based on four key 'pillars' that are a foundation for 24 separate initiatives, some of which are of particular significance to HMR. One is the Biomedical Translation Fund (BTF), which is intended to support biomedical companies by providing them with access to venture capital to commercialise HMR innovations.

The Australian Government is the single largest source of funding for HMR research in the areas of basic, clinical and health translation research.

In its 2018-19 budget, the Australian Government invested a total of approximately \$9.4 billion in general R&D.<sup>2</sup> This included funding for programs that directly support HMR, including the NHMRC's competitive grant program, which dispersed approximately \$846 million during 2018-19.<sup>3</sup> Cumulative funding through the Medical Research Future Fund (MRFF), since its establishment in 2015, stood at approximately \$222 million in 2018-19.<sup>4</sup>

The Australian Government also provides block grants to universities to support their activities in HMR. Block grants also support research, teaching and training in the public hospital systems managed by the states and territories. Government support for private sector HMR largely comes through the R&D tax incentive.<sup>5</sup> It provides a refundable tax offset for R&D-active companies with an aggregate turnover under \$20 million per annum.

HMR is the third largest social-economic area of Australian Government total R&D funding. Specific government HMR objectives are often subsumed in broader strategic policy statements, such as NISA. The Australian Government's funding priorities and objectives in HMR are contained in the three most significant sources of national HMR funding: the NHMRC, the MRFF and the BTF as well as the National Collaborative Research Infrastructure Strategy (NCRIS), which are discussed below.

### NHMRC

The NHMRC is the Australian Government's primary funding agency for all forms of HMR. It is the lead agency for the development of evidence-based policy advice on public health and

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<sup>1</sup> For additional details, see *Australia's National Science Statement*, see <<https://www.industry.gov.au/data-and-publications/australias-national-science-statement>> and the Australian Government's response to the *Australia 2030: Prosperity Through Innovation* report, see <<https://www.industry.gov.au/data-and-publications/australia-2030-prosperity-through-innovation>>

<sup>2</sup> For further details, see the 2019-20 Science, Research and Innovation budget tables, available at <<https://www.industry.gov.au/data-and-publications/science-research-and-innovation-sri-budget-tables>>

<sup>3</sup> National Health and Medical Research Council, *Annual Report 2018-19* (October 2019) p14. <<https://www.nhmrc.gov.au/about-us/publications/annual-report-2018-19>>.

<sup>4</sup> 2019-20 Science, Research and Innovation budget tables

<sup>5</sup> For further details, see the Australian Taxation Office's overview of the R&D Tax Incentive, including eligibility criteria, <<https://www.ato.gov.au/Business/Research-and-development-tax-incentive/>>

has lead responsibility for the development and administration of guidelines on the ethical conduct of human research.

The NHMRC is required to develop a corporate plan to identify the major health issues facing Australia and develop a strategy to guide HMR funding.<sup>6</sup> The current NHMRC corporate plan, which expires in 2022-23, sets out strategic priorities and a strategic plan. The NHMRC's current strategic priority areas are:

- improving the health of Aboriginal and Torres Strait Islander peoples, including by enhancing the capacity of Aboriginal and Torres Strait Islander researchers and addressing health disparities;
- resilience in relation to environmental change, emerging health threats and emergencies;
- supporting the delivery of palliative and supportive care and issues related to end-of-life care;
- furthering an integrated and coordinated approaches to chronic conditions;
- harnessing the power of data and analytical technologies; and
- improving research quality to maximise the rigour, transparency and reproducibility of NHMRC-funded research.<sup>7</sup>

The NHMRC's strategic priorities drive its HMR strategy, which is also guided by key principles, including funding both investigator-initiated and priority-driven HMR. The current HMR strategy is guided by the research themes of investment, translation and integrity and commit the NHMRC to three mutually reinforcing objectives:

- creating knowledge and building research capability through investment in the highest quality health and medical research and the best researchers;
- driving the translation of health and medical research into clinical practice, policy and health systems and the effective commercialisation of research discoveries; and
- maintaining a strong integrity framework for research and guideline development.<sup>8</sup>

The NHMRC's funding priorities are also informed by a commitment to support the 'four pillars' of HMR – basic science, clinical research, public health research, and health services research. It provides competitive and merit-based funding in support of the full spectrum of contemporary HMR, including both discovery and implementation science.

## MRFF

The NHMRC's funding priorities are intended to be complemented by the MRFF.<sup>9</sup> With a projected capitalisation of \$20 billion by 2020-21, the MRFF is designed to provide a stable and consistent source of funding for HMR that is focused on national health priorities, such as supporting effective research translation, including commercialisation, and helping to advance frontier medical research.

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<sup>6</sup> See, in particular, *National Health and Medical Research Council Act 1992 (Cth)* s.16.

<sup>7</sup> National Health and Medical Research Council (Cth), *NHMRC Corporate Plan 2019-20* (2019), 5.

<sup>8</sup> *Ibid.*, 7.

<sup>9</sup> Australian Government, *Australian Medical Research and Innovation Strategy 2016-21* (2016), 3.

The *Medical Research Future Fund Act 2015* (the MRFF Act) requires the fund’s strategic direction to be developed by the Australian Medical Research Advisory Board (AMRAB), which is a statutory advisory body under the act.<sup>10</sup> The MRFF Act requires the Health Minister to take the priorities and strategy developed by the AMRAB into account when making funding decisions, but all decisions on grant funding remain with the Minister.

The AMRAB must develop strategic funding priorities on the basis of five interrelated areas:

- addressing the burden of disease on the Australian community;
- delivering the practical benefits of HMR to as many Australians as possible;
- ensuring that the financial assistance provided under the act provides the greatest value for all Australians;
- ensuring that financial assistance provided under the act complements and enhances other financial assistance provided for HMR; and
- any other relevant matter.<sup>11</sup>

The MRFF’s strategic funding priorities balance the Australian Government’s funding in other areas of HMR, including those funded by the NHMRC. They are not intended to duplicate, or detract from, the NHMRC’s strategic focus on the full spectrum of HMR.

The MRFF’s priorities are also intended to align with the government’s priorities in broader R&D and innovation, including the strategic direction mapped out in NISA. As part of a broader strategy of complementarity and alignment, the MRFF’s strategic platforms and associated priorities are intended to be sufficiently flexible to connect with HMR investments made by state and territory governments.

These strategic priorities are in the *Australian Medical Research and Innovation Strategy 2016-21* and the *Australian Medical Research and Innovation Priorities 2018-2020*. There are six strategic ‘platforms’, with priorities linked to each ‘platform’, presented in Table 2.1.

Table 2.1: Current MRFF strategic priorities

Strategic Platform	Priorities
<b>Strategic and international horizons</b>	<ul style="list-style-type: none"> <li>• One health – antimicrobial resistance;</li> <li>• Global health and health security;</li> <li>• Aboriginal and Torres Strait Islander health;</li> <li>• Ageing and aged care</li> </ul>
<b>Data and infrastructure</b>	<ul style="list-style-type: none"> <li>• Digital health intelligence</li> </ul>
<b>Health services and systems</b>	<ul style="list-style-type: none"> <li>• Comparative effectiveness research;</li> <li>• Primary care research</li> </ul>
<b>Capacity and collaboration</b>	<ul style="list-style-type: none"> <li>• Comparative effectiveness research;</li> <li>• Primary care research</li> </ul>
<b>Trials and translation</b>	<ul style="list-style-type: none"> <li>• Drug repurposing</li> <li>• Public health interventions</li> </ul>
<b>Commercialisation</b>	<ul style="list-style-type: none"> <li>• Translational research infrastructure</li> </ul>

<sup>10</sup> See *Medical Research Future Fund Act 2015* (Cth) ss 32B and 32C.

<sup>11</sup> See *ibid* s 32E(3)

## Biomedical Translation Fund

The Biomedical Translation Fund (BTF) is designed to harmonise with NHMRC and MRFF and aims to assist the effective translation and commercialisation of biomedical discoveries in a range of HMR areas, including discoveries that are therapeutic, medical or pharmaceutical in nature.

The BTF complements the MRFF's Medical Research Commercialisation initiative. Funding from the MRFF primarily focuses on supporting early stage HMR to the proof-of-concept stage and on providing opportunities for commercialisation. The BTF focusses on the later stages of the translation and commercialisation processes.

The BTF program has two overarching policy objectives:

- to invest in promising biomedical discoveries and assist companies' efforts to commercialise their discoveries;
- to address capital and management constraints to encourage the development of companies that are seeking to commercialise biomedical discoveries.<sup>12</sup>

The BTF operates as a venture capital fund based on equity co-investment, with funding available through three private sector licensed venture capital fund managers. The fund's structure requires Australian Government program capital to be matched by private capital raised by licensed fund managers.

## National Collaborative Research Infrastructure Strategy

The National Collaborative Research Infrastructure Strategy (NCRIS), established in 2004, provides funding to support the development of a national network of significant research infrastructure assets.

The priorities guiding the NCRIS investments are set out in a National Research Infrastructure Roadmap (revised every five years) and a Research Infrastructure Plan (developed every two years). Both documents are developed in consultation with the research sector. NCRIS is not a competitive funding program. Decisions are made solely by the government, guided by the infrastructure roadmap and plan.

The majority of NCRIS-funded infrastructure is not focussed on HMR, with most facilities headquartered outside of South Australia. A number of NCRIS facilities directly support HMR, such as the National Imaging Facility (NIF), and some have nodes in South Australia. The Large Animal Imaging Facility, administered by SAHMRI, is one of 10 national nodes that make up the NIF.

In 2016, the Australian Government committed \$1.9 billion in funding over twelve years. NCRIS grants, which are administered by the Australian Government's Department of Education, Skills and Employment, generally require matching funding from a state or territory government and from the partnering HMR institution (usually a university). The South Australian Government has committed a total of \$20.5 million in matched funding for contracts commencing in 2019 and expiring in 2023.

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<sup>12</sup> Australian Government, *Biomedical Translation Fund Guidelines* (2016), 3.

## 2.3 South Australian Government policy and institutions

### Strategic policy and funding

Unlike some Australian jurisdictions, South Australia does not have a whole-of-government HMR strategy. The Department for Health and Wellbeing (DHW) has developed a portfolio HMR strategy, *Research Focus 2020*, which is intended to support research within the South Australian public health system. The strategy was released in 2017 and is aligned with the *Health and Wellbeing Strategy 2020 – 2025* and the *Clinical Excellence: Developing Strategic Direction to Build Allied Health Research and Translation Capacity: 2019-29*.

*Research Focus 2020* outlines a number of key areas in which the department aims to assess performance, such as the number of HMR projects undertaken across South Australia's public health system and the extent of clinical trial activity in South Australian public hospitals. Various submissions contend that *Research Focus 2020* is inadequately integrated within the local health networks (LHNs). Correspondence from the Women's and Children's Local Health Network argues:

SA Health's health and medical research strategy, *Research Focus 2020*, is not supported by the Health Networks in its current format as it is deficient in relevant content and vision for the future (*Women's and Children's Health Network, p. 1*)

In addition, while a number of policy documents and strategic plans with a focus on HMR have been released since SAHMRI's establishment, the Commission has been unable to determine whether the priorities identified in these plans have been formally reviewed or evaluated.

Several stakeholders, both within the state's public health system and in non-government HMR institutions, consider that South Australia's lack of an overarching HMR strategy limits the effectiveness and impact of the state's research output. They consider areas in which South Australia already has a comparative advantage could be consolidated and strengthened by a whole-of-state strategy. According to Health Translation SA:

South Australia must develop a whole of government HMR Strategy that includes research priorities based on the state's needs and strengths. This strategy must also consider broader horizons to include issues at a national and international level in which the state has leading capabilities. While there is acknowledgement that blue sky research should still be part of the research landscape, research priorities that address recognised local, state, national or international problems and challenges must be a major focus of research in order to deliver impact (*Health Translation SA, DR17 pp 9-10*)

On a whole-of-government level, state governments over the past two decades have sought to develop the state's R&D capacity, including in HMR, through a range of initiatives including the Adelaide BioMed City and Tonsley Innovation District.

Current initiatives are largely centred on the new Lot 14 precinct, including the Office of the Chief Entrepreneur. Several government programs in support of R&D and innovation have recently been consolidated under the Future Industries Exchange for Entrepreneurship (FIXE) strategy.<sup>13</sup>

On 10 October 2020, the state government launched a 10-year EXCITE Strategy<sup>14</sup> (Strategy). The aim of the Strategy is to deliver a productivity growth rate that places SA in

<sup>13</sup> For an overview of the programs under the FIXE umbrella, see <<https://www.fixe.org.au/support>>

<sup>14</sup> For more information, see <<https://innovationandskills.sa.gov.au/science/excite-strategy>>

the top quartile of OECD nations for key measures of performance in the research and innovation value chain. The Strategy focuses on a range of initiatives that aim to increase the performance of the key enablers of STEMM<sup>15</sup> research and investment. Some of the key enablers include investment, infrastructure, training, and future workforce capability. Together with the state government's FIXE Strategy, the EXCITE Strategy forms the government's overarching innovation strategy.

Two general R&D initiatives, administered by the Department for Innovation and Skills (DIS), are open to businesses or institutions in the HMR sector:

- \$28 million Research, Commercialisation and Startup Fund (RCSF), which is designed to support proposals that build industry R&D capability in South Australia; and
- South Australian Venture Capital Fund (SAVCF), which enables innovative South Australian ventures to accelerate growth into national and global markets. The SAVCF will only support HMR companies or institutions if they can demonstrate the successful completion of stage 1 clinical trials or the equivalent stage for medical devices.<sup>16</sup>

HMR conducted in the state's public health system is also supported by DHW through policy development, coordination and governance support. The Office for Research (OFR) has a role in coordinating research conducted under the auspices of the department, including clinical trials. OFR is also principally responsible for developing and implementing policy for conducting research in the South Australian public health system, including policies that relate to health research ethics and research governance obligations.

On 1 October 2020, the state government launched the Health and Medical Industries Sector Plan 2020 to 2030<sup>17</sup>. The plan is one of nine industry sector plans that will form the basis of the state government's 'Growth State' initiative. The plan identifies key enablers to drive the value of health and medical industries in SA and includes a target to more than double the sector's economic contribution to SA to \$5 billion by 2030.

Other targets include the creation of the 'Industry Connectivity Initiative' to provide a cohesive industry presence, and the SA Health Clinical Trials Portal to attract international multi-centre trials by acting as a single point of entry for new trials in SA. DTI is currently working with industry to develop operational plans for implementation.

### **South Australian government institutions**

In 2019 the state government established the Commission on Excellence and Innovation in Health (CEIH) within the DHW portfolio. The CEIH is broadly modelled on similar agencies in other jurisdictions, such as the Agency for Clinical Innovation in NSW, and is responsible for providing leadership and advice on a range of issues in the health system. These include supporting clinical innovation and enhancing collaboration between stakeholders in the public and private sectors. It does not set priorities for research.

The role of the CEIH is to provide leadership and advice within SA Health and the South Australian Government on clinical excellence and innovation, with a focus on maximising health outcomes for patients, improving care and safety, monitoring performance, championing evidence-based practice and clinical innovation and supporting collaboration.

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<sup>15</sup> STEMM stands for science, technology, engineering, mathematics and medicine.

<sup>16</sup> For more details, see <<https://innovationandskills.sa.gov.au/innovation/sa-venture-capital-fund-savcf>>

<sup>17</sup> For more details, see <<https://dti.sa.gov.au/investment/opportunities-for-industry/health-medical-industries>>.

An expert Advisory Council supports the CEIH in the delivery of its mandated functions, including the development of its future work program. Its members possess expertise in a range of health-related fields, including areas that are important for the development of HMR in South Australia, such as clinical research and research translation.

The Department for Innovation and Skills (DIS) also contributes to the broader regulatory, funding and policy landscape in South Australia in relation to HMR, particularly through the research, analysis, advocacy and policy development undertaken by the Office of the Chief Scientist and the Office of the Chief Entrepreneur, both of which are portfolio agencies responsible to the Minister.

The Department of Treasury and Finance (DTF) has direct administrative responsibility for strategic procurement. As a significant area of government expenditure, procurement can be used to provide support to HMR commercialisation in the private sector, including in areas like the procurement of health equipment and pharmaceuticals for the state's public health system.

The Department for Trade and Investment (DTI) has lead responsibility for promoting the development of the health and medical industry, including HMR, as one of the state government's growth state industries.

Over time, successive state governments have established a variety of agencies and advisory councils, both statutory and non-statutory, such as the Premier's Science and Innovation Council (PSIC) to enhance research and development in South Australia.

PSIC provides input on the performance of the state's science, research and innovation strategic plan, analyses international and national priorities and emerging technologies and considers market responses that provide opportunities for South Australia. HMR is included in this scope.

The Commission notes that Health Industries SA (HISA) and BioInnovation SA (BIS), both of which were initially independent agencies engaged in supporting the translation and commercialisation of HMR, were recently incorporated into DTI and the Office of the Chief Entrepreneur in DIS, respectively.

HISA was established in January 2014 as a business unit in SA Health, along with an advisory board.<sup>18</sup> In October 2014, it was re-established as a separate agency. HISA was intended to form a single and consolidated point of government contact for health and life science companies investing in SA. It was focused on five sectors: biotechnology, pharmaceutical companies, medical devices, digital health and nutraceuticals. Further machinery of government changes in 2014 led to HISA being incorporated into the former Department of State Development. HISA's revised mandate was to position SA as the preferred destination of choice for health industry companies.

In July 2018, HISA was abolished and its functions transferred to the Health and Medical Industries Division (HMID) of DTI.<sup>19</sup> The Commission understands that HMID is currently focused on supporting local health and medical businesses to export domestically and overseas, and attracting investment into SA.

BIS was incorporated under the *Public Corporations (Bio Innovation SA) Regulations 2001* (ceased), pursuant to the *Public Corporations Act 1993*. BIS exercised a number of functions

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<sup>18</sup> Hon Steven Joyce, *Review of the South Australian Government's International and Interstate Engagement Bodies and Functions Final Report*, February 2019, 23.

<sup>19</sup> SA State Budget 2018-19, Budget Paper 4 – Volume 4, p.158.

including fostering the growth and development of the bioscience industry in SA by providing business support through grants, providing funding for bioscience services, and encouraging the development of bioscience related products and services to attract companies to SA.

In 2016, the government re-established BIS as TechInSA and widened the new agency's remit to include, in addition to the functions exercised by BIS, the development of SA's high-tech industry by facilitating the translation of research into intellectual property (IP), providing business support (including grants and access to business incubation facilities), and contributing to policy development. In August 2018, the government announced that TechInSA would be merged into the Office of the Chief Entrepreneur, which forms part of the DIS portfolio.

The Commission notes that the Basil Hetzel Institute for Translational Health Research (BHI) is one of the few publicly-funded research institutes in SA that is integrated into, and directly supports clinical care in, a major public hospital. The BHI forms part of the Queen Elizabeth Hospital (QEH), which serves a population of around 250,000 people in the western areas of metropolitan Adelaide. Researchers at the BHI include staff and students affiliated with the QEH, CALHN and other parts of SA Health, along with academics employed by, or affiliated with, the University of Adelaide and the University of South Australia.

The BHI developed from the older Clinical Development Research Centre, which was also a constituent part of the QEH. The institute took on its current form and adopted its present research focus in 1996. In 2010, the institute's name was changed to the Basil Hetzel Institute for Translational Health Research to reflect its focus on clinical and translational research.

The BHI's areas of research priority are closely aligned with the disease burden in the geographical areas served by the QEH. The BHI undertakes research in a range of fields, but the Commission notes that its overarching focus on linking HMR with enhancing and advancing clinical care is predicated on supporting clinician researchers to undertake effective translational research.

The SA public health system also supports other significant publicly-funded research institutes, including SA Pathology and its associated research arms, the Hanson Institute and the Centre for Cancer Biology. That said, the BHI is a comparatively rare example in SA of a research institution that is embedded within, and supports the clinical focus of, a major public hospital. This model is considerably more common in other jurisdictions, such as Victoria and NSW.

## 2.4 HMR support in other jurisdictions

Some other jurisdictions have adopted a more structured approach to the provision of financial support to their HMR sectors. This is particularly true of Victoria and NSW, which have both made significant investments in different areas of HMR, including infrastructure.

Both state governments' funding initiatives are guided by strategic plans that aim to enhance areas of comparative advantage, such as HMR translation, commercialisation and clinical trials. HMR support in Victoria is guided by the government's *Healthier Lives, Stronger Economy* strategy, while the NSW Government's HMR support programs and initiatives are informed by the *NSW Health and Medical Research Strategic Review*. This was published in 2012 and provides a 10-year plan to enhance HMR outcomes in the state.

The Victorian Government has provided approximately \$400 million over the last 20 years through its Operational Infrastructure Support Program to assist independent medical

research institutes (MRIs) to defray their operational costs. The program is limited to MRIs whose primary research concentration is in fundamental HMR or clinical biomedical research.<sup>20</sup>

A similar support fund, which also targets the indirect costs of HMR, has been in place in NSW since 2003. The Medical Research Support Program is designed to assist institutions to meet their indirect research costs by matching grant funding provided by the Australian Government. Funding is allocated based on the institution's recent track record in securing competitive grants.<sup>21</sup> (See appendix 2 for further information on HMR initiatives by other state governments.)

## 2.5 Regulatory environment

Health and medical research (HMR) in Australia is subject to a range of legislative, regulatory, ethical and policy requirements. The HMR sector in Australia is not regulated by a single agency at the national level. Approval and governance responsibilities are also shared between the government and non-government sectors, including universities, medical research institutes and public sector health organisations.<sup>22</sup>

### Intellectual property

Australia's intellectual property regime is based on Commonwealth legislation and a variety of common law protections. A number of different pieces of legislation create the statutory basis of contemporary IP law. The most significant acts include the *Patents Act 1990* (Cth), the *Trade Marks Act 1995* (Cth), the *Designs Act 2003* (Cth), and the *Plant Breeders' Rights Act 1994* (Cth). The legislative framework that creates the system for IP protection in Australia is administered by IP Australia, an agency within the industry portfolio.

In South Australia, all intellectual property generated in state government agencies, including DHW and the LHNs, is subject to the Intellectual Property Policy (IPP), which is administered by the Department of the Premier and Cabinet (DPC).

The IPP sets the framework that guides the use, generation, acquisition and management of IP within the public sector, while also aiming to ensure that government-owned IP is utilised to facilitate knowledge transfer and innovation.

The state's approach to the protection and development of IP generated within the public sector is based on the principle that the government is not generally best placed to develop and commercialise IP. The IPP includes a presumption in favour of allowing third parties to benefit from the development of IP, provided this does not erode the state's IP rights.<sup>23</sup>

### Human research ethics approval

The NHMRC has oversight of the national framework that guides the conduct of human research. The NHMRC is required to issue guidelines on matters related to the conduct of HMR in Australia, particularly ethics approval and site-specific governance requirements (as

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<sup>20</sup> Additional details on the *Operational Infrastructure Support Program* can be found <<https://www2.health.vic.gov.au/about/clinical-trials-and-research/operational-infrastructure-support/>>

<sup>21</sup> For further details on the scope and objectives of the *Medical Research Support Program*, see <<https://www.medicalresearch.nsw.gov.au/medical-research-support-program/>>

<sup>22</sup> Department of Health and Ageing, *Strategic Review of Health and Medical Research* (2013) 51.

<sup>23</sup> For further details, see South Australian Government, *South Australian Government Intellectual Property Policy* (2017), 1.

an addition to, and without detracting from, any applicable legislative requirements and common law obligations).

The most significant of the NHMRC's guidelines is the *National Statement on Ethical Conduct in Human Research* (the national statement), which the NHMRC developed jointly with Universities Australia and the Australian Research Council (ARC).<sup>24</sup> The national statement is designed to create a nationally consistent framework to guide the conduct of HMR, but does not prescribe standards or processes that are legally enforceable. Its primary aim is the creation of a nationally consistent set of ethical principles and standards to inform the conduct of HMR, rather than developing a framework that is grounded in statute.

The national statement specifies that all institutions engaging in HMR should establish and fund human research ethics committees (HRECs), and prescribes that HRECs exercise primary responsibility for reviewing, approving and monitoring HMR projects that involve human participants. It also provides guidelines on the way that HRECs ought to be established, including their composition, and the steps that researchers are required to follow when submitting proposals for consideration by a HREC. In addition, the national statement outlines the issues that HREC members ought to consider when assessing the ethical implications and scientific merit of a proposal.

### **Ethics approval in South Australia**

The NHMRC's national role is complemented by institutions developing their own policy directives to give effect to the requirements laid out in the national statement.

In the South Australian public health system, these requirements are expressed in two overarching policy guidelines administered by DHW: the *SA Health Research Ethics Policy Directive* (the ethics policy) and the *SA Health Research Governance Policy*.<sup>25</sup> The policy directives provide guidance on complying with the relevant regulatory, policy and organisational requirements that apply in South Australia.

The SA Health ethics policy applies to the processes and procedures to be followed to receive HREC approval to undertake HMR in the public health system. The ethics policy also makes clear, consistent with the national statement, that SA Health's HRECs are responsible for monitoring approved HMR projects throughout their duration.

The South Australian public health system currently includes five separate HRECs, including the DHW HREC, which evaluates research proposals from SA Health staff and assesses applications from external researchers for access to SA Health data.

Both Central Adelaide Local Health Network (CALHN) and Women's and Children's Health Network (WCHN) maintain independent HRECs, and these have sole responsibility for approving research conducted at facilities associated with these LHNs. Southern Adelaide Local Health Network's (SALHN) HREC is managed in partnership with Flinders University and is responsible for approving HMR undertaken at SALHN facilities or under the auspices of the university. HMR that has a primary focus on Aboriginal and Torres Strait Islander peoples must be approved by the Aboriginal Health Research Ethics Committee. That said,

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<sup>24</sup> See *National Statement on Ethical Conduct in Human Research 2007 (Updated 2018)*, <<https://www.nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018#block-views-block-file-attachments-content-block-1>>.

<sup>25</sup> Additional details on the requirements that apply to both ethics and governance approval can be found at <<https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+and+med+ical+research/research+ethics/research+ethics>>.

these proposals also require review from one of the other SA Health HRECs (depending on the location of the proposed HMR).<sup>26</sup>

The Commission notes that ethics and governance approval processes in SA Health were separated in 2012, and that the Review of Research Governance in the Department of Health and Wellbeing and related LHNs (Birch Review) made a range of recommendations to enhance the effectiveness of the current system. The implementation of these recommendations is coordinated by the South Australian Clinical Research Governance Steering Committee, under the auspices of Health Translation South Australia (HTSA).

The recommendations from the Birch Review are outside the scope of the Commission's inquiry as their implementation is underway. Issues related to the ethics approval process not directly addressed in the Birch Review are in scope.

### Data access

South Australian researchers' access to data is governed by a complex regulatory framework, the majority of which is created by legislation and policy at the state level, including the *Health Care Act 2008*, the *Mental Health Act 2009*, the *Information Privacy Principles (IPPs)*, and the *Public Sector (Data Sharing) Act 2016* (Data Sharing Act). SA Health has also developed its own privacy policy, the *Privacy Policy Directive*.<sup>27</sup> This provides guidance on the legislative and administrative requirements that apply to access and disclosure of HMR data, including the requirements laid out in the IPPs. Adherence to its provisions is mandatory throughout SA Health.

Both the Health Care Act and the Mental Health Act contain provisions that allow for the disclosure of information for research purposes in the absence of the prior consent of the individuals concerned, provided that the proposed research has been approved by "an ethics committee [HREC] and there is no reason to believe that the disclosure would be contrary to the person's best interests".<sup>28</sup>

In addition, all South Australian public sector agencies are subject to the requirements laid out in the IPPs and other relevant state legislation. The IPPs, which carry the force of a Cabinet decision, are outlined in *Premier and Cabinet Circular 12 (PC 12)* and contain provisions that prescribe the way in which South Australian public sector agencies are permitted to collect, store, use and disclose personal information, including HMR data. PC 12 also establishes the South Australian Privacy Committee (the Privacy Committee) and specifies its membership, functions and powers.

The Privacy Committee exercises a number of powers and responsibilities under PC 12, including advising the Attorney General on the desirability of privacy legislation or additional administrative action. One of its most significant functions involves the authority to grant exemptions from one or more of the IPPs on the basis of "such conditions as the committee thinks fit".<sup>29</sup>

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<sup>26</sup> NALHN currently does not support its own HREC, but relies on external HRECs to assess and approve HMR at NALHN sites. Approval can be granted by one of SA Health's HRECs or by a committee managed by a private sector provider, such as Bellberry.

<sup>27</sup> See SA Health, *Privacy Policy Directive* (2019).

<sup>28</sup> See the act's provisions on confidentiality, *Health Care Act 2008*, (SA) s 93(f).

<sup>29</sup> Department of the Premier and Cabinet (SA), *PC 012 – Information Privacy Principles Instruction* (2017), 3.

Other aspects of privacy protection and data access are governed by legislation at the Commonwealth level, principally on the basis of the *Privacy Act 1988* (Privacy Act).<sup>30</sup> The Privacy Act applies to most Australian Government agencies and large sections of the private sector, but generally does not apply to state and territory agencies and crown instrumentalities. The Commission notes that DHW is a prescribed organisation for the purposes of the Privacy Act. That said, its inclusion under the *Privacy Regulations 2013* is limited to technical data linkage work undertaken by SA NT DataLink and DHW. The Commission understands that the decision to prescribe DHW pursuant to the Privacy Act does not create any additional legal obligations on the department or the LHNs.

## 2.6 Conclusion

This chapter has set out the landscape of Australian and South Australian Government policies, programs, institutions and regulatory arrangements that impact HMR. The evolution of the policies, funding structures and regulatory arrangements is an important element. It is evident that there has been ongoing attention and activity in connection to HMR by successive South Australian Governments over many years. Much of it has focused on administration, marketing and regulatory arrangements, rather than on measuring, nurturing actual productive research on which much depends. The Commission found no evidence of any evaluations of state government policies and programs related to HMR.

Some significant changes in South Australian policy in recent years have the potential to contribute to a more conducive environment for health and medical research in South Australia.

This landscape and its history set the context for the following chapters.

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<sup>30</sup> One of the most significant provisions in the Privacy Act in relation to HMR is in s 95. This deals with the requirements that apply to the disclosure and use of health and medical information in the absence of the consent of the individuals from whom the data has been collected. The NHMRC publishes guidelines on the way in which s 95 must be implemented by HRECs and researchers.<sup>30</sup>

## 3. Research funding

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### 3.1 Introduction

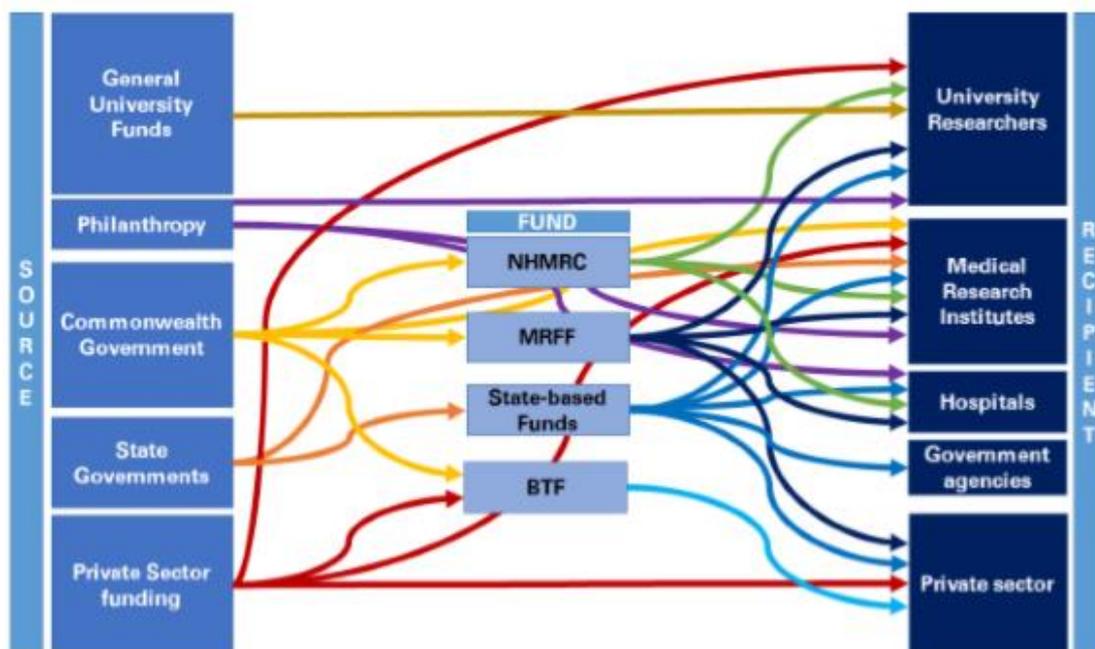
The inquiry's terms of reference require the Commission to examine and report on the following matters regarding health and medical research (HMR) in South Australia:

- assess the performance of HMR in South Australia including a comparative analysis of the state's share of national grant funding, benchmarked against other jurisdictions (TOR 1);
- identify and assess measures of the productivity and impact of research activity (including key areas of research), South Australia's share of national funding programs such as the Medical Research Future Fund (MRFF), and the performance of publicly funded research institutions in South Australia compared to other jurisdictions, including overseas (TOR 5); and
- identify and assess the characteristics of South Australia and its population that may give rise to areas of competitive advantage compared to other jurisdictions in health and medical research and development (R&D) and identify methods to maximise these opportunities (TOR 6).

This chapter examines how HMR is funded, HMR funding trends in South Australia compared to other jurisdictions and the key challenges in obtaining funding from the Australian Government and other sources.

HMR in Australia is largely funded by the Australian Government, with lesser amounts provided by state governments, non-government philanthropy, universities and the private sector. As evidenced by several stakeholders, including the Association of Australian Medical Research Institutes (AAMRI), funding arrangements across the sector are diverse and marked by a high degree of complexity and competitiveness. Figure 3.1 presents the major stakeholders in the HMR sector and the flow of HMR funding from various key sources.

Figure 3.1: Stakeholders in the HMR sector and the flow of funding from various sources



Source: Association of Australian Medical Research Institutes (AAMRI) *Economic impact of Medical Research in Australia*, (August 2018), 13.

### 3.2 Australian Government HMR programs

As discussed in chapter 2, several bodies administer Australian Government HMR funding, including the National Health and Medical Research Council (NHMRC), the MRFF and the Biomedical Translation Fund (BTF) amongst others.

The NHMRC is the Australian Government’s primary funding agency for all forms of HMR. The NHMRC competitive grant program dispersed approximately \$846 million in funding during 2018-19<sup>1</sup>. Total NHMRC expenditure has increased considerably from \$209 million in 2001 to \$709 million in 2009. Growth slowed thereafter and national total expenditure stood at \$901 million in 2019.

The Australian Government commenced the MRFF in 2015 and total funding provided through the scheme stood at approximately \$1.3 billion as at October 2020.<sup>2</sup> The Australian Government announced a \$5 billion, 10-year investment plan for the MRFF in the 2019–20 Budget. The 10-year plan provides secure funding to support research and strengthen industry partnerships.<sup>3</sup>

In 2015 the Australian Government established the \$501 million BTF with \$250 million of Commonwealth capital and \$251 million of private sector capital. BTF is an equity co-investment venture capital fund<sup>4</sup> used for venture capital investments through government licensed private sector fund managers, including Brandon Capital Partners operating in South Australia.

<sup>1</sup> National Health and Medical Research Council, *Annual Report*, (2019) 14.

<sup>2</sup> <<https://www.health.gov.au/resources/publications/medical-research-future-fund-mrff-grant-recipients>>.

<sup>3</sup> For more information, see < <https://www.health.gov.au/resources/publications/medical-research-future-fund-mrff-10-year-investment-plan>>

<sup>4</sup> KPMG, *Economic Impact of Medical Research in Australia* (Report, 2018), 10.

The Australian Government also provides funding in the form of block grants to support teaching, training and research (TTR) in the public hospital systems managed by the states and territories.<sup>5</sup> The Independent Hospital Pricing Authority (IHPA), a key body supporting delivery of National Health Reform Agreement (NHRA) funding, assesses state and territory estimates of annual TTR expenditure. SA Health has advised that the research component of TTR is relatively low. It has ranged between roughly 15 and 18 per cent of TTR expenditure in recent years.

Department for Health and Wellbeing (DHW) has advised that, according to the NHRA, states receive funding from the Commonwealth equal to 45 per cent of efficient annual growth in expenditure over the previous year. This formula is outlined in the NHRA. On this basis, Commonwealth block funding for TTR to SA in 2020-21 was \$39.5 million compared to \$37.7 in 2019-20. The Australian Government does not stipulate how these funds are used by states.

These funds are distributed by DHW to LHNs in their annual budgets. It is not clear how LHNs construct their annual TTR budgets. According to service level agreements for public health services in SA, the only HMR activity that LHNs are required to support is research governance,<sup>6</sup> which addresses principles of good practices and standards of research rather than research itself.

The Australian Government has established six Industry Growth Centres, one of which is the Medical Technologies and Pharmaceuticals Growth Centre (MTPConnect) formed in 2015 as part of the Australian Government's \$250 million Industry Growth Centres Initiative.<sup>7</sup> The Biomedical Translation Bridge and the BioMed Tech Horizons funding programs are operated by MTPConnect.

Accelerating Commercialisation (AC) is part of the Department of Industry, Innovation and Science's Entrepreneurs' Programme and provides small and medium businesses, entrepreneurs and researchers with access to expert advice and grant funding to help commercialise novel products, processes and services. The AC program introduced in 2014 provides matched funding to businesses of up to \$1 million to help lower the costs and risks of early stage (pre-revenue) commercialisation. Since AC commenced, a total of 264 grants have been offered to businesses at a value of \$133.6 million (as at 30 September 2017).<sup>8</sup> Grants have been made to 168 businesses across the five key growth sectors.<sup>9</sup>

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<sup>5</sup> Teaching and training describes: the activities provided by or on behalf of a public health service to facilitate the acquisition of knowledge, or development of skills. These activities must be required for an individual to: attain the necessary qualifications or recognised professional body registration to practice; acquire sufficient clinical competence upon entering the workforce; or undertake specialist / advanced practice in medicine, dentistry, nursing, midwifery or allied health.

Research describes: the activities undertaken in a public health service where the primary objective is the advancement of knowledge that ultimately aims to improve consumer and patient health outcomes and/or health system performance. The activity must be undertaken in a structured and ethical way, be formally approved by a research governance or ethics body and have potential for application outside of the health service in which the activity is undertaken. See <<https://www.ihsa.gov.au/sites/default/files/publications/ttr-final-report.pdf>>

<sup>6</sup> For more detail, see <[CALHN Service Agreement 2019-20](#)>. Other SLAs contain similar provisions.

<sup>7</sup> For more detail, see <<https://www.mtpconnect.org.au/overview>>.

<sup>8</sup> For more detail, see <[www.industry.gov.au/accelerating-commercialisation-grant-recipient-case-studies](http://www.industry.gov.au/accelerating-commercialisation-grant-recipient-case-studies)>.

<sup>9</sup> Information on growth sectors is available in Appendix C of the AC Customer Information Guide, <<https://www.business.gov.au/assistance/accelerating-commercialisation>>.

The Australian Government has provided significant funding for key HMR infrastructure in South Australia including \$200 million for the South Australian Health and Medical Research Institute (SAHMRI) building, \$100 million for the two university buildings in the Adelaide Bio-Med City precinct and \$68 million for the proton therapy unit to be housed in SAHMRI 2.

### 3.3 South Australia’s national funding share

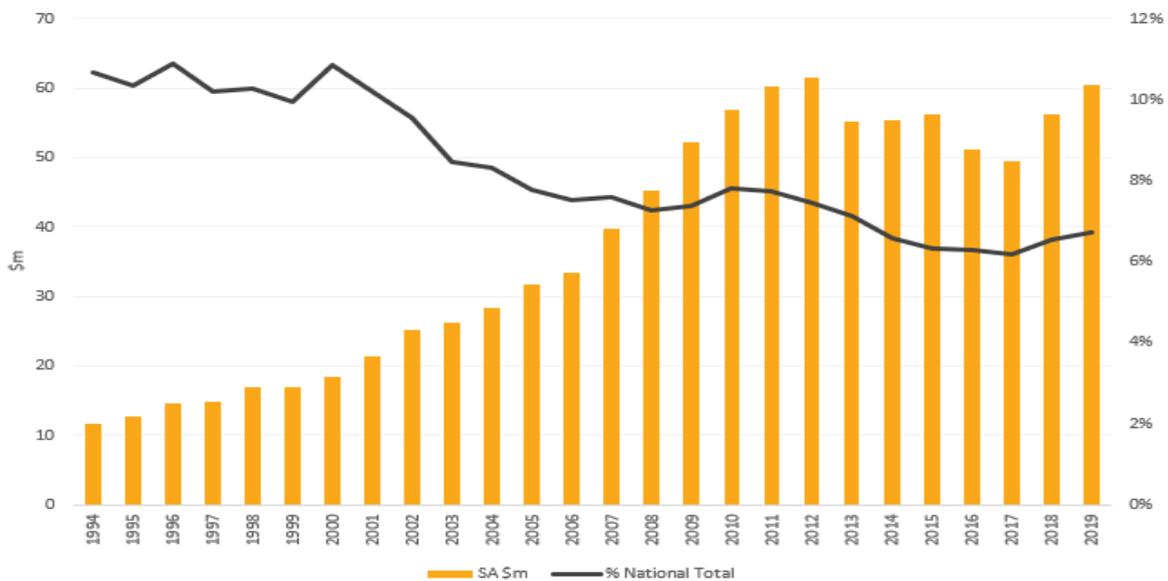
#### National Health and Medical Research Council

As the main funding source for HMR in Australia, the NHMRC provides most of the funding for health research in South Australia. Figure 3.2 shows the annual NHMRC expenditure for South Australia and the state’s share of the national total expenditure for the period 1994-2019.<sup>10</sup>

Nationally the total annual NHMRC expenditure saw a significant growth, from \$108.5 million in 1994 to \$708.5 million in 2009. During this same period, expenditure in South Australia grew at a slower rate than nationally, resulting in the state’s share declining from nearly 11 per cent in 1994 to 7.4 per cent in 2009.

It appears that growth in expenditure in South Australia has not kept pace with the significant growth in national NHMRC expenditure since 2009 with a consequent fall in the state’s share of the total. The national total expenditure stood at \$901 million in 2019, of which South Australia’s share was 6.7 per cent.

Figure 3.2: Annual NHMRC expenditure for South Australia (\$m), 1994-2019



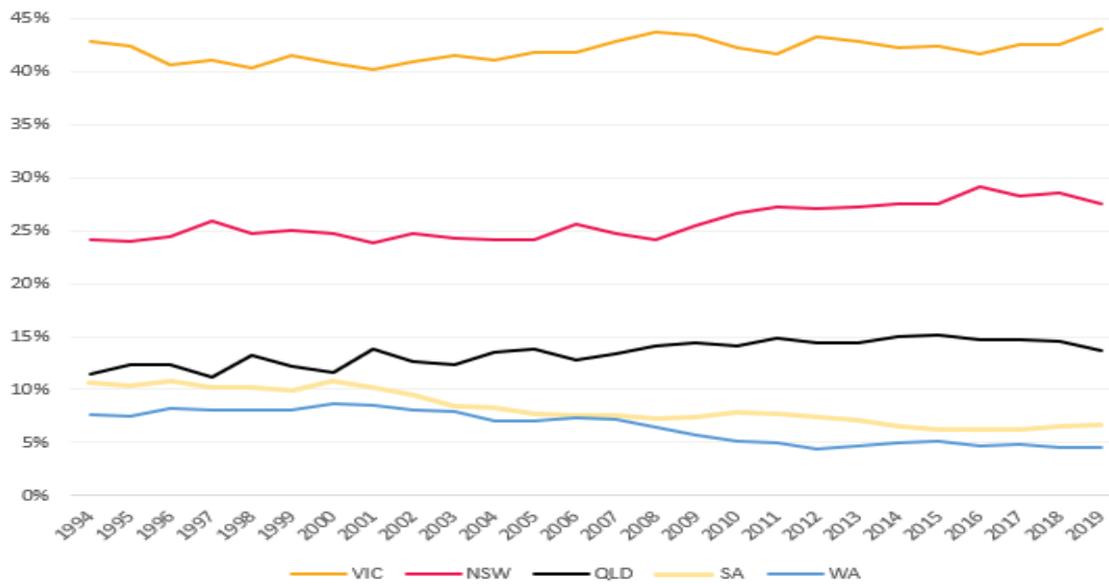
Source: NHMRC (2020).

Data current as at August 2020 and is subject to change over time due to grant status alterations, the indexation of expenditure and the allocation of funding for new awards.

Figure 3.3 presents the state share of annual NHMRC expenditure for the period 1994-2019. Victoria is clearly ahead of other states, receiving 40 to 45 per cent of the national total throughout this period. It is followed by NSW which has increased its share from 24 per cent in 1994 to 28 per cent in 2019. Queensland has increased its share from 11 per cent in 1994 to 14 per cent in 2019.

<sup>10</sup> The NHMRC defines expenditure as ‘the actual funding amount distributed to a grant within a calendar year’.

Figure 3.3: Annual NHMRC expenditure, state share (per cent), 1994-2019



Source: NHMRC (2020). Data current as at August 2020 and is subject to change over time due to grant status alterations, the indexation of expenditure and the allocation of funding for new awards.

The Commission benchmarked South Australia’s share of national grant funding against other jurisdictions by considering several possible comparators such as the national shares of population, the amount of HMR labour input and the size of the health and medical sector.<sup>11</sup> The Commission does not regard the relative performance from these measures as particularly insightful given the data limitations.

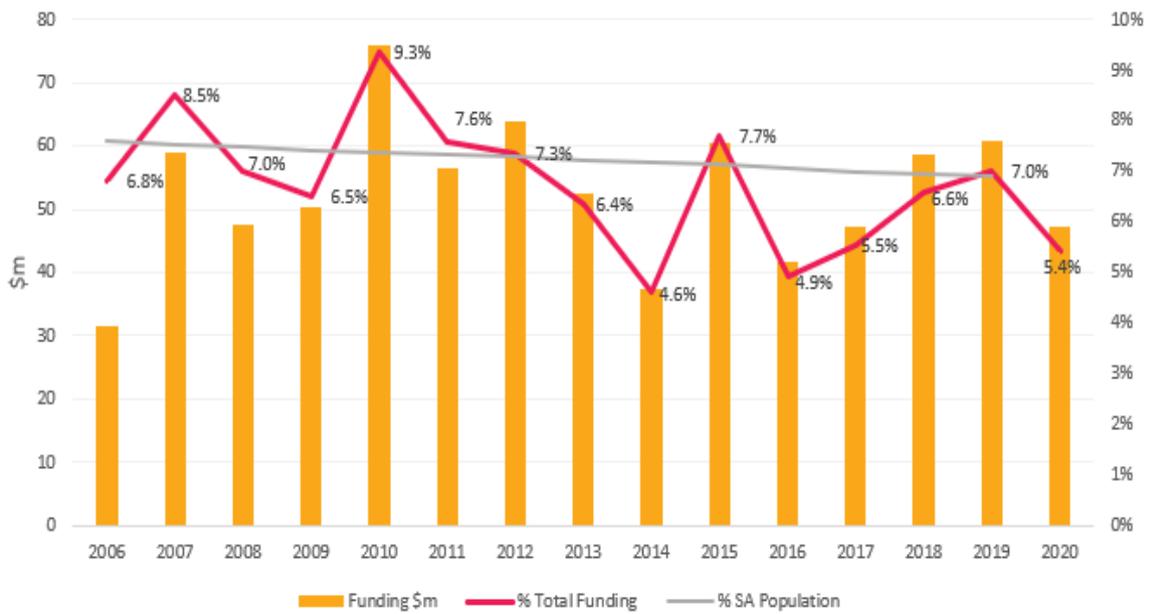
Figure 3.4 shows NHMRC grant funding for South Australia and the share of total funding for the period 2006-20.<sup>12</sup> This is conceptually different from the annual NHMRC expenditure discussed above. Total grant funding refers to the full amount awarded to a grant across all years, presented as at the project start year, while NHMRC expenditure is defined as ‘the actual funding amount distributed to a grant within a calendar year’.<sup>13</sup> Use of funding data enables consideration of grant application success rates and trends over time. The state’s share of population during this period is also included as a comparator. Nationally, total annual funding nearly doubled from \$456.6 million in 2006 to \$867.9 million in 2019. The total funding for 2020 stood at \$823 million as of October 2020.

<sup>11</sup> A detailed discussion of the Commission’s analysis is available in the inquiry draft report.

<sup>12</sup> The NHMRC notes that, due to data collection and reporting changes, data prior to 2010 includes indexation and other post-award adjustments while it is not included for data post 2010, causing a break in the series. Comparison of time trends across these periods should be undertaken with caution.

<sup>13</sup> NHMRC definition.

Figure 3.4: NHMRC grant funding for South Australia (\$m), 2006-20



Source: NHMRC (2020); ABS (2020).

Note on NHMRC data: Data available up to October 2020. For all projects (competitive and non-competitive) funding amounts refer to the total amount of grant funding announced for each project, in the year the project starts. Expenditure data prior to 2010 includes indexation and other post-award adjustments, which are not included, post 2010. Caution should be exercised when comparing the data across these time periods.

Figure 3.4 shows the state’s share of NHMRC funding has fluctuated around an amount a little less than population share. While there were several years where the funding share was above the population share (for example in 2007, 2010, 2011 and 2015), the majority were below. South Australia received \$61 million in 2019, amounting to 7 per cent of the national total, which is in line with the state’s population share (6.9 per cent). As of October 2020, South Australia had received \$47 million in 2020.

### NHMRC funding by administering institution

Table 3.1 shows the total NHMRC grant funding received by administering institution in South Australia for the period 2006-20. Note that the data presented at the sector or institution level are based on the grant administering institution, and as discussed in the following submissions, they do not reflect the total picture:

*national funding statistics for both NHMRC and MRFF grants consistently underrepresent the success of medical research institutes. Grant outcomes are reported according to administering institutions which is not necessarily the organisation where the chief investigator will be conducting the research. Most often the administering institution for medical research institutes and hospitals is an affiliated university. (AAMRI, DR5, p.16)*

*As outlined in our original submission to the Commission, SAHMRI’s success rate for NHMRC and MRFF grants is difficult to report on, given that these grants are largely administered via the Universities. As such, any publicly available data regarding the administering institution would suggest that SAHMRI has quite a low NHMRC/MRFF grant application submission and success rate, which is a substantial under-representation of SAHMRI in this research metric. (SAHMRI, FR15, p.31)*

The Commission’s consultations with stakeholders support this view.

Universities tend to administer the bulk of grants on behalf of medical research institutes (MRIs) and hospitals to enable receipt of additional block grant funding. This is evident from Table 3.1 which shows that the university sector administered the vast majority of NHMRC funding in South Australia during the period 2006-20.

South Australian universities administered \$31.6 million in NHMRC funding awarded in 2006, which had increased to \$60.9 million in 2019. While the University of Adelaide administered the highest amount of funding during this period, it has been gradually declining over the last decade. On the other hand, both Flinders University and the University of South Australia (UniSA) have continued to increase the NHMRC grant funding administered over the last decade. Hospitals have not been administering institutes since 2014. SAHMRI has been the administering institute of some NHMRC grants since 2013 and administered \$1.6 million in 2019, and the Commission notes that the majority of SAHMRI grants are administered by one or more of the South Australian universities.

Table 3.1: NHMRC funding awarded to South Australia by administering institution (\$m), 2006-20

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>\$m</b>															
<b>Hospital</b>															
<b>CALHN</b>									0.6						
<b>RAH</b>	0.4	0.1	0.6		0.3				0.3						
<b>SA Pathology</b>	0.9	1.3	0.6			0.3	0.6								
<b>QEH</b>	0.1	0.8		0.1											
<b>Repat General</b>	0.5	0.0													
<b>Women's and Children's</b>	0.3	0.3													
<b>Total health</b>	<b>2.1</b>	<b>2.6</b>	<b>1.2</b>	<b>0.9</b>	<b>0.3</b>	<b>0.3</b>	<b>0.6</b>		<b>0.9</b>						
<b>MRI</b>															
<b>SAHMRI</b>								0.4	3.4	3.4	5.5	4.0	4.5	1.6	1.7
<b>Women's &amp; Children's HRI</b>			0.6		0.1		0.3								
<b>Total MRI</b>			<b>0.6</b>	<b>0.1</b>		<b>0.3</b>	<b>0.4</b>	<b>3.4</b>	<b>3.4</b>	<b>5.5</b>	<b>4.0</b>	<b>4.5</b>	<b>1.6</b>	<b>1.6</b>	<b>1.7</b>
<b>University</b>															
<b>Flinders University</b>	7.8	8.3	9.3	8.8	8.5	10.1	9.7	6.5	7.2	6.9	6.6	8.3	11.9	18.3	14.1
<b>University of Adelaide</b>	18.6	43.6	33.2	32.7	60.3	34.1	46.5	36.4	20.0	35.6	20.0	19.3	28.8	23.0	20.0
<b>UniSA</b>	3.0	4.6	3.1	7.8	6.6	11.9	6.7	9.0	5.8	14.7	9.7	15.8	13.5	17.9	11.5
<b>Total university</b>	<b>29.5</b>	<b>56.4</b>	<b>45.6</b>	<b>49.3</b>	<b>75.5</b>	<b>56.1</b>	<b>63.0</b>	<b>52.0</b>	<b>33.1</b>	<b>57.2</b>	<b>36.2</b>	<b>43.4</b>	<b>54.2</b>	<b>59.2</b>	<b>45.6</b>
<b>Total SA</b>	<b>31.6</b>	<b>59.0</b>	<b>47.4</b>	<b>50.3</b>	<b>75.9</b>	<b>56.4</b>	<b>63.9</b>	<b>52.4</b>	<b>37.3</b>	<b>60.6</b>	<b>41.7</b>	<b>47.4</b>	<b>58.7</b>	<b>60.9</b>	<b>47.3</b>

Source: NHMRC

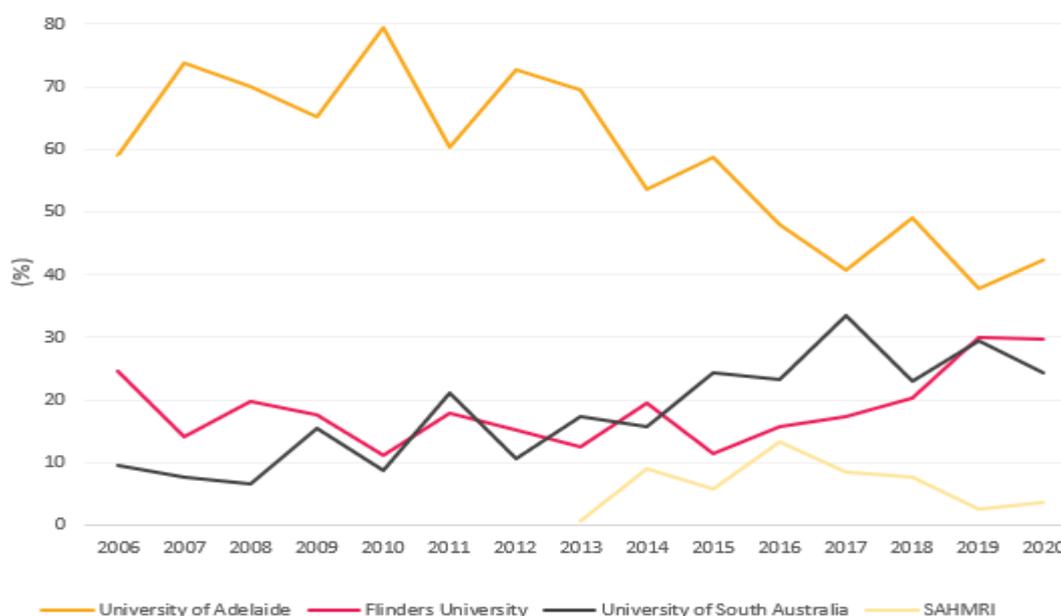
Note: Data available up to October 2020. Administering institution for projects starting in a given year. Funding amounts refer to the total amount of grant funding announced for each project, in the year the project starts.

Figure 3.5 illustrates the trend in institutional share of total NHMRC funding administered by the three South Australian public universities and SAHMRI between 2006 and 2020. The

trends observed are broadly similar to that of Higher Education Research Data Collection (HERDC) research income from NHMRC for higher education institutions.<sup>14</sup>

The University of Adelaide’s share declined from nearly 60 per cent in 2006 to 42.4 per cent by October 2020. In 2019, the University of Adelaide share was 38 per cent – the lowest recorded during this period. Meanwhile, the shares of NHMRC funding administered by UniSA and Flinders University have risen steadily during the last decade. In 2006, UniSA administered just under 10 per cent of the state’s total NHMRC funding. By 2020, it was 24 per cent. Similarly, Flinders University’s share in 2006 stood at approximately 25 per cent, which had increased to almost 30 per cent in 2020.

Figure 3.5: Administering institutional share of South Australia’s NHMRC funding (per cent), 2006-20



Source: NHMRC. Note: Data available up to October 2020. Administering institution for projects starting in a given year.

As discussed above, the Commission notes that both MRIs and hospitals are under-represented in NHMRC grant funding based on administering institution.

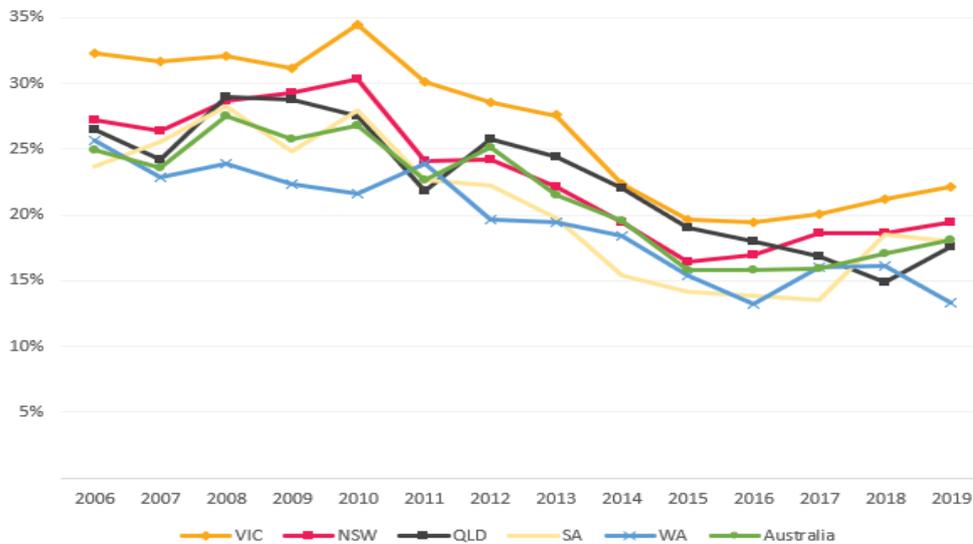
### NHMRC grant success rates

Figure 3.6 shows the success rates of NHMRC competitive grants by jurisdiction for the period 2006-19.<sup>15</sup> Nationally, there has been a declining trend in success rates, from 25 per cent in 2006 to 18.1 per cent in 2019, with a significant drop in the share of applications funded between 2015 and 2017 (approximately 16 per cent). The success rate was highest in 2008 at 27.8 per cent. Victoria has maintained the highest success rate throughout the past decade, even though the state’s success rate has dropped from 34 per cent in 2010 to 22 per cent in 2019.

<sup>14</sup> The inquiry draft report contains a detailed analysis of HERDC data.

<sup>15</sup> Competitive grants are those that go through a peer review selection process for funding as opposed to non-competitive grants that are not required to go through the same process. This analysis includes only competitive grant applications. The share of funded grant applications for a given state/institution is derived by dividing the number of successful grant applications for a given project by the total number of applications submitted by that state/institution.

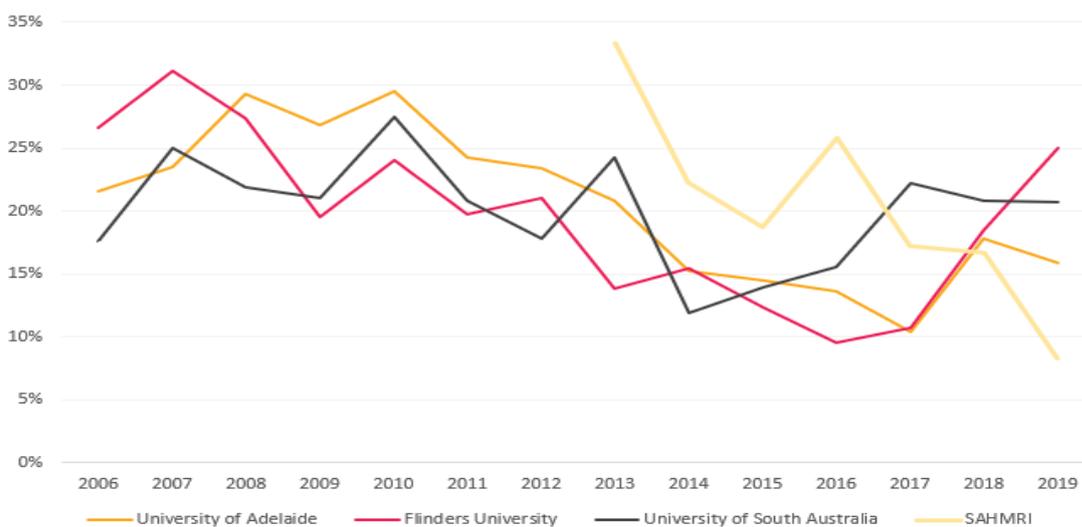
Figure 3.6: Success rates of NHMRC competitive grant applications (per cent) by state, 2006-19



Source: NHMRC. Note: Applications for grants announced in a given year. Competitive grants go through a peer review selection process, as opposed to non-competitive grants that do not go through the same requirements. Success rates of grant applications funded = (number of grant applications funded for a given project / total number of applications received for a given project).

South Australia’s performance has followed the national trend, declining from a high of 28 per cent in 2008 and 2010 to 18 per cent in 2019. However, it has improved from 13.5 per cent in 2017 to 18.6 per cent in 2018. By 2019, South Australia had a success rate of 18 per cent, slightly behind Victoria (22.2 per cent) and NSW (19.5 per cent). Notably, South Australia has been performing above or on par with the national average between 2007 and 2011 and during the period 2018-19.

Figure 3.7: Success rates of NHMRC competitive grant applications (per cent) administered by South Australian institutions, 2006-19



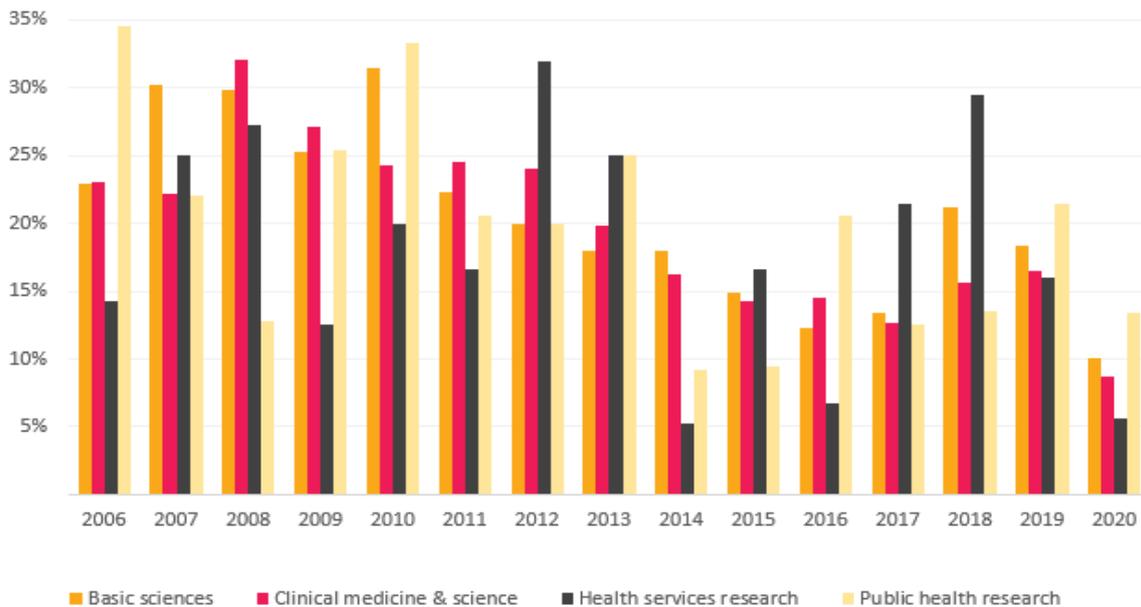
Source: NHMRC. Note: Applications for grants announced in a given year. Competitive grants go through a peer review selection process, as opposed to non-competitive grants that do not go through the same requirements.

South Australian institutional success rates of NHMRC competitive grant applications for the period 2006-19 are presented in Figure 3.7. As illustrated in the figure, success rates at the institutional level tend to fluctuate considerably due to the variation in the total number of applications submitted annually.<sup>16</sup> Overall, there was a general declining trend in the success rates across all institutions between 2006 and 2015. That said, all three universities have improved their success rates since 2015.

Figure 3.8 illustrates the NHMRC competitive grant funding success rates by broad research area<sup>17</sup> for the period 2006-20. The Commission notes that these figures vary based on the number of total applications submitted each year and should be interpreted with caution.

As evident from the figure, there is a general decline in success rates across all research areas, and the relative performance of different research areas has varied over time. This highlights the fact that HMR is a diverse field of research with a wide range of research areas. Further analysis is required to elicit a better understanding of the performance of these different research areas, which is beyond the scope of this inquiry.

Figure 3.8: NHMRC competitive grant funding success rates by broad research area, South Australia (per cent), 2006-20



Source: NHMRC. Data available up to October 2020.

Note: Applications for grants announced in a given year. Broad research areas as defined by NHMRC.

### Medical Research Future Fund

Table 3.2 shows the distribution of MRFF grants awarded from commencement of the fund up to October 2020 by state.<sup>18</sup> Victoria received 40.7 per cent of total MRFF funding for 223 grants totalling \$537.8 million. NSW had the next highest share of funding (31.7 per cent) with 141 grants funded. South Australia’s share of MRFF funding stands at 3.9 per cent, totalling \$50.9 million for 29 grants.

<sup>16</sup> For example, a ‘high’ success rate for a given year may be due to a smaller number of total grant applications submitted by an institution.

<sup>17</sup> Defined as the number of successful applications divided by the number of total applications submitted for each research area.

<sup>18</sup> Note that these figures include COVID-19 grants awarded in 2020.

Table 3.2: Total MRFF distribution by state, as at October 2020

	\$m	Share of funding (%)	Total number of grants awarded
VIC	537.8	40.7	223
NSW	418.4	31.7	141
QLD	186.5	14.1	69
SA	50.9	3.9	29
WA	76.4	5.8	23
ACT	19.7	1.5	11
NT	14.5	1.1	7
TAS	14.8	1.1	9
Global	2.0	0.2	1
<b>Total</b>	<b>1,321.1</b>	<b>100.0</b>	<b>513</b>

Source: MRFF, consolidated data as at 28 October 2020 including COVID-19 grants.

In order to get an understanding of how MRFF funding is distributed across sectors, Table 3.3 presents the amount and share of funding received by different sectors by state. The majority of MRFF funding has been to the university sector, accounting for just over half of all funding awarded nationally so far. MRIs have received a total of \$283 million, constituting around 20 per cent of total MRFF funding awarded.

Table 3.3: MRFF distribution by state and sector, October 2020

	VIC	NSW	QLD	SA	WA	ACT	NT	TAS	Global	Total
	<b>\$m</b>									
<b>MRI</b>	109.2	144.2	8.2	13.1			8.3			283.1
<b>University</b>	245.3	223.1	103.0	29.7	76.4	19.7		14.8		712.0
<b>Health</b>	164.3	35.5	75.2	1.1			6.2		2.0	284.3
<b>Other</b>	19.0	15.6	0.0	7.0	0.0	0.0	0.0	0.0	0.0	41.6
<b>Total</b>	537.8	418.4	186.5	50.9	76.4	19.7	14.5	14.8	2.0	1,321.1
	<b>Proportion (%)</b>									
<b>MRI</b>	20.3	34.5	4.4	25.8	0.0	0.0	57.4	0.0	0.0	21.4
<b>University</b>	45.6	53.3	55.2	58.3	100.0	100.0	0.0	100.0	0.0	53.9
<b>Health</b>	30.5	8.5	40.3	2.2	0.0	0.0	42.9	0.0	100.0	21.5
<b>Other</b>	3.5	3.7	0.0	13.8	0.0	0.0	0.0	0.0	0.0	3.1
<b>Total</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: MRFF, consolidated data as at 28 October 2020 including COVID-19 grants. Note: sector based on administering institution.

In South Australia, SAHMRI received \$13.1 million accounting for 25.8 per cent of the state total (Table 3.4). The university sector accounted for 58.3 per cent of MRFF grant funding, with the University of Adelaide receiving \$19.8 million (38.8 per cent of the state total). UniSA has received \$7.9 million.

Table 3.4: MRFF distribution in South Australia by administering organisation, as at October 2020

Administering organisation	\$m	Proportion (%)
University of Adelaide	19.8	38.8
University of South Australia	7.9	15.5
Flinders University	2.0	3.9
SAHMRI	13.1	25.8
Cancer Council (SA)	3.0	5.9
National Heart Foundation of Australia (SA)	4.0	7.9
Australian Lung Health Initiative	1.1	2.2
<b>South Australian total</b>	<b>50.9</b>	<b>100.0</b>

Source: MRFF, consolidated data as at 28 October 2020 including COVID-19 grants.

## Summary

Nationally the total annual NHMRC expenditure saw a significant growth, from \$108.5 million in 1994 to \$708.5 million 2009. During this same period, expenditure in South Australia grew at a slower rate than nationally, resulting in the state’s share declining from nearly 11 per cent in 1994 to 7.4 per cent in 2009.

South Australia’s share of NHMRC funding has fluctuated around the population share but was consistently below the state’s HMR workforce share during this period. The state’s share of total NHMRC expenditure relative to its population share – a measure of HMR effort per capita – compared to other states, ranked the state second after Victoria.

Nationally, there has been a declining trend in grant application success rates between 2006 and 2019. South Australia’s performance has followed the national trend and has declined from a high of 28 per cent in 2010 to 18 per cent in 2019. Notably, South Australia has been performing above or on par with the national average between 2007 and 2011 and during the period 2018-19.

The University of Adelaide continued to administer the highest amount and share of NHMRC funding, but its share of funding has been declining during this period. While the other two universities have increased their share of the funding, it has not been sufficient to compensate for the University of Adelaide decline.

South Australia received a total of \$50.9 million in MRFF grants as of October 2020, which accounted for 3.9 per cent of the amount awarded nationally.

## 3.4 South Australian Government funding

State government funding for HMR is limited primarily to SAHMRI and the local health networks (LHNs). SAHMRI was established with the support of state government funding of approximately \$85 million. The Commission understands that SAHMRI currently receives approximately \$5-6 million (\$5.884 million in 2019) of state government funding annually as an operating grant. According to the Deed of Conditions for the operating grant SAHMRI cannot use these funds for research activity as they are specifically provided to support corporate operating costs including corporate salaries and wages, other employment costs, rent and outgoings, insurance, legal fees, audit fees, and office administration expenses. The Commission understands there are no other obligations imposed on SAHMRI by the state government.

Correspondence received from DHW states that in 2007-08, the Health and Medical Research Fund (HMRF) was established administratively by DHW to receive the proceeds of research commercialisation. According to the DHW IP framework<sup>19</sup> the net returns for commercialisation of IP are split as follows: 1/3 to employees (inventors); 1/3 to the institution to be used to support further research and research infrastructure; and 1/3 to the HMRF, the expenditure of which is to be subject to further consultation between the Minister and the Premier.

The government decided that 80 per cent of the HMRF was to be allocated to SAHMRI for the purpose of research, from 2011-12 and this is an ongoing arrangement. The expenditure of the remaining 20 per cent of the fund is subject to consultation between the Minister for Health and Wellbeing and the Premier. DHW has advised that the main income source for the HMRF has come to an end so the balance in the fund is not anticipated to grow significantly in the near term. DHW was unable to provide the Commission with program guidelines or any other information on the operation of the HMRF other than that its primary purpose is to support HMR projects in South Australia.

Table 3.5 presents DHW grants to SAHMRI from 2011-12 including the operating grant and HMRF.

Table 3.5: DHW HMRF and operating grants to SAHMRI (\$ million)

\$m	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
<b>HMRF</b>	2.05	2.80	2.05	2.05	2.05	-	14.65	4.2	4.2
<b>Operating grant</b>	4.2	4.68	5.2	4.98	5.33	5.46	5.6	5.74	5.88
<b>Total</b>	<b>6.25</b>	<b>7.48</b>	<b>7.25</b>	<b>7.03</b>	<b>7.38</b>	<b>5.46</b>	<b>20.25</b>	<b>9.94</b>	<b>10.08</b>

Source: DHW audited accounts. Note: HMRF includes Beat Cancer funding from 2017-18 onwards. Beat Cancer funding was administered by SAHMRI and the majority of it was allocated to universities

DHW was unable to provide data on the balance of the HMRF from 2007–08 to 2010–11 which has made it impossible for the Commission to establish the quantum of funds in the HMRF or the use of those funds for that period. It is not possible to compare definitively the level of South Australian Government HMR funding provided to non-government bodies before and after SAHMRI’s establishment. This would require information on use of HMRF funds not directed to SAHMRI as well as research projects funded by AusHealth.

Work has begun on the \$500 million SAHMRI 2 medical research building, which will house Australia’s first proton therapy unit as well as other tenants when it is finished in 2023. The state government allocated \$47 million principally for the remediation of the land and the relocation of major rail infrastructure from the site.<sup>20</sup>

HMR conducted in the state’s public health system is supported by DHW through funding from the Private Practice Special Purposes Fund (PPSPF).<sup>21</sup> The Commission has heard

<sup>19</sup> Monetary Rewards Framework for SA Health Under the SA Government’s Intellectual Property Policy – Policy Directive V2.

<sup>20</sup> <<https://www.adelaidenow.com.au/news/south-australia/sod-turning-signals-start-of-work-on-500m-million-sahmri-2-building-housing-australias-first-cancerblasting-proton-therapy-unit/news-story/c586becfe4affa18f01475fbb93cbef6>>.

<sup>21</sup> For further details, see Special Purpose Funds Classification Policy Directive: <[https://www.sahealth.sa.gov.au/wps/wcm/connect/5e25ede2-e8ef-4d15-b125-70be88c5506b/Directive\\_Special\\_Purpose\\_Funds\\_Classification\\_V2.0\\_20200302.pdf?MOD=AJPERES&ACHEID=ROOTWORKSPACE-5e25ede2-e8ef-4d15-b125-70be88c5506b-n5jhUK7](https://www.sahealth.sa.gov.au/wps/wcm/connect/5e25ede2-e8ef-4d15-b125-70be88c5506b/Directive_Special_Purpose_Funds_Classification_V2.0_20200302.pdf?MOD=AJPERES&ACHEID=ROOTWORKSPACE-5e25ede2-e8ef-4d15-b125-70be88c5506b-n5jhUK7)>.

that the PPSPF provided up to \$3.5 million in 2016, but since then there has been a decline in the funding available.

*Unfortunately, the move to the new RAH and changes in billing efficiencies, along with some re-alignment of services has meant there has been a dramatic fall in the income to this fund, which is now at the point where no contribution to research could be made for 2019, and none envisaged for 2020. This has had a major impact on this seed grant program. (Correspondence from NAHLN)*

Stakeholders have suggested that the state government review the PPSPF to determine whether this potential source of research funding can be improved and provide better funding opportunities for research activities in the state. The Commission has heard that each LHN in SA Health operates special purpose funds which the Commission understands is a fund used by the LHN to separate money that is intended to be used for a specific purpose from general operating funds.<sup>22</sup> The Commission notes that the issue of special purpose funds is addressed in the ICAC report *Troubling Ambiguity: Governance in SA Health*.<sup>23</sup>

State government health research expenditure data provided to the Commission by DHW and LHNs are presented in Table 3.6. The Commission acknowledges that this does not necessarily represent all expenditure as some organisations were not able to provide data for every year. The Commission found that the way in which accounting systems are configured and expenditures are classified within SA Health makes it difficult for the organisation to identify, aggregate or monitor HMR expenditure. That said, Table 3.6 indicates CALHN is the most active in research, followed by SALHN and WCHN.<sup>24</sup>

*Table 3.6: State government HMR expenditure (\$ million).*

Organisation	2015-16	2016-17	2017-18	2018-19	2019-20
<b>CALHN</b>	15.59	18.54	19.28	21.00	17.91
<b>SALHN</b>	3.5	4.12	4.50	4.93	-
<b>NALHN</b>	0.66	1.04	0.85	1.70	1.85
<b>DHW</b>	0.18	2.07	2.26	1.21	1.27
<b>WCHN</b>	2.19	2.55	3.69	3.40	-
<b>Total</b>	22.12	28.32	30.58	32.24	21.03

*Source: Agency response to OSAPC information request. Approximate numbers only based on information provided.*

<sup>22</sup> <[https://icac.sa.gov.au/system/files/Troubling\\_Ambiguity\\_Governance\\_in\\_SA\\_Health.pdf](https://icac.sa.gov.au/system/files/Troubling_Ambiguity_Governance_in_SA_Health.pdf)>

<sup>23</sup> *Ibid.*

<sup>24</sup> The Commission also received HMR data from DHW on the research expenditure for each LHN across available years. A number of inconsistencies exist between the two data sets. The Commission notes that the variation reflects definitional differences that have been applied within the costing ledger (that forms the basis of data provided for NHRA/IHPA) when compared to the research expenditure data provided to the Commission by DHW and LHNs. Additionally, there is a pricing difference whereby the NHRA is explicit in not funding research that already has an external revenue source.

There are currently two major South Australian Government funding initiatives available across all fields of research; the Research, Commercialisation and Startup Fund (RCSF) and the South Australian Venture Capital Fund (SAVCF).<sup>25</sup>

In addition, AusHealth Corporate (AusHealth), a SA Government corporation owned by CALHN, provides HMR commercialisation grants through its AusHealth – Research funding initiatives.<sup>26</sup> AusHealth operates two profitable business divisions that fund intellectual property development, AusHealth Work and AusHealth Hospitals. Its operating surplus is directed to supporting HMR. During 2019-2020 the corporation provided \$2 million (2018 - 2019 \$1.7 million) in support of research and intellectual property commercialisation.<sup>27</sup>

The Commission was advised by AusHealth that its board decides the allocation of the operating surplus to projects and it appears to have a large degree of discretion in how it applies these funds. The corporation distributes the surplus generated for research in accordance with their constitution which stipulates funding for research into fields of science related to the services provided by networks, where networks are defined as: health networks incorporated under the Health Care Act 2008 (South Australia).

AusHealth funds research interstate provided there is a South Australian health network employee in the research group. There is lack of information on the Aushealth objectives and procedures for allocating this operating surplus and the research projects supported, which raises questions as to whether it is being employed to the maximum benefit of HMR activity in SA. The Commission considers that this surplus could be used to support HMR in SA more effectively and transparently, if the surplus was allocated to the HMRF. The Commission recommends this approach in chapter 9.

Successive state governments have invested significantly in public health system infrastructure and facilities. A snapshot of major capital projects is presented in Box 3.1. While the Commission has not conducted any analysis to establish the likely implications of these expenditures on HMR activity in South Australia, it recognises that access to modern health infrastructure and facilities is an important foundation for world class HMR.

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<sup>25</sup> For more details on other state government funding programs, see Appendix 2.

<sup>26</sup> For more details, see AusHealth *Annual report 2018-19* (2019)

<https://www.aushealth.com.au/assets/Uploads/Aushealth-Annual-Report-2019.pdf> >.

<sup>27</sup> AusHealth Financial Reports 2019-20, 10

*Box 3.1: Case study – SA Government investment in public health infrastructure*

The state budget 2020-21 provides \$1.7 billion to be spent on health facilities over the next four years.

2020-21 Key capital expenditure initiatives:

\$685 million for construction of a new Women’s and Children’s Hospital - an increase of \$135 million over the 2019-20 provision;  
 \$50 million for upgrade of the emergency department and other sustainment works at the existing Women’s and Children’s Hospital;  
 \$50 million for expansion of services at the Queen Elizabeth Hospital;  
 \$42.8 million over 2 years to improve country health public hospital facilities  
 \$196.8 million over 3 years to complete the rollout of the EMR and PAS systems across the remaining LHN’s; and  
 \$6.5 million to expand the Flinders Medical Centre emergency department.

2019-20 key capital expenditure initiatives:

\$550 million for construction of a new Women’s and Children’s Hospital;  
 \$537 million in new spending, including but not limited to \$69.1 million (includes \$30 million Commonwealth Government funding) over 4 years to reactive the Repatriation General Hospital site;  
 \$264 million for stage 3 of The Queen Elizabeth Hospital redevelopment;  
 \$97 million for upgrades to the Modbury hospital;  
 \$100 million for Flinders Medical Centre redevelopment;  
 \$140 million for capital works to upgrade amenities at regional hospitals; and  
 \$125 million in funding was also provided to extend the Tonsley rail line and create a direct link to the Flinders health precinct.

2018-19 key capital expenditure initiatives:

\$52 million in additional resources for the Royal Adelaide Hospital;  
 \$24 million to upgrade facilities at the existing Women’s and Children’s Hospital; and  
 \$14.5 million for acute care in Noarlunga Hospital;

2017-18 key capital expenditure initiatives:

\$52.5 million to upgrade the emergency department at the Lyell McEwin Hospital;  
 \$44.0 million for works for the SAHMRI II building; and  
 \$3.5 million to upgrade operating theatres in Flinders Medical Centre.

2016-17 key capital expenditure initiatives:

\$3.2 billion on health facilities including the new Royal Adelaide Hospital.

2015-16 key capital expenditure initiatives:

\$159.5 million for a new 55 bed rehabilitation centre at Flinders Medical Centre, \$32 million for Modbury Hospital; and  
 \$20.4 million to The Queen Elizabeth Hospital for hydrotherapy and rehabilitation facilities.

### 3.5 Non-government funding

HMR organisations also receive research funding from a variety of non-government funding bodies. A number of the submissions, including the Central Adelaide Local Health Network’s (CALHN) Executive Research Committee, point to the importance of the Health Services Charitable Gifts Board (HSCGB), the Hospital Research Foundation (THRF) and the Cancer Council of South Australia (CCSA) as major sources of local funding.

Collectively the funding awarded by these bodies was approximately \$27 million in 2019 compared to \$37 million in 2018. Further details on these sources are in Appendix 3.

The Commission has found that HMR institutions have access to quite significant levels of funding largely provided by Australian and state governments. Non-government philanthropy has been a less significant source of local funding support as the Commission has heard the majority of philanthropic donations are concentrated in the eastern states.<sup>28</sup>

### 3.6 Conclusion

South Australia's share of NHMRC funding has been in decline for the last 20 years, although the pace of decline has slowed over the last decade. At an institutional level, the University of Adelaide's share of NHMRC funding has declined, while Flinders University and the University of South Australia increased their share of the funding. The addition of SAHMRI has not offset the decline in the performance of the University of Adelaide. South Australia's NHMRC grant application success rate followed the national trend and has declined from a high of 28 per cent in 2010 to 18 per cent in 2019.

South Australia's share of the MRFF stood at 3.9 per cent for the period 2015-20 (as at October 2020), with the University of Adelaide administering 38.8 per cent and SAHMRI administering 25.8 per cent of the total amount received

The Commission considered stakeholders' views on the key factors that have affected South Australia's share of national funding since the establishment of SAHMRI. Stakeholders have generally agreed with the Commission's analysis.

The Commission observes that several factors have contributed to South Australia's weaker performance in national HMR competitive funding. These include a decline in HMR workforce capacity and capability in LHNs and some universities, budget pressures, a policy-driven reduction of priority for HMR in SA Health spending and a reduction in clinical research in hospital networks.

Some of these issues are explored in greater detail in other chapters, particularly chapter 9, which explores the relationships between the state's key HMR institutions. Other issues related to funding success include the composition of the state's HMR workforce, both in the public hospital system and the universities, including the decline in the overall number of clinician academics. Workforce issues are examined in chapter 6.

Another factor that has the potential to affect funding performance is researchers' access to data. This is particularly significant in relation to the regulatory and administrative barriers that currently restrict researchers' access to HMR data. These are discussed in detail in chapter 7.

Stakeholders across the HMR sector have argued that the decline in South Australia's funding success over the last decade has been accompanied by a reduction in the state government's financial support for HMR. The Commission concludes that whether there has been such a decline is arguable. What is clear is that state HMR funds to third parties have been directed solely to SAHMRI as a policy decision of the previous government.

The lack of an effective strategic leadership and coordination capacity within SA Health has also been a significant and consistent theme in stakeholders' submissions. The Commission

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<sup>28</sup> <<https://theconversation.com/five-australian-universities-get-the-bulk-of-philanthropic-donations-104001>>.

heard from multiple stakeholders that the weakening of connections and partnerships is especially evident in the decline in the number of clinician academics jointly appointed by the public hospitals and universities. This is regarded as a key factor affecting South Australia's capacity to secure a larger share of NHMRC and MRFF funding, with several stakeholders arguing that the state's funding performance would be strengthened by increasing the number of clinician academics in the HMR workforce.

The Commission notes that a state's share of national HMR grant funding is seen by many stakeholders in the sector as one of the most significant measures of success. In addition, funding success is generally viewed in isolation from the broader question of how productively that funding is used or the extent to which HMR improves health outcomes or contributes to economic growth. The following chapter examines other performance measures or indicators of output, productivity and impact to analyse the benefits that flow from HMR funding.

The Commission has actively sought data from DHW on research expenditure by SA Health, but the quality of the data provided was affected by inconsistencies and gaps. The Commission has not been able to establish the quantum of funds in the state government HMRF or the use of those funds during the period 2007-08 to 2011-12. From that year 80 per cent of the HMRF fund has been allocated to SAHMRI. It is not possible to compare definitively the level of South Australian Government HMR funding provided to non-government bodies before and after SAHMRI's establishment, particularly if use of the AusHealth operating surplus is considered.

In addition to Commonwealth and state government funding which is the bulk of HMR funding to South Australia, the Commission notes the contribution from key philanthropic sources.

## 4. Measuring HMR performance

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### 4.1 Introduction

The terms of reference of the inquiry require the Commission to assess the performance of health and medical research (HMR) in South Australia with particular reference to how HMR fosters innovation and improvements in healthcare service delivery that lead to improved health outcomes for the community and provide cost savings to the health system (TOR 1a). The Commission is also required to identify and assess measures of the productivity and impact of HMR activity in South Australia (TOR 5).

This chapter begins with a discussion of the varying definitions and usage of HMR and an overview of methodologies used to measure HMR activity and associated limitations. The rest of the chapter provides a brief assessment of HMR performance based on inputs, outputs, productivity and impact of HMR, including available data and their limitations. A key issue in the measurement of HMR activity relates to gaps in available data which limit the analysis. This chapter also provides an overview of the performance of the public health system in South Australia in comparison to other jurisdictions and summarises related issues and observations.

#### 4.1.1 Definitional issues

For the purpose of the inquiry, the Commission will use the NHMRC definition of research:

*The concept of research is broad and includes the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies, inventions and understandings. This could include synthesis and analysis of previous research to the extent that it is new and creative.*<sup>1</sup>

The Commission notes that there are varying definitions of HMR as discussed in the literature and raised in several submissions. Regardless of its depth and breadth, it is evident that the particular definition of HMR adopted by institutions will reflect individual organisational goals and objectives.

While acknowledging that there are other domains that affect HMR and that the boundaries of definition may vary depending on organisational goals and relevance, the Commission's use of the definition of HMR is necessarily driven by the inquiry terms of reference.

### 4.2 Measuring HMR activity

Assessing the performance of HMR is considered an important step in improving the effectiveness and accountability of research funding agencies and funding recipients:<sup>2</sup>

*Measuring performance across the entire research and innovation pipeline from discovery to translation incentivises translation activities that maximise impact and provides the means to identify gaps in investment and support. (AAMRI, DR5, p.11)*

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<sup>1</sup> National Health and Medical Research Council, Australian Research Council and Universities Australia, *Australian Code for the Responsible Conduct of Research* (2018) 5.

<sup>2</sup> See for example, S Rivera et al, 'Assessing the impact of healthcare research: A systematic review of methodological frameworks' (2017) 14(8) PLOS Medicine; UK Evaluation Forum, *Medical Research: assessing the benefits to society* (2006).

The objectives of research evaluation may include, among other reasons, accountability, advocacy or learning purposes, with each implying different organisational goals and requiring different evaluation strategies.<sup>3</sup>

Stakeholders also agreed that:

*Measuring HMR performance is equal parts important and difficult and the Commission is right to identify it as an issue. Grant funding and activity levels are easy indicators to measure but are of little use in assessing the impact of the research on the health and wellbeing of the population. Citation indexes are an attempt to measure something closer to impact on patients or population. However, these are surrogate markers at best and a large number of citations does not necessarily guarantee a change in clinical practice or improvement in health or wellbeing of a population. (Dr Adam Badenoch, FR6, p.1)*

The Commission notes the differences in the organisational goals requiring different evaluation strategies that were discussed in several submissions, particularly in relation to research in the public health system (in contrast to academic/research organisations).<sup>4</sup>

Within this context, existing approaches to measurement and evaluation of HMR activity include bibliometric analysis, retrospective case studies, surveys, peer review and micro/macroeconomic analysis.

The Commission received examples of measuring research activity in different organisational settings including the *2019 Research Activity Review* of the Queen Elizabeth Hospital which consisted of the following measures:<sup>5</sup>

- recurrent salaried FTEs;
- recurrent salaried staff costs (including on-costs);
- total non-medical grant funded FTEs;
- total research FTEs funded from university/SAHMRI payroll;
- number of refereed grants and total grant amounts;
- research funds from other sources (including commercial research, clinical academic and scientific salaries, infrastructure funding and equipment donations);
- refereed journal publication number;
- higher degrees awarded;
- scholarship value; and
- patents in national phase.

A research performance analysis may therefore include several different methods to triangulate evaluation findings and the full range of impacts of HMR.<sup>6</sup> These methods may

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<sup>3</sup> Panel on Return on Investment in Health Research, *Making an impact: a preferred framework and indicators to measure returns of investment in health research* (Canadian Academy of Health Sciences, 2009).

<sup>4</sup> This was discussed in the submissions to the draft report from HTSA (DR17, p13) and the University of Adelaide, Faculty of Health and Medical Sciences (DR28, p2) as well as information received from the South Australian Research Management Group.

<sup>5</sup> TQEH Research activity review 2019, provided to the Commission.

<sup>6</sup> R Ruegg and I Feller, *A Toolkit for Evaluating Public R&D Investment Models, Methods, and Findings from ATP's First Decade* (US Department of Commerce, 2003).

be all quantitative, all qualitative, or a combination of both, and be tailored to collect information that supports the evaluation goals such as those illustrated in Table 4.1.

Table 4.1: Potential research performance measures

Performance measure	Criteria	Source
<b>RESEARCH INPUTS – SA Health activity facilitating research productivity</b>		
Total number of active projects	<ul style="list-style-type: none"> <li>Total number of projects approved by RGO</li> <li>Approved project = ethics + governance approval</li> <li>Includes low risk applications</li> <li>Completed annual review for projects &gt; 12mths</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
New projects	<ul style="list-style-type: none"> <li>Total number of new projects approved by RGO over the past 12 months</li> <li>Includes low risk applications</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
Clinical academic staff	<ul style="list-style-type: none"> <li>LHN-funded FTE for clinical academics</li> <li>Includes operational &amp; special purpose funds</li> </ul>	<ul style="list-style-type: none"> <li>LHN Finance Office</li> </ul>
Clinical Trial Co-ordinators	<ul style="list-style-type: none"> <li>LHN-funded FTE for clinical trial coordinators</li> <li>Includes operational &amp; special purpose funds</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
Research Office staff	<ul style="list-style-type: none"> <li>LHN-funded FTE for research office staff</li> <li>Includes operational &amp; special purpose funds</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
Australian Govt block funding	<ul style="list-style-type: none"> <li>Block Funding received by Dept Health &amp; Wellbeing</li> </ul>	<ul style="list-style-type: none"> <li>Dept Health &amp; Wellbeing</li> </ul>
SA Govt research funding	<ul style="list-style-type: none"> <li>Block Funding received by Dept Health &amp; Wellbeing</li> </ul>	<ul style="list-style-type: none"> <li>Dept Health &amp; Wellbeing</li> </ul>
HSCGB funding allocations	<ul style="list-style-type: none"> <li>Non-competitive funding allocations from HSCGB for hospital research activity</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
Charity donations	<ul style="list-style-type: none"> <li>Non-competitive funding allocations from charities for hospital research activity</li> </ul>	<ul style="list-style-type: none"> <li>LHN Finance Office</li> <li>Research Office</li> </ul>
Research office efficiency	<ul style="list-style-type: none"> <li>The proportion of low to negligible risk (LNR) applications approved by the Research Governance Office including ethics assessment if required, within <i>20 calendar days</i> within the reporting month.</li> <li>The proportion of research proposals (excluding LNR) approved by the reviewing HREC within <i>60 calendar days</i> from the HREC meeting submission closing date.</li> <li>The proportion of site-specific applications (excluding LNR) approved by the Research Governance Office within <i>30 calendar days</i> within the reporting period.</li> <li>Clock paused, while awaiting details from researcher</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
<b>RESEARCH OUTPUTS – SA Health staff research productivity</b>		
Peer-review journal publications	<ul style="list-style-type: none"> <li>Only staff, where LHN contributes to salary</li> <li>Publications in PubMed listed Journals</li> <li>Excludes conference abstracts</li> </ul>	<ul style="list-style-type: none"> <li>SA Health Library Service</li> <li>Uni reporting system</li> </ul>
Conference published abstracts	<ul style="list-style-type: none"> <li>Only staff, where LHN contributes to salary</li> <li>Publications in PubMed listed Journals</li> </ul>	<ul style="list-style-type: none"> <li>SA Health Library Service</li> <li>University reporting system</li> </ul>
Book chapters	<ul style="list-style-type: none"> <li>Only staff, where LHN contributes to salary</li> <li>Published chapters/books</li> </ul>	<ul style="list-style-type: none"> <li>Uni reporting system</li> </ul>
Scientific impact - citations	<ul style="list-style-type: none"> <li>For staff where LHN contributes to salary, total citations in past 12 months</li> </ul>	<ul style="list-style-type: none"> <li>Google Scholar</li> </ul>
Commercial Impact - IP	<ul style="list-style-type: none"> <li>IP approvals over past 12 months</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
Health translation	<ul style="list-style-type: none"> <li>Publications resulting in change in hospital policy</li> </ul>	<ul style="list-style-type: none"> <li>Need develop</li> </ul>
Industry-sponsored clinical trials	<ul style="list-style-type: none"> <li>For staff where LHN contributes to salary, total dollars in past 12 months from sponsored clinical trials</li> </ul>	<ul style="list-style-type: none"> <li>Research Office</li> </ul>
Competitive grant funds	<ul style="list-style-type: none"> <li>For staff where LHN contributes to salary, total dollars in past 12 months from sponsored clinical trials</li> </ul>	<ul style="list-style-type: none"> <li>Uni reporting system</li> </ul>

Source: Information received from the CAHLN executive research committee

The Commission also received examples of frameworks that attempt to measure research activity that are a combination of inputs, outputs and impact measures such as those illustrated in Table 4.2 which describe selected research activity measures proposed by SAHMRI.

Table 4.2: Example measures of HMR activity, SAHMRI

Metric	Example measures
<b>Publication metrics</b>	Total number of publications; publications in Q1 – Q4 journals; publications in top 1% and top 10%; total citations; citation impact.
<b>Research Grant Funding</b>	Grant funding from NHMRC, MRFF, other federal, state, international, philanthropic, commercial sources; administering institutions split; grant funding spend within SAHMRI facilities (beyond that awarded directly to SAHMRI employees); HERDC vs non-HERDC.
<b>Collaboration</b>	Publications with international and interstate co-authors; top 10 institutions that SAHMRI collaborates with; publications with SA institutions e.g. universities, hospitals; publications where all three SA universities are listed as co-authors; industry collaborations; consumer listed publications; external contracts; clinical trial income and publications; identification of future collaborations e.g. health economics, biomedical engineering, artificial intelligence and machine learning.
<b>Innovation</b>	Number of patents; licencing – options assignment; commercialisation/spin outs creating new products or sales growth; innovation for the health care system e.g. introduced equipment, methodologies etc such as proton therapy; vignettes that demonstrate innovation.
<b>Translation</b>	Top 10 stories that demonstrate translation impact within the state and the relevance of this in a national and international context.; links with AHRA; links with HTSA; number of research groups with active consumer engagement; number of consumers on HTSA/SAHMRI registry; number of publications with consumers as co-authors; total number of citations; media mentions.

Source: information received from SAHMRI

Issues relating to articulating and quantifying the value of HMR in terms of impacts and outcomes on health system performance, delivery of service and patient care and patient outcomes<sup>7</sup> are discussed in section 4.3.5.

### 4.3 Assessment of HMR performance

The Commission’s assessment of HMR performance includes analysing measures of inputs, outputs and productivity based on available data. Chapter 9 provides further discussion of HMR performance measures in the public health system.

#### 4.3.1 Inputs

Inputs into HMR refer to the resources needed to undertake research and development (R&D) activity, including capital, human resources and consumables. Data on inputs to HMR at the state level are fragmented, incomplete and in some cases inconsistent. Data on input quality pose additional issues. Such gaps limit the ability to analyse investments in HMR at the state level.

<sup>7</sup> Information received from the South Australian Research Management Group.

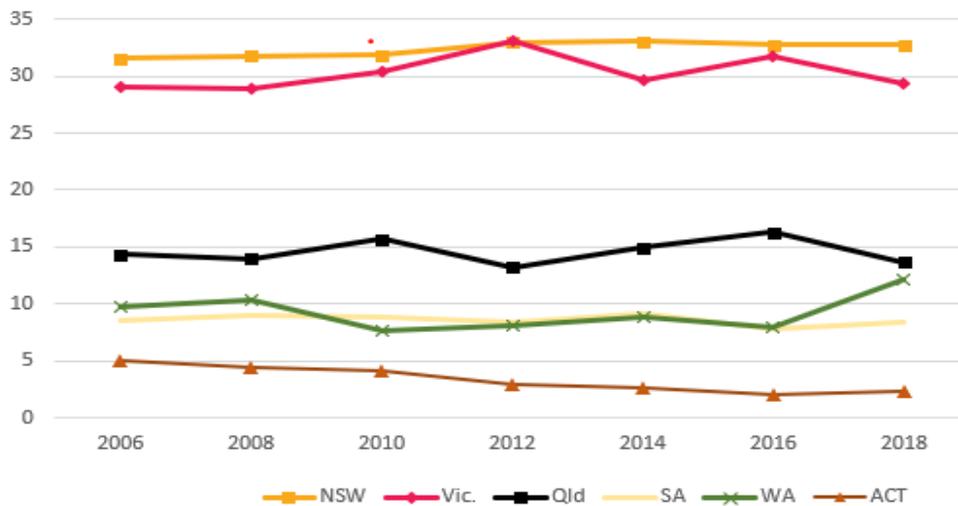
A major limitation of the data relates to the unavailability of information related to business and government investment in HMR, as Australian Bureau of Statistics (ABS) data on R&D for these sectors are not available at the field of research level by jurisdiction.<sup>8</sup> This section summarises available data on expenditure and workforce in the higher education, public health and MRI sectors in South Australia in comparison to other jurisdictions and over time.

**HMR expenditure**

Higher education sector - HERD

While higher education expenditure on R&D (HERD) captures only a part of the total expenditure on R&D, it forms a significant component of HMR research investment in South Australia. The distribution of the share of national total HERD on HMR across different states for the period 2006-18 is illustrated in Figure 4.1.

Figure 4.1: Higher education expenditure on research and development (HERD) for HMR, share of national total by state, 2006-18 (per cent)



Source: ABS (2018) cat.8110D005, Survey of Research and experimental development, Higher education organisations. Note: Data for NT and Tasmania are not included in the figure.

South Australia’s share of national HERD on HMR in 2018 was 8.4 per cent which had risen marginally from 7.8 per cent in 2016. The share of HERD to Western Australia increased from 8 per cent in 2016 to 12 per cent in 2018, which was the highest increase across all states.

Medical research institutes (MRI)

Based on Association of Australian Medical Research Institutes (AAMRI) member data, \$1.1 billion was spent on direct research costs across 49 MRIs in Australia in 2018.<sup>9</sup> Total indirect research costs amounted to \$760 million in the same year. In South Australia three MRIs, the Centre for Cancer Biology, the Robinson Research Institute and SAHMRI, reported

<sup>8</sup> Business Expenditure on R&D (BERD) and Government Expenditure on R&D (GOVERD) by field of research are available only at the national level.

<sup>9</sup> AAMRI member survey, expenditure data provided to the Commission. Data represent calendar year 2014, 2016, 2018 or financial year 2014-15, 2016-17, 2018-19 depending on the financial reporting year of the institute. Note that AAMRI membership varies across different years and the survey data may not capture all the MRIs for a given year.

spending a total of nearly \$65 million on direct research costs and a further \$29 million on indirect research costs in 2018.

### HMR workforce

This section presents available data on HMR workforce across the higher education and MRI sector, noting that there are considerable limitations and gaps in existing data. A detailed discussion of workforce issues as they relate to HMR is available in chapter 6.

The Commission received information on the HMR workforce at the South Australian public universities, which is useful in providing an understanding of their relative size, noting that the figures presented are not directly comparable as they are reported differently across institutions.

#### University of Adelaide

University staff active in HMR research, or those contributing to its facilitation, are distributed throughout a number of different faculties, departments and institutes within the University of Adelaide. The largest proportion is employed in the Faculty of Health and Medical Sciences and Table 4.3 provides the number of academic staff in the faculty for the period 2014-2018.

As evident from the data, academic staff numbers have fallen during this period both in FTE and headcount terms. In 2014 there were 449 academic FTEs in the Faculty of Health and Medical Sciences which had declined to 411 FTEs by 2018.

*Table 4.3: University of Adelaide academic staff in the Faculty of Health and Medical Sciences, FTE and headcount numbers*

	2014	2015	2016	2017	2018
Academic FTE	449	444	422	432	411
Academic no.	546	541	510	535	508

Source: University of Adelaide, Pocket Statistics, 2019,2018, 2017.<sup>10</sup>

#### Flinders University

The HMR workforce data for Flinders University, reported in Table 4.4, is estimated based on university income classified for HMR. The Commission notes that, between 2012 and 2018, Flinders University saw a decline in the total number of FTE academic staff in all areas of HMR, with the total number of FTE positions declining from 210.2 in 2012 to 170.5 in 2018.

*Table 4.4: Flinders University HMR staff numbers (FTE)*

	Academic HMR FTE All Colleges <sup>(a) (b)</sup>
2012	210.2
2014	198.5
2016	185.6
2018	179.5

Source: Flinders University response to SAPC information request.

a) All values are estimated research FTE only (i.e. the research FTE for a full-time balanced role (teaching/research) is estimated at 0.4 the employment fraction). b) The proportion of university income classified for FOR11 or SEO-92 (HMR) is used to estimate the proportion of research FTE devoted to HMR.

<sup>10</sup> <<https://www.adelaide.edu.au/planning/pocket-statistics>>.

University of South Australia (UniSA)

Table 4.5 summarises UniSA’s FTE numbers for continuing academic, fixed term and casual employees. It includes staff classified as ‘research-only’, ‘teaching and research’ and ‘professional’ in the main HMR areas within the Division of Health Sciences and the Centre for Cancer Biology.

*Table 4.5: University of South Australia total academic and professional HMR workforce.*

			2015	2016	2017	2018	2019
Academic staff	Continuing/fixed term	Teaching and research	139.88	150.90	144.43	143.70	135.80
		Research only	153.65	138.33	164.47	163.15	192.65
	Casual	Research only	18.21	21.88	20.98	23.13	24.09
<b>Total</b>			<b>311.74</b>	<b>311.12</b>	<b>329.87</b>	<b>329.98</b>	<b>352.24</b>
Professional staff	Continuing/Fixed Term	Research only	8.90	8.20	8.40	7.40	8.20
	Casual	Research only	1.74	3.88	3.68	4.91	5.92
<b>Total</b>			<b>10.64</b>	<b>12.08</b>	<b>12.08</b>	<b>12.31</b>	<b>14.12</b>
<b>Grand total</b>			<b>322.38</b>	<b>323.20</b>	<b>341.95</b>	<b>342.95</b>	<b>366.66</b>

Source: University of South Australia response to SAPC information request

Unlike the state’s other two public universities, UniSA’s HMR workforce, including both academic and professional staff, increased between 2015 and 2019, with the total number of HMR staff increasing by approximately 45 FTE positions.

MRI sector

Based on data from AAMRI based on member surveys, the MRI sector had a national workforce of 16,852 FTE spread across 55 research institutes in 2019.<sup>11</sup> This figure includes research, corporate and support staff, international and domestic research students and international staff. South Australia reported a total of 912 FTE in three MRIs in 2019, accounting for 5.4 per cent of the total Australian MRI workforce. The combined HMR workforce in Victoria and NSW made up approximately 70 per cent of the national total in the same year.

SAHMRI reported a total of 412 employees as at 4 November 2020, of which 303 were research staff. The total staff number at SAHMRI increased from 360 in 2016 to 412 by November 2020 (Table 4.6).

*Table 4.6: SAHMRI workforce (headcount), 2016-20*

	2016	2017	2018	2019	2020*
Total research staff	278	292	307	301	303
Total non-research staff (ops & admin)	82	96	98	93	109
<b>Total employees</b>	<b>360</b>	<b>388</b>	<b>405</b>	<b>394</b>	<b>412</b>

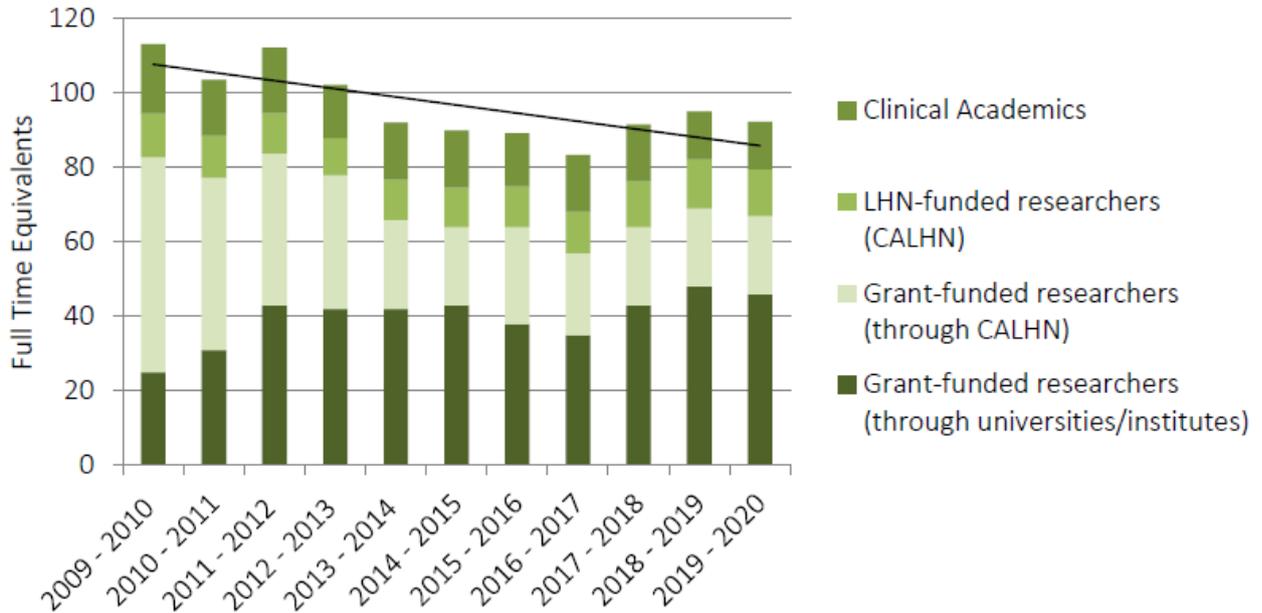
Source: SAHMRI response to SAPC information request. Data as at December 31 of year.

\*as at 4 November 2020.

<sup>11</sup> AAMRI has 56 member MRIs reported on their website. <<https://aamri.org.au/about-us/what-we-do/>>.

Workforce data from the Bazil Hetzel Institute (BHI) presented in Figure 4.2 indicate that the average FTE count has dropped from 109.6 FTE in the period 2009-12 to 93 FTE in 2017-20. The data also show that the largest decline was in the grant-funded researcher category.

Figure 4.2: BHI workforce (headcount), 2009-10 to 2019-20



Source: BHI Submission, FR4

Local health network (LHN) HMR workforce

The Commission received limited, fragmentary information on the current estimated number of clinical researchers and academics in the LHNs which are discussed in chapter 6. The Commission was informed that existing systems in SA Health are not able to accurately identify clinical researchers across the LHNs. Consequently, the Commission has not been able to identify accurate time series data on the HMR workforce within the LHNs.

**Summary**

As evident from the above discussion, there are considerable gaps in the available HMR workforce data, which limits their use in any analytical or comparative exercise. Nevertheless, existing data indicate that the universities are the largest HMR employer in South Australia, even though their numbers are smaller than those in NSW, Victoria, Queensland or WA. Nationally, the number of HMR teaching-only and teaching and research staff FTEs in universities has declined since 2015, and South Australia followed a similar trend.

The size of the MRI workforce in South Australia is small compared to that of NSW and Victoria. In 2019, there were four MRIs in South Australia. In comparison, NSW had 19 and Victoria had 18 AAMRI member MRIs. That said, the heterogeneity of MRIs, including size, composition, location and research specialisation makes it difficult to make any meaningful comparisons across states or MRIs.

The Commission reiterates the limitations of existing HMR workforce data including the lack of time-series data on the HMR workforce in the LHNs and consistent data from the state’s public universities. The Commission’s consultations suggest that existing systems within

LHNs do not enable the capture of researcher workforce data in an accurate or timely manner.

#### 4.3.2. HMR outputs

Analysing HMR performance is a complex task made more difficult by data limitations. Organisations are structured differently, with different objectives, goals and governance arrangements. Consequently organisations collect and report data with differences in definitions and usage, limiting the ability to make meaningful comparisons.<sup>12</sup>

Types of HMR outputs include research publications and related measures, patents, prototypes, clinical trial activity and drug and medical device development. Data on outputs apart from research publications are limited and fragmented. For example, patent data are not available by field of research by jurisdiction. Chapter 8 discusses HMR translation, including clinical trial activity.

#### Research publications

Given the data limitations, the most widely used output measure in the literature is research publications due to the availability of comparable data.<sup>13</sup> The Commission notes that there are considerable limitations to this approach. As clearly stated in several submissions, measuring outputs by the number of publications is an indicator of quantity only. It does not reflect the quality of research or the level of collaboration amongst researchers.<sup>14</sup> Moreover, as highlighted by stakeholders, research publications do not represent all the activities of a healthcare system whose primary objective is to improve health outcomes.<sup>15</sup>

In analysing research publications, indicators based on citations are used as measures of quality and/or academic impact. When comparing across institutions or jurisdictions, these measures require appropriate standardisation, for example, by population or number of workers in the sector based on data availability.

While both the publication numbers and citations provide a general overview of the distribution of HMR output, they do not provide a complete picture of the research landscape and are constrained by a series of limitations as discussed in the literature and supported by stakeholder submissions.<sup>16</sup>

In light of the many limitations on the use of publications as a performance measure, it is important to note they provide only a partial view of a very complex research eco-system. A more holistic approach involves a suite of measures in addition to publication metrics as suggested in the submission from the University of Adelaide School of Psychology:

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<sup>12</sup> National Health and Medical Research Council Submission to the Productivity Commission's research study on public support for science and innovation in Australia, 2006, 11.

<https://www.pc.gov.au/inquiries/completed/science/submissions/sub080/sub080.pdf>.

<sup>13</sup> See for example, *NSW Health and Medical Research Strategic review, Issues Paper* (2011); and B Kingwell et al, 'Evaluation of NHMRC funded research completed in 1992, 1997 and 2003: gains in knowledge, health and wealth' (2006) 184(6) *Medical Journal of Australia* 282.

<sup>14</sup> This is supported by the submission from AAMRI (FR3, p.9) and information received from the SA Clinical Research Governance Steering Committee.

<sup>15</sup> University of Adelaide, School of Psychology, (DR31, p.3), AAMRI, (DR5, p6; and information received from the WCHN.

<sup>16</sup> For example, D Aksnes, L Langfeldt and P Wouters, 'Citations, Citation Indicators, and Research Quality: An Overview of Basic Concepts and Theories' (2019) Jan–March *Sage Open* 1; D A Pendlebury, 'The use and misuse of journal metrics and other citation indicators' (2009) 57 *Arch. Immunol. Ther. Exp.* 1.

*It would be valuable to move away from citation counts toward assessment of research engagement. In particular, qualitative assessment of research engagement can describe the value of research in terms of its benefit to the broader Australian community. This cannot be indexed by citation counts or similar metrics. Similarly, clinician and consumer involvement in research from inception to translation is a good indicator of high quality health and medical research. (University of Adelaide School of Psychology, DR31, p.4)*

The Commission also heard that ‘relying on grant success or citation indices does not accurately reflect the contributions of all contributing parties to the collaboration’.<sup>17</sup> While acknowledging these issues, the Commission considers that an analysis of publication data is still a useful exercise as a means of understanding a particular aspect of research output. For analytical purposes, publication data from the InCites database were used based on field of research code 11 (level 1) for health and medical sciences<sup>18</sup> and publication year. The analysis is based on ‘whole publication counts’, and where a publication has authors from multiple institutions/sectors, each is given a count for that publication. While this can create multiple counting and overlaps, it provides a reasonable picture of relative contribution of each author/institution.<sup>19</sup>

The literature on HMR assessment indicates that although the number of publications is commonly used to measure research performance by individuals, institutions and countries, often as a benchmark, there are no studies formally validating this indicator in healthcare.<sup>20</sup> Moreover the number of publications does not take into account the size and composition of the research group, the type of research or the quality of the publication, further emphasising that these measures should be interpreted with caution.<sup>21</sup>

Figure 4.3 presents the total number of HMR publications by state for the period 2005-19. Victoria and NSW have consistently maintained their positions at the top, with a significant increase in the volume of output from 2017 onwards, noting that this reflects the size of the state and HMR sector. Both Victoria and NSW produced close to 5,000 HMR publications in 2005, which increased to nearly 16,000 in 2019.

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<sup>17</sup> Dr. Adam Badnoch (FR6, p.2).

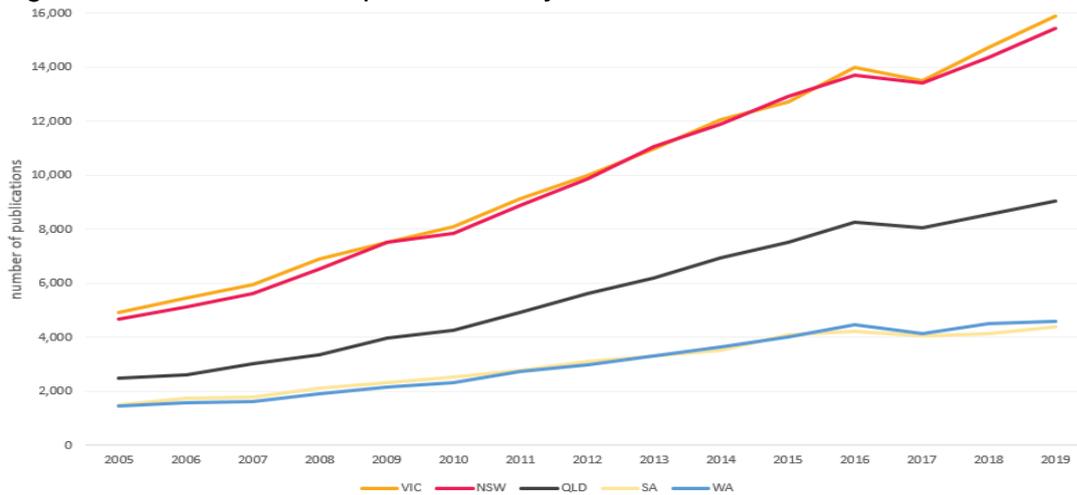
<sup>18</sup> This approach is consistent with the Australia and New Zealand Standard Research Classification (ANZSRC), 2008.  
<<https://www.abs.gov.au/Ausstats/abs@.nsf/Latestproducts/38AFE6FE9DD7BA6BCA25741800048AE8?opendocument>>.

<sup>19</sup> See NHMRC, *Measuring Up 2018* (2020) for details, where a similar approach is followed.

<sup>20</sup> V M Patel, H Ashrafian, K Ahmed et al, ‘How has healthcare research performance been assessed? A systematic review’ (2011) 104(6) *Journal of the Royal Society of Medicine* 251.

<sup>21</sup> For a detailed discussion of related issues, see V Durieux and A Gevenois, ‘Bibliometric Indicators: Quality measurement of scientific publication’ (2010) 255(2) *Radiology* 342.

Figure 4.3 Number of HMR publications by state, 2005-19.

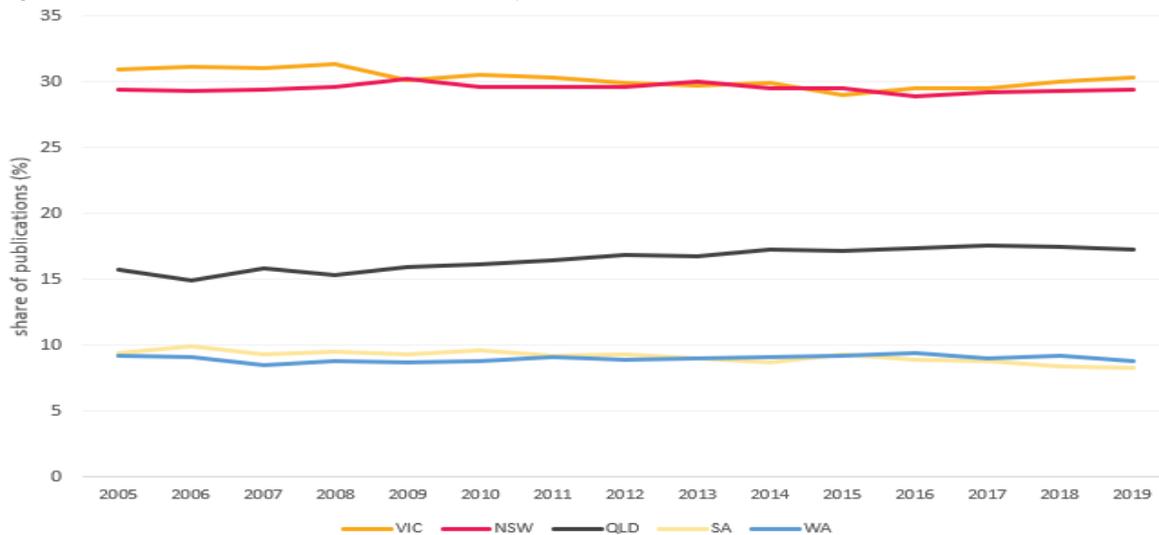


Source: InCites database updated 26 March 2020. Includes Web of Science content indexed through 29 February 2020. Export date: 24 April 2020. Note: Research area: 11 Medical and Health Sciences, Time period: 2005-19.

The data show South Australia and Western Australia have maintained a slow but steady growth in HMR publication outputs during this period. The total number of HMR publications in South Australia increased from around 1,500 in 2005 to approximately 4,300 in 2019.

Figure 4.4 shows the share of HMR publications by state between 2005 and 2019. During this period, the annual share of publications has generally remained steady across all jurisdictions. Victoria and NSW each accounted for approximately 30 per cent of annual publications, while Queensland’s share increased slightly from 15.7 per cent in 2005 to 17.3 per cent in 2019. Meanwhile, South Australia’s share of HMR publications has declined marginally from 9.5 per cent in to 8.3 per cent in 2019.

Figure 4.4: Share of HMR publications by state (per cent), 2005-19.



Source: InCites database updated 26 March 2020. Includes Web of Science content indexed through 29 February 2020. Export date: 24 April 2020. Note: Research area: 11 Medical and Health Sciences, Time period: 2005-19.

The Commission concludes South Australia’s HMR publication output - both in terms of the total number and state share - has stayed relatively steady while the state’s share of NHMRC grant funding declined during the period 2006-19 (as discussed in chapter 3).

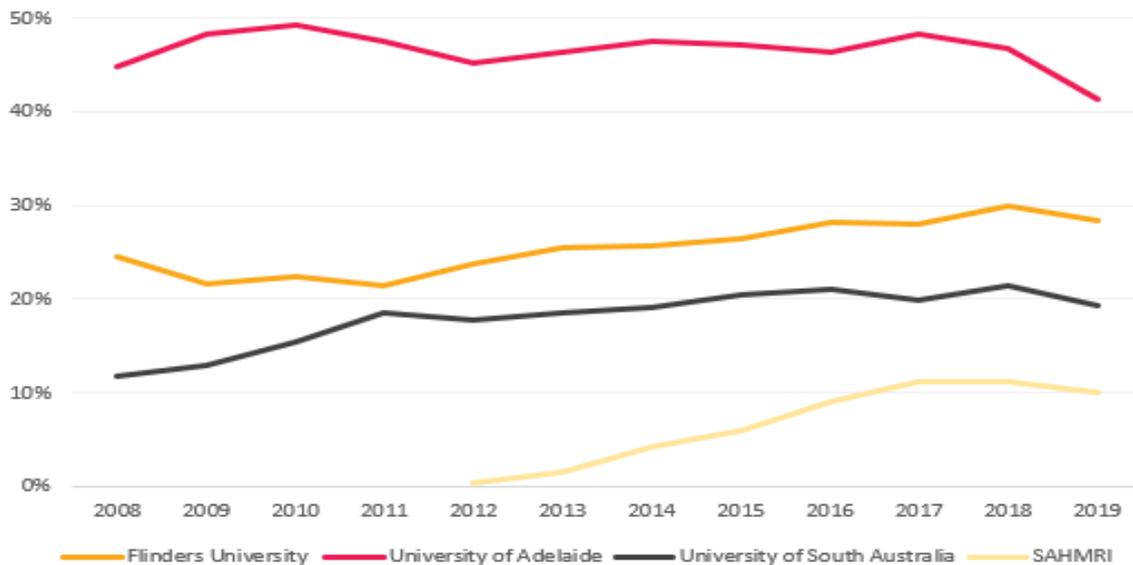
It also notes that while NHMRC grant funding plays a significant role in producing HMR publications, there are other factors that affect the development of research publications. They include, intellectual input from researchers, protected research time, the type of research (for example, meta-analyses and reviews as opposed to clinical studies), the quality and type of publication, collaborative efforts and other funding sources in addition to the NHMRC, among others.<sup>22</sup> Stakeholders broadly agreed with this view as illustrated by the submission from Flinders University:

*NHMRC is only one source of research funding that supports HMR research. Publications derive from multiple sources. For example, Higher Degree Research scholarships in the HMR area are likely to be a strong contributor to HMR publications. In addition, publication numbers are only one measure of research performance, where publication practices may prioritise fewer publications in higher impact journals or vice versa. Considerably more refined analysis would be needed to answer this question. (Flinders University, FR9, p.8)*

In addition, the Commission heard that a ‘publish or perish’ culture in HMR is a key driver of research publications, and researchers are likely to engage in producing publications utilising pre-existing research information or patient cases to maintain their ongoing publication output.

Figure 4.5 provides the distribution of the institutional share of total publications in South Australia for the period 2008-19. The highest share during this period originated from the University of Adelaide, accounting for almost half of the state’s HMR publications. Flinders University’s share gradually increased from 24.6 per cent in 2008 to 28.5 per cent in 2019. The share of publications originating from UniSA also increased during this period, from 11.8 per cent in 2008 to 19.2 per cent in 2019. SAHMRI’s share has grown rapidly to approximately 10 per cent of the total publications, highlighting the relative maturity of the institute, which only became fully research active in 2014.

Figure 4.5: Share of total state publications (per cent), South Australian institutions, 2008-19



Source: InCites database updated 29 January 2020. Includes Web of Science content indexed through 31 December 2019. Export date: 19 February 2020. Note: Research area: 11 Medical and Health Sciences, Time period: 2008-19.

<sup>22</sup> The Commission notes the examples of other funding sources provided by SAHMRI in their submission (FR15, p33).

## Summary

South Australia’s share of HMR publications has remained relatively steady and just above the population share, even when the state’s share of NHMRC grant funding declined during the period 2006-19 (as discussed in chapter 3). Stakeholder submissions and the Commission’s consultations suggest that while NHMRC grant funding plays a significant role in producing HMR publications, a combination of other factors such as the type and quality of research publications, other funding sources, collaborative efforts as well as the ‘publish or perish’ culture within the sector act as drivers of publication output.

### 4.3.3. Productivity

Productivity, defined as volume or value of research output per unit of research input, is difficult to measure in HMR due to the complexity and the limited availability of the required data at the state and institutional level.

As an example, a gross-output based labour productivity approach indicates the labour requirements per unit of output (such as research publications), and as discussed in the OECD manual on *Measuring Productivity* (2001) it is often misinterpreted as the ‘productivity of the individuals in the labour force’.<sup>23</sup> Measuring labour productivity would require the total number of labour hours actually worked (or FTE as a second-best approach) as an input measure.<sup>24</sup>

The task is further compounded by inconsistent definitions and terminology. It is not uncommon in the literature to use the terms research ‘productivity’, ‘output’ and ‘performance’ interchangeably.<sup>25</sup> In most cases these issues are driven by organisational goals and the type and nature of research activity within an organisation. As an example, Figure 4.6 shows the proposed measures of research productivity outlined in the 2016 CAHLN strategic research review provided in correspondence from the CAHLN executive research committee.

Figure 4.6: Measures of research productivity

TABLE-10. Proposed CALHN Research Productivity Measures

Productivity Measure	Quantification	Data Source
Clinical Translation	> Number of CALHN Research projects resulting in change in hospital clinical management and practice	> List of research influenced policy change from Clinical Directorate Leads.
Publications	> Total number of publications > Number of original publications (not reviews)	> Publication list from SA Health Library > Original pubs identified by Directorate
Research Grants	> Number of Category-1, 2, 3 and 4 grants	> Identified by Clinical Directorate
Research Activity	> Number of investigator-initiated trials in progress > Number of industry-initiated trials in progress	> Identified by CALHN Research Office

Source: Correspondence from CAHLN executive research committee

<sup>23</sup> OECD *Measuring Productivity* – OECD Manual (2001) p14 < <http://www.oecd.org/sdd/productivity-stats/2352458.pdf>>.

<sup>24</sup> Ibid 14.

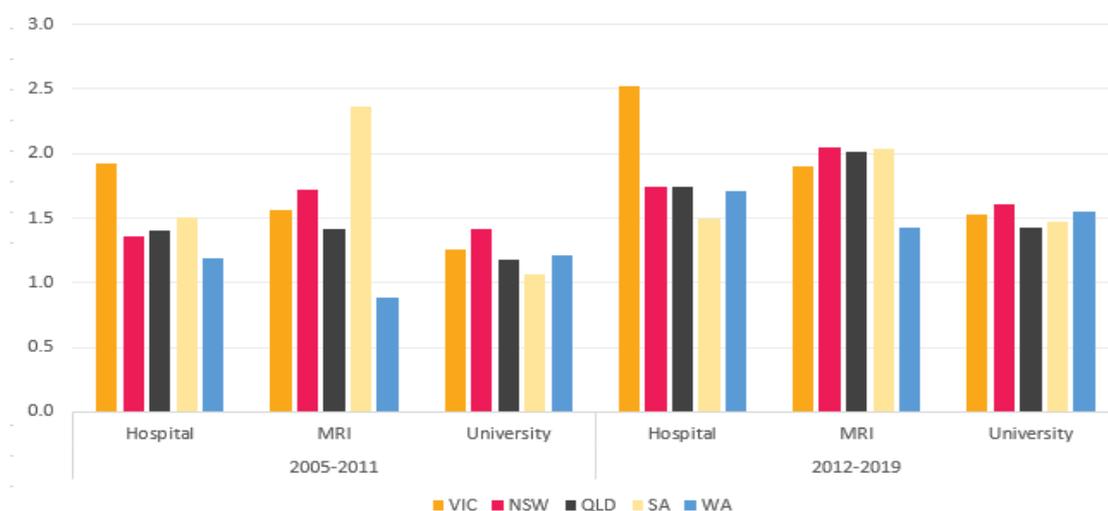
<sup>25</sup> See for example, C Caminiti, E Iezzi, C Ghetti, *et al*, ‘A method for measuring individual research productivity in hospitals: development and feasibility’ (2015) 15 BMC Health Serv Res 468; Patel *et al* (n 19); A Elie *et al*, ‘Effects of assessing the productivity of faculty in academic medical centres: A systematic review’ (2012) 184(11) CMAJ 602; Durieux and Gevenois (n 20).

Nevertheless, a common approach to measuring research productivity relates to indicators based on publication data including citations per publication over a given period of time. While there are several well documented limitations of this approach, including accurately accounting for co-authorship, contribution and variations in intensity of publications, the ability to quantify publications makes this a practical tool for measuring research productivity.

Figure 4.7 shows the category normalised citation impact for HMR publications by state between 2005 and 2019 based on the InCites database. A category normalised citation impact of one (1) represents performance on par with the world average, and values above one (1) are considered above average while values below one (1) are considered below average.

While this indicator is considered a better alternative to using simple citation numbers, the InCites database has documented known limitations of this measure, including the impact of small sample sizes and disproportionate influence of a few highly cited papers.<sup>26</sup>

Figure 4.7: Category normalised citation impact by place of research and state, 2005-11 and 2012-19.



Source: InCites database updated 28 May 2020. Includes Web of Science content indexed through 30 April 2020. Export date: 20 June 2020. Note: Research area: 11 Medical and Health Sciences, Time period: 2005-19. Includes all independent and non-independent MRIs.

Based on the category normalised citation impact, Australian HMR publications have performed above the world average in both time periods (except for Western Australian MRIs during 2005-11 ). Publications originating from hospitals and MRIs generally have a higher impact than those from universities, which is consistent with observations made by the NSW Health and Medical Research Strategic Review.<sup>27</sup>

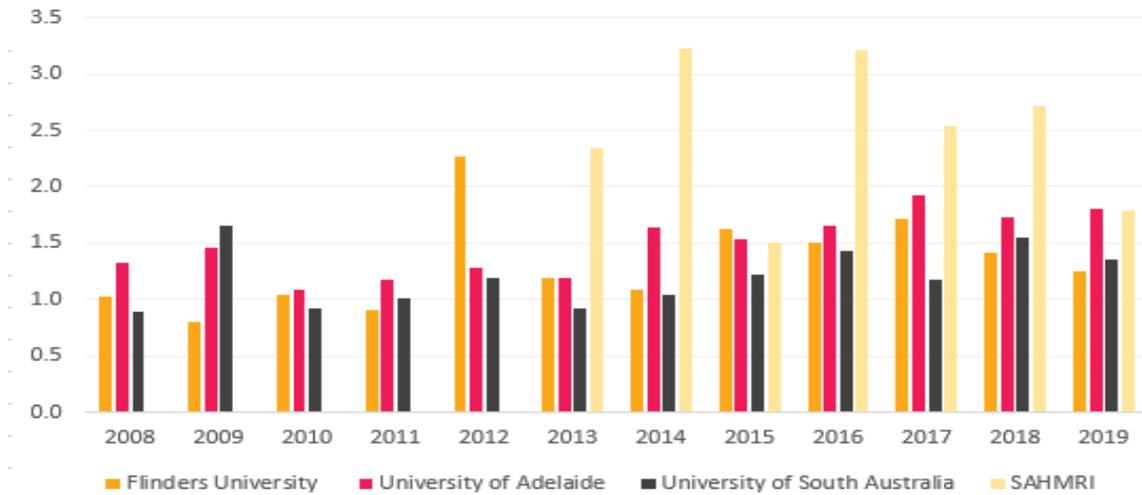
Figure 4.8 presents the category normalised citation impact of publications for South Australian publicly funded research institutions. As evident from the figure, this measure can vary widely from year to year. All three universities have generally maintained a citation impact above the world average from 2014 onwards. SAHMRI's impact factor, while only

<sup>26</sup> < <http://help.prod-ncites.com/inCites2Live/indicatorsGroup/aboutHandbook/usingCitationIndicatorsWisely/normalizedCitationImpact.html> >

<sup>27</sup> NSW Health and Medical Research Strategic Review, Final Report (2012), p.78.

applicable since 2012, is above the world average and leads the universities by a considerable margin.

Figure 4.8: Category normalised citation impact of HMR publications, South Australian institutions, 2008-19

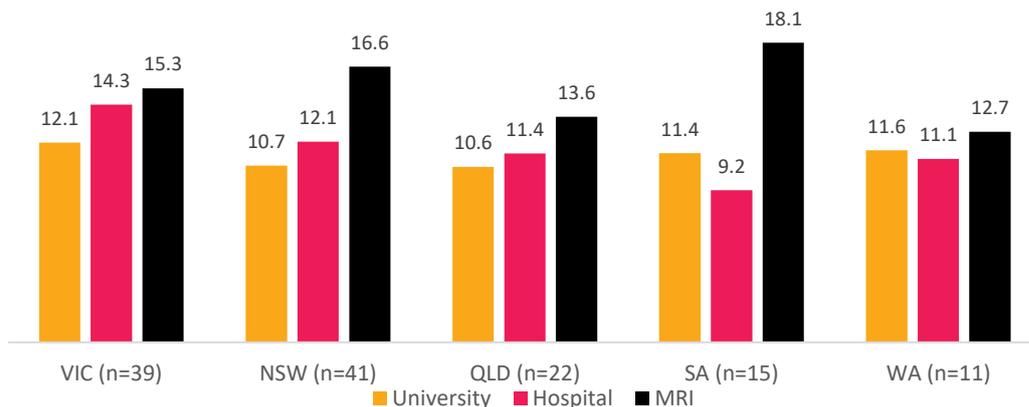


Source: InCites database updated 29 January 2020. Includes Web of Science content indexed through 31 December 2019. Export date: 19 February 2020. Note: Research area: 11 Medical and Health Sciences, Time period: 2008-19.

**Measures of quality**

Another aspect of research performance is quality, which is not captured in the number of publications. One measure of research quality is highly cited publications which is an indicator of highly performing research. Figure 4.9 shows the share of HMR publications that are in the top 10 per cent of citations by place of research and state for the period 2005-19.

Figure 4.9: Proportion of HMR publications in top 10 per cent of citations by place of research and state, 2005-19.



Source: InCites database updated 29 January 2020. Includes Web of Science content indexed through 31 December 2019. Export date: 27 February 2020. Note: Research area: 11 Medical and Health Sciences. n= the number of entities considered in the analysis.

The InCites database defines this indicator as the top 10 per cent most cited documents in a given subject category, year and publication type divided by the total number of documents

in that particular set.<sup>28</sup> The typical performance is around a value of ten V values of higher than ten are considered to be higher performance.<sup>29</sup>

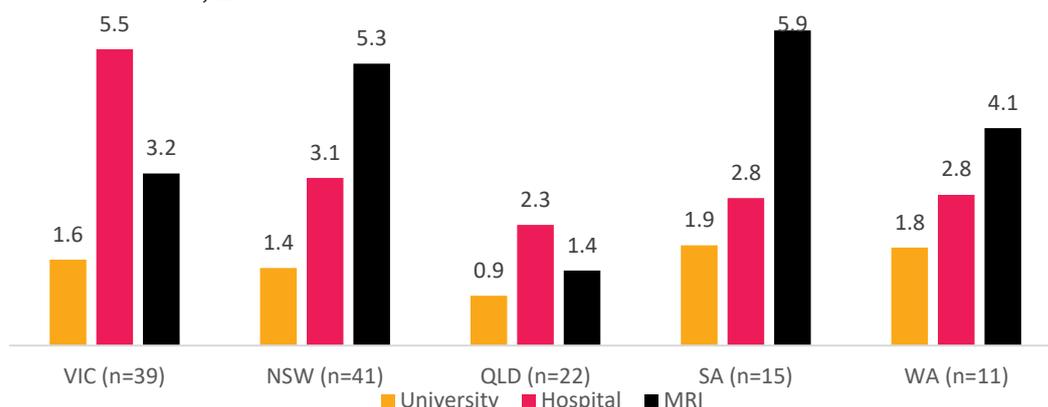
Publications originating from MRIs have been performing considerably above those from universities and hospitals across all states during the period 2005-19. South Australia has performed well above average (equal to a value of ten) in university and MRI research publications. The South Australian hospital sector had the only value less than ten across all states and sectors during this time period, indicating slightly below average performance.

### Measures of collaboration

Collaboration is considered an important aspect of HMR, particularly in relation to translating basic science discoveries into improving public health outcomes. There are well known benefits of improved research collaboration including speeding up translational research, greater scientific impact and innovation.<sup>30</sup> Using measures of collaboration for HMR assessment was also discussed in several submissions including the following:

*One measure that the Commission might consider including is some index of researcher networking – e.g. how much interdisciplinary and/or cross-institutional collaboration is taking place as measured by CI positions on grants and co-authorship? (University of Adelaide School of Public Health, DR32, p.3)*

Figure 4.10: Proportion of HMR publications with industry collaboration (per cent) by place of research and state, 2005-19



Source: InCites database updated 29 January 2020. Includes Web of Science content indexed through 31 December 2019. Export date: 27 February 2020. Note: Research area: 11 Medical and Health Sciences, Citation impact is defined as number of citations per publication.

Figure 4.10 presents the share of publications with industry collaborations by place of research and state between 2005 and 2019.<sup>31</sup> Publications originating from MRIs have had the highest proportion of industry collaborations during this period in all jurisdictions, except in Victoria where hospital research had the highest share of industry collaborations. Universities generally had a lower share of industry collaborations in all states. In South Australia, nearly six per cent of MRI publications had industry collaborations while 2.8 per

<sup>28</sup> A similar measure is the percentage in the top 1%, however by definition its small sample size for a given set of documents has significant issues relating to statistical relevance. Details of definitions and related issues are available at: <https://incites.help.clarivate.com/Content/Indicators-Handbook/ih-percent-doc-top-1.htm>

<sup>29</sup> Ibid

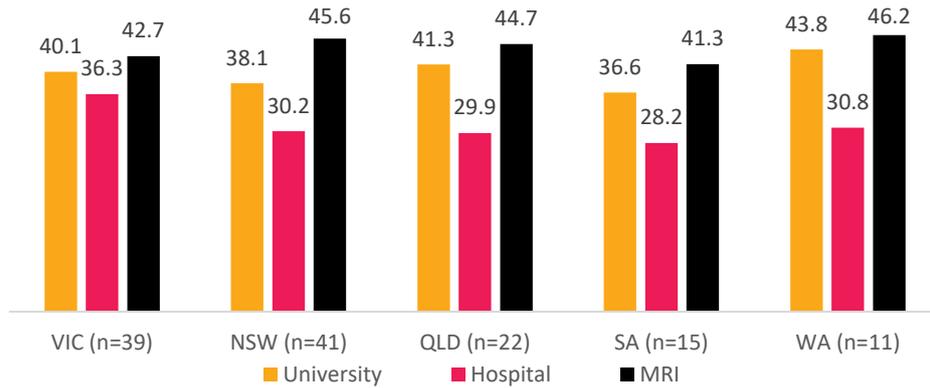
<sup>30</sup> B B Tigges, D Miller, K M Dudding et al, 'Measuring quality and outcomes of research collaborations: An integrative review' (2019) 3(5) *J Clin Transl Sci*. 261.

<sup>31</sup> This is defined as the total number of industry collaborative publications for a given entity divided by the total number of publications for that entity for a given period of time.

cent of hospital-based research and 1.9 percent of university research had an industry collaborator.

Figure 4.11 presents another aspect of collaboration, the share of publications with international collaboration by place of research and state for 2005-19. Based on this indicator, both universities and MRIs have performed well above hospital-based research during this period. In South Australia, only 28 per cent of publications originating in hospitals had an international collaborator, while the share for the MRI sector was 41 per cent.

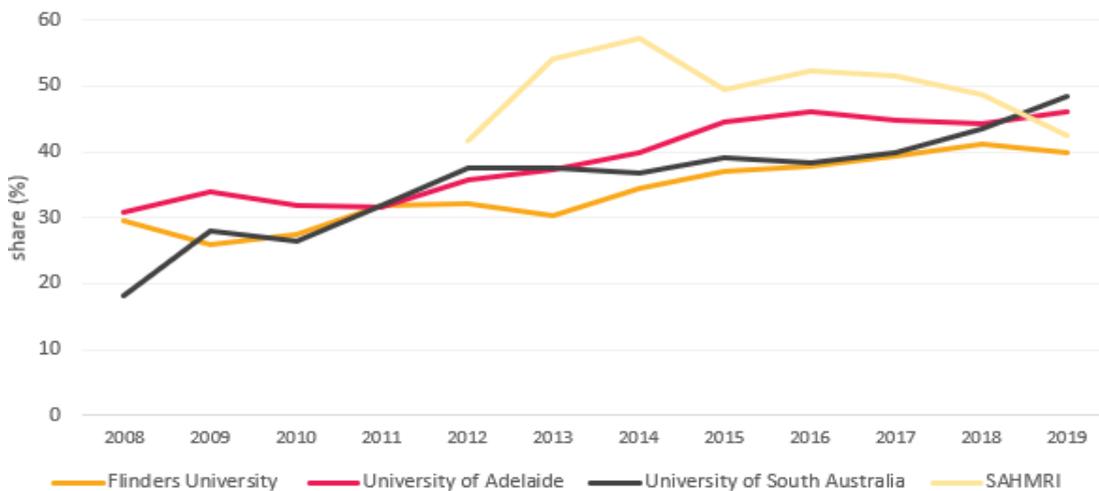
Figure 4.11: Proportion of HMR publications with international collaboration (per cent) by place of research and state, 2005-19



Source: InCites database updated 29 January 2020. Includes Web of Science content indexed through 31 December 2019. Export date: 27 February 2020. Note: Research area: 11 Medical and Health Sciences, Citation impact is defined as number of citations per publication.

Figure 4.12 shows that the share of HMR publications produced through international collaboration in South Australian public universities has increased consistently through the last decade. UniSA in particular increased the share of international collaborations in HMR publications from 18.2 per cent in 2008 to 48.5 per cent in 2019. SAHMRI’s share of publications with international collaboration outstripped the public universities, with the exception of 2019 (42.5 per cent).

Figure 4.12: Proportion of international collaborations in HMR publications (per cent) by place of research, South Australia, 2005-19



Source: InCites database updated 29 January 2020. Includes Web of Science content indexed through 31 December 2019. Export date: 19 February 2020. Note: Research area: 11 Medical and Health Sciences, Time period: 2008-19.

## Summary

While conceptual, definitional and data issues pose considerable limitations on constructing HMR productivity measures, the Commission's consultations suggest that there are efforts across the state at the institutional level to improve measurement and there are benefits to be gained from shared endeavours. The Commission considers these efforts important in developing HMR and organisational performance measures, which are discussed further in chapter 9.

Conventional indicators such as those related to publication citation impact measures and collaboration are useful in providing a broad understanding of the quality of research. Category normalised citation impact measures show that HMR publications originating from South Australia have in general performed above world average. Similar to other states, MRIs and hospitals tend to have a higher impact factor than university-based publications, reflecting the type of research undertaken at these institutions. The data also indicate that the level and nature of collaboration resulting in publications vary across the different types of research areas.

### 4.3.5. Impact

Research impact has been described as 'an inherent and essential part of research and acts as an important way in which publicly funded research is accounted for'.<sup>32</sup> Monitoring and measuring research impact is a complex objective task requiring the involvement of many actors within the research pipeline.

Key issues in evaluating HMR impacts or outcomes include the lack of consistent definitions, data and methodologies that support empirical evidence across the sector.<sup>33</sup> In addition, the lack of standard terminology, the multifaceted nature of the evaluation, and the heterogeneity of the frameworks make it difficult to make comparisons.<sup>34</sup> According to a review by the Canadian Academy of Health Sciences, the results of such assessments are 'on average, contradictory, and the evidence of health research impact is either highly qualified or mixed'.<sup>35</sup>

Given the absence of a standardised HMR impact assessment framework, funding bodies and research institutes use different definitions and approaches, limiting the ability to make meaningful comparisons across the sector. This is further confounded by limited and varying understanding of the definition of impact by researchers.<sup>36</sup> Even with definitions and a framework in place, there are challenges in assessing the impact of health research, including:<sup>37</sup>

- attribution – of a causal link between observed (or expected) changes and a specific intervention;<sup>38</sup>

<sup>32</sup> E Terama, M Smallman, S J Lock, C Johnson and M Z Austwick, 'Beyond Academia: Interrogating research impact in the research excellence framework' (2016) 11 *PLoS ONE* 0168533.

<sup>33</sup> Penfield *et al*, 'Assessment, evaluations and definitions of research impact: a review' (2014) 21(1) *Research Evaluation* 21.

<sup>34</sup> R Banzi, L Moja, V Pistotti, V *et al*, 'Conceptual frameworks and empirical approaches used to assess the impact of health research: an overview of reviews' (2011) 9 *Health Res Policy Sys* 26.

<sup>35</sup> Panel on return on investment in health research (2009), p.47.

<sup>36</sup> *Ibid*, 10.

<sup>37</sup> *Ibid*, 72.

<sup>38</sup> OECD, Glossary of key terms in evaluation and results-based management. 2002 <<http://www.oecd.org/development/peer-reviews/2754804.pdf>>

- the absence of a counterfactual scenario;<sup>39</sup>
- time lags of research impact; and
- levels of aggregation (individual, research group/grant, institution/department, funding agency, national/jurisdictional) for evaluation.

The Commission was informed that ‘there is currently no approved, standardised methodology to conduct impact evaluation of research projects in South Australia’.<sup>40</sup> That said, several initiatives are underway to address this issue, both nationally and in South Australia.

At the national level, the NHMRC has developed an expanded definition of research impact<sup>41</sup> that captures ‘the verifiable outcomes that research makes to knowledge, health, the economy and/or society, and not the prospective or anticipated effects of the research’. It recognises four specific types of impact: knowledge, health, economic and social. A key feature of this framework is that it includes both output and outcome measures of HMR. Selected impact case studies are published on the NHMRC website.<sup>42</sup>

Meanwhile the Australian Research Council (ARC) introduced a new framework on engagement and impact assessment in 2018.<sup>43</sup> The ARC defines research impact as the “contribution that research makes to the economy, society, environment or culture, beyond the contribution to academic research”, and universities are required to report on impact and approach to impact. The ARC maintains a publicly available searchable impact studies database on their website.<sup>44</sup>

In addition, an MRI-led impact assessment framework funded by the Ian Potter Foundation is currently in development as a potential standardised framework for the MRI sector.<sup>45</sup> There was stakeholder support for the use of this framework in South Australian MRIs.<sup>46</sup>

Another approach developed by the Hunter Medical Research Institute is the Framework to Assess the Impact of Translational health research which is a combination of three quantitative and qualitative methodologies for measuring research impact (economic analysis, modified payback method and a narrative of the process of translating research that generates impact).<sup>47</sup>

Flinders University supported the adoption of this framework in South Australia:

*The Commission notes the "Framework to Assess the Impact of Translational health research (FAIT)" on page 101 of the draft report. Developed by Hunter Medical Research Institute it is a hybrid of three proven methodologies for measuring research impact, namely a modified payback method, social return on investment, and case studies or narratives of the process by which research translates and generates impact. Researchers at Flinders University are supportive of this approach, and its adoption in South Australia. (Flinders University, FR9, p.9)*

<sup>39</sup> The gold standard for evaluation with a comparison is the randomised control trial, but this is not often possible. See for example discussion in the Panel on return on investment in health research (2009), p.72.

<sup>40</sup> The Hospital Research Foundation (DR26, p.9).

<sup>41</sup> <<https://www.nhmrc.gov.au/research-policy/research-translation-and-impact/research-impact>>.

<sup>42</sup> <<https://www.nhmrc.gov.au/about-us/resources/impact-case-studies>>.

<sup>43</sup> <<https://www.arc.gov.au/engagement-and-impact-assessment>>.

<sup>44</sup> <<https://dataportal.arc.gov.au/EI/Web/Impact/ImpactStudies>>.

<sup>45</sup> AAMRI, DR5, p11. Further information at: <<https://aamri.org.au/members/theresearchimpactproject/>>.

<sup>46</sup> SAHMRI (FR15, p.39).

<sup>47</sup> Additional information available at <<https://hmri.org.au/FAIT>>.

The Commission also heard that the Hospital Research Foundation (THRF) is developing its own framework, which is 'designed to accommodate the evaluation of projects with diverse research types, medical specialties and budgets'.<sup>48</sup> In addition, the Health Translation SA (HTSA) is currently developing an 'impact framework' that maps the progress of research translation in South Australia, which it argues could be an important reporting tool to the NHMRC, stakeholders and funders.<sup>49</sup> Further, the HTSA suggests that:

*An Impact Framework, with suitable agreed metrics, is included in the state-wide HMR Strategy to measure the success of health and medical research across South Australia over the next 10 years. (HTSA, DR17, p.13)*

An important consideration in this regard, raised by THRF, is the lack of skills and human resources required to conduct proper HMR impact evaluations.<sup>50</sup> It is therefore necessary to address existing capacity and skill gaps when developing new frameworks. Additionally, the

## Summary

An array of definitional, methodological and data issues limit consistent evaluation of HMR impacts. This has resulted in funding bodies and research institutes using different definitions and approaches, limiting the ability to make comparisons across the sector. The Commission's consultations indicate that there is broad support among stakeholders to adopt a state-wide impact assessment framework for HMR. This issue is discussed further in chapter 9.

## 4.4 Performance of the public hospital system

There is a widely held belief that engagement by clinicians and healthcare organisations in HMR improves healthcare performance at various levels. It is assumed that new policies and practices improve the quality and efficiency of healthcare leading to improved health outcomes or avoided costs in the health system. However, the literature provides limited evidence to support this hypothesis. A 2015 study conducted in the UK finds an association between HMR and the translation of HMR into new policies and practices.

*Current evidence suggests that there is an association between the engagement of individuals and healthcare organisations in research and improvements in healthcare performance. The mechanisms through which research engagement might improve healthcare performance overlap and rarely act in isolation, and their effectiveness often depends on the context in which they operate.<sup>51</sup>*

Over the last five years, only a few papers have been published in this area, indicating that it is difficult to establish a causal relationship between quality and quantity of HMR and hospital performance at a health system wide level, and that work in this area is still in its infancy. A response to the draft report from Flinders University indicates that empirical evidence is difficult to source in South Australia:

*It is difficult to provide empirical evidence requested here as the conduct of HMR within public hospitals, the delivery of healthcare services and resulting public health outcomes is complex and performance is dependent on many variables. Furthermore, this research has largely not*

<sup>48</sup> The Hospital Research Foundation (DR26, p.9).

<sup>49</sup> HTSA (DR17, p.3).

<sup>50</sup> The Hospital Research Foundation (DR26, p.9).

<sup>51</sup>A Boaz, S Hanney, T Jones et al, 'Does the engagement of clinicians and organisations in research improve healthcare performance: a three-stage review' (2015) 5 *BMJ Open* e009415, 1.

*been conducted and patients aren't systematically followed to enable these insights. (Flinders University FR9, p.9)*

For many years, the Health Performance Council (HPC) has published data on South Australian public health outcomes in their report *State of Our Health*,<sup>52</sup> which monitors public health outcomes as a proxy measure of health system performance. The HPC believes this is the only source of detailed publicly available information on public health outcomes for South Australia. Evidence of individual HMR programs leading to improved health outcomes and improved hospital performance has been demonstrated more readily in case studies.

The Commission considers that, as is the case in other organisations, embedding a research function in public hospitals is an important underpinning of any organisational business process improvement strategy aimed at delivering improvements in the efficiency and quality of service delivery. Considerable work has been done by governments across Australia to develop a comprehensive suite of performance indicators for the public hospital system. An overview of selected indicators is discussed in the following section.

#### 4.4.1 Performance indicators overview

The Australian Productivity Commission *Report on Government Services (RoGS) 2020* has developed a performance indicator framework for public hospitals. This provides information on equity, efficiency and effectiveness, and distinguishes the outputs and outcomes of public hospital services.<sup>53</sup> While many of these indicators may be affected by the rate of innovation, those of particular relevance to this inquiry relate to efficiency and quality and safety. Other indicators of interest are those which signal the capacity of South Australia's public hospitals to engage effectively in HMR.

In 2017-18 there were 693 public hospitals and 657 private hospitals in Australia which offered approximately 62,250 beds for admitted patients.<sup>54</sup> Australia also had 3.9 beds per 1,000 population in public and private hospitals, compared with an average of 4.7 beds per 1,000 population for countries analysed by the OECD, and ranked in the middle of the 35 OECD and other selected countries.<sup>55</sup>

In 2017-18 South Australia had a rate of 2.6 beds per 1,000 people, on par with the eastern states and the national average of 2.5 beds per 1,000 people. This has decreased since 2011-12 when South Australia had a high of 3.2 public hospital beds per 1,000 population.<sup>56</sup>

Figure 4.13 presents Australian Institute of Health and Welfare (AIHW) data on public hospital size by state for 2017-18. It shows that the South Australian health system has a higher proportion of small to mid-size public hospitals, and a smaller proportion of large hospitals with greater than 100 beds, compared to many of the other states and the national average. Research involving patients and clinical trials relies on large hospitals to obtain suitable cohorts of participants.

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<sup>52</sup> For more information see: <[https://hpcsa.com.au/state\\_of\\_our\\_health](https://hpcsa.com.au/state_of_our_health)>

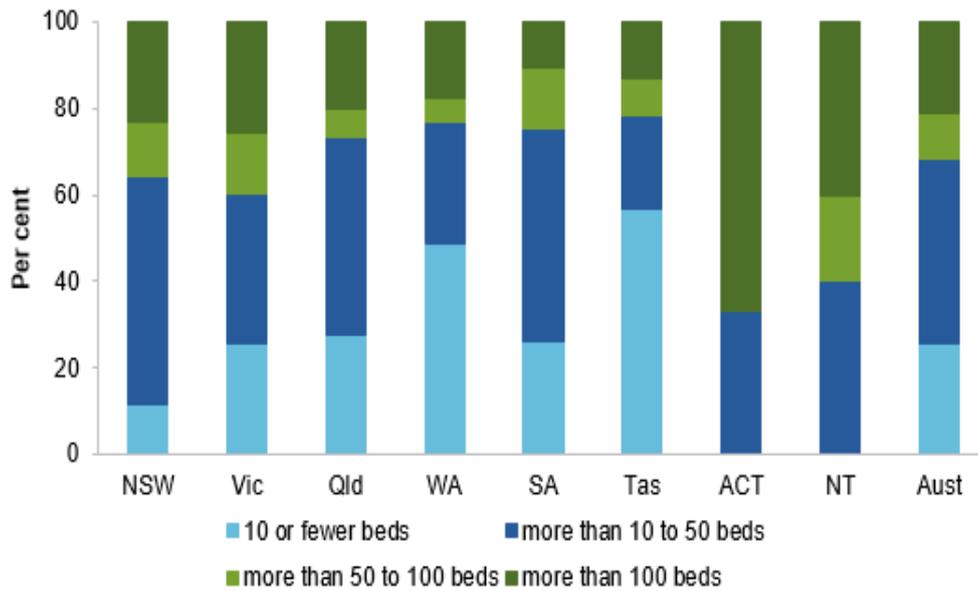
<sup>53</sup> Australian Productivity Commission, *Report on Government Services (2020)*, Part E: Health, 12.7 <<https://www.pc.gov.au/research/ongoing/report-on-government-services/2020/health>>.

<sup>54</sup> Ibid 12.3.

<sup>55</sup> OECD, *Health at a Glance 2019: OECD Indicators* (OECD Publishing, 2019) 194.

<sup>56</sup> Australian Productivity Commission, (n53) 12.3.

Figure 4.13: Public hospitals by size 2017-18.

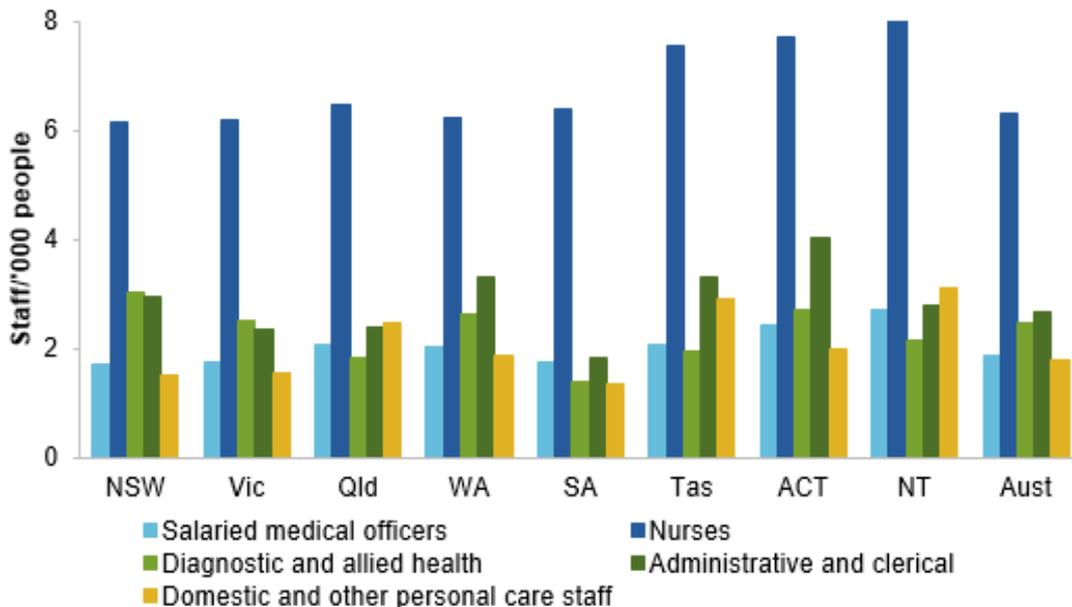


Source: AIHW, Hospital resources 2017-18: Australian hospital statistics, (2019) table 12A.3.<sup>57</sup>

**Workforce**

AIHW data presented in Figure 4.17 indicate that South Australian public hospitals have similar nursing FTE’s compared to the eastern states and a slightly lower number of salaried medical officers per 1,000 people compared to the eastern states.

Figure 4.17: FTE staff per 1,000 people, public hospital services, 2017-18.



Source: AIHW (2019), Hospital resources 2017-18: Australian hospital statistics (2019).<sup>58</sup>

<sup>57</sup> Ibid. 12.3.

<sup>58</sup> Ibid.12.29

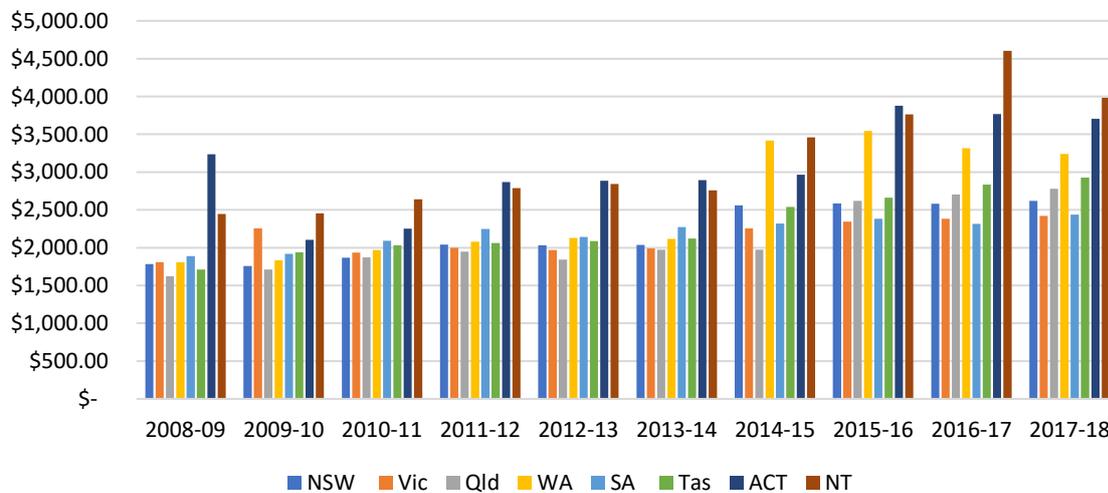
Public hospital staff numbers in Australia have grown from 11.5 FTEs per 1,000 population in 2008-09 to 15.1 FTEs in 2017-18. Growth in South Australia has been slower, with 12.3 public hospital services FTEs per 1,000 population in 2008-09 compared to 12.6 FTEs in 2017-18, the lowest of all states and territories.<sup>59</sup>

**Efficiency**

Recurrent expenditure

Total Australian, state and territory government recurrent expenditure on health services was estimated to be \$109.2 billion for 2017- 18, around 44.3 per cent of total government expenditure. Public hospitals are the largest contributor at \$67.2 billion. (see Figure 4.18)

*Figure 4:18: Recurrent expenditure on public hospital services (including psychiatric hospitals), dollars per capita.*

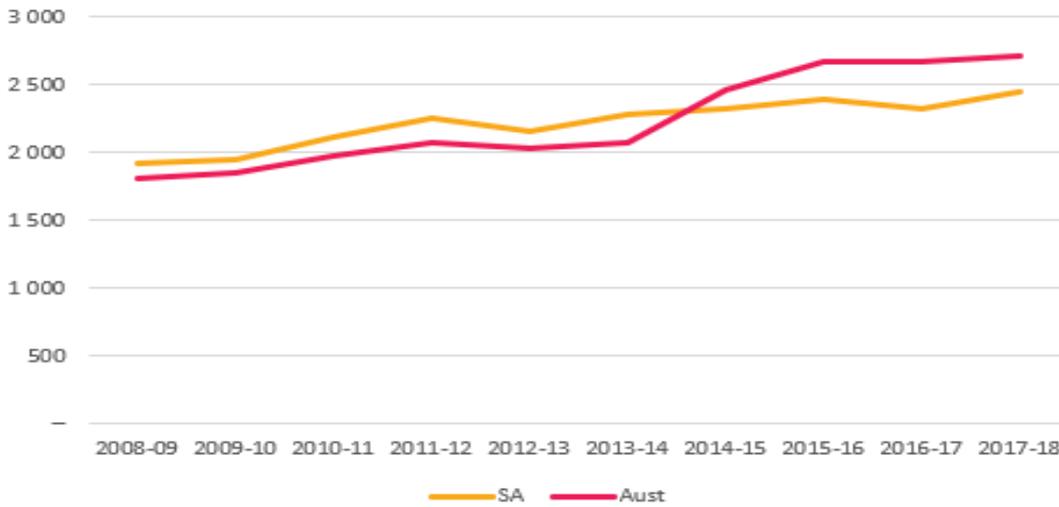


Source: Report on Government Services 2020, part E, section 12, Table 12A.1 Public Hospitals Data Tables <https://pc.gov.au/research/ongoing/report-on-government-services/2020/health/public-hospitals> and ABS 3101.0 - Australian Demographic Statistics, (December 2019) < <https://www.abs.gov.au/>>.

As shown in Figure 4.19, recurrent expenditure per patient in the South Australian public hospital system has tracked slightly above the national average from 2008 to 2014 but has been lower than the national average since 2014, when the expenditure for other states rose noticeably.

<sup>59</sup> Health Performance Council [South Australia], Report on Government Services (2020). Summary of Productivity Commission’s Annual Publication of Selected Health Performance indicators for South Australia compared to other states and territories

Figure 4.19: Recurrent expenditure per patient, public hospital services, South Australia 2008-18.

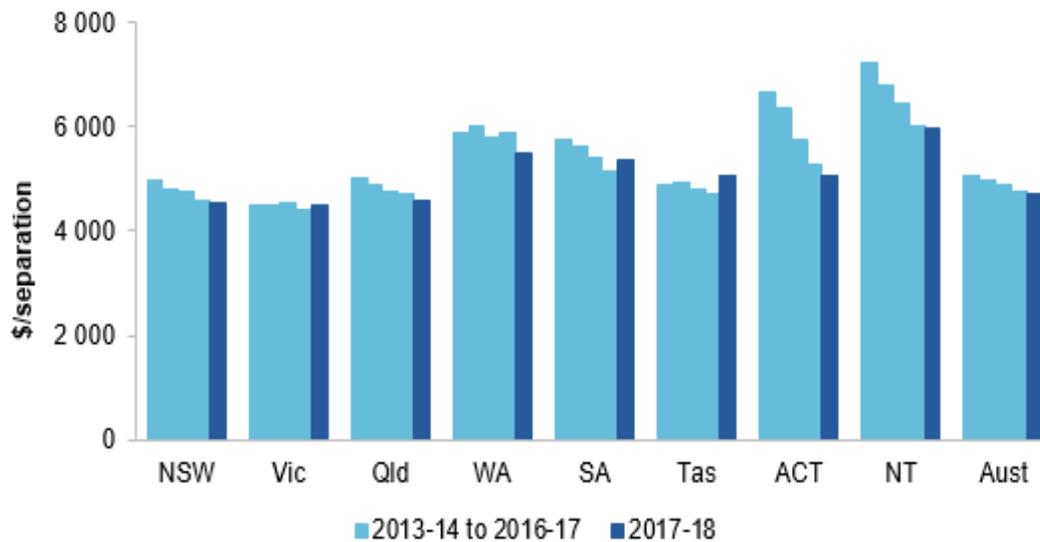


Source: <<https://www.pc.gov.au/research/ongoing/report-on-government-services/2020/health/public-hospitals/rogs-2020-part2-section12.pdf>> p.1 of Table 12A.2.

Cost per separation

Figure 4.17 presents the recurrent cost per weighted separation by state.<sup>60</sup> Nationally in 2017-18, the recurrent cost per weighted separation was \$4,726. South Australian public hospitals, with a cost of \$5,365, are comparable with Western Australia (\$5,504) but higher than NSW (\$4,537), Victoria (\$4,518) and Queensland (\$4,574).

Figure 4.17: Recurrent cost per weighted separation.



Source: IHPA National Hospital Cost Data Collection; table 12A.57.<sup>61</sup>

<sup>60</sup> Recurrent cost per weighted separation' is the average cost of providing care for an admitted patient (overnight stay or same day) adjusted for casemix. Case mix adjustment takes account of variation in the relative complexity of the patient's clinical condition and of the hospital services provided, but not other influences, on length of stay. For more information see Australian Productivity Commission (n 53) 1229.

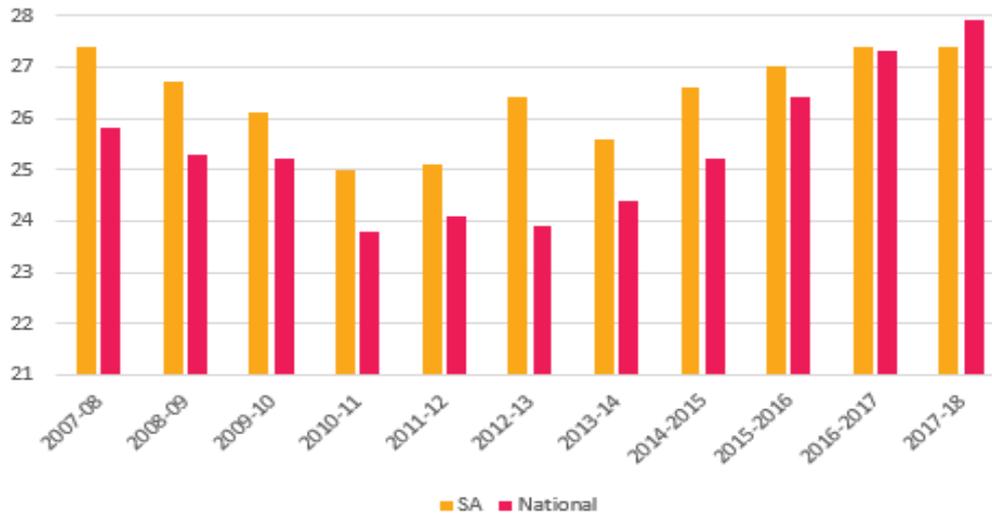
<sup>61</sup> Ibid.1231.

### Quality and safety

Measures of preventable admissions<sup>62</sup> and avoidable deaths are regarded as indicators of hospital quality and safety and may reflect changes in health practice as an outcome of research.

According to Figure 4.18, South Australia had a higher than average rate of preventable admissions for the period 2007-16, after which the rate decreased to below the national average indicating an improvement in the public hospital system.

Figure 4.18: Potentially preventable hospitalisations per 1,000 admissions, age-standardised rate, South Australia, 2007/08 - 2017/18.



Source: AIHW Health System: Effectiveness<sup>63</sup>

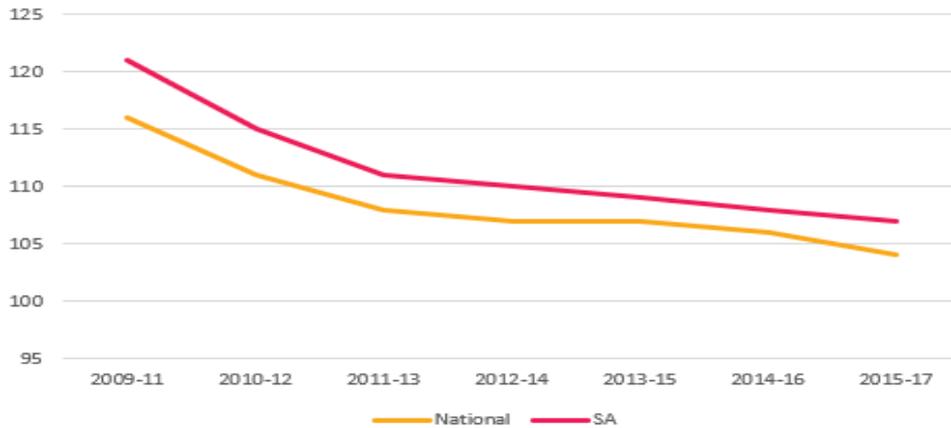
### Avoidable deaths

In South Australia and nationally, the rate of potentially avoidable deaths for people aged under 75 has steadily decreased, as shown in Figure 4.19, but South Australia remains above the national average. Not all avoidable deaths are attributable to the burden of disease. In comparison, Victoria and NSW have a consistently lower rate of potentially avoidable deaths.

<sup>62</sup> There are three broad categories of preventable admissions: vaccine preventable, acute conditions (whilst not preventable could result in reduced hospitalisation if preventive care was received) and chronic conditions (which may be preventable through health behaviour changes and innovation).

<sup>63</sup> <<https://www.aihw.gov.au/reports-data/australias-health-performance/australias-health-performance-framework/national/all-australia/effectiveness/effectiveness?tab=2.1.4|Table>>.

Figure 4.19: Potentially avoidable deaths, age-standardised rate per 100,000 people, South Australia.

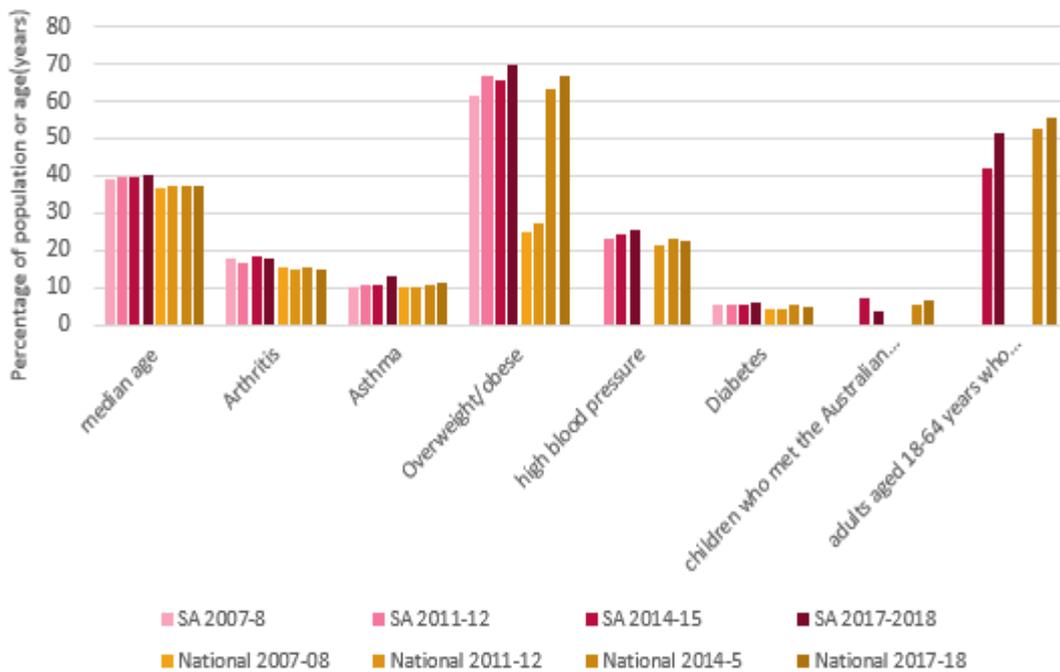


Source: AIHW: Health System: Effectiveness: Potentially avoidable deaths.<sup>64</sup>

**South Australia’s population health**

One of the key aims of HMR is to improve population health outcomes. The ABS National Health Survey in 2017-18 showed that South Australia has an older median age of 40 compared with 37 nationally and higher rates of arthritis, asthma, obesity, diabetes, adult high blood pressure, lower levels of adult exercise and a lower rate of children who met the Australian Dietary Guidelines. Figure 4.20 shows little improvement over 12 years in these key indicators of SA’s population health, which remain below the national average.

Figure 4.20: SA population health vs national population health (%).



Source: ABS National Health Survey: First results series and Regional Population series

<sup>64</sup> <[Final Report](https://www.aihw.gov.au/reports-data/australias-health-performance/australias-health-performance-framework/national/all-australia/effectiveness/effectiveness?tab=2.1.4|Table&tab=2.1.6|Table.> .</a></p>
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## Summary

This section examined the performance of the public hospital system based on the Report on Government Services framework, which attempts to measure impact but does not provide any insights on causal relationships.

South Australian public hospitals are performing relatively close to the national average for the range of performance indicators reviewed with some signs of improvement in performance. That said, population health data indicates little changes in the long-term trends in health problems experienced in the South Australian population.

While there is qualitative evidence that hospital based HMR leads to better and improved hospital systems and public health outcomes, the Commission has not been able to identify empirical evidence that proves the causal link between them.

## 4.5 Conclusion

This chapter began with an overview of approaches to assessing HMR performance and their limitations. In addition to definitional issues, there are significant data gaps and limitations which prevent a full assessment of HMR activity at both the sectoral and institutional level. The Commission's research and consultations with stakeholders indicate that this problem is not unique problem to South Australia.

There are particular difficulties in assessing the performance of HMR activity due to very long lags between the conduct of research and occurrence of economic or health outcomes. While international literature suggests there is an association between R&D, improved health outcomes and economic growth, it is difficult to establish a causal relationship in South Australia.

That said, the Commission notes existing efforts at the institutional level and considers them an important step in developing HMR performance measures that are relevant and reflect organisational goals and objectives. Suggested HMR performance measures received from stakeholders presented earlier are a positive step in this regard.

While a key aim of HMR is to improve health outcomes, it is difficult to establish a direct causal relationship in practice. This chapter examined some selected indicators on the performance of the South Australian public hospital system over time, and in comparison with other jurisdictions. The general picture presented by these indicators is one of stable or improving performance close to the national average

The Commission notes that consistent definitions and datasets for inputs, outputs, productivity and impacts are needed to enable evaluation and benchmarking of performance at the institutional level as well as sector-wide inter-jurisdictional comparisons. The Commission also notes that available HMR workforce data at the state and institutional level, while not suitable for constructing productivity measures, still provide useful insights into its general trends and size.

In chapter 9, the Commission recommends the adoption of a framework for measuring HMR in South Australia, focusing on the health system, and its collaborating partners such as the universities, both to make investment in HMR in South Australia more transparent and to make those responsible for HMR more accountable.

## 5. Regulatory reform

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### 5.1 Introduction

The inquiry's terms of reference require the Commission to examine and report on the key factors that influence, whether positively or adversely, the level of public and private sector health and medical research (HMR) output and activity. This includes the current regulatory environment as it relates to HMR, particularly the ethics approval process (including its interaction with governance approval) and the policy and statutory framework regulating researchers' access to the data required for HMR.

A consolidated, streamlined and efficient regulatory environment is an important enabling condition of competitive HMR. That said, the regulatory framework facing researchers and administrators in SA is marked by a complex and interlocking web of policy and statutory requirements, many of which do not appear to be well understood by stakeholders in either the government or non-government sectors.

This is especially true of the provisions that determine the way that researchers are granted ethics approval and in the way their access to data held by SA Health is regulated and facilitated. The Commission notes that the policy and legislative framework regulating researchers' access to data intersects with, and is affected by, the need to receive ethics and governance approval before a HMR project can commence.

Accordingly, the chapter examines the key components of the ethics approval process, including its points of intersection with governance approval, before considering the regulatory environment affecting researchers' access to HMR data, much of which is held by the Department for Health and Wellbeing (DHW), the local health networks (LHNs), SA-NT DataLink and other public sector agencies.

### 5.2 Ethics approval

Ethics approval within SA Health as a whole is guided by the National Health and Medical Research Council's (NHMRC's) national statement and constitutes one of the most significant regulatory requirements that apply to HMR. A range of stakeholders, including both government and non-government institutions involved in HMR, have argued that the current processes have the potential to constrain HMR conducted in the public health system.

The Commission notes the recent Birch Review made recommendations on reforming and enhancing research governance processes in SA Health with a focus on the site specific approval (SSA) process managed by each LHN.<sup>1</sup> Following the release of the report, the Clinical Research Governance Steering Committee (CRGSC), under the auspices of Health Translation SA (HTSA), was tasked by the Minister for Health and Wellbeing with implementing the recommendations arising from the Birch Review. Some of these recommendations bear on the ethics approval process, and the Commission understands that implementation of the majority of recommendations is underway. For example, KPIs determining site-specific assessment (SSA) average response times are being included in

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<sup>1</sup> See Jim Birch, *Review of Research Governance in the Department of Health and Wellbeing (SA) and related LHNs* (2018).

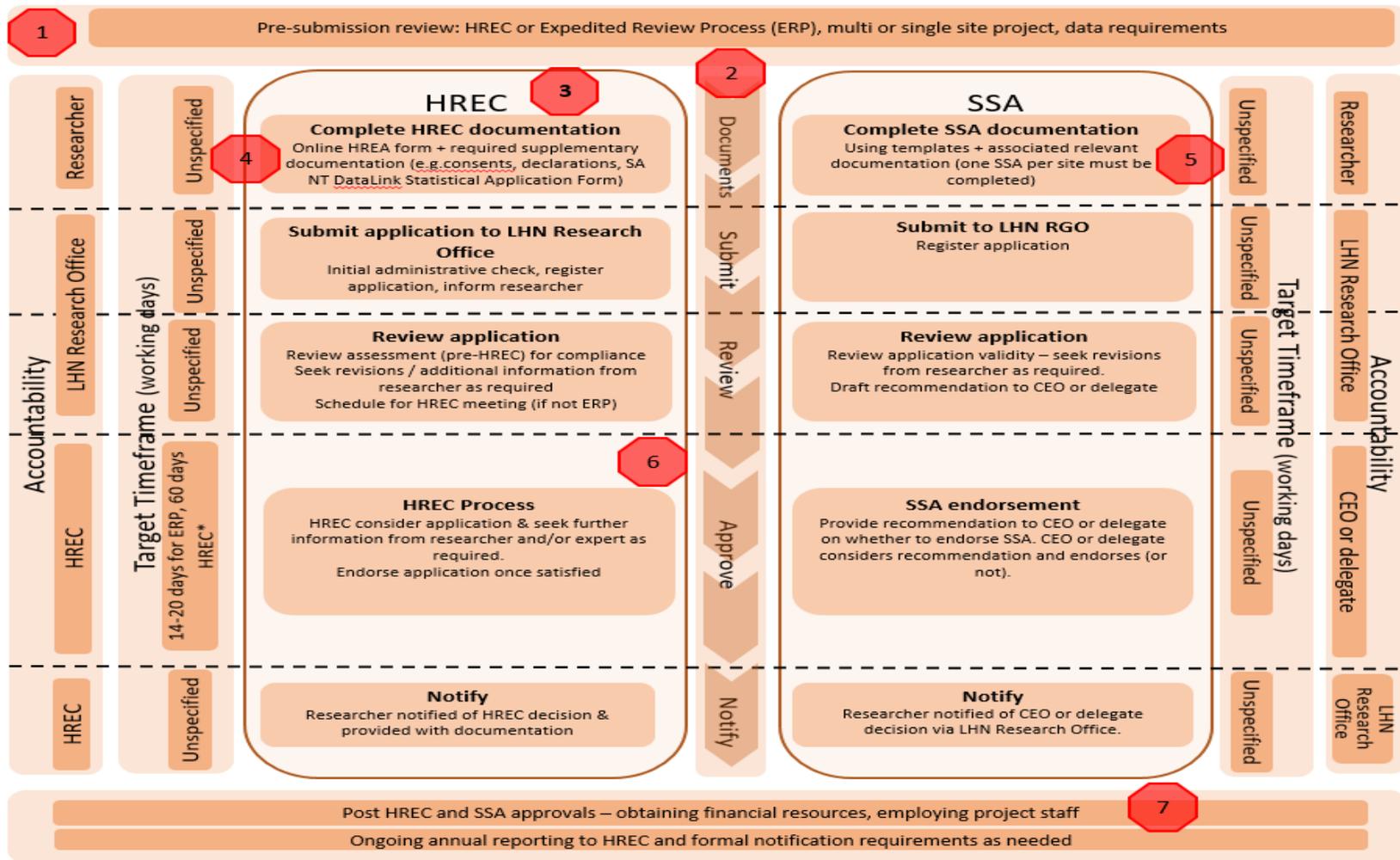
selected LHNs service agreements, with a reporting function to be transitioned to DHW by the end of 2020. The Commission understands that Research Office managers are also working together to develop standard concurrent SSA processes for all LHNs, where possible.

As outlined in Chapter 2, the requirements of the ethics approval process in South Australia are contained in SA Health's *Research Ethics Policy Directive* (the ethics policy). The ethics policy applies to the processes and procedures for approval from a human research ethics committee (HREC) to undertake HMR in the public health system. The ethics policy also specifies that SA Health's HRECs are responsible for monitoring approved HMR projects throughout their duration.

The state's public health system currently includes five separate HRECs, including the DHW HREC, which evaluates research proposals from SA Health staff and assesses applications from external researchers for access to SA Health data.

The ethics approval process, including its interaction with governance approval, is marked by a high degree of administrative, policy and statutory complexity. As a result, the Commission sets out the steps involved in both processes through a simplified process map in Figure 5.1. Figure 5.2 illustrates the most significant 'pressure points' that adversely affect both the ethics and governance approval processes.

Figure 5.1: HREC and SSA processes

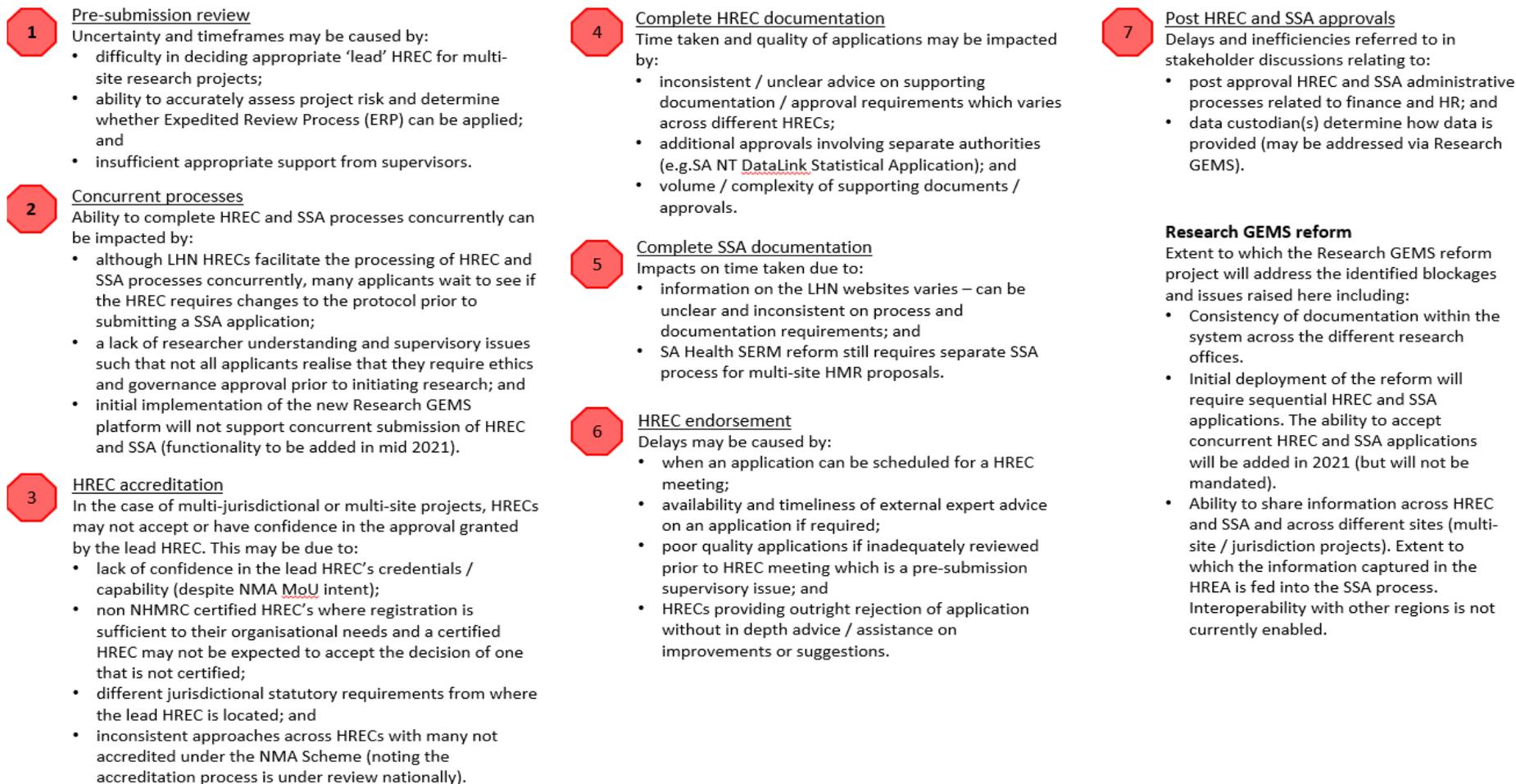


**HREC:** Concerned with ethics and scientific merit.

**SSA:** concerned with site capacity to undertake research project. SSA required for each site involved in research project.

Source: South Australian Productivity Commission

Figure 5.2: HREC and SSA process pressure points



**HREC:** Concerned with ethics and scientific merit.  
**SSA:** concerned with site capacity to undertake research project. SSA required for each site involved in research project.

## HREC processes

The ethics review and approval process in SA has undergone a number of reforms over the last decade or so, both at the national and state levels. SA Health introduced a 'single ethical review model' (SERM) at the state level in 2011 to enhance the efficiency of the approval process within SA. SERM was intended to avoid the unnecessary duplication of approval processes within SA public health institutions by allowing a single local HREC to approve research projects that are to be undertaken at multiple sites in the public health system.

All SA Health sites participating in the research are required to accept the approval granted by the 'lead' HREC under SERM. That said, SERM only applies to the ethics review and approval process. Any research project granted ethics approval under SERM still requires a separate site-specific assessment (SSA), which must be undertaken at every site involved in the proposed research (regardless of whether the research takes place at multiple sites within SA or whether the project includes interstate research sites).

At the national level, the expansion of the National Mutual Acceptance (NMA) framework in 2015 to include all HMR projects, rather than confining the framework to clinical trials, has lessened the significance of SERM as a mechanism to streamline the approval process. The Commission understands that the expansion of the NMA's scope means that a research project approved by a full HREC committee in a participating jurisdiction will receive approval at other research sites, both in SA and in other jurisdictions.

As CALHN's research office observed in correspondence, this has had the effect of limiting the utility of SERM to low and negligible risk research projects, which can be approved without the need for a review by a HREC's full committee. That said, the effective 'triaging' of research projects remains an important aspect of an efficient approval process, and SERM likely assists in expediting the approval of proposals that do not require review by a full HREC committee (and are therefore excluded from approval under the NMA, which is predicated on full committee consideration). The Commission also notes that DHW has recently updated its HMR research policy to include Bellberry, the major private provider of ethics review in SA, under the SERM initiative. This will likely contribute to streamlining the ethics approval process for a range of research proposals including clinical trials.

The Commission notes, that the introduction of the SERM and NMA initiatives has not fully addressed some stakeholders' concerns about the efficiency and effectiveness of the current ethics and governance approval frameworks, both of which contain a number of duplicative steps (see Figure 5.1). The lack of a centralised SA Health HREC that could consolidate the functions of the HRECs currently providing ethics approvals in SA Health has been identified by some stakeholders as an obstacle to greater efficiency within the system. The University of Adelaide's School of Public Health argued that enhancing the efficiency of the ethics approval process is likely to require additional consolidation:

*concatenating the local health network HRECs into one centralized Department of Health and Wellbeing (DHW) HREC for SA would be ideal and would eliminate redundant processes and variability between local HRECs. (University of Adelaide, School of Public Health, DR32, p. 2)*

The CRGSC also largely concurred with the view that the current system of research ethics review, which consists of four separately constituted HRECs, is a potential barrier to streamlining and enhancing the efficiency of the current review and approval process:

*There is potential to simplify current HREC approval processes in South Australia through the standardised coordination of all HREC requests rather than the current process of four separately constituted HRECs all functioning independently of each other and all with their own*

*Research Office processes and support. Such a revised structure could achieve...a simplified submission process for researchers through a 'single point of entry'. (Correspondence from SA Clinical Research Governance Committee)*

The Commission heard from DHW that the department has recently begun a process of consolidating the administrative resources supporting HRECs in SA Health. This initiative will not include administrative support services in WCHN, largely because of the specialist paediatric HMR proposals considered by the WCHN's HREC. Administrative consolidation of research offices into DHW creates potential to lift the efficiency and quality of support for HRECs. As the department observed in correspondence:

*I note the recommendation within the draft report on the 'consolidation of the Human Research Ethics Committees (HREC)'. This is already a priority within SA Health with significant work under way. Consolidating the HREC's administration resources under the DHW (with the exception of the Women's and Children's Health Network HREC) would reduce the administration offices from four to two. To further support this streamlining, the DHW would commit to the provision of ongoing system administrators for both the South Australian Clinical Trials Portal and the Research Management System. (Correspondence from DHW)*

The Commission considers that any reforms to the way that HRECs are supported within SA Health will require reforms to the way that research offices are currently funded. The Commission understands that the metropolitan LHNs' research offices (CALHN, WCHN, SALHN and NALHN) currently employ a total of approximately 18 FTEs, with SALHN the only LHN to fund research services entirely out of its operating budget. Both CALHN's and WCHN's research offices derive the bulk of their funding from fees levied on external institutions seeking ethics approval, mostly for clinical trials, along with grants from charitable bodies like the Health Charitable Services Gifts Board and the Hospital Research Foundation.

The Commission considers that there is a need for research offices in the SA Health system to be funded out of the operating budgets of the LHNs or DHW, as appropriate. Operational efficiencies from centralising administrative services could help to ensure that HRECs are supported by research offices with a stable funding stream. That said, the Commission considers that the specialist HRECs, such as the Aboriginal Health and Research Ethics Committee, have an important and ongoing role to play in the HMR ethics approval process. Any consolidation of the existing approval process would need to ensure that specialist input is retained. Reforms can be more usefully focused on achieving efficiencies in the approval process itself.

The Commission notes that Flinders University has expressed reservations about the capacity of structural reforms, including the consolidation of HRECs, to improve the efficiency and effectiveness of the approval process:

*We do not believe that a consolidated HREC and single point of entry, even alongside the SA Health Single Ethical Review Model (SERM) will achieve the outcome of reduced duplication to enable rapid commencement of multi-site trials within the State. Confounding factors such as the National Mutual Acceptance (NMA) and Site Specific Assessment (SSA) will otherwise dilute anticipated efficiency gains and may significantly reduce improvement in net performance related to clinical trials. We maintain that streamlining bureaucratic processes including the SSA will be required to see this benefit. (Flinders University, FR9, p.7)*

The Commission considers that streamlining the current ethics and governance approval processes would be strengthened by expanding, where appropriate, a joint application process for ethics and governance approval. CALHN's research office has recently introduced a joint ethics and governance approval form for low to negligible risk research projects, which

largely removes the need for researchers to complete an SSA application form that largely duplicates the ethics application form. CALHN's Research Office maintains that this:

*...new process and form removes the requirement to complete the extremely duplicative SSA form, and to simply attach supporting ethics and governance documentation (such as a head of department approval email, or a budget, or a quote from a service provider) with their initial submission. CALHN Research Services staff then conduct a review of the governance components of a research project and request any changes/further information about governance issues from researchers before an application proceeds to review by the HREC (Correspondence from CALHN Office of Research).*

The Commission considers that there is scope to expand the joint application initiative further to include projects that require review by a full HREC committee. This would ensure that researchers could receive an 'in principle' approval from an institution as a whole, and could help to eliminate administrative 'bottlenecks' associated with separating the ethics and governance approval processes. Temporarily expanding the resources to do HREC assessments to clear backlogs and more frequent meetings, are two further options to accelerate the approval process.

The Commission notes that a parallel SSA and HREC assessment process will be assisted by the second stage implementation of the new research Governance and Ethics Management System (GEMS) software solution, which is expected to become operational in December 2020. GEMS is designed to create a single point of entry for researchers' submissions, which will likely enhance accountability and improve decision timeframes.

The need to streamline the current ethics approval process, especially through the introduction of process reforms that seek to reduce complexity and duplication, should be balanced by a 'holistic' focus on the quality and effectiveness of the research proposals that are submitted for review by a HREC. There would be significant benefit from a perspective that is grounded in the concept of 'total quality management', whereby effectiveness and efficiency are enhanced by addressing every major input into a process. The Commission understands that, at present, a significant number of proposals, especially from junior researchers, are adversely affected by analytical and administrative shortcomings. As the CRGSC observes, there is a need:

*...to provide focused effort on recognising and establishing appropriate supervision for researchers. This particularly applies to first time researchers. It has been estimated by SALHN that approximately 70% of all research projects submitted for ethics approval were for first time researchers. Approximately half of these projects were identified as incomplete and unable to be approved due to insufficient detail or required further consideration of the proposed methodology. (Correspondence from CRGSC)*

The Commission considers that the current processes for ethics and governance approval could be improved through the establishment of systems and processes that proactively address the overall quality of proposals being submitted to HRECs. These reforms could be managed by research offices within SA Health, on behalf of the HRECs, and would address research competence within SA Health and in other institutions that form part of the state's HMR architecture, including the public universities. Such reforms would require, as a starting point, the development of revised job descriptions or employment plans that emphasise the key role that research supervisors and discipline leaders have in developing the research competence of staff (discussed in chapter 6). This ought to be complemented by the development, within DHW, of an evaluation framework to allow HRECs to provide researchers with feedback on research proposals, particularly those from which approval is withheld, to

strengthen the quality of proposals and enhance the efficiency of the review process. These amendments to the current process would be assisted by setting explicit timeframes for the approval of applications, along with a standard of one resubmission per application, with HRECs to report against these measures.

### Recommendation 5.1

To increase South Australia's share of Australian Government health and medical research funding through improved quality and competitiveness of South Australian research proposals, the Commission recommends that the Department for Health and Wellbeing (DHW), working in conjunction with the local health networks (LHNs), streamline and simplify the current ethics approval process within SA Health, including by:

1. establishing ongoing operating budgets for LHN research offices that are sufficient to ensure that their services to researchers and research committees do not depend on short-term or unstable funding sources, such as fees levied on external research proponents;
2. ensuring any fees charged to applicants for research ethics approval are competitive with other Australian jurisdictions;
3. developing an evaluation framework to enable Health Research Ethics Committees (HRECs) to provide researchers, both within SA Health and in other institutions, with feedback on research proposals submitted for ethics approval, as a way of strengthening the quality of proposals and enhancing the efficiency and time taken for the ethics approval process as a whole;
4. further simplifying, streamlining and connecting the current ethics approval and site specific approval processes, including by proportionate processes having regard to risk and complexity, to create a 'single point of entry' for researchers, and using the new Governance and ethics management system to facilitate process reforms;
5. setting explicit target timeframes for approval of applications and a standard of one resubmission, and reporting performance against those targets;
6. providing a simple map of the streamlined process and advice to researchers on the application process requirements, including the data requirements for complete applications to enable efficient process without rework; and
7. providing temporary staffing to clear any approval backlogs.

## 5.3 Data access regulation

The large volume of data held by the Australian Government and its state and territory counterparts is an underutilised and valuable national resource.<sup>1</sup> This includes HMR.

A streamlined access to data is cited as a key enabling factor for high-quality HMR. Many stakeholders have argued that access to data in South Australia is problematic, especially for

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<sup>1</sup> See, for example, the Australian Government's Public Data Policy Statement, <[https://www.pmc.gov.au/sites/default/files/publications/aust\\_govt\\_public\\_data\\_policy\\_statement\\_1.pdf](https://www.pmc.gov.au/sites/default/files/publications/aust_govt_public_data_policy_statement_1.pdf)>

data administered by the DHW. CALHN's Executive Research Committee exemplifies these repeated concerns:

*Central to effective translational research is the availability of clinical data. Access to this data must be undertaken with ethical and privacy considerations. However, impediments to data access is extremely disruptive to translational research, as exemplified by recent cases of industry-sponsored and investigator-initiated clinical trials in CALHN being abandoned owing to SA Health's interpretation of the secondary use of clinical data for patient recruitment. (Correspondence from CALHN Executive Research Committee)*

South Australia is almost alone among state and territory jurisdictions in lacking legislation that specifically regulates privacy protection. For example, NSW's *Health Records and Information Privacy Act 2002* (NSW) governs the collection and use of data in the state's public and private health systems.<sup>2</sup> SA NT DataLink argues the lack of state privacy legislation has adversely affected how data custodians respond to requests for data access:

*The lack of privacy legislation has been a barrier to both data custodians and consumers having the confidence to make their data available to SA NT Datalink and to researchers. While there is governance from an ethics perspective, there is no legislative mechanism that provides transparency in the use of data and that, particularly consumers feel, protects their rights or provides significant sanctions should data be misused. (SA NT DataLink, DR24, p.5)*

In South Australia, researchers' access to data is governed by a complex regulatory framework. This includes the *Health Care Act 2008* (Health Care Act), the *Mental Health Act 2009* (Mental Health Act), the *Public Sector (Data Sharing) Act 2016* (Data Sharing Act), and the *Information Privacy Principles* (IPPs). SA Health has also developed its own privacy policy, the *Privacy Policy Directive*, which provides guidance on the legislative and administrative requirements that apply to the collection, storage, use and disclosure of HMR data. It is based on the requirements laid out in the IPPs.<sup>3</sup>

The IPPs are effectively a Cabinet directive, making adherence mandatory for all public sector agencies. The IPPs are outlined in *Premier and Cabinet Circular 12* (PC 12), which also establishes the South Australian Privacy Committee (the Privacy Committee) and specifies its membership, functions and powers. The Privacy Committee, among other roles, advises the Minister on the desirability of legislation or additional administrative action and authorises exemptions from the IPPs on the basis of 'such conditions as the Committee thinks fit'.<sup>4</sup>

Despite their importance for the management of data access in the public sector, the IPPs create a purely administrative framework regulating public sector agencies. Their provisions are not legally enforceable. The only legally binding requirements that apply to public sector data arise from the interplay of a variety of statutes, almost all of which are at the state level.

The only legislation not enacted in South Australia that directly affects researchers' access to data is the Commonwealth *Privacy Act 1988* (Privacy Act). The Privacy Act generally applies to Australian Government agencies and broad sections of the private

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<sup>2</sup> For details of the NSW legislation, see <<https://www.legislation.nsw.gov.au/#/view/act/2002/71/full>>. The only other jurisdiction to lack specific privacy legislation is Western Australia, although the Western Australian government has commenced consultation on privacy legislation that would regulate the way in which public sector agencies collect, store and disclose information.

<sup>3</sup> See SA Health, *Privacy Policy Directive* (2019).

<sup>4</sup> Department of the Premier and Cabinet (SA), PC 012 – Information Privacy Principles Instruction (2017), 3.

sector, but can apply, under specified circumstances, to state and territory agencies, authorities and crown instrumentalities.

The Commission notes that DHW is alone among state and territory health authorities in being a prescribed organisation for the purposes of the Privacy Act. Its inclusion under the *Privacy Regulations 2013* is heavily circumscribed and limited to technical data linkage work undertaken by SA NT DataLink and DHW. The Commission understands that the decision to prescribe DHW pursuant to the Privacy Act does not create any additional legal obligations for the department or the LHNs.

This means that the regulatory framework governing the collection, use and disclosure of public sector data in South Australia is largely within the direct control of the state. The two most significant state statutes directly regulating HMR data access are the Health Care Act and the Mental Health Act. They make unlawful the disclosure of information collected about a person (known as the primary purpose) without their consent for any secondary purpose, except for a limited number of exemptions.<sup>5</sup>

The distinction between primary and secondary purposes, which is mirrored in the IPPs, creates a 'default' position that prohibits the use and disclosure of data for any purpose that is separate from the primary purpose (such as collecting patient information to facilitate the provision of health care) or not directly related to the primary purpose.<sup>6</sup>

The Commission concludes that the South Australian legislation creates a strong presumption against the release of data. This is consistent with other jurisdictions, including the Australian Government, and reflects an underlying intention to privilege privacy protection over the requirements of research (albeit with clearly defined exemptions).

In practice, researchers' access to identifiable patient data is curtailed unless they receive patients' consent or the research project has been approved by 'an ethics committee [HREC] and there is no reason to believe that the disclosure would be contrary to the person's best interests'.<sup>7</sup>

As part of the ethics approval process, a properly constituted HREC, under s 93(f) of the Health Care Act, can approve access to data in the absence of the consent of the individuals to whom that data relates. The waiver of consent must be in accordance with the requirements laid out in the National Statement on Ethical Conduct in Human Research. That said, a HREC's approval to access data only applies to researchers' right to receive personal information held by SA Health, but does not provide authorisation to access the systems or databases in which that information is stored.

In addition to ethics approval, researchers seeking access to data stored on SA Health's systems or databases require approval from the relevant data custodians. This approval is provided as part of the site-specific assessment. As SA Health's *Research Governance Policy Directive* makes clear, 'access to and use of SA Health information for the research must be approved by the data custodian(s) of the information or data'.<sup>8</sup> The Commission considers that

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<sup>5</sup> These exemptions are contained in section 8 of the IPPs, covering 8(a) – 8(g)(i-ii).

<sup>6</sup> This is also true of the Privacy Act, which only allows for the limited disclosure of identifiable patient data for a secondary purpose, such as HMR. The circumstances in which information can be legally disclosed – referred to as a 'permitted health situation' under the Act – are severely circumscribed and require organisations to follow the steps outlined in the guidelines to s 95a of the Privacy Act. Under the guidelines, the approval of a properly constituted HREC is necessary in cases where consent cannot be obtained and identifiable data is required for research.

<sup>7</sup> Health Care Act 2008, s 93(f)

<sup>8</sup> SA Health, Research Governance Policy Directive (2020) 13.

this requirement creates an additional layer of complexity within the regulatory framework governing researchers' access to HMR data.

CALHN's Research Services Office (RSO) argues that the multiple layers of approval required for researchers to access publicly held HMR data adversely affects HMR in South Australia, especially in selecting an appropriate patient cohort for clinical trials:

*The practical application of these provisions means that unless approved by an appropriate HREC, where researchers are not part of the team directly caring for a patient or are acting on behalf of someone not directly caring for a patient, there is no authority for those researchers to access that patient's medical record without appropriate consent. This includes both for the purposes of conducting a HMR project, and also for determining eligibility to recruit a patient to a HMR project. (Correspondence from CALHN Research Services Office)*

The RSO considers that these requirements can negatively affect potential HMR projects at the earliest stages of their development. The University of Adelaide's Clinical Academics agreed:

*...All researchers not directly involved in a patient's care, were precluded from reviewing patient records for clinical trial recruitment. These policies had [a] devastating impact on clinical research productivity and the bureaucratic processes established are a further cost burden. (Correspondence received from the University of Adelaide Clinical Academics)*

Data sharing is further regulated in South Australia by the recently enacted Data Sharing Act, which provides a statutory foundation for sharing and linking data held by South Australian public sector agencies. It is administered by the Office of Data Analytics in DPC. The Data Sharing Act creates an effective legal mechanism by which diverse data held by public sector agencies can be used for policy development and evaluation. That said, SA NT DataLink observes that the utility of the Data Sharing Act for HMR has been low:

*The ODA operations and priorities are clearly in the government operational business arena and not that of health and medical research. It could be difficult for the ODA to directly undertake such research under the Act, since there is no clear remit for itself to undertake health and medical data linkage research and no specific requirement for ethics approval for the work it undertakes (approvals are guided by a set of principles – the Five Safes). The ODA can and has worked with researchers who themselves undertake ethically approved research. (SA NT DataLink, DR24, p. 5)*

In addition, significant HMR datasets held by public sector agencies are prescribed under the *Public Sector (Data Sharing) Regulations 2017* and cannot be shared except in limited circumstances. Any agreements to utilise these datasets require the specific approval of the Minister for Health, thereby introducing an additional regulatory requirement into the data sharing process.

The Commission notes that a range of stakeholders, including specialist data linkage agencies like SA-NT Datalink, support the development of privacy legislation as a statutory mechanism to streamline and enhance SA's regulatory environment. In its submission in response to the Commission's draft report, SA NT DataLink observed:

*SA NT DataLink strongly supports this [draft] recommendation [the introduction of privacy legislation] for the reasons outlined in the draft report. It has a strong interest in supporting the proposed legislation and considers itself to be a key stakeholder who should be consulted in the construction of a draft Bill. Sound privacy legislation should provide strong support for the use of personal information in health and medical research as well as providing the assurances needed*

*by the public about its ethical use, protection for their privacy and public accountability in its use. (SA NT DataLink, FR14, p.2)*

CALHN's Executive Research Committee observes that privacy legislation, as a way of clarifying the current statutory environment, will likely produce a number of benefits for HMR in the state. The committee maintains that a consolidated legislative framework would ensure that the relevant legal obligations are clearly understood by all affected stakeholders:

*The Committee endorses [Draft] Recommendations 7.1, 7.2 & 7.3, with emphasis on the importance of Recommendation 7.2 [introducing privacy legislation] since the absence of this legislation has significantly impacted on clinical studies. In particular, SA Health data policies are often released without prior consultation with clinical researchers, resulting in an abrupt disruptive impact on clinical research. When this occurs with industry-sponsored clinical trials, there is a reduction in patient recruitment resulting in (a) less patients having the treatment available, (b) reduced research income to fund the clinical trial co-ordinators, with some redundancies required, and (c) and further detriment to South Australia's reputation to productively conduct clinical trials. (Correspondence from CALHN Executive Research Committee)*

Support for the Commission's draft recommendation on the introduction of privacy legislation also came from the state's public universities, with Flinders University arguing that a streamlined statutory framework is a precondition for the effective use of data in HMR:

*Flinders University is extremely supportive of [Draft] recommendation 7.2 and 7.3, and adoption of a legislative instrument to provide certainty and clarity in relation to data access and privacy protection. As outlined in our response to the corresponding information requests, only with clear data policy, governance, and infrastructure will privacy and security concerns be addressed to allow effective HMR involving data. Flinders University encourages policies that enable data access and analytical activities to be undertaken by organisations outside of DHW and SA Health. This will benefit the public who may see a new and diverse research approach from a variety of sources including university and industry and may result in highly innovative and entrepreneurial solutions. (Flinders University, FR9, p.7)*

CALHN is equally supportive of the need to streamline the current regulatory environment, arguing that greater legislative and policy clarity is needed to ensure that data access provisions support clinical research:

*Access to SA Health data by researchers has been a long standing and significant impediment to South Australia's competitiveness in HMR. There is an urgent requirement for the SA Government and SA Health to develop policies to address this matter - the absence of legislation and policies has, and will continue to, negatively impact clinical studies. These policies must be workable, transparent, rapid and at all times, protect the privacy and interests of participants. Notably, SA Health data policies in relation to data access have impeded recruitment to industry-sponsored clinical trials, limiting patient access to cutting edge therapy and has led to a loss of critical research income. Furthermore, SA Government should provide a legislative and policy framework that will allow effective population-based data linkage (i.e. socio-economic, employment, education, criminal justice, etc.) with health systems data to provide a deeper understanding of the role and impact of social determinants to health. (Correspondence from CALHN)*

State Records of South Australia (State Records), which has responsibility for the administration of the IPPs and supports the SA Privacy Committee, has expressed strong support for the introduction of statutory privacy protections. The Commission notes that stakeholders' desire to improve data access (while maintaining robust privacy protections) might also be achieved by other statutory means, such as targeted reforms to the Health Care Act and associated statutes. However, State Records argues that any reforms to the privacy framework need to proceed on the basis of a consolidated information privacy statute, rather

than piecemeal amendments to the acts that currently regulate access to personal health information. State Records argues that it is:

*not in favour of injecting privacy considerations into multiple pieces of legislation. While considerations around sensitivity and purpose of information are relevant in individual Acts, the maintenance and oversight of a distributed form of legislation for this issue would be very difficult to manage. It is important that agencies are working with a single, transparent and consistent set of rules that apply across all sectors. We are often approached by individuals (and agencies) trying to find that single piece of legislation that is relevant to their privacy concern or situation. They expect that SA has Privacy Legislation in place, not that it is covered by administrative instruction and multiple disjointed regulatory regimes. For the public, learning that there is no one source for them to reference raises concern about the lack of transparency and accountability in the government's management of their personal information.*  
(Correspondence from State Records of South Australia)

The Commission notes that stakeholders as a whole strongly support reforming the current statutory and policy environment regulating researchers' access to HMR data. Stakeholders are particularly supportive of privacy legislation as a mechanism with which to simplify and consolidate the legal obligations that currently affect researchers' ability to access data.

The Commission concludes that the statutory and policy environment regulating agencies' collection, storage, use and disclosure of data for HMR is complex and inefficient. Multiple acts, including the Health Care Act, the Mental Health Act and the Data Sharing Act, shape the legal obligations that agencies, HRECs and data custodians must observe when deciding to make data available for HMR research. This landscape is also complicated by the fact that South Australia's state privacy framework is based on an administrative instruction that cannot be legally enforced.

In addition, the Commission considers that the legislative landscape governing access to public sector data is unnecessarily complex and is further complicated by the way that it intersects with the HMR ethics and governance approval processes. The governance approval process, which includes the requirement that data access requests are approved by the relevant data custodians, introduces further statutory and administrative complexity into an already cluttered regulatory environment. Streamlining the current legislative framework through the introduction of information privacy legislation has the potential to minimise duplicative processes and enhance data access and protection.

The Commission also notes that the absence of a statutory privacy protection regime in South Australia created legal obstacles to SA NT DataLink being accredited as a Commonwealth Data Integrating Authority. The demand for, and the scope of, data integration between the Australian Government and the states and territories is likely to increase over time. Future opportunities could be adversely affected by South Australia's lack of privacy legislation. There is material risk, as inter-jurisdictional data linkage becomes more widespread, that Australian jurisdictions with statutory privacy regimes might refuse to include SA in data linkage initiatives because the state lacks a statutory mechanism to investigate and remedy potentially unlawful data disclosure.

The Commission notes that the Data Sharing Act has both simplified and enhanced the capacity of agencies, along with a limited number of non-government partners, to share public sector data for a range of purposes, including policy analysis and evaluation. The benefits of this legislation are considerable, including in different areas of HMR, such as population health research within government. That said, the Commission considers that the provisions in the Data Sharing Act are insufficient to provide the combination of regulatory clarity and

effective access required by HMR researchers and administrators. This is not an inherent fault of the legislation, which was designed to facilitate the sharing of data within government as a way of strengthening evidence-based policy evaluation and development.

SA NT DataLink, for instance, has questioned the adequacy of the Data Sharing Act as a mechanism to facilitate HMR:

*The SA Public Sector (Data Sharing) Act 2016 (the DS Act) enables the sharing of personally identifying information and associated clinical and/or service information between Government agencies. Under the Act, data sharing is only subject to the approval of the respective Chief Executives of the agencies and on condition that data is shared in manner consistent with the DS Act's 'Trusted Access Principle'...The limited legislation and reliance on Principles are not regarded as robust mechanisms for supporting access to data or privacy protection and accountability. For this, and to be consistent with all other jurisdictions, there is a need for a statewide legislative framework and a body independent of Government acting to support access to personal and sensitive information as well as protect privacy and ensure transparency and accountability in its use inside or outside of government. (SA NT DataLink, FR14, p.3)*

The Commission considers a broader statutory mechanism is needed to support effective access to HMR data. Information privacy legislation would increase the transparency with which personal information, including HMR data, is regulated in the SA public sector. The introduction of a statutory framework to manage data access would consolidate a range of statutes and policy directives, including the current IPPs, and would ensure that there is a single point of accountability and oversight in the state. This function could be exercised by a dedicated Privacy Commissioner or responsibility could be transferred to the Ombudsman.<sup>9</sup> The Commission considers that legislative consolidation is the most effective way to reform the currently diffused and inefficient statutory and policy landscape and create a unified and transparent set of legal rules that apply throughout the public sector.

Privacy legislation that complements the Data Sharing Act, simplifies the current regulatory environment and streamlines approvals would give certainty to researchers, data custodians, public sector agencies and individuals. The Commission notes that suitable legislative models for a statutory privacy framework already exist in Victoria and NSW, while proposed privacy legislation in WA could provide another suitable model for an equivalent statutory framework in SA.

## Recommendation 5.2

To position South Australia to benefit fully from inter-jurisdictional data linkage opportunities and enhance researchers' access to public sector data, whilst ensuring robust privacy protections are guaranteed in statute, the Commission recommends that the South Australian Government develop and enact information privacy legislation that:

1. complements the *Public Sector (Data Sharing) Act 2016*;
2. streamlines and clarifies the current regulatory environment as it relates to the collection, storage, use and disclosure of HMR data, in order to enhance researchers' access to public sector data; and
3. ensures that robust privacy protections are consolidated in statute.

<sup>9</sup> The Commission notes that transferring oversight of a state privacy act to the Ombudsman would require additional resourcing and consequential amendments to the *Ombudsman Act 1972*.

## 5.4 Patient-related data

A lack of access to patient records was highlighted in a number of submissions as a major factor limiting HMR. The Basil Hetzel Institute stated the:

*electronic health record system (Sunrise Medical Records system) rolled out in the Central Adelaide Local Health Network/SA Health, is a rich source of clinical data that could be used by South Australia researchers to achieve outcomes ... that influence patient care, health service delivery and government policy. The records, however, remain a largely untapped resource. Whilst it is hard for SA Health researchers to tap into this resource, it is even harder for non-SA Health employed researchers, such as those employed by the universities and located at the BHI. (Basil Hetzel Institute, DR8, pp. 6–7)*

The Commission was advised that the SA Health electronic patient medical record (EMR) is the most comprehensive record system in Australia, but that it does not support HMR in a meaningful way. The EMR is unable to record patients involved in clinical trials or research projects; data about any HMR projects; or patients' consent to participate in research.

Responding to the draft report, DHW has advised that DHW Legal and Governance Unit has been working with the Sunrise project team to develop an effective process for non-SA Health researchers to access the patient records of individuals recruited into trials. Pre-consent processes are being piloted in the Sunrise and OACIS systems to enable efficient identification and recruitment of patients into clinical trials.<sup>10</sup>

HTSA has advised that all LHNs have agreed to the implementation of 'pre-consent' for adult patients except WCHN where 'pre-consent' would not apply to paediatric patients, their parents or guardians. CALHN, SALHN, Digital Health SA and the CEIH are testing various models including research affiliates; research credentialing and the use of a researcher passport to allow non-SA Health researchers to access the patient records.<sup>11</sup> The Commission recognises that an agreed non-duplicative solution needs to be identified, prioritised and implemented as a matter of priority.

SA NT DataLink states some data custodians, for a mix of legal, commercial, attitudinal and resource reasons, are reluctant to make their data available for research projects through the SA NT DataLink privacy-protecting linkage system. The lack of private sector health data available for linkage, including general practice and private hospital data including private emergency department presentations, day surgery, pathology, medical imaging, allied health care and specialist services, is a noteworthy gap, effectively making approximately one third of health data unavailable in South Australia.<sup>12</sup>

*While there is governance from an ethics perspective, there is no legislative mechanism that provides transparency in the use of data and that, particularly consumers feel, protects their rights or provides significant sanctions should data be misused. (SA NT DataLink, DR24, p.5)*

In 2014, the Health Performance Council (HPC) recommended that private hospital data be made available to the SA NT DataLink in a form that would allow monitoring of all-of-South-Australia population health outcomes.<sup>13</sup> The HPC 2018 report notes that this had still not occurred and went on to recommend priority should be given to: 'the availability and use of data and robust analysis and transparent reporting on health outcomes, including patient-

<sup>10</sup> Correspondence from Chief Executive, DHW.

<sup>11</sup> Correspondence from SA Clinical Research Governance Steering Committee, p.11-13.

<sup>12</sup> SA NT DataLink, (FR14, p.3).

<sup>13</sup> Health Performance Council, *What's Working, What's Not* (2014) 8.

reported outcomes that arise from services in public and private sectors, to inform clinical improvement and policy-making'.<sup>14</sup> The HPC advised the Commission that:

*Access to comprehensive, timely data that can be linked and shared is an important factor affecting South Australia's capacity to secure funding; and identify opportunities to improve South Australia's capability to attract investment in health and medical research. South Australia cannot compete for health and medical research funding without integrated all-of-population data infrastructure that is shared widely and used widely to see the whole.*  
(Correspondence from HPC)

The Birch Review recommended prompt action toward necessary legislative changes to support access to private sector health data.<sup>15</sup> On 10 February 2020, the South Australian Government announced its intention to develop legislative amendments to allow the collection of data from private health care providers.<sup>16</sup>

The Commission concludes that HMR in SA would be enhanced by removing barriers to access to patient-related data for approved HMR. This task needs to address the competing considerations of research and patient privacy and also provide an efficient incremental improvement to the current system. Correspondence received from the LHNs, SAHMRI and DHW advises that progress is being made by DHW and the LHN's towards patient pre-consent and non-SAH researcher access to patient data sets for clinical trials.

The Commission notes that the use of private healthcare data is currently enabled in NSW and Victoria, giving access to larger linked datasets than in South Australia. There has been no apparent progress toward planned legislation in South Australia since the announcement in February. The Commission understands that a secure portal in the Office of Data Analytics is available to DHW, and that the Calvary Group and St Andrews have agreed to submit their data voluntarily.<sup>17</sup> This is an important positive step, yet the Commission understands that pursuing access to the remaining private health data sets may require legislative or regulatory intervention.

Recommendation 5.3 has been strongly supported in all submissions addressing the data chapter.

### **Recommendation 5.3**

To ensure that complete and representative data sets are available and readily accessible for all SA Health and non-government health and medical researchers in South Australia, the Commission recommends that DHW:

1. In the absence of South Australian privacy legislation and to address the need for immediate improvement of access to patient related data, by mid-2021:
  - a) develops and implements a standardised system-wide patient pre-consent process in conjunction with LHNs, to assist in the recruitment of research participants; and

<sup>14</sup> Health Performance Council, *Review of the Performance*, 4.

<sup>15</sup> Birch (n 1).

<sup>16</sup> For more information, see <<https://www.premier.sa.gov.au/news/media-releases/news/delivering-better-patient-services>>.

<sup>17</sup> HTSA, FR 11, 4.

- b) resolves the issue of access to public health system data with LHNs, the university sector and SAHMRI, for those researchers who are not employed directly within SA Health.
2. Enables access to all forms of public health data and patient data by building on-line capability:
  - c) in the electronic medical record (EMR) to facilitate access to patient groups and individual patient records for HMR purposes; and
  - d) to provide access and analytic capability to DHW in the use of administrative and public health data for HMR and quality improvement.
3. Ensures HMR can be undertaken across the whole population by giving effect to the state government commitment to enact the necessary legislative or regulatory changes to allow the collection and use of data from private health care providers by mid-2021.

## 5.5 Conclusion

The Commission concludes that HMR in SA would benefit significantly from a regulatory environment that consolidates, simplifies and streamlines the complex web of statutory, policy and administrative requirements that apply to ethics approval and data access, especially where these processes intersect.

There is a particular need to reform the ethics approval process through a combination of process reforms that reduce duplication and enhance the quality of research proposals that are submitted for review by a HREC. The Commission considers that this can be most effectively achieved through the introduction of systems and process that proactively address the overall quality of proposals being submitted to HRECs. These reforms would address research competence within SA Health and other institutions that form part of the state's HMR architecture. The Commission considers that such reforms to the ethics approval process must be bolstered by setting explicit timeframes for the approval of applications. This should include a standard of one resubmission per application, with HRECs given the task of reporting against these measures.

The regulatory framework unnecessarily restricts researchers' access to identified, or potentially identifiable, patient data. This framework adversely affects various forms of HMR, including clinical trials, by not providing legal authority for researchers to access patient data unless they are part of the team caring for a patient. Other forms of HMR may be affected, such as those that require, or would benefit from, access to identifiable patient data in situations where it is not feasible to seek consent from patients.

A situation now exists where data custodians lack confidence in data protection and fear potential legal issues arising from the use of their data. In the absence of a statutory privacy framework, the Commission considers that it is necessary to proceed with immediate reforms to facilitate a system-wide pre-consent process to allow the recruitment of research participants; resolve restrictions on data access for researchers not employed by SA Health; and enhance EMRs to facilitate researchers' access to patient groups and individual patient records for HMR.

In the longer term, the Commission considers that the complexity and opacity of the framework regulating researchers' access to data in SA can be effectively enhanced by the introduction of information privacy legislation to regulate the way that public sector agencies collect, store, use and disclose data (including HMR-related data). In its absence, a number of individual statutes, including the Health Care Act, the Mental Health Act and the Data Sharing Act, and policy directives, principally the IPPs, regulate the collection, storage, use and disclosure of patient health information. This creates a situation in which there is no single point of accountability, oversight and efficient regulation in the state. Consolidating the many layers of inefficient regulation would greatly simplify data custodians' task of providing timely, efficient and safe access to HMR data.

## 6. Workforce

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### 6.1 Introduction

The terms of reference of the inquiry require the Commission to assess how health and medical research (HMR) in South Australia encourages staff development that promotes high professional standards and supports recruitment and retention (ToR 1b); to identify and assess key factors influencing the level of public sector HMR output and activity in South Australia including talent and capacity to attract new talent (TOR 2a) and the potential for greater connectivity between the local health network (LHN) medical workforce and university recruitment (TOR 2f); and to identify and assess South Australia's competitiveness as it relates to the HMR workforce (TOR 6).

This chapter addresses the workforce elements of the inquiry's terms of reference. It considers the role of clinical academics and researchers and basic and applied science researchers, barriers faced by researchers and strategies to address them. This chapter also addresses issues related to attracting and retaining health and medical researchers in the state, partnerships between SA Health and the broader research workforce and workforce strategies to help strengthen HMR in South Australia.

The available evidence and the Commission's analysis support the broadly held view that the declining number of clinical researchers and academics is a crucial factor in South Australia's failure to increase its share of competitive grant funding. For clinicians, competing demands and lack of protected research time are key barriers to engaging in research. The importance of facilitating the crucial links between clinical and basic science research was also highlighted. One of the main issues facing the general HMR workforce is the lack of job security which is related to how researchers are employed through short-term grant funding. The analysis also found that attracting and retaining researchers in South Australia would benefit from a comprehensive and coordinated effort by all stakeholders including the LHNs, universities and medical research institutes (MRIs).

#### 6.1.1 Defining the HMR workforce

A strong and active research workforce is critical for maintaining and strengthening the HMR sector.<sup>1</sup> The McKeon Review (2013) identified that managing and monitoring the research workforce is a key factor in maintaining research excellence.<sup>2</sup> This issue was also discussed in several submissions<sup>3</sup> to the inquiry, including from the Australian Society for Medical Research (ASMR), which highlighted the gap in workforce data in South Australia:

*Whilst organisations like the ASMR have surveyed the Australian health and medical research workforce, there is no reliable data on the number of health and medical researchers in South Australia, their career stage and their area of expertise. (ASMR, DR7, p.10)*

HMR takes place in a range of organisations spanning diverse disciplines including universities, research institutes, health services, non-government organisations and the

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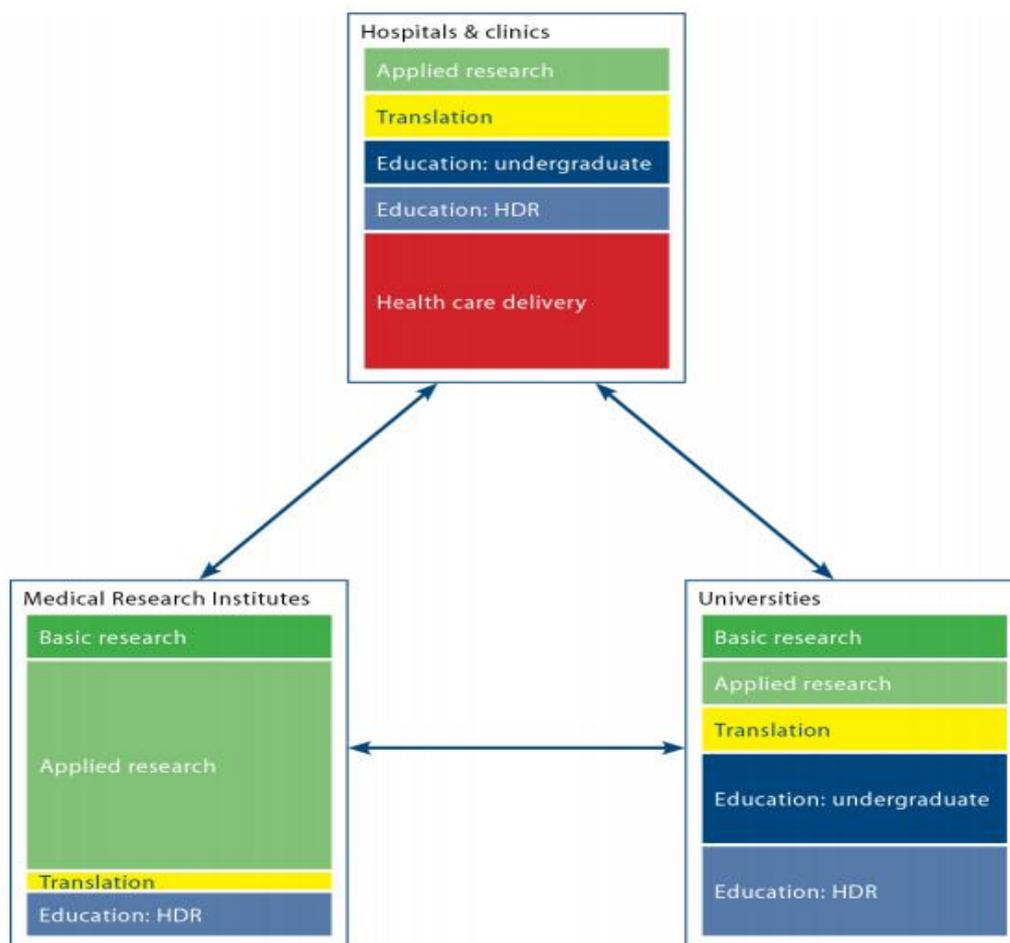
<sup>1</sup> Australian Society for Medical Research, *Australia's health and medical research workforce: Expert people providing exceptional returns* (2016).

<sup>2</sup> S McKeon, E Alexander, H Brodaty et al., *Strategic Review of Health and Medical Research: Better Health Through Research, Final Report* (Commonwealth of Australia, 2013) 129.

<sup>3</sup> Submissions from stakeholders including AAMRI (DR5) and HTSA (DR17) also discuss this issue.

private sector, making it difficult to track and monitor the state’s workforce.<sup>4</sup> Figure 6.1 illustrates where health research, teaching and care take place.

Figure 6.1: Health research, teaching and care – where it happens.



Source: Group of Eight, Go8 Issues paper: Excellence in medical and health professional education, research and health care delivery (2018)<sup>5</sup>

The submission from ASMR noted that ‘the definition of a health and medical researcher is broad, with researchers often spanning diverse disciplines’<sup>6</sup> and that:

*The health and medical research workforce can be divided into those who are trained in science, medicine, nursing or allied healthcare practices, and those in supporting disciplines such as biostatistics and bioinformatics. (ASMR, DR7, p.11)*

The diversity of the HMR workforce was emphasised in information received from the Central Adelaide Local Health Network (CALHN):

*In the context of CALHN, the HMR workforce is comprised of discovery scientists, clinical researchers (medical, nursing, allied health, pharmacy, dentistry and hospital scientists)*

<sup>4</sup> For example, ASMR (DR7) and HTSA (DR17) discuss this aspect in detail.

<sup>5</sup> Available at <[https://go8.edu.au/files/docs/go8-issues-paper-medical\\_2nov09\\_0.pdf](https://go8.edu.au/files/docs/go8-issues-paper-medical_2nov09_0.pdf)>.

<sup>6</sup> ASMR (DR7, p.10).

*and clinical academics (substantive appointments with a university). (Correspondence from CALHN)*

The lack of accurate and up-to-date data on the HMR workforce at the jurisdictional level is a key limitation in understanding its size and dynamics. According to a survey of the HMR workforce, there were 23,411 research staff in Australian universities and medical research institutes in 2009.<sup>7</sup> Another source estimated that there were approximately 32,000 researchers in the higher education, MRI and hospital sector in 2016-17.<sup>8</sup>

There are no comprehensive HMR workforce data for South Australia and the Commission constructed a partial picture of the HMR workforce based on data from different sources which is presented in detail in chapter 4.

The HMR workforce spans a broad range of disciplines including university academics, research scientists, clinicians, nursing, midwifery, allied health, technical and support staff employed in universities, research institutes, hospitals, private sector and other organisations.

Given the paucity of reliable and complete information on the HMR workforce, the ASMR argues for the implementation of an HMR workforce register to help monitor, manage and plan the research workforce in South Australia:

*An online register, managed initially through the Office of the Chief Scientist of South Australia, would provide crucial information about South Australia's Health and Medical Research workforce capacity, and support the development of a research support strategy that capitalises on South Australia's workforce strengths. (ASMR, DR7, p.10)*

The Commission notes that actively monitoring the nature and dynamics of the local HMR workforce would help identify gaps and improve workforce planning and development. This is a key factor in building capacity and enhancing research excellence in the HMR sector on a continuous and strategic basis.<sup>9</sup>

In addition to the general lack of reliable and state-wide data on the workforce, several key issues were raised during the consultation process, including the :

- role of clinical researchers, clinical academics and basic scientists across all fields of HMR;
- importance of attracting and retaining researchers;
- need to improve partnerships between SA Health and the employers of the broader HMR workforce; and
- need to strengthen the skills and capacity of the HMR workforce in South Australia.

## **6.2 Clinical and basic science researchers and academics**

Active research participation by health and medical professionals is a key factor in identifying research questions, conducting research, teaching and implementing translational activities to

<sup>7</sup> Australian Society for Medical Research, *Planning the health and medical research workforce 2010-2019* (2009).

<sup>8</sup> KPMG, *Economic Impact of Medical Research in Australia*, a report prepared for the Association of Australian Medical Research Institutes, (2018) 13 <<https://aamri.org.au/wp-content/uploads/2018/10/Economic-Impact-of-Medical-Research-full-report.pdf>>.

<sup>9</sup> *Ibid*, 33

improve the health system, highlighting the importance of embedding research in the health system.<sup>10</sup>

The Commission notes that the definition of clinical research broadly encompasses “research by all members of the healthcare team acknowledging the contribution of the nursing and allied health professions and conducted in all settings”.<sup>11</sup>

*It is important to acknowledge clinical academics and clinical researchers in their broadest context, beyond the medical model and encompassing nursing and allied health researchers. Furthermore, medical scientists have a significant role to play alongside clinician researchers, particularly related to basic and applied research activities and can often catalyse research activity within a clinical unit. (Flinders University, FR9, p.11)*

*It is vitally important to challenge the implicit assumption that the Productivity Commission and other opinion-leaders have made in assuming that the clinical research we discuss as a priority is only led by medical officers or specialist medical clinicians. It would be a significant lost opportunity to only refer to clinical research as that being done in hospitals by medical doctors and to assume that clinical research careers are for one health discipline only. (Flinders University, Caring Futures Institute, FR10, pp.3-4)*

Moreover, the important role played by basic and applied scientists across the HMR spectrum and the crucial links with clinical outcomes was highlighted in consultations and submissions.<sup>12</sup>

The Commission’s consultations highlighted that clinical academics in practice are not limited to medical specialists, and include medical non-specialists, nursing or allied health professionals.<sup>13</sup> Stakeholders noted that clinical academic appointments in nursing, midwifery and allied health disciplines were problematic even though there were no barriers to such appointments in the enterprise agreements. A key factor in this regard relates to research not being considered the core business of the health system. Stakeholders were also of the view that there was misalignment in roles where service delivery, management and research duties were often combined in joint appointments.<sup>14</sup>

While the Commission has been unable to obtain comprehensive state-wide data on the number of clinical researchers and academics in South Australia, consultations with stakeholders, submissions and information received in the inquiry process indicate a general decline.

*Clinician researchers and clinical academics are an endangered species in SA! The number of clinical academics at Flinders University/Medical Centre has reduced by approximately 50% since I commenced in 2002.... The trend is downwards. (Prof. David Watson, DR15, pp.2-3)*

*Unfortunately, with diminishing hospital funds and the focus away from clinical research in the hospital there has been a decline in clinical academic appointments in recent years. (BHI, DR8, p.3)*

<sup>10</sup> McKeon Review (2013), summary report, p.15; information received from University of Adelaide Clinical Academics, p.1; SAHMRI (DR25, p.36). In addition, a detailed discussion of clinical researchers/academics and their role is provided in the HTSA submission to the Issues paper.

<sup>11</sup> For example, submissions from Caring Futures Institute, (FR10); Flinders University (FR9); The University of South Australia (FR19); University of Adelaide School of Public Health (FR17) and information from the CAHLN Executive Research Committee.

<sup>12</sup> Ibid.

<sup>13</sup> Information from the CAHLN executive research committee.

<sup>14</sup> Consultations with the Australian Nursing and Midwifery Federation, SA Branch.

This view is consistent with the information received from the CALHN executive research committee and from the University of Adelaide Clinical Academics, which noted that the current decline is partly due to clinical academic positions not being replaced due to cost-saving measures by public hospitals.<sup>15</sup>

The Commission also heard that the number of medical scientists employed within the health system has declined over time:

*We have anecdotal evidence that the numbers of clinical academics within the public health system have been declining. Alongside a decline in clinical academics, there has been a substantial progressive decline in numbers of medical scientists employed within our public health system over the past 10 years. (Flinders University, FR9, p.11)*

The continued decline in the clinical research workforce in South Australia was identified as a key issue affecting broader HMR performance by the Robinson Research Institute:

*Loss of clinical research capacity and engagement has been a major element in the decline of Health and Medical Research in South Australia over recent years. In our view, it reflects a culture led by State Government policy and failure to value, promote and support clinician-led research. (Robinson Research Institute, DR21, pp.1-2)*

The Commission was able to compile the following information on the current distribution of clinical researchers and academics in South Australia from stakeholders including the LHNs:<sup>16</sup>

- CALHN: 39 clinical academics with teaching and research roles;<sup>17</sup>
- University of Adelaide: 45 clinical academics spread across LHNs;<sup>18</sup>
- South Australian Health and Medical Research Institute (SAHMRI): 12 clinical researchers and academics;<sup>19</sup>
- Basil Hetzel Institute (BHI): 38 active clinical researchers in the Queen Elizabeth Hospital precinct in 2018-19;<sup>20</sup>
- Women's and Children's Health Network (WCHN): 14 clinical academics working across the network;<sup>21</sup>
- Southern Adelaide Local Health Network (SALHN): 15 clinical academics;<sup>22</sup>
- Northern Adelaide Local Health Network (NALHN): 5 clinical academics.<sup>23</sup>; and
- Flinders University: 21 joint clinical appointments through the College of Medicine and Public Health; 2 additional appointments through the College of Nursing and Health Sciences.<sup>24</sup>

<sup>15</sup> Information received from CALHN Executive Research Committee; University of Adelaide Clinical Academics.

<sup>16</sup> Note that there may be double counting in some numbers reported in the submissions, and the Commission has not been able to verify these figures for accuracy. From this information, it is also not possible to ascertain the nature and extent of their teaching and/or research roles.

<sup>17</sup> Information received from CALHN research services.

<sup>18</sup> Correspondence from the University of Adelaide Clinical Academics

<sup>19</sup> SAHMRI (DR25, p.36).

<sup>20</sup> BHI (DR8 p.13).

<sup>21</sup> Correspondence from WCHN.

<sup>22</sup> HTSA (DR17 p.27).

<sup>23</sup> Ibid p.27.

<sup>24</sup> Flinders University (FR9 p.11).

While these numbers are not comprehensive, they provide a partial snapshot of the current numbers of clinical academics and researchers spread across different institutions in South Australia.

The Commission has not been able to obtain more accurate or current data on the number of clinical researchers in the state. The Commission was informed that existing systems in SA Health do not capture relevant information to be able to identify clinical researchers in an accurate manner.<sup>25</sup> The lack of key workforce data that

The Commission received data on the number of clinical academics (headcount) spread across the LHNs for the financial years 2015-16 to 2020-21. As shown in Table 6.1, the number of clinical academics across the public hospital system declined during this period, supporting the views of stakeholders.

Table 6.1: Number of clinical academics by LHN, 2015-16 to 2020-21(headcount)

Financial year	CALHN	SALHN	NALHN	WCHN	Total SA Health
2015-16	49	20	4	13	86
2016-17	48	20	4	11	83
2017-18	48	16	5	10	79
2018-19	45	16	6	10	77
2019-20	40	16	5	10	71
2020-21	38	14	4	8	64

Source: SA Health. Headcount figures are based on contracts classified as 'Clinical Academic'.

### 6.2.1 Supporting clinical researchers and academics

Stakeholder consultations, submissions and information received in the inquiry process broadly support the Commission’s analysis of the key underlying barriers to clinical research in South Australia’s public hospital system, summarised as follows:

- the current system failing to adequately facilitate, incentivise or support research by the clinical workforce;
- competing demands and lack of protected research time;
- lack of mentoring and research training early in the career; and
- insecurity of tenure, lower remuneration and the lack of dedicated funding and research support from universities and the LHNs.

The key to supporting clinical researchers and academics is recognising the importance of embedding research within the public health system in South Australia. As argued by many stakeholders, this requires a ‘cultural shift’ and concerted effort across the sector.

*Changing the culture at SA Health to value research and give examples of how good clinical research can lead to better outcomes for patients. (University of Adelaide School of Public Health, DR32, p.5)*

*There needs to be a significant ‘cultural shift’ towards better integration between the university and hospital, with recognition of the valuable role both serve in practice improvement and*

<sup>25</sup> Correspondence with SA Health.

*quality care. This has been progressively eroded by economic imperatives, at the detriment of future generations and patient care. (Correspondence from Adelaide University Clinical Academics)*

*Having research conscious and research participative staff requires leadership and value of research. Protected time must be allocated for modelling and leadership at an operational level. Research-ready skills need the support of research-enabling strategy and culture. This is not currently a high priority within SA Health. This time can be imbedded into service level agreements and the better utilisation of the current enterprise agreement will assist in improving the time allocated to clinical staff during working hours. (Correspondence from the SA Allied Health and Scientific Health Office).*

The submission from the Association of Australian Medical Research Institutes (AAMRI) made the point that this is a ‘longer-term goal’ which entails supporting clinical researchers as an initial step:

*While a cultural shift is a longer-term goal, a step in the right direction would be to establish a clinician-researcher fellowship scheme in South Australia. This scheme should incorporate a clear workforce model that prioritises research alongside health service delivery. Such a scheme could catalyse a cultural shift to recognise the value of research in the health system as the driver for improving health and economic outcomes for the population. (AAMRI, DR5, p.13)*

### **Commitment to research in enterprise agreements (EAs)**

There are five separate EAs that cover public sector health and medical professionals in South Australia:

- SA Health Clinical Academics EA 2018<sup>26</sup>;
- SA Health Salaried Medical Officers EA 2017<sup>27</sup>;
- SA Health Visiting Medical Specialists EA 2019<sup>28</sup>;
- Nursing Midwifery SA Public Sector Enterprise Agreement 2020<sup>29</sup>; and
- SA Modern Public Sector EA for Salaried Employees 2017<sup>30</sup> (includes allied health professionals, medical scientists, grant funded scientists and medical physicists).

With respect to the three SA Health EAs, the Commission notes that they do not specifically articulate the role of research. Inclusions in the EAs that do refer to research are:

- a clause each in the first two SA Health EAs indicating that the EA does not limit ‘reasonable academic freedom’ to pursue research (Clinical Academics), and that the department acknowledges research as an integral part of a consultant’s work (Salaried Medical Officers);

<sup>26</sup> <[https://www.treasury.sa.gov.au/\\_data/assets/pdf\\_file/0020/45551/SA-Health-Clinical-Academics-Enterprise-Agreement-2018.pdf](https://www.treasury.sa.gov.au/_data/assets/pdf_file/0020/45551/SA-Health-Clinical-Academics-Enterprise-Agreement-2018.pdf)>, 5.

<sup>27</sup> <[https://www.treasury.sa.gov.au/\\_data/assets/pdf\\_file/0007/37339/20180104-SA-Health-Salaried-Medical-Officers-Enterprise-Agreement-Advice-2017-2.pdf](https://www.treasury.sa.gov.au/_data/assets/pdf_file/0007/37339/20180104-SA-Health-Salaried-Medical-Officers-Enterprise-Agreement-Advice-2017-2.pdf)>.

<sup>28</sup> <[https://www.treasury.sa.gov.au/\\_data/assets/pdf\\_file/0008/94679/SA-Health-Visiting-Medical-Specialists-Enterprise-Agreement-2019-Agreement-Advice.pdf](https://www.treasury.sa.gov.au/_data/assets/pdf_file/0008/94679/SA-Health-Visiting-Medical-Specialists-Enterprise-Agreement-2019-Agreement-Advice.pdf)>.

<sup>29</sup> <[https://www.treasury.sa.gov.au/\\_data/assets/pdf\\_file/0009/240759/Nursing-Midwifery-SA-Public-Sector-Enterprise-Agreement-2020\\_approved.pdf](https://www.treasury.sa.gov.au/_data/assets/pdf_file/0009/240759/Nursing-Midwifery-SA-Public-Sector-Enterprise-Agreement-2020_approved.pdf)>.

<sup>30</sup> <[https://www.treasury.sa.gov.au/\\_data/assets/pdf\\_file/0015/37410/South-Australian-Modern-Public-Sector-Enterprise-Agreement\\_Salaried-2017.pdf](https://www.treasury.sa.gov.au/_data/assets/pdf_file/0015/37410/South-Australian-Modern-Public-Sector-Enterprise-Agreement_Salaried-2017.pdf)>.

- a clause in the SA Health Visiting Medical Specialists EA encouraging a commitment of 15 per cent of hours worked to be directed to research activities (and/or teaching); and
- guidance on role descriptions that may include research activities, with the level of responsibility increasing with role seniority.

It is noted that the Victorian Public Health Sector – Medical Specialist Enterprise Bargaining Agreement 2018-21 provides the basis for an aggregate budget for research of 20 per cent of the total time for relevant employees, which can then be allocated in a way that provides for some researchers (full or part time) in hospitals. The entitlements do not imply that every doctor must agree to allocate 20 per cent of their time to teaching, training and research.

None of the South Australian EAs listed above specifically prohibit the allocation of a specific amount of time for research activities. Such an approach provides sufficient flexibility for an organisation to create a time budget suitable for specific roles and employees.

Inquiry participants proposed several initiatives to address these issues including:

- a supportive workplace culture;
- access to research funding;
- administrative and research management support;
- mentoring and capacity development for early and mid-career researchers; and
- opportunities for collaboration.

The Commission concludes that the current industrial relations framework does not present a barrier to staff engagement in HMR. Rather, it is a matter for management decision requiring appropriate leadership, culture, budget allocations and workforce planning and development.

### 6.3 Attracting and retaining health and medical researchers

Maintaining a critical mass of well-trained and highly skilled workers is crucial for the long-term success of the HMR sector.

Stakeholders agreed that:

*The growth of the HMR workforce will require competitive contractual arrangements for defined periods (5-year contracts, contingent on satisfactory outputs), opportunities for continuing education and leadership roles and provision of adequate resources. This will ensure that we attract and retain the best and brightest clinical research expertise as a key capability in our translational research effort. (Correspondence from CALHN).*

This task is particularly difficult given the absence of comprehensive, reliable information on the size, composition and skill profile of the HMR workforce in South Australia. Attracting and retaining top research talent in South Australia remains a major concern across the sector.<sup>31</sup>

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<sup>31</sup> University of Adelaide School of Public Health (DR32, p.4); University of Adelaide Centre of Research Excellence Translating Nutritional Science to Good Health (DR27, p.2); University of Adelaide Faculty of Health and Medical Sciences (DR28, p.3); information received from the Department for Health and Wellbeing Office for Research

The Commission notes the important role of SA Health in facilitating HMR and supporting researchers. This view was acknowledged by participants including information received from the Department of Health and Wellbeing Office of Research:

*If SA Health does not provide sufficient opportunities to new and emerging researchers and provide a supportive environment which allows them to pursue their research, there will likely be a loss of expertise interstate and overseas. (Correspondence from the Department for Health and Wellbeing, Office for Research)*

A recurring theme in the Commission's consultations and participants' submissions is the apparent absence of a strategic approach to attract and retain health and medical researchers, especially outstanding research leaders, in South Australia.<sup>32</sup>

*SA lacks a state-wide approach—and supporting resources—to attract outstanding health and medical researcher talent, or to grow the population of Aboriginal and Torres Strait Islander researchers. (University of South Australia, DR34, p.1)*

Despite this apparent lack of a coordinated and strategic approach, individual organisations appear to use various measures to attract new talent, including special schemes and investing in infrastructure and relationships.<sup>33</sup>

In this regard, Flinders University provided the following example:

*Flinders University, in partnership with SALHN, are endeavouring to address attraction and retention of research talent in a variety of ways, including through the development of clear entry pathways into PhDs/Masters for clinicians. The pathway of MD/PhD as implemented at Monash, University of Queensland and other universities is a possible model. Flinders University is also offering Practitioner Fellowships to grow and retain early and mid-career clinician-researcher fellows. While these target clinicians from all areas including allied health and primary care, feedback from the LHN indicates that they would be keen to work more closely to ensure alignment with clinical service delivery of successful individuals employed by the LHN (this could also be extended to other clinical providers). Ideally, these could be co-designed as joint full-time appointments that place equal value on education, research and clinical activities of the individual, creating a potential career pathway for clinical academics. (Flinders University, FR9, p.11)*

As noted in some submissions, they have had mixed results and have not been sustainable in the longer term.<sup>34</sup> Some stakeholders described the movement of researchers and research groups within South Australia as a 'zero-sum game'.<sup>35</sup> This view was echoed by the University of Adelaide:

*There is also movement of researchers within SA where individuals and groups are attracted to move from one SA university to another. While this may improve the research environment for those individuals and groups, it does nothing to bring new talent and capacity into the SA HMR workforce. (University of Adelaide, Faculty of Health and Medical Sciences, DR28, p.3)*

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<sup>32</sup> For example, information received from the LHNs (NALHN, CALHN, RAH), and submission from UniSA (DR33, p.1).

<sup>33</sup> Examples provided include, The University of Adelaide 'Investing in Top Talent' scheme (The University of Adelaide (DR29, p.4); Faculty of Health and Medical Sciences, DR28, p3); NAHLN's strategic partnerships with universities (information received from NAHLN); Flinders University Practitioner Fellows scheme (Flinders University, DR14, p.5); SAHMRI (DR25, p.38).

<sup>34</sup> University of Adelaide, Faculty of Health and Medical Sciences (DR28, p.3).

<sup>35</sup> UniSA (DR34, p.1).

The Commission notes that such moves may also reflect the labour market for top talent as well as funding and internal red tape disincentives.

HMR strategic reviews from other jurisdictions emphasise the importance of maintaining a quality workforce by attracting researchers from interstate and internationally. The NSW HMR strategic review (2012) discussed this issue and recommended establishing an elite researcher scheme to attract Australian and international researchers,<sup>36</sup> and both Victoria's HMR strategy 2016-20 and Queensland's advancing health research 2026 strategy include a range of programs with government investment to support and attract researchers across a range of disciplines and levels.<sup>37</sup>

Additional examples provided by stakeholders include:<sup>38</sup>

- VESKI Innovation Fellowships to support individuals in the fields of science and innovative technology. Recipients receive \$50,000 per year for 3 years (matched by their host institution) to undertake their research in Victoria.<sup>39</sup>
- University of Melbourne MACH-track program to increase the number of young clinicians taking up higher research degrees.<sup>40</sup>
- Programs through the Queensland Health Innovation, Investment and Research Office:
  - Queensland advancing clinical research fellowships (\$3.9 million awarded to date);
  - junior doctor research fellowships (\$4.25 million awarded to date);
  - nursing and midwifery research fellowships (\$1.6 million awarded to date);
  - physiotherapy research fellowships (\$1.4 million awarded to date); and
  - health and medical research fellowships (\$40.9 million awarded to date).

The Commission notes that a top-quality clinical research leader conducting internationally competitive HMR is a large investment that is potentially highly productive in terms of research outputs, building research teams and the professional development of researchers. There are limited resources and competing priorities for the health system, hospitals, universities and research institutes. This is a particularly important issue for universities making choices between HMR and non-HMR areas.

As discussed in the submission from the BHI, growing and fostering local talent is important. South Australian universities and hospitals train a considerable number of students who 'represent a substantial investment in the clinical workforce of tomorrow'.<sup>41</sup> The submission from Flinders University also addressed this issue:

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<sup>36</sup> NSW HMR Strategic Review (2012) pp.36-37.

<sup>37</sup> Healthier lives, stronger economy: Victoria's Health and Medical Research Strategy 2016-20, p.17; Queensland – Advancing Health Research 2026, p.10.

<sup>38</sup> SAHMRI, FR15, p44, information received from SAHLN, Flinders University,

<sup>39</sup> <<https://www.veski.org.au/vif?q=vif-criteria>>.

<sup>40</sup> Information received from SALHN.

<sup>41</sup> BHI (FR4, pp.1-2).

*We strongly support the appointment of additional medical scientists to increase the scope of basic and applied research within public hospitals and increased clinical academic positions supported jointly by LHNs and universities. Joint clinician academics should include a balance of medical, nursing and allied health positions. This requires a multifaceted approach, broader than simply 'parachuting' in a handful of nationally recognised clinical academic leaders, including accountability by all stakeholders to 'develop our own', with explicit expectations of equity, and that research is a shared responsibility for all those engaged in healthcare. (Flinders University, FR9, pp3-4)*

The Commission considers attracting and retaining talent, especially key research leadership roles, 'a complex issue that will require a strategic and multi-pronged approach rather than a focus on only one method'.<sup>42</sup> This is a matter to be addressed by all the institutions – the LHNs, universities and medical research institutes – as an integral component of a strategy to rebuild clinical research capability in the state.

## 6.4 Partnerships between SA Health and the broader HMR workforce

The connections and partnerships between the different institutions as well as with SA Health exist at many levels. They range from employment arrangements, training and teaching to collaborative research groups that span the universities, MRIs and the health networks.<sup>43</sup> It is evident from the information and submissions received that these associations are crucial to a well-functioning HMR sector in the state.

*In fact, the structures, frameworks and relationships with universities within which clinicians operate as researchers may be the single most important focus for HMR innovation. Such innovation needs to be centrally coordinated through SA Health and Wellbeing, LHNs and universities – all of whom need to commit to taking research as a serious long-term structural investment. This is key to the success of the HMR ecosystem...21st Century HMR cannot be done without foundational partnerships that embed research into the day-to-day business of health systems. (The University of Adelaide, Faculty of Health and Medical Sciences, DR28, p.4)*

The current nature of these relationships in practice is complex, heterogenous and in some cases fragmented and dysfunctional with adverse impacts on the workforce as evident from the following submissions:<sup>44</sup>

*These connections are critical but are probably dysfunctional. SA Health is interested in clinical service provision. The university is interested in research and teaching. Both compete for time but can work together. Currently, there is poor coordination of clinical academic appointments. A new appointment requires a contribution from both parties, and coordination of the appointment process. This joint appointment process worked well in the 1990's and 2000's but has fallen apart in SA over the last decade, aggravating current workforce issues. (Prof. David Watson, DR15, p.3)*

*Not only are there fewer Clinical Academics but those who are employed are frustrated by the excessive and often conflicting bureaucracy within the University and SA Health, as well as the disconnection between the two institutions that is hindering their ability to do their jobs. The consequential job dis-satisfaction not only impacts on retention but also contributes to the increasing attraction of young medical graduates to private medical practice rather than a public hospital clinical academic career. (Correspondence from the University of Adelaide Clinical Academics)*

<sup>42</sup> Flinders University (FR9, p.12).

<sup>43</sup> Examples are provided in the submissions from University of Adelaide School of Psychology (DR31, pp 4-8); University of Adelaide School of Public Health (DR32, p.5); Flinders University (DR14, p.5); information from LHNs and

<sup>44</sup> Professor. David Watson (DR15, p.2).

These relationships are a key element in embedding research within the broader health system and supporting clinical researchers and academics. Given the complex nature of the institutions and contractual arrangements, it is crucial that all parties are equally invested and committed to investment of resources and research excellence.

In some cases, previously existing relationships between LHNs and universities have either been lost or deteriorated over the recent years.<sup>45</sup> This may be due to a combination of systemic and cultural factors, or as noted in the submission from Flinders University, due to diverging priorities of SA Health and the university sector.<sup>46</sup>

The Commission heard that a 'significant 'cultural shift' towards better integration between universities and the health system was needed.<sup>47</sup> The majority of stakeholders supported better partnerships and strategic initiatives to foster research.<sup>48</sup>

Stakeholders also reiterated the importance of joint appointments:

*Sustained investment in a significant clinical-academic researcher program by the State Government is critical. Efforts to highlight areas of need for such appointments within LHNs must be prioritised. All SA universities need to host these positions, playing to their research strengths and also acknowledging their complementary research capabilities. (Flinders University, Caring Institute, FR10, p.4)*

The Commission's consultations identified fractional appointment of clinical researchers and academics as a key factor in the attrition of clinicians to private practice. Stakeholders were of the view that better partnerships and commitment between the hospitals and universities to encourage full-time appointments would improve the current situation.

The Commission notes that there are successful partnerships between South Australian research institutions and the LHNs. Examples of such collaborative efforts were provided by stakeholders:

*Maintaining and developing relationships with academic status holders and partners such as SA Health, particularly for Flinders through the Southern Adelaide Local Health Network, is critical to ongoing success in health and medical research.... A significant proportion of Flinders University's research capacity is provided by academic status-holders who are not staff members, but gain access to the University's, research infrastructure, research support and intellectual resources. (Flinders University, DR14, pp.4-6)*

The Commission notes the LHNs including the WCHN and CALHN stated their commitment to these relationships and partnerships:

*The WCHN is committed to further develop existing research strengths, partnerships and collaborations and in doing so to support capacity building for emerging research groups and future research leaders. This includes supporting early and mid-career researchers. It is acknowledged that funding is a limiting factor in developing such talent, but over the years the WCH Foundation has supported developing researches via PhD Scholarships, Post-doctoral Fellowships and Research Project Grants, but there is a need for more research funding. (Correspondence from WCHN)*

*CALHN, SAHMRI and the Universities will continue to work collaboratively to identify critical workforce requirements in teaching, training and research. Future joint*

<sup>45</sup> Information received from the RAH Research Committee, Flinders University (DR14, p.4).

<sup>46</sup> Flinders University (DR14, p.4).

<sup>47</sup> Information received from the University of Adelaide Clinical Academics.

<sup>48</sup> Submissions and information received from the universities, LHNs and research institutes generally support this argument.

*appointments of clinical research leaders will be built on an expectation of excellence in teaching and research and serve to build a culture of research-informed clinical care. Finally, CALHN, via its newly formed Learning Innovation and Leadership Centre (LILC), will play a critical role in the training and education of clinicians in pathways related to translational skills which directly link research with patient care, including clinical practice improvement and clinical audits. Acquisition of these core competencies at an early stage in clinician training represents a pathway to research capability. In addition, CALHN will look to provide dedicated training in clinical research via an NHMRC-endorsed program, currently described as good clinical practice (GCP). (Correspondence from CALHN)*

The Commission considers partnerships between SA Health, universities and research institutes are a key means of providing the opportunities to embed research in the health system that drive excellence in HMR leading to better health outcomes.

## 6.5 Strengthening the HMR workforce in South Australia

It is clear from the above discussion that workforce issues in HMR are interrelated with a multitude of sector-wide factors. The issues are deep-seated in many cases and longstanding. Moreover, the institutions have different roles with respect to the HMR workforce.

That said, a productive HMR workforce is a critical foundation for world-class HMR in South Australia. It calls for focused efforts by different institutions to ensure there is an ongoing investment in:

- building and maintaining a cadre of top research leaders, including a focus on succession;
- development of HMR talent for early- and mid-career researchers; and
- commitment to high standards in research.

In the Commission's view the heavy lifting in these efforts largely rests with the universities and the hospital networks. This is particularly important given the cost of high quality HMR and competing priorities in any university's research program.

While the government may have an enabling role, a clear understanding of the accountability for these activities among the various institutions is essential.

### 6.5.1 Building on South Australia's competitive advantages

While there are challenges across the sector, building on South Australia's (non-HMR) competitive advantages is an important aspect of strengthening HMR, including the research workforce.

Many inquiry participants highlighted South Australia's liveability as an attraction for early and mid-career researchers. The relevance of that factor depends on having essential elements such as research support and facilities in place; liveability by itself is insufficient:

*South Australia has a quality of life/cost of living advantage over other states, especially for early and mid-career researchers raising young families. However, a key challenge is that South Australia is generally behind in the advanced infrastructure that attracts young researchers in health and medical fields... Researchers can be required to 'wait in line' to use the equipment interstate delaying critical research and incurring costs that need to be absorbed within the research project funding envelope. (Flinders University, DR14, p.6)*

Taking advantage of the small size and physical spread of the state’s HMR sector to enhance collaboration among research groups is another example of how South Australia’s competitive advantages can be utilised to support the research workforce:

*South Australia has a unique advantage over research institutes and universities in other major Australian States, with South Australia’s three main universities, hospitals and the SAHMRI all located within a 12km radius of each other. (ASMR, DR7, p.10)*

*Without a doubt, SA has several competitive advantages in attracting and retaining high calibre HMR’s from interstate and overseas. These include the obvious lifestyle and affordability aspects which are particularly appealing to families... There is clearly an opportunity to promote this aspect and reverse the “brain drain” from interstate/overseas. (Adelaide Institute for Sleep Health, DR3, p.4)*

The Commission considers a comprehensive HMR workforce strategy for South Australia may be helpful. This was a recurring theme in the submissions received by the Commission:

*It is suggested that SA Health develops appropriate workforce strategies that are better able to support HMR activity, which can build capacity and capability within the public health system, recognising the difficulties of short-term and ‘soft’ funding in being able to recruit and retain high quality staff to conduct HMR. (Correspondence received from the DHW Office of Research)*

The Commission considers the primary responsibility for such strategies is with the employing entities, namely the hospitals and universities in the first instance.

### **6.5.2 Job security and career pathways**

A key concern amongst health and medical researchers across Australia is the lack of career pathways and job insecurity. In the 2019 ASMR Workforce Survey, nearly 60 per cent of South Australian respondents indicated that they were on fixed-term employment contracts of less than a year. A further 30 per cent on fixed-term employment had two to three-year contracts, with limited availability of full-time positions and funding being the primary reason for these employment arrangements.<sup>49</sup> Information received from ASMR indicates that this is consistent with national trends. Other existing evidence also suggests that the HMR workforce in Australia is increasingly casualised and the share of those employed part-time has also been on the rise.<sup>50</sup>

Submissions identified the prevalence of precarious employment arrangements and lack of job security across the HMR sector including in hospitals, universities and MRIs.<sup>51</sup> This issue was identified at the national level in the McKeon Review and relates to funding flows to researchers. Information received by the Commission suggests that this is a pervasive issue across the sector including the LHNs, universities and MRIs:

*Consequently, the funding arrangements are precarious, with the research support staff having no job stability and limited opportunity for career advancement. Hence young scientists embarking on a research career within the hospitals currently have limited opportunities to advance their careers in South Australia... The ancillary research positions (research assistants, etc) are funded via competitive grants obtained by senior researchers. Thus, even within the*

<sup>49</sup> ASMR Workforce Survey, 2019 (unpublished), made available to the Commission.

<sup>50</sup> Deloitte Access Economics, *Australia’s Health and Medical Research Workforce – Expert People Providing Exceptional Returns*, (Report prepared for the Australian Society for Medical Research, 2016).

<sup>51</sup> Information received from CALHN Executive Research Committee.

*university structure, the funding of research positions is precarious with staff having little job security. (Correspondence from the CAHLN Executive Research Committee)*

The Commission notes that 75 per cent of 'South Australian respondents viewed a career in medical research as negative with a weak and uncertain future'.<sup>52</sup> In light of this situation, improving employment arrangements including better job security and long-term career pathways for the HMR workforce is a priority, as echoed in the submission from the ASMR:

*It is crucial to improve job security in health and medical research to secure the current workforce and create a realistic career option for future South Australian researchers. Immediate steps must be taken to support defined and long-term secured career structures for South Australian health and medical researchers. (ASMR, DR7, p. 10)*

The ASMR further noted the different types of constraints faced by health and medical researchers across the sector. These may range from clinicians with barriers to participating in research to scientists and research students who are faced with issues around career pathways, job security and remuneration.<sup>53</sup>

Access to research funding also has flow-on effects on job security and employment arrangements for research staff. In fact, a survey of the HMR workforce conducted by the ASMR in 2006 found that employment insecurity and lack of funding were causes of considerable anxiety among health researchers.<sup>54</sup> Details of funding related issues are discussed in chapter 3.

Implications for the HMR workforce of the COVID19 pandemic, including funding, job security and employment remain to be seen. A recent study on the impact of the pandemic on Australia's research workforce by the Australian Academy of Science predicts that the pandemic will have severe and long-term negative impacts on the Australia's research workforce including in medical research.<sup>55</sup>

These views were supported by stakeholders as illustrated by the following examples:

*The impact of COVID-19 on the research workforce, primarily through the loss of international student income impacting on university research capacity, has been extensively reported. The recently announced investment of an additional \$1billion to support university research is a desperately needed contribution, but is only for 2021, perhaps predicated on a return of international students in 2022. However, the level of job opportunity for HMR researchers in South Australia remains uncertain. We suggest that the primary mitigation measure would be to provide local short term 'bridging' support for researcher salaries, similar to the 'JobKeeper' approach, to ensure retention of our key early and mid-career researchers. (Flinders University, FR9 p.12)*

*The economic downturn and social distancing restrictions during the COVID-19 pandemic have already begun to impact researchers and other staff within the sector. Early observations on the broader research workforce have identified four different groups that are likely to be disproportionately impacted. These include early and mid-career researchers (EMCRs), women, international staff and students and clinician-researchers. (AAMRI, FR3, p. 10)*

<sup>52</sup> ASMR (DR7, p.10).

<sup>53</sup> *ibid* p.11

<sup>54</sup> M Kavallaris et al, 'Perceptions in Health and Medical Research Careers: The Australian Society for Medical Research Workforce Survey' (2008) 188(9) *Medical Journal of Australia* 520.

<sup>55</sup> Rapid Research Information Forum, *Impact of the Pandemic on Australia's Research Workforce* (2020) <<https://www.science.org.au/sites/default/files/rrif-covid19-research-workforce.pdf>>.

The Commission considers these important aspects need to be taken into account in future HMR workforce strategies.

### **6.5.3 Consistency in employment arrangements in the health networks, universities and MRIs**

Inquiry participants identified the ad-hoc nature of existing employment arrangements between the health networks, universities and the research institutes as an important workforce issue. Widely varying arrangements across the sector were identified, and sometimes within the same organisation:

*There are no consistent arrangements for clinical researchers in terms of splitting FTE across clinical service and research. Appointments differ across LHNs and even within hospital departments where clinicians in one specialty are granted more research time than another department. (University of Adelaide, Faculty of Health and Medical Sciences, DR28, p.4).*

*In SA there are substantial differences in clinician workforce models and employment contracts across the state, within a university and even within each health network (such as WCHN)... At present clinical service requirements for a full time clinical academic vary within the University of Adelaide teaching hospitals from 0.2 - 0.8 FTE. (Robinson Research Institute, DR21, p.2)*

The Commission considers the complexity of such joint employment arrangements is excessive. Several stakeholders believed that such arrangements are very difficult to coordinate and require joint long-term planning and commitment.<sup>56</sup> Flinders University noted existing partnerships with SALHN had eroded over the recent past due to diverging priorities of the university and SA Health.<sup>57</sup>

That said, the majority of submissions argued the benefits of such arrangements outweigh the costs of setting them up. Consistent employment arrangements across the health system, which include well-defined research responsibilities and protected research time, will help mitigate some of the issues currently faced by clinical researchers and academics and by the broader HMR workforce in general:

*While there has been a decline in the numbers of senior, jointly SA Health and University funded clinical academic positions, often as a result of difficulties in matching the differing recruitment needs of universities and hospitals, there needs to be a revised approach to recruitment for the HMR workforce of the future. Combined appointments that function under a clinical academic award would benefit both the health and university sectors and drive clinical research, translational research and bench research capability guided by research active clinicians. (Flinders University, DR14, p.6)*

*However, a core factor to address is the relationship between the university sector and service providers. Joint appointments and reciprocal arrangements that enable a cross-over of skills, knowledge and time, may be one way to address limitations for both sectors, in (a) producing translational research and (b) ensuring a teaching/training and research nexus is maintained and enhanced. (The University of Adelaide, School of Psychology, DR31, p.5)*

Such appointments would recognise research as part of the core workload and supported appropriately, including protected research time.<sup>58</sup>

<sup>56</sup> Professor David Watson (DR15, p.2).

<sup>57</sup> Flinders University (DR14, p.5).

<sup>58</sup> This aspect is discussed in a number of submissions including those from the University of Adelaide School of Psychology (DR31, p.5); Robinson Research Institute (DR21, p.2); Flinders University (DR14, p.6).

Additionally, the submission from the University of Adelaide School of Psychology considered these partnerships to be crucial in workforce training and skill development across the HMR sector.<sup>59</sup> Stakeholders including several LHNs recommended joint funding arrangements between the relevant institutions to facilitate and support such partnerships.<sup>60</sup>

#### 6.5.4 Building HMR capacity

Lack of or limited training in research methods and skills is often cited as a barrier by clinicians and also in the broader health workforce.<sup>61</sup>

*Opportunities to undertake further training or to attend conferences are often very limited in terms of time and funding and so any support that could be given to increase this would greatly increase the impact and scope of the research that could be carried out. (The University of Adelaide, School of Psychology, DR31, p.5)*

The Commission's consultations and participant submissions indicate investment has mostly been directed at building infrastructure with declining investment in human capital. The University of Adelaide Medical School Research Committee considered:

*While the recent investments into HMR at the University of South Australia (new CCB building at North Terrace), the University of Adelaide (e.g. new Medical School on North Terrace/AHMS) and Flinders University (FHMRI) has a high potential to create a more competitive HMR field in SA, the HMR infrastructure investment must be matched with the investment into people, especially into key HMR leaders and talent. While the buildings matter, it is the quality of the 'bums on seats', which matters much more. (The University of Adelaide, Medical School Research Committee, DR4, p.3)*

The Commission broadly agrees with this view. This points to the broader issue of the lack of a comprehensive workforce strategy at the state level raised in the inquiry consultations.

That said, the Commission received examples of collaborative efforts by different groups to build and develop HMR capacity in South Australia. The submission by Health Translation SA (HTSA) provided details of research capacity building initiatives facilitated and undertaken, including a 'research translation capacity building leadership group'.<sup>62</sup>

HTSA also provided examples of potential platforms for HMR capacity building in South Australia, including in the areas of:<sup>63</sup>

- clinical research development;
- health data analytics (Health Analytics Research Collaborative);
- health economics (Embedded Economist Project and CommPrac);
- grant funding development (SA MRFF Working Group);
- consumer engagement (Community Engagement Action Group); and
- research commercialisation.

<sup>59</sup> Adelaide University, School of Psychology (DR31, p.5)

<sup>60</sup> Information received from NALHN and CALHN Executive Research Committee.

<sup>61</sup> McKeon et al, *Summary Report* (n 9) 23; Correspondence from the South Australian Research Management Group.

<sup>62</sup> See for example HTSA (FR11); Flinders University (FR9); Flinders University – Caring Futures Institute (FR10).

<sup>63</sup> HTSA (DR17); HTSA (FR11).

The Commission considers HTSA may be well placed to encourage capacity building in these areas through its informal role as a high-level community of practice in health translation and research.

The Commission was advised of examples of training programs and fellowships offered at an institutional level<sup>64</sup> including the following from Flinders University.<sup>65</sup>

*Flinders University offers extensive and comprehensive researcher training that aims to build researcher capacity and capability. Programs aim to impart the knowledge, key traits, and attributes of effective, highly successful researchers. Supporting all career stages, a range of programs are on offer including: researcher induction program; researcher mentoring scheme; training and development workshops and information sessions... Furthermore, the College of Medicine and Public Health offer discipline relevant and targeted support including establishing community of practices, early-mid career support programs, and industry engagement programs through our Researcher Education and Development Hub (RED). (Flinders University, FR9, p. 12)*

Additionally, the importance of nurturing and developing early-to-mid career researchers was highlighted in several submissions.<sup>66</sup> The availability of such programs is one consideration, having the time to participate in them is another.

The Commission notes examples of research capacity building programs in other jurisdictions, including those discussed in section 6.3 above. Additionally, the Queensland Metro South Hospital and Health Service *Allied Health Research Capability Strategic Framework 2017-2020* provides a good example of targeted capacity building within the sector.<sup>67</sup>

In NSW, training opportunities in HMR are provided through targeted 'learning and development' initiatives including the NSW Biostatistics Training Program and the NSW Public Health Training Program.<sup>68</sup>

In addition, the Australian Government has several programs in place to support HMR researchers, including specialised schemes from the Medical Research Future Fund (MRFF)<sup>69</sup> and National Health and Medical Research Council (NHMRC).<sup>70</sup> Furthermore the MTPConnect REDI (Researcher Exchange and Development within Industry) program<sup>71</sup> provides opportunities for training and development in HMR.

South Australian health and medical researchers compete nationally for these opportunities, with relatively low success rates.<sup>72</sup> It is therefore important to build HMR capacity at the local level to support researchers to be more competitive for national level opportunities and to drive research excellence in the sector.

## 6.6 Conclusion

This chapter discussed the key HMR workforce issues as they relate to South Australia. The Commission's analysis of the submissions, information received, and available data supports

<sup>64</sup> CADOSA (DR11, p.9); Information received from WCHN.

<sup>65</sup> See for example. Flinders University (FR9).

<sup>66</sup> For example, ASMR (DR7, p.10); University of Adelaide School of Public Health (DR32, p.4); AAMRI (DR5, p.13) and Information received from the Office of the Chief Scientist.

<sup>67</sup> <<https://metrosouth.health.qld.gov.au/sites/default/files/allied-health-research-strategy.pdf>>.

<sup>68</sup> <<https://www.health.nsw.gov.au/training/Pages/default.aspx>>.

<sup>69</sup> Further details are available from <<https://www.health.gov.au/initiatives-and-programs/medical-research-future-fund/mrff-research-themes/researchers>>.

<sup>70</sup> <https://www.nhmrc.gov.au/funding/find-funding>.

<sup>71</sup> <<https://www.mtpconnect.org.au/projects/REDI>>.

<sup>72</sup> As discussed in detail in chapter 3.

the generally held view that the declining number of clinical researchers and academics from all fields of HMR is a critical factor in the performance of HMR in the state. This includes medical scientists, and nursing and allied health professionals. Stakeholders highlighted the crucial links between clinical and basic research activities across the HMR spectrum.

Stakeholders agreed that competing demands and the lack of protected research time are key barriers to research by clinical researchers. It appears that the complex and heterogenous employment arrangements between universities, LHNs and research institutes tend to confound these barriers.

The Commission found no inherent barriers in the current enterprise agreements to staff engaging in HMR. The key need is for management decisions and practice that gives greater weight to clinical research through decisions regarding work priorities, role design, time allocations and resourcing.

The Commission also heard that similar to other states, South Australian health and medical researchers face issues relating to lack of job security and career pathways, primarily resulting from the short-term grant-funded employment arrangements. The implications of the COVID19 pandemic on the HMR workforce were also highlighted.

Attracting and retaining top health and medical researchers to South Australia remains a key workforce issue on which the long-term performance of HMR in the state depends. Stakeholders generally supported the Commission's analysis of key issues relating to attracting and retaining an HMR workforce and highlighted the importance of investing in local talent. The Commission considers this would best be addressed through a comprehensive, coordinated and sustained effort by the universities, LHNs and SAHMRI. In the Commission's view it is essential to counterbalance the investment in buildings and physical HMR with investing in building research human capital, especially in building and maintaining top quality research teams.

Stakeholders also agreed on the Commission's analysis of issues relating to capacity building in the state's HMR workforce and identified several areas of skills gaps which would benefit from improved training to help build and foster local talent.

### **Recommendation 6.1**

As part of delivering a step change in the capability of SA Health's health and medical research workforce, the Commission recommends that the Department for Health and Wellbeing (DHW) and local health networks (LHNs) develop and implement a multi-year plan to raise the size, proficiency and effectiveness of the HMR workforce and to increase the quantum and quality of the HMR effort in SA Health containing quantitative targets, clear accountabilities for achieving them and ongoing progress reporting. The elements include:

1. DHW and the LHNs to work out the scope and content of the plan, including:
  - a) defining the HMR workforce and clinical researchers including nurses and allied health professionals;
  - b) clearly articulated research expectations and performance outcomes in HMR role statements and employment contracts;
  - c) training and development to address identified skill requirements;

- d) incentives to encourage a research career by health and medical professionals and promote take-up of joint hospital-university appointments and affiliations;
  - e) succession planning for key HMR leadership roles; and
  - f) an online register of health and medical researchers to support future workforce modelling.
2. As part of this step change in the state's HMR workforce, the LHNs also:
- a) require LHN management to ensure the roles of clinical researchers incorporate sufficient time to do research effectively;
  - b) increase the number of clinical/academic affiliations and joint appointments between LHNs, universities and other institutions with top priority given to clinical research leaders' roles;
  - c) expect universities and research institutes, as part of the research collaboration with LHNs, to have an active professional development program for HMR researchers which includes:
    - i. facilitating networking between researchers and industry;
    - ii. mentoring early and mid-career scientists and researchers across all health and medical professions; and
    - iii. reporting on their contribution to HMR workforce development in the state.

## 7. Access to data

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### 7.1 Introduction

The inquiry's terms of reference require the Commission to examine and report on the key factors influencing the level of public and private sector output and activity, including the factors affecting access to data, regulation of data and the efficiency of collection and acquisition of data.

Access to high-quality data has emerged as a foundation for competitive health and medical research (HMR) in South Australia. That said, there are several barriers to collecting, accessing and using data that, if remedied, will greatly simplify the environment for data-driven HMR.

Of key importance is the regulatory environment. The legislative and policy environment regulating researchers' access to data in South Australia is marked by considerable complexity, which is examined in detail in chapter 5.

There are three main South Australian repositories of health data. The Department for Health and Wellbeing (DHW) holds a large amount of relatively inaccessible and untapped data including 20 years of patient records from the previous electronic medical record (EMR) system, administrative data, SA Pathology, SA Imaging and the ipharmacy system data. The other two repositories are SA NT DataLink and the South Australian Health and Medical Research Institute (SAHMRI) registries, some of which are nationally recognised registries in their own right. The SA NT DataLink is said to be the most comprehensive data repository and linking service in Australia. It could be a major strength for South Australian HMR. Ongoing funding arrangements for SA NT DataLink are uncertain, placing its future existence in doubt. Other South Australian and Australian Government departments also hold significant social data sets of relevance to HMR.

There are significant gaps in available data, including data from the private healthcare sector and data about under-represented groups in the community. Access to complete datasets would allow researchers to engage in studies likely to benefit the whole South Australian population and improve overall population health.

The chapter examines data characteristics and the availability of linked data and data registries in South Australia, key factors affecting data access including time factor barriers, funding and infrastructure, and data as a source of competitive advantage to South Australia. Some options to improve data collection, access and use in South Australia are identified, which complement regulatory reforms proposed in chapter 5.

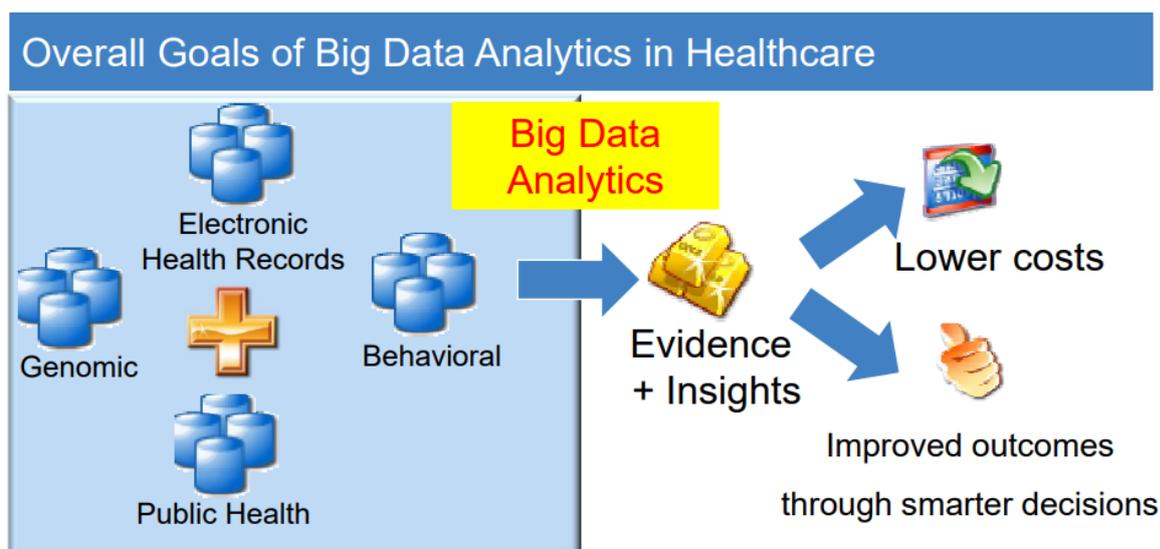
### 7.2 Data state of play

South Australia is home to some unique data registries, linked datasets, artificial intelligence (AI) capabilities, a comprehensive electronic medical records system and a wealth of untapped public health data. These assets provide the potential to apply big data analytics to HMR and to improving health care. That said, nearly every submission and information document received by the Commission pointed to the need for significant changes to policy, governance, infrastructure and support in order to improve and fully utilise the extensive range

of South Australian data registries for HMR. According to Sun and Reddy in 2013,<sup>1</sup> the overall goals of big data analytics in health care (see Figure 7.1) are to:

- take advantage of the massive amounts of data and provide the right intervention to the right patient at the right time;
- deliver personalised care to the patient; and
- provide benefit to potentially all the components of a healthcare system.

Figure 7.1: Big data analytics in health care



Source: Sun and Reddy (2013).<sup>2</sup>

These goals can be described as precision public health (PPH). PPH is a relatively new field driven by technological advances that enable more precise descriptions and analysis of individuals and population groups, with a view to improving the overall health of populations.

MTPConnect<sup>3</sup> identified precision medicine as one of the top megatrends in their 2020 Medical Technology, Biotechnology and Pharmaceutical (MTP) Sector Competitiveness Plan, identifying the importance of data standardisation, artificial intelligence and cyber-security as central concerns for the MTP sector.<sup>4</sup>

The growing volume and variety of available data, decreased costs of data capture, and emerging computational methods mean a capability to use big data is likely to become a foundation of future PPH.<sup>5</sup> Big data studies are already being undertaken by three bioinformatics groups comprising over 25 researchers within SAHMRI. The Commission considers that interdisciplinary work between data mining and bioinformatics is likely to add value to the data and enable this transformative technology to have a positive public health impact. Information received from both CALHN and Flinders University indicate that South

<sup>1</sup> J Sun and C K Reddy, 'Big Data Analytics for Healthcare' (Tutorial presentation at the SIAM International Conference on Data Mining, Austin, TX, 2013).

<sup>2</sup> Ibid.

<sup>3</sup> MTPConnect is a not-for-profit Industry Growth Centre. For more information, see <<https://www.mtpconnect.org.au/overview>>.

<sup>4</sup> MTPConnect, *Medical Technology, Biotechnology & Pharmaceutical Sector Competitiveness Plan* (2020) 18.

<sup>5</sup> S Dolley, 'Big Data's Role in Precision Public Health' (2018) 6 *Frontiers in Public Health* 11. doi: 10.3389/fpubh.2018.00068.

Australia has the building blocks to build big data analytics as an area of strength and strategic advantage for SA. However, 'to realise this potential will require significant changes to policy, governance, infrastructure, investment and support related to data treatment'. (Flinders University FR9, p.12)

SAHMRI has recently established an Artificial Intelligence and Machine Learning Platform, in collaboration with the Australian Institute for Machine Learning (AIML), University of Adelaide to achieve world-class AI-in-Health research capability in South Australia. At the time of writing this report, the Commission understands discussions are underway in relation to the advancement of AI within the SA health system through the establishment of an "AI in Health" platform.<sup>6</sup> The commercial value of digital health innovation has also been recognised with the development of a business case for a digital health innovation hub (HIVE) backed by SA organisations and national and international investors. The South Australian Department for Trade and Investment also identified digital health opportunities as a health and medical industry subsector enabler for SA HMR:

*South Australia will continue to capitalise on state-of-the-art health and medical research, with scientific and academic institutions pursuing innovations in technology, such as artificial intelligence, and providing opportunities through data linkages.<sup>7</sup>*

The Commission understands world-class digital health innovations, AI skills and bioinformatics programs could provide South Australia with a competitive edge in research and data-driven health care providing that timely access to data for researchers can be achieved.

### Data sources

Data are routinely collected during medical procedures as well as research, including clinical trials and public health investigations. Broad-level performance data on expenditure and activity at individual medical facilities, along with finer levels of performance data such as complications, drugs prescribed and diagnostic testing are also regularly collected.

SA NT DataLink identified that it is important to share data sourced from areas of increasing research focus, including data from genomics, clinical trials and post-marketing surveillance of drugs and medical devices linked to other health and human services data.

Submissions and correspondence received from the Basil Hetzel Institute (BHI), the South Australian Health Performance Council (HPC), SA Research Management Group and the Robinson Research Institute asserted data can contribute to better health outcomes. They cite the importance of current and historical data on client experiences, health system sustainability and economic growth. This information includes, among other things, administrative data, hospital-generated data, patient and carer experience, socio-economic and demographic data, patient-level data, testing activity and results data, patient-reported outcome measures, clinical indicators, financial modelling data, natural language program findings and sentiment analysis.

Data sources include the electronic health records of patients in primary, community or emergency care, prescribing information databases (for example, the Pharmaceutical Benefits Scheme), Medicare Benefits Schedule, new technologies and devices that capture data,

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<sup>6</sup> SAHMRI (FR 15, p.46).

<sup>7</sup> Department for Trade and Investment, *Health and medical industries sector plan 2020 to 2030* (2020) 27.

especially those with mobile applications, genomic information, imaging information, pathology data, digital patient communications, and results of organised and specific research activities. Broader demographic information from census data, survey data and specialist registries all provide potential for linking datasets. SA Health considers non-traditional health data repositories to be significant, including those of other government agencies.

Data quality, veracity and value can be questionable depending on their source and the purpose and method of collection. Data-related issues can arise without effective management and governance, and these include unreliable, inaccessible, missing, or inaccurate data.<sup>8</sup>

The HPC<sup>9</sup> stated that some South Australian data are unavailable at state level for some specific and vulnerable population groups including: Aboriginal persons, persons living with a disability, carers, veterans, aged persons, persons in custody, and other socially or economically disadvantaged groups. These missing data are essential to understanding the full impacts of health policy for particular population cohorts over time.<sup>10</sup>

The Rosemary Bryant AO Research Centre emphasised the current under-reporting of patient-reported data. In their view this weakness could be addressed through standardised reporting and collection to provide South Australia with a strength relative to other jurisdictions.

*Patient-reported data represent standardised systematic assessments of patients' symptoms, adverse side-effects of treatment, experience of navigating the health system, and the impact of these things on quality of life. (Rosemary Bryant Research Centre, DR22, p.3)*

The Southern Adelaide Local Health Network (SALHN) has identified key data gaps including the inability to track patient journeys within SA Health and between the public and private sector. Longitudinal data such as 1,2 and 5 year survival rates following hospitalisation, quality of life, return to the workforce and the ongoing use of health care all have key outcomes relevant to HMR and suggest the development of a state-wide clinical informatics database hosted centrally through DHW Digital Health as a solution.<sup>11</sup> The Commission understands that the Commission on Excellence and Innovation in Health (CEIH) is addressing this issue in their Data and Analytics Plan.

In a 2017 report on data availability and use in Australia, the Australian Productivity Commission found that Australia stands out in poorly using health information, citing legal, technical and institutional causes.<sup>12</sup>

The HPC claimed key data are non-existent, inaccessible and under-used:

*South Australia's health systems hold vast amounts of routinely collected data that could and should be informing clinicians on improving clinical practice and guide policy-making. The data could and should support the Council and other entities in enabling the scrutiny and accountability of system performance, including comparing the quality and efficiency of care in*

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<sup>8</sup> G Shaw, *Data Analytics: Actionable Information to Improve Healthcare* (2013).

<sup>9</sup> The Health Performance Council is a statutory ministerial advisory body established under the *Health Care Act 2008* (SA). For more information see: <[https://www.hpcsa.com.au/about\\_us](https://www.hpcsa.com.au/about_us)>.

<sup>10</sup> Correspondence received from the Health Performance Council.

<sup>11</sup> Correspondence received from SALHN pp.13-14.

<sup>12</sup> Productivity Commission, *Data Availability and Use* (Inquiry Report, 2017) 6.

*different parts of the state, for different therapeutics and between public, private and other care sectors.*<sup>13</sup>

The council stated they have been unable to find or access the data to support these performance objectives, all of which aim to support better health outcomes.

In 2014, the HPC<sup>14</sup> found limited evidence that the health system linked and analysed data or disseminated results to inform decision making across the service for continuous improvement and it reported that little had changed in this regard in 2018.<sup>15</sup>

This was supported in correspondence and submissions in response to the draft report, with CEIH, SAHMRI, HTSA and others indicating that DHW holds a large amount of unstructured, relatively inaccessible and untapped administrative and public health system data including 20 years of patient records from the previous EMR system, SA Pathology, SA Imaging and the ipharmacy system all of which could be used for quality improvement.

Further to the myriad of data sources and notable data gaps is the confusion created by data managers, data groups, data custodians and human research ethics committees (HREC's). Information received by the inquiry indicates the apparent proliferation of data groups are a challenge within DHW. The SA Clinical Research Governance Steering Committee correspondence indicates that, outside DHW, there appears to be some confusion about who to go to for what data and who is the data custodian. The following DHW groups all play a role in data collection and/or analysis:

- CEIH – has clinical analytic resources;
- Office of the Chief Medical Officer;
- System Performance – provides activity dashboards;
- health programs and funding – for clinical analytics;
- financial analysis;
- health economics and analytics;
- Digital Health SA – chief information officer; and
- Mental Health – analytics.

Adding to the state's health and medical data landscape are:

- SA NT DataLink;
- data groups within the university sector;
- LHN's individually developing their own data capacity;
- SAHMRI – as custodian for several data collections/registries; and

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<sup>13</sup> Health Performance Council, *Review of the Performance of South Australian Health Systems, Health of South Australians and Changes in Health Outcomes Over the Reporting Period 2015–2018* (Government of South Australia, 2018) 4.

<sup>14</sup> Health Performance Council, *What's Working, What's Not: Review of the South Australian Health System Performance for 2011–2014* (2014).

<sup>15</sup> Health Performance Council, *Review of the Performance* (n 12) 4.

- Health Analytics Research Collaborative (HARC).<sup>16</sup>

Information received from the DHW Office for Research confirms there has been a lack of clarity around organisational ‘ownership’ of the authority to provide access to SA Health data for HMR, especially for researchers employed outside SA Health.<sup>17</sup> The absence of standardised protocols, guidelines and procedures to support appropriate access to SA Health data for HMR leads to inefficiencies and limits research activities by external users.

*It is difficult to negotiate access to SA Health data, even when ethics and privacy issues are appropriately accounted for. A risk-averse approach to data access, not adequately balanced against potential benefits and opportunities lost, prevents South Australian researchers from accessing the specific health and demographic data required to undertake research with any level of efficiency. (SAHMRI, FR15 p.27)*

The CEIH stated it has been developing a three-year Data and Analytics Plan for SA Health which focuses on the five key areas of people, processes, data, strategy and technology. The plan aims to build capacity to inform: prioritising health needs, identifying infrastructure needs, and facilitating cross-sector research collaboration and integration in the public and private sectors. The Data and Analytics Plan aims to make the pool of untapped and inaccessible SA Health data a functional resource and Digital Health SA has the task of progressing the plan. The Commission considers a key outcome of the plan will be to clarify and simplify access to SA Health data for HMR researchers, both within and outside SA Health.

The Commission suggests the work by DHW could be further assisted by a whole-of-government data strategy to support and underpin agency data plans giving departments such as DHW guidance to address issues of efficiency and regulatory complexity. In correspondence received, the CEIH indicated it would strongly support an:

*overarching ‘meta’ plan linking individual agency plans and ensuring connection and interoperability to optimise utility of each individual plan and data asset, including those federally and in other jurisdictions. (Information received from CEIH)*

Flinders University see a whole-of-government data strategy as:

*particularly important in developing a thriving big data analytics capability within SA which interfaces between HMR organisations and industry to encourage research translation and commercialisation. (Flinders University FR9, p.13)*

SA NT Datalink suggests it could provide:

*significant technical, ethical and legal insights for the development and implementation of a SA Health Data and Analytics Plan. (SA NT DataLink, FR14, p.1)*

## Summary

The Commission concludes the current fragmented architecture for collecting, storing and accessing information for HMR and improving hospital and patient outcomes is unsatisfactory. It is very likely to be holding back both HMR (clinician research in particular) and improvements to patient care. Some potentially important efforts by the CEIH and other parts of DHW are at an early stage and warrant priority.

<sup>16</sup> HTSA has created HARC which has also engaged data analysts in conjunction with the CEIH.

<sup>17</sup> Information received from the Department for Health and Wellbeing Office for Research.

## Data registries

SA NT DataLink houses many core health and social data registries used for data linking including but not limited to data sets from SA births, deaths, public hospital services, Drug and Alcohol Services South Australia, SA Cancer Registry, SA Ambulance Service dataset, SA Perinatal Statistics Collection and several data sets from the Women’s and Children’s Hospital.<sup>18</sup>

Over 30 other South Australian and national data registries are held in South Australia. They hold data about patients with similar characteristics such as age, disease, condition, or implant and transplant recipients, including:

- Registry of Senior Australians;
- Australian Orthopaedic Association National Joint Replacement Registry;
- Australia and New Zealand Dialysis and Transplant Registry;
- Transcatheter Aortic Value Implementation Registry;
- South Australian Clinical Cancer Registry Central Coordination Unit; and
- Australian Corneal Graft Registry (Flinders University).

Most of these registries are co-located (in the SAHMRI building), offering the data custodians use of shared infrastructure and opportunities to share knowledge and generate new expertise. The SAHMRI IT department has created significant intellectual property in clinical trial platforms for these registries, which can be accessed nationwide.<sup>19</sup> In their submission, HTSA referred to the need for infrastructure support for South Australia’s registries:

*While SAHMRI is currently leading an active Registry Centre that is working to develop the impact of over 30 Registries, more could be done for the state to benefit from this registry expertise. Developing mechanisms to ensure registry data can inform service planning and services to improve patient outcomes is vital. (HTSA, DR17, p.16)*

The Quality Use of Pathology (QUP) database is a unique South Australian registry managed by SA Pathology, covering both public and community patients across the entire demographic of the state. The QUP aims to enable identifying best practice in the use of pathology, eliminate the overuse of pathology and ensure that pathology testing is properly targeted to deliver the best outcome for patients.<sup>20</sup> SA Pathology suggested the QUP database could support a centre of research excellence as there are no other pathology services with such wide coverage in Australia.

The Commission concludes data registries contain essential data required for HMR and there are economic benefits from collecting appropriate data and maintaining registries that can be used repeatedly for HMR purposes. Increased benefits come from linking them.

### 7.2.2 Linked data

All Australian states have specialist units that link health and other related data at the person level. Linked data enables in-depth research that can benefit patients, the health sector, the population and the state’s economy. The Australian Productivity Commission’s *Data*

<sup>18</sup> SA NT DataLink (DR 24, p.10); SA NT DataLink,(FR14, p.2).

<sup>19</sup> SAHMRI (DR25, p.67).

<sup>20</sup> Information received from SA Pathology

*Availability and Use* report (2017) concluded that the availability of linked data is fundamental to analysis that will trigger innovation and service improvements.<sup>21</sup>

Data linkage techniques allow statistically significant connections to be drawn between different sources of information which relate to the same place, event, person or family.<sup>22</sup> This is important for many different types of HMR, including clinical trials, by drawing on information sources at the ‘whole-of-population’ level.

Several initiatives have been launched over the last decade to improve data linkage and access at a national level, including the Population Health Research Network (PHRN). The PHRN was established by the Australian Government in 2009 and is supported by state and territory governments and some universities. It includes participation from regional data linkage units, including the SA NT DataLink.<sup>23</sup> An independent report on the economic impact and return on investment from the Australian Government National Collaborative Research Infrastructure Strategy (NCRIS) funding and co-investment in population data linkage infrastructure across Australia, indicates an approximate benefit-to-cost ratio of 16.<sup>24</sup>

SA NT DataLink is said to have the most diverse range of linked longitudinal datasets in Australia. In 2020 it was provided with SA Department of Corrections, SA Ambulance Service and SA Pathology data for linkage and to be held as de-identified content records within the Custodian Controlled Data Repository.<sup>25</sup>

SA NT DataLink provides access to over 70 health, registry, education and human services datasets and 70 million individual records for linked data research and analysis. All Australian states have health data linkage capability, but not all have full state government coverage, thus limiting integration with other social data sources. Data linkage units for each state are presented in Table 7.1.

Table 7.1: Data linkage in Australia

Data linkage units in Australia	
Australia	Australian Institute of Health and Welfare (AIHW)
	Population Health Research Network (PHRN): National Network comprising: program office in WA, a Centre for data Linkage in Curtin University (WA ), a remote access laboratory at the SAX Institute (NSW) and a network of project participants and data linkage units in each Australian state and territory.
NSW/ACT	Centre for Health Record Linkage (CheRel) - established 2006
WA	WA Linkage System - established 1995
SA/NT	SA NT DataLink: established 2009 connecting health education and social services.
Tasmania	Tasmanian Data Linkage Unit (TDLU)
Queensland	Queensland Research Linkage Group (RLG) - located in Qld, Dept. of Health
Victoria	Victorian Data Linkages (VDL)

Source: Bureau of Health Information (2015).<sup>26</sup>

<sup>21</sup> Productivity Commission (n 11) 2.

<sup>22</sup> Menzies Institute for Medical Research, What is Data Linkage? (2015) <<https://www.menzies.utas.edu.au/research/research-centres/data-linkage-unit/what-is-data-linkage>>.

<sup>23</sup> For additional details on the PHRN, including its relationship with its regional partner linkage units, see <<https://www.phrn.org.au/about-us/participants/>>.

<sup>24</sup> Lateral Economics *Executive Summary Report on the Return on Investment from PHRN (2017)* 5 <[https://www.phrn.org.au/media/81399/final-report-phrn-lateral-economics-oct-2017\\_exec-summary-final-clean.pdf](https://www.phrn.org.au/media/81399/final-report-phrn-lateral-economics-oct-2017_exec-summary-final-clean.pdf)>.

<sup>25</sup> SA NT DataLink (DR24, p.2).

<sup>26</sup> Bureau of Health Information, *Data Matters – Linking Data to Unlock Information. The Use of Linked Data in Healthcare Performance Assessment* (2015) 8.

In NSW and the ACT, the Centre for Health Record Linkage (CHeReL) has a significant role in data linkage and provides tailored data linkage services for health-related research from a linked system of over 107 million records via their Master Key Linkage system. The research use has attracted more than \$70 million in competitive grant funding to NSW from sources such as the National Health and Medical Research Council (NHMRC) and the Australian Research Council.<sup>27</sup>

The Commission was advised that SA NT Data-Link can provide a cost-effective data linking service compared to the Australian Institute of Health and Welfare (AIHW). However, SA NT DataLink is unable to compete against other jurisdictional linkage units on pricing owing to lower government subsidies and greater dependence on non-government joint venture partners.<sup>28</sup> With PHRN and state government support, both the Centre for Victorian Data Linkage and DataLink Queensland are able to provide free-of-charge data linkage services to a wide range of users giving researchers using their data a significant advantage.<sup>29</sup>

This is demonstrated in Table 7.2 which compares the charge for data linkage for the same \$133,700 project if it were conducted by different jurisdictions data linkage units.<sup>30</sup>

Table 7.2: Comparison of linkage charges for same project

Project: n ~ 133,700, linking 2 datasets & Cwth data		\$
Western Australian - DLB		8632
DataLink Queensland		0
Centre for Victorian Data Linkage		100
Tasmania DLU		3774
AIHW		30500
CHeReL (NSW/ACT)		6278
SA NT DataLink		28250

Source: SA NT DataLink (2020)

Several submissions considered that a linked data environment is needed to lift the percentage of NHMRC and Medical Research Future Fund (MRFF) grants awarded to South Australian HMR and that SA NT DataLink is an important component of that environment.

SA NT DataLink was established in 2009 as an unincorporated joint venture initially supported by the Ministers for Health and Education and the NT Government. It is currently part of the PHRN. It is funded by the Australian Government through the NCRIS and joint venture partners in the university sector, the SA and NT governments and non-government organisations.<sup>31</sup> The University of South Australia is the administering body on behalf of the joint venture partners and also contributes in-kind support such as accommodation, IT, human resource management, and legal services support and consumables. Whilst SA NT DataLink

<sup>27</sup> Ibid 9.

<sup>28</sup> SA NT DataLink, (DR24, p.3).

<sup>29</sup> For more information see <<https://www2.health.vic.gov.au/about/reporting-planning-data/the-centre-for-victorian-data-linkage>>.

<sup>30</sup> Documentation provided to SAPC by SA NT DataLink for the Strategic Directions Workshop.

<sup>31</sup> Joint venture partners include University of South Australia, University of Adelaide, Flinders University, Menzies School of Health Research (joined 2018), NT Government, SA Health, SA Department for Education, Cancer Council SA and SAHMRI.

is funded by a subscription model, counterparts in other states have a greater percentage of ongoing government funding.

The funding position of SA NT DataLink is said to be fragile:

*the premier data linkage service in Australia. However, while SA NT DataLink is well utilized by SA HMR researchers, it does not receive sufficient funding from the SA Government and is perpetually in a precarious financial position. This puts the world-leading research being done using linked health data in SA at ongoing risk. (University of Adelaide, School of Public Health, DR32, p.6)*

SA NT DataLink estimates, based on limited information, the value of successful research grant funding to projects using data made available through SA NT DataLink to be at least \$20 million over the last five years.<sup>32</sup>

SA NT Datalink advise that the NCRIS PHRN has committed funding to SA NT DataLink up to June 2023, providing approximately 21 per cent of total annual funding in 2019–20. This is in line with funding supplied to other state-based registries. According to the PHRN Annual Review 2018–2019,<sup>33</sup> a substantial proportion of SA NT Datalink funding is ‘in kind’ compared to other data linkage units.<sup>34</sup>

The joint venture agreement expires on 31 December 2020. SA NT DataLink has advised that commitments for funding beyond December 2020 are significantly varied and four out of nine joint venture partners have committed to only one year at their current funding level and the others at significantly reduced rates of funding.

South Australian Government agencies contribute approximately 20 per cent to SA NT DataLink’s funding compared with most other jurisdictional linkage units receiving between 60–100 per cent of funding from a state government as shown in Table 7.3.<sup>35</sup>

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<sup>32</sup> SA NT DataLink, (DR24, p.8).

<sup>33</sup> Population Health Research Network, *Annual Review 2018–19* (2019) 22.

<sup>34</sup> In kind is considered to be: the data contributions made to SA NT DataLink by data custodians, the research support provided by data custodians to researchers, the consumables, accommodation, human resource management, IT and legal services support provided by the University of South Australia and the security and other services provided by SAHMRI as part of SA NT DataLink’s location in the SAHMRI building (Information received from SA NT DataLink 2020).

<sup>35</sup> SA NT DataLink (DR24, p.1).

Table 7.3: Estimated funding shares by source for 2019–20, per cent.

Current estimated % of revenue by source	PHRN NCRIS funding	Govt. contribution	Project cost recovery or other income	Comments relating to the cost recovery or other income
WA Department of Health Linkage Branch	0	75	25	25% includes 5% from grant sources outside of WA Dept. of Health.
Victorian Centre for Data Linkage (DHHS)	25	60	15	The 15% funding is from another Victorian Government agency
AIHW Data Linkage Unit	23	32	45	45% includes 23% external project cost recovery, 10% contracted projects, and 12% internal AIHW units.
Qld Data Linkage Unit	N/A	100	N/A	
NSW/ACT Data Linkage Unit (CHeReL)	N/A	100	N/A	
SA NT DataLink	24	20 (SA) 11 (NT)	Minimal	SA universities 29%, SA & NT research institutes, NGO sector 16%

Source: SA NT DataLink (2020).

A SA NT DataLink strategic directions workshop, held in October 2020 and attended by investors, stakeholders and key data users examined the value proposition of SA NT DataLink along with potential alternative governance and business models. Key messages from the workshop include:

- Greater and secure investment should be provided through the government sector;
- Investment funding should be sought from the private corporate sector. However, good reason for this investment must be provided. That is, the value of the data;
- A Board having, or having access to, a range of skills and knowledge is required to establish clear strategic goals and manage the business;
- People centred care should remain the focus of the outputs.<sup>36</sup>

Enhancing the value of linked data, HARC established by HTSA, is a source of analytical expertise in the South Australian HMR data environment. HTSA states HARC's intention is to connect the expert analytic capability within the academic and research sectors to exploit relevant information sources to enhance policy, practice and care across the health system.<sup>37</sup>

Analytical expertise can be extended by linking to AI. An editorial in *Clinical Leader* (2019)<sup>38</sup> indicated the AI market for health care is expected to top \$35 billion by the middle of 2020, with Microsoft, Google, and IBM already collaborating with top universities to further AI. The University of Adelaide is regarded as a world leader in AI and their Australian Institute for Machine Learning (AIML) is a recognised world-class facility.

<sup>36</sup> Correspondence received from SA NT DataLink.

<sup>37</sup> For more information see: <<https://healthtranslationsa.org.au/our-work/platforms/health-analytics-research-collaborative/>>.

<sup>38</sup> E Miesta, 'AI is Ready to Impact Clinical Trials', *Clinical Leader* editorial, 8 May 2019.

The University of Adelaide considers that SA NT DataLink could leverage AIML's capabilities.<sup>39</sup> Currently, AIML is collaborating with SAHMRI to create an artificial intelligence and machine learning platform in order to achieve world-class AI-in-health research capability in South Australia.<sup>40</sup>

## Summary

Drawing these elements together, the Commission concludes:

- SA NT DataLink has been cited by almost every submission and information document received as a vital, but under-resourced asset, with further potential for data collection and linking to incorporate a more diverse range of state agency datasets. A number of key stakeholders including the universities and LHNs agree that SA NT DataLink is at risk of closure if a reliable funding arrangement is not secured.
- SA NT DataLink will require a revised governance structure and business model to ensure it can operate as a reliable and responsive piece of infrastructure for HMR in SA and offer a competitive advantage to South Australian HMR.
- There may be an opportunity to apply a recognised South Australian strength in AIML to SA NT DataLink in the field of health research to generate novel AI methods to raise health outcomes and HMR.

The Commission concludes the current funding situation for SA NT DataLink is not conducive to providing, building and maintaining a quality data linkage service for South Australian HMR. There is a role for government and other interested parties to find a solution.

This conclusion has been strongly supported in submissions and correspondence from SA NT DataLink, CEIH, SALHN, Flinders University, Adelaide University, HTSA, CALHN Executive Research Committee and others. In addition to securing stable, multi-year core funding, submissions have also identified the need for accountability processes to ensure the effects of increased investment can be monitored, achieving this through a modified governance and business model.

### Recommendation 7.1

To ensure that South Australia remains competitive in its ability to use trusted and accurate data to understand its population and improve their quality of life across the board (including health, education and social support), the Commission recommends that the South Australian Government ensures the ongoing operation of SA NT DataLink with the Department of the Premier and Cabinet (DPC), as a matter of some urgency to:

- a) assist SA NT Datalink to develop a business model and business case for securing stable, multi-year funding, including guidance on the performance outcomes it expects;
- b) assist stakeholders and joint venture partners establish a new skills based governance model including consumer advocacy and engagement; and

<sup>39</sup> The University of Adelaide (DR29, p.11).

<sup>40</sup> SAHMRI (DR25, p.4.2).

- c) work with the NT Government and SA Government agencies that are users or beneficiaries of SA NT Datalink to secure appropriate ongoing core funding from the SA and NT governments together with a simplified joint venture partner funding model and governance process in line with other successful Australian data linkage programs.

### 7.3 Infrastructure

Data infrastructure protects, preserves, processes, moves, secures and serves data as well as their applications for information services delivery. Technologies that make up data infrastructures include hardware, software, cloud or managed services, servers, storage, input/output, and networking along with people, processes, policies and various tools spanning legacy, software-defined virtual networks, containers, and the cloud.<sup>41</sup>

Data are a valuable economic resource and the support of clinical registries and linked data resources is vital to the timely and efficient use of the available data. Suitable information-storage capacity and interrogation capability are required for the management of big data and expert analytics staff are essential for quality outcomes. Submissions from universities and information received from DHW identify an infrastructure gap affecting data management and storage in South Australia.

The University of South Australia (UniSA) provides infrastructure for SA NT DataLink and stated:

*The absence of state government-supported high-performance computing capability is a major bottleneck for larger-scale, collaborative, data-driven research. (University of South Australia, DR34, p.2)*

UniSA also considers that data needs to be part of that infrastructure strategy, not a separate user-pays component.

Despite the recognised importance of data access, data collection, data registries and linked datasets, the CEIH considers:

*South Australia does not have an identifiable sustainable research data asset. Filling the research-data sharing gap in SA is the valuable and important SA NT DataLink. (Correspondence from CEIH, p.4)*

It seems likely that the current infrastructure would inevitably be further tested if the pool of private health data becomes available for collection and linkage. Private health providers consider their data a commercial asset, and responsibility for the associated costs of storing and managing that data in a wider infrastructure is unclear.

South Australian registries including CADOSA and business units such as CALHN Research Services, universities and SA NT DataLink have advised investment in their own siloed infrastructure and governance has resulted in infrastructure gaps and data accessibility issues that constrain HMR capability.

Flinders Medical Research Institute considers the capacity to house and securely store data for national and international clinical trials and clinical repositories in South Australia, and making this information accessible to other researchers, would strengthen HMR in South

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<sup>41</sup> <<https://www.networkworld.com/article/3171257/whats-a-data-infrastructure.html>>.

Australia. The Adelaide BioMed City Expert Taskforce considers the capability of South Australian clinical trial data would be increased by establishing and supporting:

- *Study Coordinator Database – providing contact details of study co-ordinators available to assist in clinical trials.*
- *Clinical Trial Employment Database – listing of available clinical trial positions including project managers, project administrators and study co-ordinators.*
- *Healthy Volunteer Database – contact details of healthy volunteers available for clinical trials.*
- *Clinical Trial Patient Database – contact details of patients available for clinical trials, with their particular preference for clinical trial participation. (Adelaide BioMed City Expert Taskforce, DR45, p.7)*

The Office of the Chief Scientist considers developing a broader ‘SA Research and Innovation Intelligence Database’ would provide a shared resource to a range of agencies, research institutions and health care providers.

While the Commission considers all these suggestions may be useful to researchers, further work to develop an infrastructure strategy and business case is needed.

The Commission understands DHW Research Office has finalised the procurement of a new Research Governance and Ethics Management System (GEMS), due for phase 1 implementation in December 2020 to manage, report and track research governance activities, grants and post-approval processes. GEMS will provide a standardised, single entry point for research applications, manage a dual approval and administrative process through the HREC and site-specific assessment stages and provide greater clarity for the individual researcher who will be able to monitor progress.<sup>42</sup> DHW has advised that it will commit to the provision of ongoing system administrators for both the new South Australian Clinical Trials Portal and the recently procured GEMS.<sup>43</sup> The value of both systems has been recognised in the state governments, *Health and Medical Industries Sector Plan* released in October 2020. The Commission considers this will create a more efficient and researcher friendly system.

The current development of a DHW data analytics plan, one of whose stated aims is to identify infrastructure requirements, will inform decisions on infrastructure investment and the role of the state government.

## 7.4 Conclusion

The Commission accepts that world-class HMR depends on access to high-quality data in data collections that are, increasingly, linked. South Australia has some advantages in current data repositories and data linkage. That said, the data environment in South Australia is fragmented in quality, quantity, availability and ownership and an unhelpfully complex regulatory environment limits access to data repositories and promotes risk-averse responses from their custodians.

The absence in South Australia of a whole-of-state approach to health data management, evident in other jurisdictions, is a significant gap that may eventually be addressed by DHW’s current efforts to develop a health data and analytics plan. That plan may also address a range of specific issues including obtaining patient consent for research, data use licences,

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<sup>42</sup> For more information on GEMS see:

<https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+and+medical+research/research+gems>.

<sup>43</sup> Correspondence received from the Chief Executive, DHW, 21 October 2020.

electronic medical record optimisation for research, missing data types for under-represented population groups, fragmented data silos and so on.

The Commission also concludes South Australia would benefit from a stable and secure data environment conducive to investment in data infrastructure where data custodians are confident of data integrity, security and safety.

The funding for data linking and data registry management is uncertain in some important areas. SA NT DataLink is funded largely by uncertain commitments from joint venture partners along with some Commonwealth PHRN funding. Fragmented and short-term funding does not allow for long-term surety and development or for secure expert staffing.

Data registries held in SA NT Datalink, SAHMRI and other SA Health locations also require high-level expertise to secure, manage, retrieve and interrogate data. Data analytics expertise is relevant to realising the potential of available data types and sources and bringing together members of the research community.

In short, in the Commission's view, South Australia has opportunities to strengthen its position in data by linking HMR and existing data with other capabilities, especially AI, machine learning and big data analytics.

The Commission concludes that an ideal data environment to support HMR includes the following features: a stable suite of data registries including private healthcare provider data and a quality linking service, all managed in a financially sustainable manner, decluttering of the regulatory environment to remove access bottlenecks, and a robust SA Health data and analytics plan supported by a whole-of-state-government data strategy to promote a coordinated approach to data development and use.

The Commission understands that some action is underway to improve the state's data environment and has recommended further reforms, including regulatory changes to remove access bottlenecks in chapter 5, to improve South Australia's competitiveness in data-driven HMR. Looking to the future, data access will require ongoing strong leadership from DHW to ensure these reforms are effectively implemented.

## 8. Translation and commercialisation

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### 8.1 Introduction

This chapter considers translation and commercialisation processes in the context of how health and medical research (HMR) leads to improved health and economic outcomes. An understanding of these processes is necessary to inform government action to increase both the translational impact of HMR and its impact on the state's economy.

The Commission is asked to:

- identify and assess the opportunities for increased commercialisation of health and medical research in South Australia (TOR 4);
- identify industry needs and current barriers to undertaking health and medical research and development (R&D) in South Australia and identify models to facilitate industry health and medical R&D in South Australia (TOR 7) including industry structure and composition (TOR 2);
- identify and assess the characteristics of South Australia and its population that may give rise to areas of competitive advantage compared to other jurisdictions in health and medical R&D and identify methods to maximise these opportunities (TOR 6); and
- recommend action the government might take to increase the scale and productivity of private sector R&D.

The Australian Government Department of Health defines translation as the process by which new medical discoveries become part of the clinical practice of GPs, other specialists and hospitals, and enhance human health and well-being at the personal and community level. The Robinson Research Institute further noted:

*Research improves outcomes for patients through improvements to clinical practice, application of current knowledge from emerging research, access to clinical trials and new treatments and interventions, and also through attracting high quality clinician researchers to the state. (Robinson Research Institute, DR21, p.3)*

There are several stages through which research ideas ultimately become clinical practice. Figure 8.1 shows the McKeon model, which the Commission considers to be a generally accepted framework and which has been used in this report. HMR is translated into economic benefits through commercial activity to develop new and improved products from research findings.

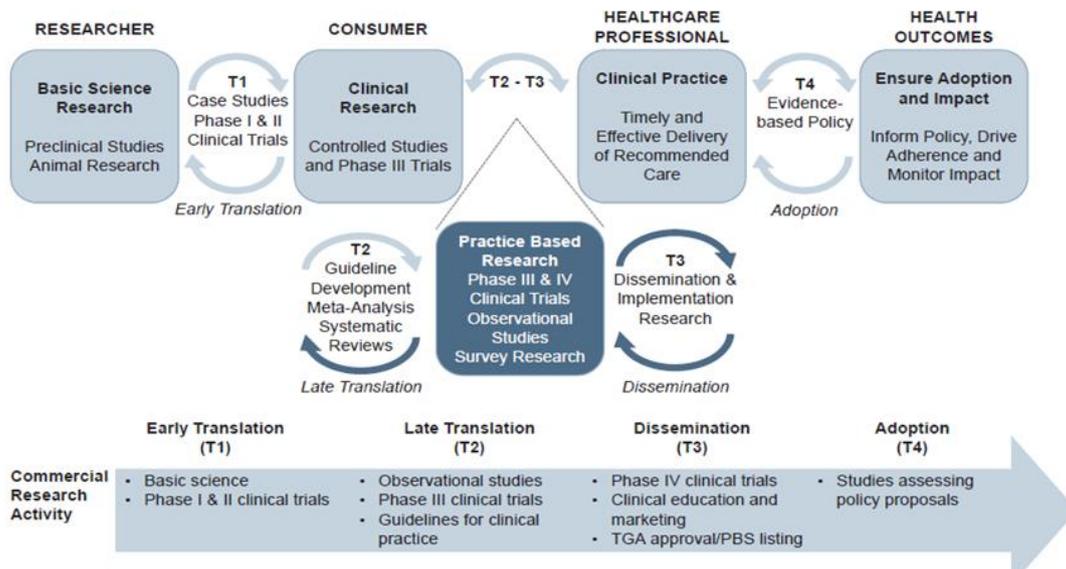
The Commission is interested in the extent to which local research results in translation or commercialisation and possible actions by the South Australian Government to increase the impact of health and medical R&D activity in South Australia on the state's economic growth.

The rate of translation of research into practice and policy in Australia and overseas is relatively slow. The University of Adelaide considers:

*the commercialisation of new technologies from the health and medical sector can be a long and complicated process ... the timeframe to go from 'bench to bedside', from the initial breakthrough in a research laboratory to a new therapeutic being approved by regulators and available to the health care system can take between 10 to 15 years. There are also many reports highlighting the average cost of developing and launching*

*new therapeutics to exceed an investment of well over US\$800M – some reports put this cost at over US\$1B. (The University of Adelaide, DR29, p.7)*

Figure 8.1: HMR translation.



Source: S McKeon et al, (2013), p. 176.

The chapter covers translation (Section 8.2), commercialisation (Section 8.3) and opportunities and barriers to both (Section 8.4). Section 8.5 considers clinical trials followed by Section 8.6 on the health and medical industries. The Commission’s conclusions are set out in the final section.

The Commission notes the subject matter of this chapter is very large and would itself justify a separate inquiry.

## 8.2 Translation

This section sets out the key issues raised by inquiry participants on health translation.

The McKeon Review (2013) classified translation of HMR into public health research, health services research, health system innovation and evidence-based policy; and by level of focus on impact. This categorisation is shown in Figure 8.2.

Figure 8.2: Types of non-commercial research and translation.

Focus on Impact	Evidence Creation			Evidence Translation	
	Type of Research	Public Health Research	Health Services Research	Health System Innovation	Evidence-based Policy
1. Descriptive Studies ('Describe Y')	• Epidemiology and population studies	• Health system studies	• N/A	• N/A	
2. Evaluation ('Does Intervention X work?')	• Assessment of preventive measures	• Comparative effectiveness • Health economics	• Assessment & audit of evidence-based practice	• Policy evaluation	
3. Translation ('How best to implement X?')	• Public health improvement	• Implementation evaluation	• Clinical guidelines • Implementation research	• Social and behavioural studies • Policy proposals	
4. Implementation ('Do X')	• Preventive programs	• Change Management	• Adoption of guidelines • Regulation	• Evidence-based policy	

Source: S McKeon et al. (2013) summary report, p.42.

Non-commercial translation activity provides individual and population health benefits through improvements in healthcare policies and practices. The Commission notes the shift in national policy to reorient HMR toward research translation and improving health outcomes and impact including the establishment of health translation centres. Health Translation South Australia (HTSA) is the state’s only National Health and Medical Research Council (NHMRC) accredited and funded advanced health research translation centre. It was founded in 2015 to facilitate successful translation by bringing together universities, health researchers and health service providers and to ensure that health research can positively impact the health of individuals and the community via changes to healthcare policy and practice.

Translation may also have significant indirect economic benefits, including cost savings and avoided costs from reduced hospitalisations. According to the Public Health Association of Australia:

*Much of the focus in health and medical research appears to be on clinical trials and laboratory-based research, rather than health protection, health promotion, and prevention approaches ... An increased focus on this, to elevate public health in South Australia, as a complement to commercialisation of research outcomes, should be an objective of a reformed approach to health and medical research in South Australia. (Public Health Association of Australia, DR20, p.2)*

And the HTSA:

*emphasis is being placed on the benefits of research to end users, including patients or other service recipients, as well as the traditional bibliometrics of publications and grant success. (HTSA, DR17, p.5)*

This trend has been encouraged by the NHMRC’s attention to assessing the impact of research, and by the Medical Research Future Fund (MRFF) which provides funding for translational research.

NHMRC grants are categorised as contributing to one of the four pillars of HMR: basic science, clinical medicine and science, public health and health services research. The performance of SA HMR grants in public health can potentially signal the relative competitiveness of translational activity in SA HMR. In 2019, SA was allocated 21 per cent of the national funding for all NHMRC grant awards which had a focus on public health - behind

Victoria (29 per cent), NSW (24 per cent) and the ACT (23 per cent).<sup>1</sup> This compares to 2018, when SA was allocated 13 per cent of the national funding, behind NT (25 per cent) Victoria (23 per cent) and NSW (23 per cent).

The Commission has examined R&D expenditure data in an attempt to identify the research focus in the state and its implications, if any for the level of commercialisation activity in the state. The absence of a culture or incentives to engage in market-oriented applied research may limit local commercialisation even with an increase in grant funded research activity if that activity is focused more on basic than applied research and less geared toward achieving translational outcomes compared to other states. Data providing a breakdown of type of research activity by field of research are not available.

In analysing expenditure by type of research activity for the South Australian and Australian higher education sectors in 2018, compared to the national average, South Australia's higher education R&D focuses less on applied research (43 per cent compared to 48 per cent) and experimental development (8 per cent compared to 11 per cent). However, the Commission's view is the split between applied and experimental research is close to the national average and the difference does not appear to be significant.

Several South Australian organisations focus on translational research including the Basil Hetzel Institute for Translational Health Research (BHI), the South Australian Health and Medical Research Institute (SAHMRI), the Robinson Research Institute, SA Pathology and the Southgate Institute for Health, Society and Equity.

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<sup>1</sup> Percentage of competitive applications submitted by each state's broad research area, awarded NHMRC funding (\$m). Competitive grants are those that go through a peer review selection process for funding as opposed to non-competitive grants that are not required to go through the same process. This analysis includes only competitive grant applications.

*Box 8.1: Case study – Translation of research evidence into health and economic benefits.*

SAHMRI has noted that their researchers have achieved translational outcomes across a range of disease states and health service settings, including cardiovascular health, cancer and precision medicine, emergency medicine and aged care.

Below are examples of projects where SAHMRI has attempted to quantify the true cost savings to the health system:

**Chronic myeloid leukaemia (CML)**

- cost savings from pioneering treatment cessation in patients achieving deep molecular response of approximately \$250 million nationally over 10 years;
- removal of need for 3 monthly bone marrow tests for 5000 CML patients nationally – saving at least \$600,000 annually; and
- avoidance of bone marrow transplants nationally – saving \$18 million annually.

**Improving care for newborns in South Australia**

- predicted or estimated future savings of \$43,000 annually with reduced preterm births resulting in cerebral palsy;
- lifetime cost saving of \$5.57 million per cerebral palsy case; and
- projected estimated cost savings of \$200,000 per year from reducing newborn length of stay and \$242,000 per year from reduced maternal length of stay through better targeting of antibiotics.

*Source: SAHMRI, DR25, p.45.*

Several submissions including one from Southgate Institute considered public health research has been under-funded in Australia relative to medical research. Some participants considered that transferring state government research funding to SAHMRI (discussed in chapter 3) has led to the loss of public health improvement opportunities in South Australia.

Southgate Institute noted that from 2013 SA Health de-funded public health research units and reduced its internal public health research capacity:

*This included defunding of the South Australian Community Health Research Unit (SACHRU), which was previously co-located with the Southgate Institute and Discipline of Public Health at Flinders University. This funding was also provided to SAHMRI on its establishment. (Flinders University, Southgate Institute, DR16, p.4)*

Inquiry participants stated that, by comparison, several state governments, including NSW, WA, Victoria and Queensland, fund programs that promote HMR translation (see Appendix 2).

Stakeholders such as the Public Health Association of Australia and the School of Public Health have contended that public health research was not suitably addressed in the draft report. The School of Public Health noted:

*We note that the report is almost solely focussed on clinical research (hospital-based, LHNs) and clinician researchers and does not consider that community-based or public health research is also undertaken (and often not by clinicians). Public health research, of which health services research is a part, along with enablers of public health research, receive little mention in the SAPC report. (School of Public Health, FR17, p.1)*

And the Public Health Association of Australia considered:

*of the 133 references to public health in the draft report, the majority appear to relate to the system and clinical aspects of public health, rather than that of public health promotion, protection and prevention approaches. The current COVID-19 pandemic highlights the critical need for public health approaches. As stated in the PHAA policy position statement, health promotion and illness prevention action have significant positive impacts on population health, and evidence-based health promotion and illness prevention initiatives result in major cost-savings and deliver public return on investment for governments and the community, including hospital avoidance. (Public Health Association of Australia, FR12, p.1)*

The Commission acknowledges the importance of public health research leading to translation which provides individual and population health benefits through improvements in healthcare policies and practices. The contribution of public health research to public policy intervention is potentially a significant contribution to the wellbeing of SA citizens. As discussed in chapter 4, based on the assessment of trends and interstate comparisons of public hospitals, South Australia appears to have improved its performance towards the national average. That said, the extent of translation of local research in SA's health system is difficult to establish, particularly given the potentially long and variable lags between research and outcomes and the lack of available data on a health system-wide basis.

Translational research covers both new and improved products (goods and services) and process improvement. While both make important contributions to the efficiency and quality of health care, process improvement benefits such as higher effectiveness, quality and efficiency tend to be somewhat overlooked.

The Commission has been advised of improved productivity and patient outcomes in public health care due to initiatives and mechanisms that encourage and support continuous improvement and innovation at the front line of healthcare services. For example:

- NALHN's strategic focus on research-based productivity improvements to sustain high performing health and well-being services for an increasing northern catchment population with a relatively high disease burden; and
- the best practice spotlight organisation (BPSO) program for nurses and midwives which aims to improve patient outcomes by providing a structured methodology for organisations to prepare, implement and evaluate evidence based practice improvements over time.

Information provided to the Commission has indicated that continuous improvement initiatives can provide benefits that go beyond the relatively small initial investment. The Australian Nursing and Midwifery Federation (SA Branch) (ANMFSA) advised the Commission that there have been numerous benefits arising from the relatively low cost BPSO Program in hospitals including: reduced lengths of stay; reductions in falls, pressure ulcers and amputations; improved consistency of practice; improved quality of care and patient and staff satisfaction; and net cost savings (by reducing falls etc).<sup>2</sup> A culture of evidence-based continuous

<sup>2</sup> ANMFSA (FR22, p.3).

improvement – an important dimension of a research culture – has underpinned these dividends.

NALHN argued that investment in a locally embedded research capability, training and mentoring of staff will support a culture of research and continuous improvement that will deliver ongoing productivity and quality improvements resulting in better health outcomes in Adelaide's northern suburbs. (Correspondence from NALHN)

The Commission has found that some of the more common elements required for successful evidence-based continuous improvement programs include:

- a strong commitment from leadership – particularly with respect to focussing research resources on front line patient care as against pure scientific research, and providing an effective voice for the front line workforce to identify and implement change;
- a cultural change that prioritises and embeds research at the front line of healthcare and acknowledges the need for ongoing incremental change, as well as occasional step-change;
- a recognition that HMR research and translation involves a range of professional participants including allied health professionals and nurses; and
- the effective application of enabling infrastructure and mechanisms to support research activity at the front line including adequate ICT (to capture and report on research data), communications (to foster collaboration), and HR policies and practices (to minimise adverse impacts on existing staff responsibilities).

These success patterns are also commonly found in other industries. The above suggests that typical barriers can include:

- inadequate data and evaluation of initiatives to provide a case for change to both decision makers and the workforce (with notable exceptions including the ANMFSA's economic evaluation of the BPSO Program<sup>3</sup>);
- lack of leadership commitment and inadequate attention to cultural change challenges;
- not accepting the role of front line healthcare workers in identifying, implementing and evaluating research innovations in a practical environment.

Many of the success elements and barriers identified above are relevant to research-based productivity improvements that arise both from incremental / continuous improvement changes, as well as improvements arising from step-change initiatives. Moreover, locating the relevant research capability in proximity to successful frontline improvement activity can increase the effectiveness of those efforts and reinforce a research culture in hospitals.

Current HMR funding programs encourage a research focus on treatments and devices. The Commission concludes that attention to research effort linked to continuous improvement in process and care practices offers potential to deliver significant improvements in productivity and quality in the health system. It also offers opportunities to create improvement dividends that can increase the resources available for HMR.

### 8.3 Commercialisation

All three public universities have established commercialisation entities. Adelaide Enterprise is the University of Adelaide's commercialisation arm and forms part of the university's Innovation and Commercial Partnerships (ICP) branch. The university also has a commercialisation accelerator scheme, which is wholly internally funded and administered by

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<sup>3</sup> ANMFSA, *Best Practice Spotlight Organisation (BPSO) Pilot Project Evaluation Report* (2015).

ICP. It provides a competitive funding stream for researchers designed to support innovations at all stages of the translation process, including to the point at which they can be successfully commercialised.

At Flinders University, responsibility for identifying intellectual property that possesses commercialisation potential is diffused among several groups and individuals, including Flinders commercialisation, the Flinders-based Medical Device Partnering Program (MDPP) and the New Ventures Institute (NVI). The MDPP, which is partly supported by the South Australian Government, supports collaboration between researchers, industry, end users and government to develop new or adapted medical technologies. The NVI is based at the Tonsley Innovation District and is intended to provide people with training, mentoring and connections.

*Box 8.2: Case study – The Medical Device Partnering Program*

The MDPP was founded in 2008 by Flinders University as an ideas incubator focused on the early stage development of medical device technologies, ensuring that cutting-edge concepts aren't left languishing in the minds of their inventors.

It is being expanded nationally, with help from the Australian Government's Industry Growth Centres Initiative, to support entrepreneurs to bring medical technologies to market.

Through leveraging collaborative networks of researchers, entrepreneurs, industry experts and end users, the program takes these concepts and provides up to 250 hours of professional expertise to rapidly establish proof of concept, prototypes, commercial planning or clinical evaluation.

LaunchVic has committed \$2 million to establishing the program in Victoria, and the South Australian Government has announced a further \$1.5 million over five years for the program. Together, this support allows the MDPP to screen over 150 enquiries for new medical technologies and undertake 30 projects per year.

*Source: [Industry.gov.au/IndustryGrowthCentres](http://Industry.gov.au/IndustryGrowthCentres)*

The University of South Australia (UniSA) has established UniSA Ventures, a technology commercialisation and investment management company as a wholly owned subsidiary of UniSA.

AusHealth, is a wholly owned subsidiary of the Central Adelaide Local Health Network (CALHN) incorporated under the provisions of the *Corporations Act 2001* and is responsible for commercialising research sourced from CALHN. AusHealth (originally called Medvet Science Pty Ltd) was established in 1985 by the South Australian Government as part of the *Institute of Medical and Veterinary Science (IMVS) Act* to generate funds to develop intellectual property in the Royal Adelaide Hospital and IMVS.<sup>4</sup>

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<sup>4</sup> In 2018 Medvet Science Pty Ltd became AusHealth Corporate Pty Ltd which operates three business divisions: AusHealth Work: provider of drug & alcohol testing in Australia and other services for worker wellness; AusHealth Hospitals: manages patient payment solutions, improving the performance of hospital billing; and AusHealth Research: intellectual property development focused on health in hospitals in South Australia. AusHealth operates two business divisions that fund intellectual property development.

The Northern Adelaide Local Health Network (NALHN) has recently contracted a private intellectual property and commercialisation company to assist it with all intellectual property development. The Southern Adelaide Local Health Network (SALHN) has its own commercialisation agreement with Flinders University. The Commission understands that the university manages intellectual property (IP) generated by SALHN employees. SAHMRI has its own commercialisation division – Bright Arena. Since 2017, SAHMRI has partnered with Bright Arena to support commercialisation activities within the institute.

Health and medical industries have been identified by the state government as a strategic growth sector for South Australia. In support of commercialisation the *Health and Medical Industries Sector Plan* released in October 2020, notes that the state government's ongoing investment in the MDPP will create additional HMR opportunities in SA:

*The MDPP will support more projects, creating medical technology start-ups and knowledge-based employment opportunities in South Australia. Dedicated facilities and funding will be developed to help commercialise the intellectual property of local research.*<sup>5</sup>

Other than the MDPP, the South Australian Government does not have a program specifically for HMR commercialisation, although the sector falls within the broad remit of the government's general commercialisation initiatives (discussed later in the chapter). This contrasts with the approaches taken in other mainland states. NSW, Victoria, WA and Queensland initiatives to support HMR commercialisation are outlined in Appendix 2. The Commission is not aware of any evaluation of the performance of these programs.

## 8.4 Opportunities and barriers

### 8.4.1 Translation

As noted in Chapter 4 the NHMRC has increased the weighting given to the impact of research in assessing grant applications. The commencement of the MRFF, which prioritises research translation and improving health outcomes, has given further impetus to focusing on translation of activity in South Australia. UniSA noted:

*The MRFF, in particular, provides an outstanding opportunity for key players to build upon other major successes, such as clinical trials, to embark on an ambitious strategy for translational research. (University of South Australia, DR34, p.2)*

Clinical research undertaken jointly between hospitals and universities plays a critical role in translation. The University of Adelaide Faculty of Health and Medical Science argued:

*Research translation works best when it is pragmatically hard wired into operational practice, because the distance from generating research evidence to practice is shorter. Clinicians have a key role to play. Much accumulated evidence suggests effective translation is unlikely to be achieved by 'translators' external to the core business. Lead clinician researchers used to play these roles in the health system by creating evidence, synthesizing best practice and working within the system for research translation into practice. That harmonization of research, practice and translation is not optimal in SA, but there is plenty of guidance and exemplars of how to achieve this by building genuine research partnerships across academia and the health system. (University of Adelaide Faculty of Health and Medical Science, DR28, p.6)*

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<sup>5</sup> Department for Trade and Investment, *Health and Medical Industries Sector Plan 2020 to 2030* (2020) 29.

And the University of Adelaide considered:

*The next element to support greater success in this endeavour is closer links between fundamental research at universities and clinical needs in hospitals (as detailed under Term of Reference 2) ... within the wider Health and Medical Precinct, there continues to be a disconnect where these activities are not linked as effectively as they could be to leverage the expertise and capability of each individual group to drive outcomes in clinical translation and have significant impact on patients and our community. (University of Adelaide, DR29, p.8)*

Anecdotal evidence from stakeholders and reviewed literature identified challenges in research translation, including:

- lack of clear structures and processes for change management as part of the implementation of new evidence;
- lack of people with implementation science skills;
- lack of clear guidance and frameworks for improving or changing practice; and
- the need to strengthen the research culture and the ability to use evidence as important components of clinical practice and teaching/training.

The Commission also heard of some successes in translating medical research into public health policy in South Australia. Stakeholders provided examples of historical clinical innovations that have improved clinical care and health services.

That said, chapter 4 established there is no clear consensus on the methodology for quantifying the health or economic benefits of translation and little rigorous assessment of translation in practice on a system-wide basis. The Commission considers much greater attention to evaluation, including quantification, of impact is required.

*Box 8.3: Case study – Aboriginal health.*

The Aboriginal Health Equity group (AHE) at SAHMRI, led by Professor Alex Brown, conducts research relevant to the health and well-being of Aboriginal people in South Australia and Australia, with a focus on reducing inequity in health and well-being.

AHE is recognised for its expertise across a wide range of public and population health research and translation capabilities. It is the largest group of Aboriginal researchers in Australia.

SAHMRI has been successful in winning NHMRC funding for Aboriginal and Torres Strait Islander health research over the past seven years. As a lead or partner, SAHMRI has received 90 per cent of all NHMRC funding to South Australia for Aboriginal and Torres Strait Islander health research.

*Source: SAHMRI, DR25, p. 28.*

### 8.4.2 Commercialisation

Commercialisation is the primary means through which medical products reach the market, improve health outcomes and generate economic gains for the organisations involved and the broader economy as well as generating interest in further research.<sup>6</sup>

The Commission's perspective on commercialisation is heavily influenced by the international evidence and the personal experience of Commissioners. The Commission considers:

- Building an internationally competitive health and medical sector in South Australia depends on a flow of deals and opportunities coming from world-class local HMR.
- Size matters for commercialisation and deal flow. International benchmarks that relate research spending to relevant commercialisation outputs, such as licensing agreements, invention disclosures, patents and start-up company activity mean, in the Commission's view the most plausible scenario is that South Australia's current HMR activity could provide a small number of commercialisation opportunities.
- The Australian Government Department of Industry undertook international benchmarking of commercialisation metrics from 2004 to 2014.<sup>7</sup> The historical Australian performance suggests that for every US\$100 million of R&D expenditure it should be possible for South Australia to generate 10–11 licences and 0.2–1.0 start-up companies. In 2016 South Australian expenditure on HMR was A\$240.3 million<sup>8</sup> or US \$173.7 million. The state could therefore expect in the order of 17 licence agreements to be executed and 1–2 start-up companies to be established each year.
- Research undertaken in the LHNs currently represents a fraction of the state's total HMR, which calls into question the cost effectiveness of separate commercialisation units.
- Building HMR capability depends on strategic investments in people – especially world-class leaders of clinical research – rather than new buildings; and possibly applying other areas of excellence such as artificial intelligence and machine learning to HMR.
- Addressing other gaps and inefficiencies identified by inquiry participants will help at the margin, including cutting red tape and duplication.

Against that background, the Commission notes inquiry participants provided many views on the barriers to commercialisation, supported by mainly anecdotal evidence about the adverse impact of:

- fragmentation and a lack of coordination between the state's research commercialisation organisations;
- shortage of skilled commercialisation 'translators' and links to clinical collaborations to mentor researchers in commercialisation strategies;
- difficulties in accessing venture capital;

<sup>6</sup> T Caulfield and U Ogbogu, 'The Commercialisation of University-Based Research: Balancing Risks and Benefits' (2015) 16 *BMC Medical Ethics* 70, doi:10.1186/s12910-015-0064-2.

<sup>7</sup> <<https://www.industry.gov.au/sites/default/files/2019-02/2014-nsrc-table-3-2004-2014.pdf>>.

<sup>8</sup> <<https://www.abs.gov.au/ausstats/abs@.nsf/mf/8111.0>>.

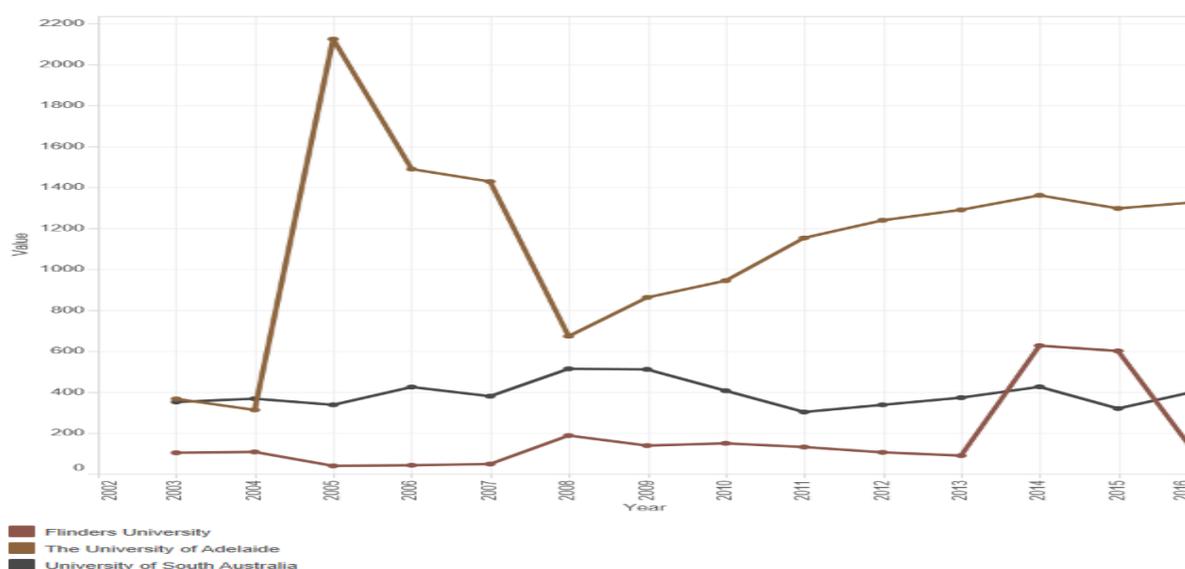
- obstructive intellectual property controls;
- lack of industry scale in the sector;
- ethics approvals processes;<sup>9</sup> and
- access to data and analytical capability.

The remainder of this section considers the level of commercialisation activity and some factors thought to affect it including collaboration, access to finance, intellectual property and commercialisation skills. The research approvals processes and access to data are addressed in chapters 5 and 7 respectively.

### Commercialisation activity in South Australia

The traditional method of assessing commercialisation activity is to consider the research outputs and income metrics such as licences, start-ups, consultancies, contracts and collaborations, which can indicate the translation success of an institution and sector.<sup>10</sup> Figure 8.3 compares the number of consultancies, contracts and collaborations per year for Flinders University, the University of Adelaide and UniSA, based on the National Survey of Research and Commercialisation.<sup>11</sup>

Figure 8.3: Number of consultancies, contracts and collaborations by South Australian universities, 2002–16.



Source: <[https://public.tableau.com/views/NSRC\\_Tableau\\_Visualisation\\_2018/NSRC?:embed=y&:toolbar=no&:display\\_count=no&:showVizHome=no](https://public.tableau.com/views/NSRC_Tableau_Visualisation_2018/NSRC?:embed=y&:toolbar=no&:display_count=no&:showVizHome=no)>.

Notes: Consultancies, contracts and collaborations executed in the reporting year may include work with partners in grant-funded research such as competitive research grant projects. As data are based on a survey methodology, trends may be impacted by individual institutions non-reporting in certain years.

<sup>9</sup> The Commission notes that this is being addressed through the government response to the Birch Review.

<sup>10</sup> Definitions and metrics for research commercialisation are available through the National Survey of Research Commercialisation, which is conducted by the Department of Industry, Science, Energy and Resources. For more information, see <<https://www.industry.gov.au/data-and-publications/national-survey-of-research-commercialisation>>.

<sup>11</sup> Ibid.

The Commission also examined available patent data as a proxy both for R&D innovation output and the extent businesses turn investment in R&D into new technologies, improved processes or new products launched.<sup>12</sup>

At an institutional level, based on the information provided by the universities, around 50 out of 74 active patents in the UniSA Ventures’ portfolio are in HMR. UniSA Ventures also has a history of commercialisation through licence options and assignments (LOAs). Over the past five years, UniSA Ventures has concluded almost 40 LOAs in HMR-related areas.

The University of Adelaide has established 43 active HMR technology licences to commercial partners since 2007. Of these, 25 have been entered into in the last five years. During this time, the university has considered 59 HMR technologies with 23 progressing to patent. Over the last three years, Flinders University has filed 11 patents in addition to spinouts and exploiting licensing opportunities for Flinders HMR.<sup>13</sup>

The Commission notes that this historical rate of activity is consistent with the annualised rates of licensing agreements predicted on the basis of the size of HMR activity and the international benchmarks. It is not known to what extent any of this activity occurred locally or had any economic impact in SA.

Table 8.1 presents the top applicants for HMR standard patents in South Australia, excluding universities. Since 2000, HMR patent applicants make up almost 15 per cent of the total in South Australia.

Table 8.1: Top ten applicants for HMR organisational patents in South Australia, 2000–19.

Name	Organisational count *	Main industry output
<b>Bionomics Limited</b>	156	Industry (bio – pharma)
<b>Medvet Science</b>	101	Medical science
<b>Women’s &amp; Children’s Hospital</b>	49	Hospital
<b>Soniclean</b>	29	Industry (cleaning)
<b>Ellex Medical</b>	28	Industry (ophthalmic lasers)
<b>Bresagen Limited</b>	25	Industry (stem cells)
<b>CALHN</b>	22	LHN
<b>SAHMRI</b>	18	MRI
<b>Micro – X Limited</b>	13	Industry (X-ray)
<b>Flinders Medical Centre</b>	9	Hospital

Source: OSAPC based on data provided by IP Australia.

\*Note: Approximate numbers only.

Patents are an imperfect measure of commercialisation activity. They can block innovation, waste resources and are often not a viable source of protection due to the short life of a medical device product (usually two–three years).<sup>14</sup> Moreover, medical device companies

<sup>12</sup> A patent is a right that is granted for any device, substance, method or process that is new, inventive and useful. For more information, see <<https://www.ipaustralia.gov.au/ip-reprot-2020/patents>>.

<sup>13</sup> Information received from the University of Adelaide, University of South Australia and Flinders University.

<sup>14</sup> S McKeon et al, *Strategic Review of Health and Medical Research: Better Health Through Research. Final Report* (Commonwealth of Australia, 2013) 226.

often use alternative methods of protection such as confidentiality agreements, and trade secrets. Many patent applications are filed prematurely which wastes time and resources. In addition, as noted by McKeon et al., premature award of patents creates a monopoly, which can slow the rate of innovation. Over-patenting can be a perverse driver, hindering commercialisation, especially where it involves too many parties.<sup>15</sup>

The Commission notes that data limitations prevent a full assessment of HMR commercialisation activity at both the sectoral and institutional level. This problem is not unique to South Australia. Additional HMR output measures are further discussed in chapter 4.

## Collaboration

Stakeholders identified several barriers to collaboration on commercialisation activity. Flinders University College of Medicine and Public Health stated:

*There are significant barriers to the commercialisation of research that has been conducted by academic status holders who are employed by SA Health and conduct research. Currently, there is limited to no coordination between SA Health and universities to facilitate commercialisation to benefit South Australia. (Flinders University, DR14, p.11)*

The Hospital Research Foundation (THRF) argued that commercialisation is an area where South Australia can realise high level outcomes via collaboration<sup>16</sup>, as shown in their view by the recent cooperation of health facilities and research offices across the state during the pandemic:

*the COVID-19 pandemic has spotlighted the crucial need for international scientific collaboration in both the public and private sectors to develop diagnostics, vaccines and treatments in order to tackle health emergencies. This requires open exchange of, and rapid access to, samples and information. (Correspondence from Office of the Chief Scientist, Department of Industry and Skills)*

This view of collaboration was reinforced by Dr Leanna Read, former SA Chief Scientist:

*the collaborative approach provided the opportunities for researchers to apply their skills to entirely new fields in which they had no prior experience. For example, some of the CRC's surface chemistry experts had never worked with living cells. By bringing these scientists together with cell biologists, they were able to achieve applications and outcomes of their research that would never be possible in the absence of such collaborations. (Dr Leanna Read, DR12, p.4)*

The Commission heard that focusing on a limited range of research areas is more effective than trying to compete across a wider spectrum of research. The Robinson Research Institute was identified as an example of the value of focus, in their case in reproductive medicine and science.

Several submissions including from Adelaide BioMed City, Health Translation SA, and the University of Adelaide identified the importance of organisation culture.<sup>17</sup>

*There is an opportunity to enable and boost clinician-led research in South Australia by promoting a culture where research is valued in the health system. (AAMRI, DR5, p.14)*

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<sup>15</sup> Ibid 228.

<sup>16</sup> THRF (DR15, p.19).

<sup>17</sup> Adelaide BioMed City (DR1, p.20); Health Translation SA (DR17, p.13); University of Adelaide (DR27, p.3).

Several submissions noted that South Australia has a comparatively small and diverse population, which can be advantageous in facilitating coordination and collaboration activity between institutions.<sup>18</sup>

The Commission also heard:

*SA is a smaller state with hospitals and universities within a short distance of each other with a relatively stable population seemingly ideal for studies to assist our community. The main barriers are territorial, administrative and financial. These are possible to address but has not materialised to-date. (Correspondence from University of Adelaide Clinical Academics)*

Submissions also identified the potential opportunities of applying the state's strengths in other disciplines to HMR. For example, some stakeholders suggested making the University of Adelaide's Australian Institute for Machine Learning (AIML) facility available for researchers across the state, not just those in the university.

Collaboration to share resources was also seen as a means of improving engagement between researchers and industry. Several stakeholders considered greater collaboration between the commercialisation arms of the three universities would be beneficial:

*An effective cooperation between the university commercialisation arms would be particularly attractive to potential investors and commercial partners. It is highly inefficient for an investor or company to have to deal separately with three universities in a city the size of Adelaide. Also, a close working relationship between the universities offers the potential to 'mix and match' technologies, resulting in a more competitive commercial opportunity. (Dr Leanna Read, DR12, p.5)*

Dr Leanna Read considered an incentive for universities to share resources to optimise commercial outcomes would appeal to investors and commercial partners.

*This would not necessitate a formal merger of their commercialisation arms, which is unlikely to appeal to the universities. Rather it should provide the opportunity and incentive to share resources to optimise commercial outcomes. Given the scarcity of quality commercialisation and investment managers for early stage HMR, some form of formal collaboration would seem an essential strategy. (Dr Leanna Read, DR12, p.6)*

The Commission notes the Victorian BioCurate model uniting two universities and the Victorian Government specifically aims to address the barriers that limit the translation and commercialisation of early stage research.

Although there are examples of successful research collaboration the Commission has heard from a number of stakeholders that discrete silos and competitive practices remain. Differing institutional and research priorities can constrain collaboration. After seeking further clarification none of the submissions received or information gathered led to the Commission modifying its views on this issue.

### **Access to venture capital**

HMR commercialisation requires funding at three key stages: preclinical, early clinical and late clinical. The Commission has heard that it is at the first two stages that shortfalls in funding, or

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<sup>18</sup> For example, Flinders University (DR14); University of Adelaide Faculty of Health and Medical Sciences (DR28).

inappropriately targeted funding, are frequently experienced. As acknowledged in the McKeon review, targeted support at these points is important.<sup>19</sup>

The Commission also notes the current size of HMR in South Australia means, on international benchmarks, the state could expect of the order of 15–20 licence agreements and 1–2 start-up companies to be established each year. This is a small deal flow.

Against that background, participants provided a range of views. SAHMRI considered:

*Early stage commercialisation is impacted upon by lack of funding for preclinical and early clinical work, as well as data collection. This must be addressed in order to ensure future success of commercial and economic impact. We must ensure that researchers receive funding to support these activities that are often considered too early for support from venture capital companies, but too late for academic funding from bodies such as the NHMRC and ARC. (SAHMRI, DR25, p.53)*

Venture capital has historically been seen as limited in Australia. That said, Australian venture capital has grown from \$124 million in funds in 2014 to \$568 million in 2016.<sup>20</sup> Government-supported funds exist at national and state levels.

The Medical Research Commercialisation Fund (MRCF)<sup>21</sup> is the largest life science investment fund in Australia and New Zealand. The MRCF is a \$250 million investment fund intended for the initial stage of research and works closely with its member institutes to identify opportunities with strong commercialisation potential.<sup>22</sup> It is a collaboration between major Australian superannuation funds, the Australian and New Zealand governments, Australian state governments and over 50 leading medical research institutes and research hospitals.

There are two major South Australian Government commercialisation funding initiatives available across all fields of research, including HMR. The \$28 million Research, Commercialisation and Start-up Fund (RCSF), launched in February 2019, supports researchers, entrepreneurs and businesses to accelerate commercialisation. The \$50 million state government South Australian Venture Capital Fund (SAVCF) is intended to help build early-stage companies to accelerate their growth to a national and global scale.

The University of Adelaide observed:

*It is a credit to the SA Government that these funds are made available. Unfortunately, it is a relatively small sum of money that is promoted to support technology opportunities from across all sectors and not just the health and medical sector, further 'diluting' the scale of funds available ... Access to such funding would see more new research breakthroughs, developed locally, reach the point of further investment by companies and/or investors to commercialise these outcomes and deliver new products to market. (University of Adelaide, Research Facility, DR29, p.8)*

The SAVCF is structured as a co-investment fund that requires each initial investment into an eligible company to be matched with at least 50 per cent investment from other venture capital funds. The SAVCF supports HMR businesses or institutions if they can demonstrate the successful completion of stage 1 clinical trials or the equivalent stage for medical devices.

<sup>19</sup> McKeon et al. (n 13) 144.

<sup>20</sup> Australian Private Equity & Venture Capital Association, *The Venture Capital Effect: A Report on the Industry's Impact on the Australian Economy* (2017) 12 <<https://www.avcal.com.au>>.

<sup>21</sup> For further details, see <<https://www.mrcf.com.au/>>.

<sup>22</sup> For the entire member list, see <<https://www.mrcf.com.au/who-we-are/members/>>.

*Unfortunately, and particularly, in the current economic environment, this may prove a significant financial barrier for South Australian universities or Medical Research Institutes. While there may be an established Proof of Concept there may not be available internal funds to provide matching funding. (Flinders University, DR14, p. 11)*

Since its establishment in 2017, the SAVCF has met with 472 applicants, with only four becoming successful. The low number, in SAVCF's opinion, reflected the BlueSky business model – the nature of the mandate is to generate income for the government and prove the business is on a path to commercial returns. That requires businesses to have an appropriate exit strategy. This mandate has since been reviewed. Of 46 opportunities assessed in 2020 to date (as at 13 May 2020) five have come from (or been developed in) a university, with all five being in health care or medical devices.

The Commission also heard from several stakeholders including SAHMRI about the 'valley of death' stage in the commercialisation process – taking a discovery from a possibility to a proof of concept that offers commercial possibilities. The absence of funding for this high-risk stage was argued to be currently the most serious funding impediment to a higher rate of potential deals for consideration by venture capitalists. This view, rather than shortcomings in venture capital, is consistent with Commissioners' experience and indicates that the current most critical gap is in 'proof of concept' funding to work up an investible proposition.

The Commission sought information about successful approaches to addressing this gap. Several stakeholders, including the University of Adelaide and Flinders University agreed with the Commission's view that proof of concept funding is a critical gap in progressing early stage concepts closer to an investible offering. This is evidenced by the University of Adelaide:

*While the University invests in IP and proof of concept funds across the institution, the level of funding available limits the number of projects that can be supported to the 'development' phase. ... The point at which traditional funding sources can progress research will only get them so far along the technology readiness scale (TRL), which is often far too early for equity investors. As such, there is a considerable gap that could be addressed through a revised grant funding initiative that is government led. (University of Adelaide - Supplementary, FR18, p.4)*

The Commission has heard that university commercialisation teams have modest proof of concept funds that they use to invest in projects with a principal goal of leveraging this investment with other funding sources to drive as much value as possible.<sup>23</sup> However, the University of Adelaide observed:

*due to the limited nature of this funding, and sources to seek leverage, there are many opportunities that, with further work, investment and time, could be developed into commercialisation outcomes but simply do not progress. (University of Adelaide – Supplementary, FR18, p.2)*

As noted by SAHMRI, there is no dedicated local state support mechanism for health and medical research proof of concept development:

*The Research Commercialisation Start-up Fund (RCSF) supports early stage companies but is industry agnostic and medical start-ups funded through this mechanism are already well into product development with significant funding already raised (e.g. GPN vaccines, Carina Biotech). (SAHMRI, FR15, p.49)*

The Commission has formed the view that there is a role for the state government to address this funding gap through the repurposing of existing funds. A number of stakeholders,

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<sup>23</sup> University of Adelaide (FR18, p.2).

including Dr Terry Sweeny suggested that there was an opportunity for the government to consider the best alternative uses of existing funds or the adjustment of existing grant funding mandates and guidelines to increase the eligibility of grant applications to accelerate translational research into industry or commercial outcomes.<sup>24</sup> The Commission notes a recent positive example of such an adjustment in response to the COVID-19 pandemic, the RCSF requirement for matched funding for Stream 2 applicants has been temporarily waived on a case-by case basis at the sole discretion of the Department for Innovation and Skills (DIS).

### Intellectual property

Several stakeholders identified diverse approaches to IP policy in the HMR sector as a barrier to commercialisation. Each hospital or research organisation manages its own intellectual property. In the case of public hospitals this is done within the state-wide framework of the government IP policy, discussed in chapter 2. Reaching multiparty agreements on intellectual property ownership and management has been difficult, with stakeholders asserting this has led to lost commercial opportunities. According to HTSA:

*one of the key barriers to successful research translation is the matter of Intellectual Property (IP). Sorting out who will own IP at research contractual stage causes delays in contract approval and research commencement. This is a particular issue when projects straddle both an LHN and a University. Clarity on IP ownership and education on IP for researchers, research office staff and executives approving research contracts is essential to overcoming this barrier. (HTSA, DR18, p.18)*

And SAHMRI:

*South Australia has several diverse approaches to the management of intellectual property. Each hospital and research organisation manage their own intellectual property (IP) and provide advice to their own staff. South Australia should consider avoiding duplication of effort and coordinating some of this centrally through the creation of a centralised IP network. (SAHMRI, DR25, p.54)*

And Flinders University:

*Due to the differences in organisational drivers, negotiations with LHNs to establish intellectual property and commercialisation rights have proved to be difficult and protracted. This contrasts with an earlier agreement between Flinders University and SALHN that the University would manage IP generated by SALHN employees. Unfortunately, this leads to lengthy delays in achieving successful negotiations and loss of funding and opportunity for the researchers, universities, LHNs and the South Australian economy. (Flinders University, DR14, p.11)*

The Commission considers the current fragmented and inefficient IP arrangements are an impediment to realising South Australia's commercialisation opportunities and to clinical research, especially where universities and their affiliated LHNs have different IP policies. This fragmentation is also a longstanding issue that has not been addressed effectively.

Lack of guidance and expertise on IP across SA Health increases the likelihood of different and problematic interpretations of the state-wide government IP policy, particularly when intellectual property is created by a clinician researcher jointly employed by an LHN and a research institution.

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<sup>24</sup> Discussion notes from interview with Dr Terry Sweeny.

The Commission sought views on possible approaches to simplifying and clarifying IP requirements including:

- establishing a centralised IP network as suggested by SAHMRI;
- SA Health, in conjunction with universities and industry, developing guidance on intellectual property and commercialisation;
- addressing intellectual property ownership and treatment in the contractual arrangements for clinician researchers who are employed in LHNs (including joint appointments); or
- making specific overarching framework agreements between LHNs and individual universities, as noted by Flinders University.

The Commission heard from a number of stakeholders, including SAHMRI, HTSA and Flinders University.

SAHMRI considers that South Australia is too small to compete with itself and would do well to pool its efforts, suggesting that a coordinated precinct and state strategy is required.<sup>25</sup> Flinders University stated that the state government IP Policy promotes the translation and commercialisation of IP for the benefit of the state.<sup>26</sup> However, a framework that describes the processes to enact the policy does not exist. According to Flinders University:

*The development of an IP framework is the first step in addressing key structural and procedural barriers to efficient IP commercialisation and translation. This framework should be developed in conjunction with SA Health, university and industry, and should be dynamic in providing certainty through centralised principles and policies whilst flexible and adaptable to meet individual needs and respecting local decision making within LHN's. (Flinders University, FR9, p.15)*

HTSA also agrees that the current state government IP policy promotes translation and commercialisation of IP but does not have the procedures and processes to enact the policy:

*In South Australia, a process to facilitate the provision of expert advice and commercialisation recommendations within SA Health is limited primarily to AusHealth for CALHN. This limits the opportunity to commercialise IP that has arisen solely within SA Health as well as limiting the opportunity to commercialise IP that has been generated jointly by researchers from SA Health collaborating with researchers from non-SA Health centres, such as universities...we are aware of examples for which the involvement of researchers from SA Health has hindered commercialisation of IP solely because of the barrier of getting decisions out of SA Health. (HTSA, FR11, p.10)*

The Commission notes that HTSA has argued for a process involving input from an expert panel to support government agencies to enact the IP policy and assess commercialisation opportunities. HTSA proposed:

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<sup>25</sup> SAHMRI, (FR15, p.28).

<sup>26</sup> Flinders University (FR9, p.15).

*The provision of expert commercialisation advice and associated recommendations will ultimately enhance the capability to translate health research into tangible services and products which benefit patients. (HTSA, FR11, p.11)*

Flinders University and several other stakeholders provided support to the proposed establishment of an independently run expert panel that could provide commercialisation advice to LHNs when required.

The state government's IP policy applies to the activities of all SA public sector agencies and entities, including SA Health. It provides for employees involved in the creation and commercialisation of IP to receive one third of the net returns.<sup>27</sup> In September 2017, the South Australian Government implemented a revised whole of government IP policy. The Department of the Premier and Cabinet (DPC) (Cabinet Office) has lead responsibility for this policy across government. Correspondence received from DPC confirmed that there has been no action by DPC to ensure the adoption and facilitate implementation of this policy. Primary accountability for implementation sits with agency chief executives and DPC has not promoted, monitored or evaluated its use, apart from checking compliance of any relevant proposals considered by Cabinet. The Commission has heard that little effort has been made to develop guidance procedures or training on implementation of the policy by either the Department for Health and Wellbeing (DHW) or LHNs. As evidenced by SALHN:

*Currently there is no state-wide mechanism to support the development of IP from public institutions. This includes patent lodgement and initial support for projects. While there is crown ownership of IP, the LHN's have minimal mechanisms available to support the development of projects and their commercialisation. (Correspondence from SALHN)*

The problem lies with the administration of the government IP policy in SA Health and the lack of expertise and experience or clearly established procedures rather than regulatory complexity. The Commission has formed the view that responsibility for the state IP policy should be transferred from the Premier to the Minister for Innovation and Skills with consequent effort devoted to its adoption and possible review.

There is scope for the development of a standard template for IP agreements, including IP clauses within research agreements and commercialisation agreements that can be used between LHNs, universities and industry partners. These will need to be fair to all parties and encourage innovation through efficient commercialisation of jointly owned IP including where developed by a clinician researcher jointly employed by or affiliated with an LHN and a research institution. An example is the extension of the 'AusHealth Lite' agreement to assist with resolving issues around IP and commercialisation revenue. The University of Adelaide proposed:

*Clinical researchers can often have multiple appointments and affiliations. This can cause complexity in determining inventorship and ownership of IP. In 2017, the University of Adelaide and AusHealth developed the 'Lite' agreement to establish a fair and equitable agreement to address IP ownership, benefit and future contribution. This agreement should be rolled out more broadly. Greater coordination and alignment across the LHNs under a similar structure could be expected to make the process of dealing with IP rights across multiple employers more straightforward and transparent. (University of Adelaide - Supplementary, FR18, p.4)*

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<sup>27</sup> An SA Health appendix to the state policy includes a different split of the net returns from commercialisation of IP: while the one third share to employees is the same, instead of the balance being held by the institution, it is split equally between the institution and the DHW Health and Medical Research Fund.

**Recommendation 8.1:**

To ensure that the South Australian Government's IP policy framework encourages collaborative translational research which leads to improved health and economic outcomes, the Commission recommends that:

1. responsibility for the government's IP policy transfer from the Premier to the Minister for Innovation and Skills;
2. The Department for Innovation and Skills (DIS), in consultation with DHW and other relevant agencies, review the IP policy to clarify arrangements for sharing the benefits of IP development with non-government research partners;
3. DHW, in consultation with DIS, facilitate adoption of the IP policy in SA Health through development of guidance material and training, and monitor and evaluate the policy over time;
4. DHW facilitate development of a 'Community of Practice' on intellectual property development and commercialisation throughout SA Health; and
5. LHNs develop overarching framework agreements with universities and the South Australian Health and Medical Research Institute (SAHMRI) on commercialisation and IP management along the lines of those used by CALHN.

**Commercialisation skills**

The limited commercialisation skills and capacity of HMR staff were identified as a barrier to commercialisation. Several submissions suggested most universities, medical research institutes (MRIs) and hospitals lack internal access to commercialisation expertise and there is an inherent risk of failure in the definition stage of commercialisation required to access commercial investment. Submissions considered commercialisation requires specific skills and seeking commercialisation funding is a time-consuming activity that requires due diligence. They are not necessarily skills held by academic researchers. According to Flinders University:

*Many HMR researchers, particularly those who are employed in the South Australian Health System, have limited capacity to be able to engage in commercialisation activities due to their research, teaching and clinical loads. (Flinders University, DR14, p.11)*

And the Hospital Research Foundation:

*There is a shortage of experience with successful commercialisation and industry partnerships in SA. There are not enough people with successful experience who can use their knowledge to maximise the investments being made ... Researchers are not trained to have a business mindset and further assistance is required in this area in SA. (The Hospital Research Foundation, DR26, p.16)*

The current approach to commercialisation by LHNs results in potential for duplication and fragmentation of effort and creates complexity and uncertainty for private research organisations and industry in their dealings with LHNs.

Consideration of commercialisation potential in South Australia must have regard to the volume of the HMR activity and reasonable expectations about the rate of conversion of that

activity into start-up companies and licensing agreements. Any effort to build sustainable local health and medical industries must depend on the quality of that research, especially clinical research.

The Commission notes its view stated earlier regarding both a reasonable expectation for an annual stream of licensing agreements and start-up companies from all HMR and the fraction of SA HMR attributable to the LHNs. The small numbers call into question the effectiveness and value of individual LHNs developing their own separate commercialisation units.

That said, there are areas where government can simplify the enabling environment to make it more conducive to local commercialisation. A more centralised and coordinated approach to commercialisation in SA Health could offer efficiency gains and provide greater certainty and lower transaction costs for the public and private sector organisations with which they deal.

The Commission sought stakeholder feedback on three possible approaches to achieve these outcomes:

- one organisation, such as AusHealth, be engaged by all LHNs to deliver and manage commercialisation activities;
- a centralised back office function be established in SA Health to provide commercialisation advice, training and other support services to all LHNs; and
- a precinct approach in which collaborating institutions can pool resources.

The Commission has heard from a number of stakeholders. SALHN and Flinders University supports a precinct approach in which collaborating institutions can pool resources. This is evidenced by Flinders University:

*Flinders University's preferred position is to adopt a precinct approach, in which collaborating institutions can pool resources, and enable flexible and local decision making that meet the needs and benefits of stakeholders. (Flinders University, FR9, p.17)*

Alternatively, HTSA, Dr Leanna Read and CALHN all provided broad support for one organisation to be engaged by all the LHNs to deliver and manage commercialisation activities. This is only after extensive due diligence to determine the parameters and limitations of what is offered, which needs to be clearly understood.<sup>28</sup> CALHN proposed:

*A coordinated approach to IP protection and commercialisation across the LHNs and SAHMRI is supported by CALHN. A future merger of AusHealth with SAHMRI would complement the newly created Adelaide Health Innovation Partnership (AHIP) and Adelaide Health Innovation Ventures (AHIV) – an enterprise of SAHMRI and CALHN – supported by the UoA and UniSA. (Correspondence from CALHN)*

The Commission sees merit in consolidation of effort and has formed the view that recognising the complex and specialised skills sets required for IP management and commercialisation and the low scale of such activity in LHNs, DHW establish a coordinated approach across LHNs with clearly defined functions around the work to be undertaken.

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<sup>28</sup> HTSA (FR11.p.2).

### Recommendation 8.2:

To increase the impact of HMR involving LHNs on the state's economic growth, the Commission recommends that the DHW adopt a more consistent and coordinated approach to commercialisation of HMR across SA Health by establishing a central commercialisation support function to serve all LHNs that includes:

1. a dedicated commercialisation service with a focus on commercial development of HMR goods and services;
2. protection of the intellectual property of LHNs through the provision of advice for IP management in contracts and commercialisation strategies for LHN staff;
3. assistance to LHNs in establishing overarching agreements with universities and research institutes regarding joint management of IP;
4. a business development capability that also serves as a first point of contact for industry and investors; and
5. improvements to capability and commercial skills by sharing best practice and expertise and improving the understanding of relevant government policies including the IP policy.

## 8.5 Clinical trials

Clinical trials (CT) are an essential component of the HMR commercialisation pathway with potentially significant economic impact. CT volumes have grown strongly since 2010. Australia has outperformed most competitor nations for industry-sponsored drug and device trials.<sup>29</sup>

About half of all CTs conducted in South Australia's LHNs are industry initiated<sup>30</sup> and the other half are investigator led.<sup>31</sup> Industry-led CTs are also conducted by private clinical research organisations (CROs) and CT businesses. CT volumes have experienced strong growth since 2010, with Australia outperforming the majority of competitor nations for industry sponsored drug and device trials.<sup>32</sup>

More than \$1 billion is invested in Australian CTs each year by both government and industry. A 2017 report, jointly commissioned by the Australian Clinical Trials Alliance and the Australian Commission on Safety and Quality in Health Care estimated that \$1 invested returned more than \$5 for investigator-initiated trials conducted within trial networks.<sup>33</sup> The global CT industry was valued at US \$49.4 billion in 2020 and the study projects a compound growth rate of 5.1 per cent between 2020 and 2027.<sup>34</sup> According to *Marketwatch* the world

<sup>29</sup> MTPConnect, *Clinical Trials in Australia: The Economic Profile and Competitive Advantage of the Sector* (2017) 37.

<sup>30</sup> Industry-initiated CTs are paid for by an industry organisation that has contracted with a faculty or hospital researcher to conduct a clinical trial and focus on development and testing of new drugs and devices.

<sup>31</sup> Investigator-led CTs are usually funded by government grants and these grants are competed for by other Australian jurisdictions and focus on optimising use of clinical treatments and processes in the health system

<sup>32</sup> MTPConnect, (n 23) 37.

<sup>33</sup> L M Askie, K E Hunter, S Berber et al, *The Clinical Trials Landscape in Australia 2006–2015* (Australian New Zealand Clinical Trials Registry, 2017) 2.

<sup>34</sup> Grand View Research, *Clinical Trials Market Size, Share & Trends Analysis Report By Phase (Phase I, Phase II, Phase III, Phase IV), By Study Design (Interventional, Observational, Expanded Access), By Indication, And Segment Forecasts, 2020–2027. Report Summary* (2020).

market is expected to be dominated by phase 3 trials, with phase 1 trials expected to grow most rapidly.<sup>35</sup>

Australia is emerging as a popular location to conduct clinical trials owing to favourable R&D tax incentives, the quality and reputation of the medical industry and the relatively rapid turnaround time for clinical trial approval in comparison to other countries.

In their report *Clinical Trials in Australia* (2017), MTPConnect predict:

*If Australia can maintain its historical growth in trial numbers and improve patient recruitment by 25%-50% on average across trials, the value of the sector could increase to approximately \$2.1-2.5 billion and sector employment could increase to approximately 13,000-16,000 by 2025.*<sup>36</sup>

Based on data from the Australia-New Zealand Clinical Trials Register (ANZCTR), South Australia's share of CTs conducted in Australia increased from 13.1 per cent in 2015 to 15.2 per cent in 2018.<sup>37</sup> Whilst data from the ANZCTR are not a complete representation of clinical trials in Australia, the trend suggests SA is performing above its population share.

In March 2020, DHW launched a new Clinical Trials Portal<sup>38</sup> to help attract new CT business to SA. New clinical trial management software solutions are also being rolled out at various LHNs in order to improve CT capability and capacity for South Australia.<sup>39</sup>

In response to the draft report, correspondence received from DHW has advised of a commitment by DHW to providing an ongoing system administrator for the new South Australian Clinical Trials Portal. The value of this system has also been recognised in the Department for Trade and Investment's, *Health and Medical Industries Sector Plan* released in October 2020 where CTs have been identified as a growth sub-sector within the South Australian Government's health and medical industries sector.

*South Australia will continue to be marketed as a place for clinical trial investment through DTI's network of international offices and by capitalising on international business missions.*<sup>40</sup>

A range of challenges for the CT environment were identified in the Commission's draft report, many of which are being addressed in recommendations in other sections of this report. Some have current work underway involving DHW and LHNs. The remaining challenges include:

- lack of infrastructure to support clinical trials including: lack of dedicated trials space, high cost of drugs for clinical trials and limited administrative collaboration between research institutions creating 'red tape' delays;
- workforce issues including: lack of job security, limited numbers of skilled clinical trial coordinators, lack of recruitment of clinical researchers and principal investigators, limited opportunities for career advancement, lack of clinician time allocated to

<sup>35</sup> For more information see <<https://www.marketwatch.com/press-release/clinical-trials-market-size-report-forecast-2020-2024-business-revenue-opportunities-future-growth-trends-plans-top-key-players-global-analysis-by-share-2020-06-01>>.

<sup>36</sup> MTPConnect, (n 23) 58.

<sup>37</sup> Available from <<https://www.anzctr.org.au/>>. The data available from the register may not capture all the clinical trials taking place in the country, as there is no mandatory requirement for registration.

<sup>38</sup> For more information see:

<<https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+and+medical+research/clinical+trials/clinical+trials>>

<sup>39</sup> Department for Trade and Investment (n 4) 25

<sup>40</sup> Ibid 25

research and hospital and university administrative instability with constant change in senior executives

- few multinational pharma companies headquartered in Adelaide and limited awareness of SA clinical researchers by industry; and
- funding issues including: SAVCF not available for phase 1 clinical trials.<sup>41</sup>

Various submissions and information received by the Commission, including from SAHMRI, outlined several substantial strengths South Australia has to offer in clinical trials:

- SAHMRI's clinical research platform;
- by late 2020, a single point of entry in SA Health for CTs via the SA Clinical Trials Portal and streamlined processes for ethics approvals via the new research management software, GEMS.
- several key and unique registries from which clinical trials can be run;
- a moderately stable, ethnically diverse and ageing population, often with several generations available and 90 per cent located in Adelaide (also cited as a disadvantage if the specific population group required is not available in SA);
- lower cost of living, transport and office space costs;
- a new biomedical precinct containing extensive basic laboratory facilities in SAHMRI, University of Adelaide and University of SA, CMAX phase I and phase II clinical trial facility, access to research students, and PARC – a twelve bed multi-user trial facility located in the Royal Adelaide Hospital (RAH) intensive care unit;
- the future SAHMRI 2, including the first Australian proton therapy unit; and
- fast regulatory approvals processes compared to other countries, anticipated to improve when GEMS is fully implemented.

The Commission concludes that a more competitive CT environment appears likely to be achieved through recent progress made by DHW to develop the SA Clinical Trials Portal. Important progress toward streamlining patient pre-consent processes and testing various models enabling all researchers to access patient data is underway. Recommendations in chapters 5, 6 and 7 of this report also seek to address some of the challenges identified here.

### **8.5.1 Industry-initiated clinical trials**

Industry-led CTs account for approximately half of trials conducted in South Australia's LHNs. They are fully funded and are conducted by commercial entities such as pharmaceutical companies or contract research organisations, typically from overseas sources. A local CRO reports approximately 60 per cent of their CT business comes from the USA, 30 per cent from the Asia-Pacific region (including Australia) and 1 per cent from Europe and other countries.<sup>42</sup>

CALHN Research Service data from 2018–19 reports a total of 958 CTs, of which 55 per cent are sponsored trials and the remainder are investigator-initiated. Most sponsored trials are in

<sup>41</sup> For more information, see <<https://www.fixe.org.au/sa-venture-capital-fund-savcf>>.

<sup>42</sup> Discussion notes from interview with Avance Clinical.

the phase 3 category. Investigational drug trials make up 94 per cent of the industry-sponsored trials conducted in CALHN.<sup>43</sup>

The Adelaide BioMed City (ABMC) Clinical Trials Expert Taskforce report a strong overseas interest in South Australia as a location for CTs. Its view is there is a potential flow of CT business available to South Australia. ABMC considers a lack of centralised professional expertise results in a significant number of fully funded trials being lost from South Australia to interstate facilities.<sup>44</sup> PARC Clinical Research, a multi-user dedicated CT inpatient facility at the RAH, has attracted CTs across a broad range of medical specialties. PARC states it is currently operating at close to capacity and plans to allow substantial expansion are under consideration.

Flinders University is investing \$4 million over five years to establish the health data and informatics platform and clinical trials infrastructure to support large-scale trials across South Australia with a focus on improved health service delivery and outcomes for the consumer.<sup>45</sup>

The Commission heard from industry stakeholders that currently there are funded industry-led clinical trial opportunities being conducted interstate that might be available to South Australia if the right infrastructure was in place.

Other identified barriers in workforce limitations, patient access (especially slow human research ethics committee [HREC] and site-specific assessment [SSA] approval processes), data accessibility and data management have been addressed in other chapters of this report. During roundtable discussions, the Commission heard that additional barriers involving financial approval and HR processes regularly pose problems for fully funded trials in LHNs and there is some degree of duplication in the HR process. The Commission considers there is merit in streamlining the process for CT approvals and identifying potential pathways for fast tracking fully funded CTs.

Industry stakeholders consider that to grow CT activity more local complementary support for industry capability is needed.

### **8.5.2 Investigator-led clinical trials**

Investigator-led CTs are usually funded by competitive government grants, commercial institutions, consumer groups and public institutions.

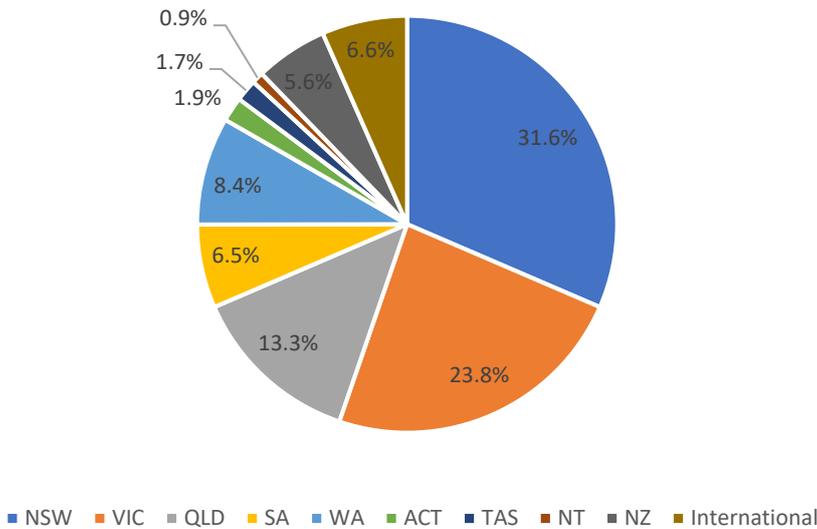
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<sup>43</sup> Information received from CALHN Research Services.

<sup>44</sup> Information received from ABMC Clinical Trials Expert Taskforce.

<sup>45</sup> Flinders University, DR14,12–13

Figure 8.4: Clinical trial network distribution.



Source: NHMRC, *Report on the Activities & Achievements of Clinical Trials Networks in Australia (2015)*.

A total of 37 Australian CT networks were identified in the 2015 report by the Australian Clinical Trials Alliance on behalf of NHMRC (see Figure 8.4). These networks span a wide range of clinical disciplines and disease groups and incorporate upwards of 10,000 clinical researchers across the country.<sup>46</sup> The number of active CT networks in SA was 34 in 2015, suggesting that South Australia has an active research population participating in, but not necessarily leading, research through CTs. No CT networks are administered from South Australian universities or research institutes. Most clinical research network members are in the eastern states.

### 8.5.3 Opportunities for growth in clinical trial activity

The draft report identified a number of opportunities for growth in the clinical trial sector. Information received during consultation indicated that a program of reform in DHW and LHN’s is underway to address barriers to this growth, including:

- routinely inviting hospital patients to participate in research, overcoming issues of consent;
- adding a clinical trials component to the SA Health Sunrise electronic medical record so that patient clinical trial activity and availability can be recorded and extracted readily;
- ensuring patient record availability to all researchers by trialling credentialing and affiliation programs for non SA Health researchers; and
- making patients more accessible by improving the approval speed of the HREC and SSA processes.

The Commission considers these reforms to increase patient availability will facilitate more and varied clinical trials. Opportunities to increase patient recruitment could be further

<sup>46</sup> NHMRC, *Report on the Activities & Achievements of Clinical Trials Networks in Australia 2004–2014 (2015)*.

improved by attracting consumers through a media campaign to self-register on a clinical trial database. Models for this process exist interstate.

The Commission concludes that CT activity is an important element of translation and commercialisation of HMR, with consequential positive effects on economic and public health outcomes. South Australia’s appears to have some competitive strengths in this area, with the prospect of future growth given the assets identified by stakeholders and the development of a single entry point for clinical trial business in SA Health.

That said, workforce instability, limited CT space, data access issues and slow approval processes are impediments to growing commercial clinical trials. These matters are addressed in other chapters of this report.

## 8.6 HMR industries

This section considers the role of the medical technology (medtech) and pharmaceuticals (pharma) industries in commercialisation.

### 8.6.1 Medtech

The United States has the largest medical technology market in the world. Based on combined revenue of the top 40 medical device companies, the USA accounts for nearly 66 per cent of revenue, followed by Germany at 14 per cent, then Japan with 7 per cent.<sup>47</sup> In comparison Australia has approximately 500 medtech companies, few of which are ASX-listed.

Table 8.2 shows the industry sub-sectors into which the ASX-listed medical technology companies are located.

When considering all listed and private Australian medical technology companies, the main sub-sectors are: in vitro diagnostics technology, digital health, biomaterials, implantable, respiratory, orthopaedics, surgical, cardiovascular, wound care and medical imaging.<sup>48</sup>

Table 8.2: ASX-listed medical technology companies.

	Number of listed companies
Digital diagnostics, sensors, e-health	14
IVD	10
Imaging and diagnostic hospital devices	9
Respiratory	8
Surgical	5
Orthopaedics	2
Ophthalmic	2
Wound care	2

Source: MTPConnect (2019)<sup>49</sup>

Medtech is an industry that lends itself to clusters. Internationally recognised clusters are noted in the USA in California, Massachusetts and Minnesota as well as Israel, Ireland and Singapore. Talent is identified as the single most important factor that can contribute to the

<sup>47</sup> Australian Trade and Investment Commission, *Medical Technology and Life Sciences, US Clusters* (2016) 4.

<sup>48</sup> MTPConnect, *How Global MedTech & Pharma Corporates Engage with Australia* (2019) 11.

<sup>49</sup> Ibid 11.

success of a medtech cluster. Most medtech companies are small- to medium-sized businesses focused on high-quality output rather than cost reduction and a key factor in the underlying success of the industry is the availability of research institutions nearby. In 2016, the California San Francisco cluster was home to 1,377 life science and biotech companies with 140,000 employees and averaging 30 new companies each year.<sup>50</sup>

One exit strategy for many small- to medium-sized companies is to be acquired by a large multinational corporation. That said, the Australia Trade and Investment Commission considers:

*In the current environment more than three-quarters of medical device acquisitions occur after regulatory approval. Multinationals are prepared to pay considerably more for a technology once it has been proven in the market and de-risked as much as possible.<sup>51</sup>*

### 8.6.2 Pharma

The Australian prescription and ‘over the counter’ pharmaceutical market was estimated at US\$22.9 billion in 2016. Table 8.3 presents 24 ASX-listed pharmaceutical companies, roughly divided into the listed sectors.

The dominant focus on oncology is linked with the strong oncology capability at Australia’s leading universities and research institutes. Other recognised areas of Australian pharmaceutical and biotechnology strength include pain, drug delivery technologies, and inflammation.

Table 8.3: ASX-listed pharmaceutical companies.

Sector	Number of listed companies
Oncology	17
Neuroscience, CNS pain	10
Dermatology	7
Immunology & inflammation, autoimmune disease	6
Infection, vaccines	6
Cardiovascular	4
Respiratory	3
Ophthalmology	3
Metabolism, GI, diabetes	2
Rare diseases	2

Source: MTPConnect (2019)<sup>52</sup>

ASX-listed Australian companies, except CSL, are very small in international terms and by necessity have a narrower focus. For Australian listed companies, oncology is the predominant therapeutic area followed by neurology. There are comparatively fewer Australian biopharma companies in those areas that are in high demand from multinational pharmaceutical companies, including metabolism, gastrointestinal and diabetes.

Several inquiry participants considered the small size of the biomedical, pharmaceuticals and medical devices industry in South Australia limits opportunities for commercialisation

<sup>50</sup> Australian Trade and Investment Commission (n 40) 7.

<sup>51</sup> Ibid 16.

<sup>52</sup> MTPConnect,(n 41) 28.

partnerships with existing businesses. South Australia's share of national pharmaceutical exports has declined, accounting in 2018–19 for 1.4 per cent of the Australian total. The pharmaceutical industry in Australia is dominated by New South Wales and Victoria. South Australia's share of Australian total medical device exports has remained static at 3.9 per cent. The medical device industry in Australia is also dominated by New South Wales, which accounted for 62.7 per cent of national medical device exports in 2018–19.

Despite this small industry base, South Australia has performed well on one measure of commercialisation. Accelerating Commercialisation<sup>53</sup> (AC) has granted approximately \$300 m to SA over the last nine years, around 16 per cent of the funding in Australia. Approximately one third of that funding has been for HMR with successful applications coming from entrepreneurs, engineers and IT specialists, but not the university sector.

Overall, the Commission considers the small size of Australia's medical technology and pharma is a constraint on the South Australian health and medical sector.

### 8.6.3 Industry barriers and opportunities

The literature reviewed by the Commission identifies several barriers preventing overseas medical technology companies from considering Australia as an external innovation hub. They include:

- the health system in Australia is spread between federal and state responsibilities and further split between public and private. This leads to complicated integration pathways including a competitive ecosystem between universities, MRIs, start-up companies, businesses, investors and governments;
- there is low investment by multinationals. The presence of multinational corporations with a well-established market can support research innovation through to commercialisation via strong networking, investment and productivity;
- regulatory frameworks and policy approaches are dated;<sup>54</sup>
- there is a perception of limited opportunities in Australia (partly stemming from a lack of familiarity with Australia);
- geographical isolation requires considerably higher cost and time commitment than other regions. The time zone also makes it difficult to seek out innovation and engage with innovators; and
- perceptions that innovators in Australia have low commercial acumen can make opportunities less 'investment ready' and commercial negotiations and due diligence difficult.<sup>55</sup>

Some specific Australian hurdles identified by industry include:

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<sup>53</sup> Accelerating Commercialisation (AC) is part of the Department of Industry, Innovation and Science's Entrepreneurs' Programme and provides small and medium businesses, entrepreneurs and researchers with access to expert advice and funding to help commercialise novel products, processes and services.

<sup>54</sup> B Palmer and V Kishore, *When Australia innovates, the world of healthcare changes* (Medtech Actuator, 2017) 2 <[http://medtechactuator.com/wp-content/uploads/2017/11/MedTech-Paper\\_When-Australia-Innovates-The-World-of-Healthcare-Changes\\_.pdf](http://medtechactuator.com/wp-content/uploads/2017/11/MedTech-Paper_When-Australia-Innovates-The-World-of-Healthcare-Changes_.pdf)>.

<sup>55</sup> MedTech Pharma Growth Centre, Medical Technology, Biotechnology & Pharmaceutical Sector Competitiveness Plan (2019).

- The Therapeutic Goods Administration (TGA) process to audit applications for companies intending to manufacture medical devices in order to gain ISO 13485 compliance is arduous with a lead time of approximately nine months. This is not well suited to cutting-edge innovation. Whilst the TGA has acknowledged their framework hinders innovation, changes are yet to be seen. In contrast, a product manufactured in China can get approval in 60 days. Some advisers recommend Australian start-ups manufacture in China to avoid TGA holdups;<sup>56</sup>
- Government grant programs are cumbersome and time consuming with long delays in decision making not helpful in a competitive marketplace: *‘These two elements – the complexity and the volatility – lead to a high risk of firms sinking time and effort on securing grants which may or may not come to fruition;’*<sup>57</sup>
- Markets are unavailable on home territory. The Australian Government support program, Accelerating Commercialisation,<sup>58</sup> supports business developments that are prepared to export. Small start-ups and newer firms struggle with public sector procurement processes;<sup>59</sup>
- Policy and programs for early stage funding of enterprises are often directed towards publicly funded research organisations (PFROs). PFRO incentives are geared towards driving publications, not financial or healthcare returns to the nation; ... Targeting programs for deep-tech startups from outside PFROs may assist with this process.<sup>60</sup>
- Piecemeal fragmented funding and support programs have short and unpredictable lifespans and do not focus on the business journey and provide confidence for the business industry.<sup>61</sup>

The Commission notes many of these elements are beyond the influence or control of the South Australian Government.

Some stakeholders, including The Hospital Research Foundation, consider several key steps are needed to improve the industrial and commercial environment, including:

*providing training and support for researchers to develop the skills required to navigate the industry and a business mindset and bring people with collaborative experience to the state, help them share and teach and give them flexibility and leadership positions. This should lead to teams that can support researcher. (The Hospital Research Foundation, DR26, p.17)*

The Adelaide BioMed City Board proposes better use of existing expertise, such as South Australia’s world-class artificial intelligence (AI) research capabilities as an opportunity for HMR partnership and translation. It notes the global healthcare AI market is projected to

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<sup>56</sup> Discussion notes, consultant to Accelerating Commercialisation. Personal opinions not official views of Accelerating Commercialisation.

<sup>57</sup> Palmer and Kishore, (n 54) 5.

<sup>58</sup> Accelerating Commercialisation provides small and medium businesses, entrepreneurs and researchers with access to expert advice and funding to help get a novel product, process or service to market.

<sup>59</sup> Discussion notes with consultant to Accelerating Commercialisation. Personal opinions not official views of Accelerating Commercialisation.

<sup>60</sup> Palmer and Kishore, (n 54) 6.

<sup>61</sup> Discussion notes with consultant to Accelerating Commercialisation. Personal opinions not official views of Accelerating Commercialisation.

exceed \$13 billion in 2025 and the UK healthcare AI market is projected to grow by 42.4 per cent from 2019 to 2025.<sup>62</sup>

*The Australian Institute for Machine Learning (AIML) at The University of Adelaide is number three in the world in high-quality computer vision papers over the last decade (csrankings.org), and Australia's largest and leading machine learning group. Excitingly, Adelaide will house the Amazon Research Australia office in Adelaide ... This one major multinational company could help trigger more global companies to come to a state where quality of life and work can be combined for skilled and affordable workers. (ABMC, DR1, p.11)*

Anecdotal evidence provided by stakeholders suggests there is a disconnect between South Australia's universities and industry. There is also evidence of industry engagement; for example, UniSA notes that it prioritises engagement with the HMR industry and aligns its research accordingly. That said, engagement appears to be sporadic and varied between the universities.<sup>63</sup>

The Commission considers the small size of the biomedical, pharmaceuticals and medical devices industries is a practical constraint on developing commercialisation partnerships with existing businesses. Few existing small and medium sized enterprises can commercialise ideas coming from South Australia's research institutions.

#### **8.6.4 Models to facilitate industry research and development**

Stakeholders and the Commission's research identified several different approaches for facilitating industry research, including several international models.

Successful overseas models include Galway in Ireland, Israel's Sheba Medical Centre, the UK's Medical Research Council and the Texas Medical Centre in Houston.

Recommendations received by MTPConnect from industry sources in their 2019 report: *How Global MedTech & Pharma Corporates Engage with Australia*, include a proposal that draws on Israel and Ireland:

*A major government initiative to make medical technologies a priority industry in Australia would help the region to be perceived in a similar way to Ireland or Israel. Both of these regions have been very successful in recruiting a robust medtech start-up scene: they have available seed capital, along with government sponsored programmes that act as a base from which industry can percolate and grow.<sup>64</sup>*

THRF considered Israel's model of collaborative research and commercialisation to be relevant:

*Unmet need problems are first identified in the hospital, followed by the university, research institute, industry and other institutions involved putting together a multidisciplinary team to solve the problem. There are a number of documented examples where significant new medical outcomes and commercialisation income has been generated. Israel has many examples of the benefit of unfettered collaboration providing mutual benefit to all parties. (THRF, DR26, p.19)*

The Commission notes the apparent central role of clinical research in this model.

<sup>62</sup> Marketstudyreport.com: Global Healthcare Artificial Intelligence Market Growth 2019–2024.

<sup>63</sup> Flinders University response to information request.

<sup>64</sup> MTPConnect, *How Global MedTech & Pharma* (n 55) 36.

J. Matthews' submission suggests the Texas Medical Centre (TMC) as a model that SA could aspire to, stating that:

*TMC is renowned for its research, innovation, collaboration and commercialisation of medical research. (J. Matthews, DR19, p.3)*

Galway is an Irish city with a population of under 100,000, yet 15 of the top 20 global medical device companies operate in Ireland. Galway produces over 80 per cent of the world's stents. Ireland is the second largest exporter of medical devices in Europe. Substantial growth of the biomedical industry over the past 15 years is attributed to a comprehensive research strategy including goals and commitment to industry.

The Sheba Medical Centre in Israel has produced successes through their Accelerate, Redesign, and Collaborate strategy which focuses on emerging trends such as digital health, welcoming start-ups, collaboration and up-to-date facility infrastructure. The Israeli market is very small and, according to the Sheba Chief Innovation Officer, 95 per cent, if not more, of start-ups in Israel aim for the US market.

The TMC in Houston claims to be the largest medical city in the world. It created its first campus-wide strategic plan in 2014 to identify key areas for collaboration. Today TMC is functioning as a well-established biomedical precinct supporting overseas investment in the precinct.

Successful translation models like those above are all defined by having a strong government research strategy and HMR in place. The UK government identified a need to embed translation and industry partnerships into the research portfolio over ten years ago. The UK Medical Research Council's (MRC) 'UK research and innovation delivery plan 2019' claims that ten years of targeted funding has firmly entrenched translation into research. The MRC has promoted partnerships with more than 500 companies, ranging from the large pharmaceutical companies to small- and medium-sized healthcare companies resulting in the development of 518 products, with 23 in wide-scale adoption.<sup>65</sup>

Canada and New Zealand both identify similar translational issues to Australia and have similar government policies in place. The New Zealand strategy stresses the importance of strategic leadership in research, repeated in most submissions from inquiry participants.

In Australia, NSW and Victoria both recognised unfulfilled potential in the area of HMR over 10 years ago, listing issues of concern similar to those identified for SA. Both states have created research strategies that focus on realigning research towards clinical practice and commercialisation. WA has released its *Health and Medical Research and Innovation Strategy Discussion Paper* and is seeking to increase its share of national funding along with other states. Further detail on overseas and interstate models is provided in Appendix 4.

As discussed in chapter 3, the Commission notes South Australian industry has access to significant levels of national and state government assistance to support commercialisation.

The Commission also observes that successful industry models in Australia and overseas tend to have sustained a long-term direction and commitment from government. The Commission examines in more detail the relevant aspects of the international models to South Australia in chapter 9.

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<sup>65</sup> For more information see <<https://mrc.ukri.org/innovation/working-with-industry/partnerships-with-industry/>>.

## 8.7 Conclusion

Quantifying the level of translation and commercialisation activity in South Australia is difficult for several reasons, including the patchy information available, the complexity of the translation pathways and time lags in the translation process. It is apparent that insufficient attention is paid to evaluating both translation impact and the commercial return from South Australia's investment in HMR. This is a general problem for all Australian jurisdictions.

The Commission concludes that improvements can be made in several areas that would help to improve both translation and commercialisation activity.

They include the better alignment and simplification of the various IP policies used in the sector, including those determined by the government for HMR in its agencies. The Commission has recommended a number of significant changes to ensure that the SA Government's IP policy framework encourages a collaborative translational research.

Other impediments such as the existing fragmented commercialisation efforts in the LHNs also needs to be addressed. The Commission sees merit in the consolidation of effort and has formed the view that recognising the complex and specialised skills sets required for IP management and commercialisation DHW establish a coordinated approach across LHNs.

The Commission acknowledges the importance of public health research leading to translation which provides individual and population health benefits through improvements in healthcare policies and practices. The contribution of public health research to public policy intervention is potentially a significant contribution to the wellbeing of SA citizens. The Commission also considers that attention to locating research effort in LHNs linked to continuous improvement in process and care practices offers potential to deliver improvements in productivity and quality in the health system.

There appears to be an opportunity to lift the quantity and quality of clinical trials conducted in the state. That said, the Commission has heard from a number of industry sources that there are clinical trial opportunities offered to South Australia that are unable to be taken up for reasons including the complexity and delays in obtaining approvals (see chapters 5 and 7). Recent progress by DHW to develop the SA Clinical Trials Portal and streamlining patient pre-consent are likely to improve South Australia's competitive position in the clinical trial market.

On the question of opportunities for increased commercialisation activity in HMR and the growth of health and medical industries, the Commission considers a cautious approach is warranted.

A sustained local sector requires a foundation of a competitive local HMR effort that includes some world-class performance. International benchmarks provide a view of the size of the stream of licensing and start-up opportunities that might reasonably be expected from the size of HMR activity. Absent recruitment of companies from overseas which may bring a sovereign risk with them, the growth trajectory of the sector is ultimately constrained by the size and quality of local HMR.

The Commission sought information about 'proof of concept' funding and has formed the view that there is an opportunity for the government to consider the best alternative uses of existing funds or the adjustment of existing grant funding mandates and to accelerate translational research into industry or commercial outcomes. The health and medical industries sector is small in South Australia, containing mostly small businesses. This limits opportunities for collaboration between researchers and existing businesses for commercialisation.

## 9. Towards a more enabling HMR architecture

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### 9.1 Introduction

This chapter contributes to the Commission's inquiry into health and medical research (HMR) in South Australia (SA) by examining the key publicly funded HMR institutions, the Department for Health and Wellbeing (DHW) and the local health networks (LHNs); the South Australian Health and Medical Research Institute (SAHMRI); and the state's three public universities.

The analysis is guided by three interconnected terms of reference (TOR):

- assessing the influence on public sector HMR output of the current level of integration of research partners with SA Health (TOR 2g);
- identifying and assessing existing collaboration between publicly funded institutions on HMR (TOR 3); and
- recommending changes to the structure, governance and operation of publicly funded HMR to increase research output and translational impact (TOR 9).

The chapter begins with an overview of the role and contribution of key institutions. It concludes with the Commission's current thinking on changes that would enable the state to pursue an objective of excellence in HMR that would:

- strengthen South Australia's competitiveness in national grant funding;
- strengthen the state's public health system; and
- provide an essential underpinning for a sustainable local health and medical industries sector.

The Commission uses the term 'HMR architecture' as shorthand for the structured relationship of governance, accountability framework, roles, relationships, and capability between and within the key organisations involved in doing, framing or governing HMR.

### 9.2 SA Health

#### 9.2.1 Structure

The South Australian public health system is generally referred to as 'SA Health', and includes a number of agencies, business units and statutory authorities.

The entities within the SA Health portfolio deliver a variety of health and wellbeing services, including, but not limited to, hospital treatment and care, drug and alcohol services and pathology services. Many of these services are also important for HMR undertaken in the public health system, such as the research services provided by SA Pathology. Other areas of the SA Health portfolio, including DHW, are responsible for a variety of ancillary, administrative and policy and regulatory services. These functions support service delivery throughout the public health system, including in relation to HMR conducted within SA Health.

SA Health is constituted by the following entities, the majority of which play a role in either undertaking or facilitating HMR conducted in the public health system:

- Department for Health and Wellbeing (DHW);
- Central Adelaide Local Health Network, including Sa Pathology (CALHN);
- Southern Adelaide Local Health Network (SALHN);
- Women's and Children's Health Network (WCHN);
- Northern Adelaide Local Health Network (NALHN);
- Barossa Hills Fleurieu Local Health Network;
- Eyre and Far North Local Health Network;
- Flinders and Upper North Local Health Network;
- Limestone Coast Local Health Network);
- Riverland Mallee Coorong Local Health Network;
- Yorke and Northern Local Health Network;
- South Australian Ambulance Service;
- SA Pathology (SAP).<sup>1</sup>

As a result of recent reforms, DHW now includes the Commission on Excellence and Innovation in Health (CEIH), which forms an attached office to DHW. The Commission notes that the creation of CEIH may reflect a renewed focus within DHW on supporting and facilitating HMR. The SA Health portfolio also includes the Health Performance Council (HPC), which functions as a statutory advisory body.

The SA Health portfolio is structured and regulated by a number of pieces of state legislation, including the *Health Care Act 2008* (Health Care Act) and the *Public Sector Act 2009* (Public Sector Act). The state's 10 LHNs are incorporated under the Health Care Act, while DHW is an administrative unit pursuant to the Public Sector Act.

A large number of acts, ranging from the *South Australian Public Health Act 2011* to the *Transplantation and Anatomy Act 1983*, are committed to the Minister for Health and administered by DHW. Many of these statutes regulate aspects of HMR conducted in the SA public health system, including provisions in the Health Care Act that govern the use and disclosure of patient information for the purposes of research.

SA Health's governance arrangements were significantly reformed in 2019 with the creation of 10 new LHNs and the introduction, for each LHN, of governing boards. The legislative amendments implementing these new governance arrangements commenced on 1 July 2019. They created a range of responsibilities to be exercised by the governing boards, including overseeing performance and budget goals, clinical governance, safety and quality, and risk management. The governing boards are directly accountable to the Minister for Health and are responsible for appointing the LHN's chief executive, who, in turn, is responsible to the board for the overall management of the organisation.

### 9.2.2 HMR strategic leadership

In SA, policy leadership and administrative functions in support of HMR in the public health system are concentrated in DHW. The department has lead responsibility, on behalf of the Minister, for the development and implementation of the government's strategic priorities in relation to the public health system, and also exercises primary responsibility in respect of planning and system leadership functions. These responsibilities include monitoring the

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<sup>1</sup> For additional details on the SA Health portfolio, including the latest organisational chart, see <https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/about+sa+health/about+sa+health>.

overall performance of the public health system against priorities identified in service agreements with the LHNs.

SA Health's strategic priorities are currently articulated in a number of policy documents and strategic plans. The most significant of these include the *Health and Wellbeing Strategy 2020–2025* and the *Clinical Excellence: Developing Strategic Direction to Build Allied Health Research and Translation Capacity: 2019–29*. The plans and priorities outlined in these policy statements are intended to align with, and contribute to, DHW's statement of strategic priority in relation to HMR, *Research Focus 2020*. The document makes clear that HMR is a central component of the public health system, with the capacity to enhance the quality and efficiency of health care delivery:

*High quality research is an essential component of SA Health's mission, as it provides the evidence to inform improvements in illness prevention and health promotion, clinical care, service delivery and health system policy and decision making. High quality health and medical research delivers real benefits to our consumers and wider population. An active research culture across our health system is vital to supporting innovation, attracting high quality clinical and medical staff, and delivering strong population health, social and economic benefits for South Australia.<sup>2</sup>*

*Research Focus 2020* was released in 2017 and is administered by the department's Office for Research (OFR).

The OFR is currently the main business unit in SA Health with a primary focus on supporting, coordinating and developing the HMR conducted in the SA public health system. Following machinery of government changes in 2016, the OFR now forms part of the Chief Medical Officer's portfolio within the System Leadership and Design Division of the department, which is headed by a deputy chief executive. The Commission understands that reductions in funding and structural changes since the establishment of SAHMRI have seen OFR's staff numbers reduce from approximately 20 full-time equivalent (FTE) positions in 2008 to its current level of around 2 FTEs. There is currently no position at the director level in DHW with specific responsibility for HMR, with the Chief Medical Officer primarily accountable for the department's activities in relation to HMR undertaken within SA Health.

The OFR's current mandate extends to the coordination and oversight of DHW's strategic priorities for HMR, as articulated in *Research Focus 2020* and other policy statements like the *Health and Wellbeing Strategy 2020–2025*. The office also oversees the development and administration of SA Health's policy directives in areas related to HMR, such as ethics approval and governance oversight.

OFR's principal responsibilities are:

- develop and implement HMR policy throughout the South Australian public health system;
- work collaboratively with research offices in the LHNs to support shared priorities, including research ethics and governance policies;
- support state and Australian Government priorities in HMR, including attracting increased HMR funding to South Australia;

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<sup>2</sup> SA Health, *Research Focus 2020* (2017) 1.

- support streamlining and improved coordination of research in South Australia around key priority areas including clinical trials;
- support and initiate training and development activities for SA Health staff linked with HMR;
- lead the procurement, implementation and ongoing support for SA Health's research management system; and
- represent SA Health on a number of national committees and groups to collaborate and coordinate improvements to the HMR sector including clinical trials.

The Commission notes that a number of stakeholders, both within government and in the wider HMR sector, considered that both the OFR's mandate and its capacity to deliver it have been severely cut over time and that the current level of resources is inadequate. This appears to reflect a reduced priority within DHW on providing state-wide leadership for HMR, and a tight focus on service delivery, health outcomes and reducing costs. The Faculty of Health and Medical Sciences in the University of Adelaide argues that it is difficult to discern a clear South Australian Government-led strategic direction in the years since SAHMRI's creation:

*SA investment in HMR does not appear to be guided by a framework or structure. Some other jurisdictions appear to have such structures, with several examples of large investments in HMR made by other jurisdictions in research platforms and infrastructure ... SA Health and Wellbeing does not have a discernible structure for research strategy or investment. This role appears to have been largely devolved to SAHMRI and LHNs. For example, SA Health used to be a source of partner funding for NHMRC Partnership Project Grants, but that funding seems to no longer exist and directly disadvantages SA HMR applications to that NHMRC scheme (University of Adelaide, Faculty of Health and Medical Sciences, DR28, p.2)*

The Commission understands that the Transforming Health initiative from 2014 to 2017 focused the priorities of SA Health on consolidating and improving service delivery. In effect, Transforming Health appears to have led to a reduced focus by SA Health – by DHW and the hospital networks in particular – on one of the central recommendations from the Shine and Young Review, which called for the development within SA Health of 'a clear and coordinated set of strategic research priorities, directions and outcomes for the alignment and implementation of health and medical research activities in South Australia'.<sup>3</sup>

The perception that there has been a pronounced shift towards service delivery within SA Health following the decision to establish SAHMRI, combined with policy shifts like Transforming Health, has led several stakeholders to argue that SA Health is not in a position to provide a strategic leadership role in HMR. Correspondence received from the WCHN is representative of the view that DHW has not been able to develop and articulate a systematic approach to supporting and expanding HMR in the public health system:

*South Australia (SA) does not have a whole-of-government Health and Medical Research Strategy. The SA Health's health and medical research strategy, Research Focus 2020, is not supported by the Health Networks in its current format as it is deficient in relevant content and vision for the future. In addition, policy is lacking in regard to support for research and associated infrastructure, often left to hospital research foundations and grants for funding such requirements. (Correspondence from the Women's and Children's Health Network)*

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<sup>3</sup> John Shine and Alan Young, *Review of Health and Medical Research in South Australia* (2008) 19.

The Commission notes that SA Health's current broad public health strategy, *Health and Wellbeing Strategy 2020–2025*, acknowledges the importance of HMR as part of an innovative and effective public health system. HMR is highlighted as a major component of SA Health's key priorities, including effective translation, better use of clinical information and workforce development. The strategy also explicitly commits SA Health to the goal of furthering research, training and teaching.

That said, this strategic commitment is not matched by a framework by which to measure or evaluate research input, output and any resultant impact.<sup>4</sup> This is reflected in the absence of any publicly available goals and key performance indicators (KPIs) with which to judge HMR performance in DHW or the LHNs, and is further exacerbated by the fact that SA Health does not publish any expenditure data on HMR in the public health system, the numbers of staff engaged in HMR, or information on which hospitals or other entities undertake HMR in the public sector. The Commission has obtained data from DHW on research expenditure within SA Health, but the quality of the data to date is affected by numerous inconsistencies and gaps. The Commission requires additional and accurate data to assess the level and effectiveness of research expenditure by DHW and the LHNs.

The absence of an integrated strategic approach to HMR within SA Health has been put forward as further evidence that research has been deprioritised within the public health system. The Clinical Research Governance Steering Committee (CRGSC) provided a clear summation of this concern:

*It has become evident to the Steering Committee that the focus on research within the health system has diminished over the past decade. Following the allocation of federal funding to construct the SAHMRI in 2009, other distractions occurred including severe budget pressures, the design and construction of the new Royal Adelaide Hospital over a 9 year period, the development of the Adelaide Health Service in July 2010 which was in place for only 12 months, significant turnover of leadership across SA Health as a whole with e.g. nine CALHN CEOs in eight years between 2011 and 2018, and then the change in LHN governance arrangements which commenced in 2018. (Correspondence from Clinical Research Governance Steering Committee)*

*Research Focus 2020* remains the key document outlining the place of HMR in the South Australian public health system. That said, the Commission notes that the significance accorded to HMR in *Research Focus 2020* is much more apparent in theory than evident in practice. The Commission has found no evidence that DHW has developed any measures or indicators of research output and impact, as foreshadowed in *Research Focus 2020*. By contrast, the available evidence strongly suggests that there has been a systemic failure on the part of DHW to implement the strategic objectives outlined in *Research Focus 2020*.

There is limited evidence that either DHW or the LHNs have made any significant attempt to develop research capacity within SA Health as a whole, although there are clear signs of recent renewed commitment to HMR in some LHNs. The Commission notes that many submissions have suggested the state needs a strategy for HMR, yet generally provide little guidance, beyond the need for strategic consolidation and direction, on the central aspects of a whole-of-state HMR strategy for SA.

The Commission considers that the objectives of such a strategy are in essence interrelated:

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<sup>4</sup> Correspondence received from the Clinical Research Governance Steering Committee.

- ensuring that HMR is translated into the state's health system, improving its performance and the health of South Australians. This aligns closely with the objectives of SA Health's Health and Wellbeing Strategy, discussed above; and
- providing a stream of commercialisation opportunities that strengthen a local health and medical industries sector as part of the government's Growth State initiative.

On a structural level, the Commission also notes that responsibility for HMR within SA Health is fragmented. Several entities, in addition to the OFR, exercise some responsibility for HMR, including CEIH, which forms an attached office to DHW, and the HPC, a statutory advisory body under the Health Care Act.

The government established the CEIH in 2019. The Commission understands it is broadly modelled on similar agencies in other jurisdictions, such as the Agency for Clinical Innovation in NSW, and is responsible for providing leadership and advice on a range of issues in the health system. These include supporting clinical innovation and enhancing collaboration between stakeholders in the public and private sectors. It does not set priorities for research.

The role of the CEIH is to provide leadership and advice within both SA Health and the wider SA Government on clinical excellence and innovation. Its primary points of focus include maximising health outcomes for patients, improving care and safety, monitoring performance, championing evidence-based practice and clinical innovation and supporting collaboration. An expert Advisory Council supports the CEIH in the delivery of its mandated functions, including the development of its future work program. Its members possess expertise in a range of health-related fields, including areas that are important for the further development of HMR in South Australia, such as clinical research and research translation.

In addition, the Commission also noted in chapter 7 that CEIH has lead responsibility for, and recently released a strategic plan on, the future direction of data analytics within SA Health. The plan develops a broad 'road map' to ensure that all relevant stakeholders, including clinicians and researchers, enjoy efficient and timely access to publicly-held data and can share data-driven insights in a secure environment. The Commission considers that the CEIH's work program, including its leading role in enhancing data analytics within SA Health, is vital to the development of a strategic direction for HMR in the public health system and the state more broadly.

The HPC was established by in statute in 2008 with responsibility for providing independent advice to the Minister on the performance of the public health system. It has a focus on evaluating and reporting on a range of interrelated objectives and performance indicators, including:

- strategic objectives that have been set or adopted within the government's health portfolios;
- international, national and state health system performance standards and benchmarks;
- significant trends, health outcomes and future priorities of the health system;
- latest research on best practice models of healthcare systems and services including for specific population groups; and
- community and individual engagement strategies and outcomes.<sup>5</sup>

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<sup>5</sup> For further information, see the HPC's terms of reference, particularly p.1

The Commission considers that the HPC's analytical expertise and resources, especially in relation to developing evidence-based evaluations of the state's public health performance, could be usefully directed to the development and periodic evaluation of a whole-of-state HMR strategy.

### 9.2.3 Local health networks

The portfolio-wide governance reforms that were implemented in July 2019, including the creation of LHN governing boards, clearly delineate DHW's responsibilities for planning and leadership at the system-wide level. By contrast, LHNs have primary responsibility for the delivery of health services within their geographical areas. The division of responsibilities between DHW and the LHNs ensures that the majority of HMR in the public health system takes place under the auspices of, or in conjunction with, the LHNs. This includes clinical research and research translation and commercialisation.

The relationship between DHW and the LHNs is predominantly managed through service level agreements (SLAs), which set out the statutory, legal and service obligations of the LHNs. These obligations are generally contained in expectation statements and performance deliverables. The requirements outlined in the SLAs are supplemented by goals articulated in statutory reporting and strategic policy documents, such as annual reports and strategic plans. Taken together, these documents help to structure the full range of LHNs' activities and service delivery obligations, including in relation to HMR.

The Commission notes that HMR does not appear to be fully integrated into the current SLAs or LHNs' strategic goals. That said, while HMR is generally acknowledged as a key activity of LHNs, at least as a general point of principle, there are currently no KPIs in place to support and guide the way that HMR is incorporated into the broader suite of health services delivered by LHNs.

The Commission notes, for instance, that the most recent annual reports published by two of the largest metropolitan LHNs, CALHN and SALHN, appear to place very little specific emphasis on HMR. For 2018–19, both CALHN and SALHN committed themselves to pursuing the following strategic priorities:

- deliver better patient outcomes;
- operate a modern health service;
- be a great place to work and learn;
- better leadership of Adelaide's health; and
- sustainably allocate resources.

These strategic priorities, in turn, are designed to produce a number of specific performance outcomes and improvements, with a principal focus on utilising permanent staff more effectively, lowering the costs associated with service delivery and improving services.<sup>6</sup> Supporting or expanding HMR undertaken within CALHN does not appear under the agency's key objectives, whether directly or indirectly, including in relation to the translation of research findings into improved patient care.

In 2018–19, the SLAs between DHW and the largest LHNs within the public health system – CALHN, SALHN, WCHN and NALHN – uniformly subsumed HMR under the provision related

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<sup>6</sup> Central Adelaide Health Network, *Annual Report 2018–19* (2019) 12.

to ‘teaching, training and research’. The SLAs stipulate that research is to be consistent with SA Health’s strategic directions and policies, but only require the LHNs to provide sufficient resources to ensure that appropriate governance and oversight processes are in place.

The SLAs also outline the key outcomes for which LHNs’ chief executives are responsible, but they do not specifically address HMR. Schedule 4 of the SLAs details the KPIs against which the LHNs are measured. They do not include specific KPIs to facilitate the evaluation of an LHN’s performance in either HMR or training and education.

The *SA Health Strategic Plan for 2017–2020* (the plan) also contains a section focused on research, education and training, but the various commitments listed in this section do not appear to be directly related to HMR conducted in the public health system, and are predominantly focused on:

- building a learning health and well-being system, where innovation and continuous improvement is prioritised and achievement is shared and replicated across all parts of our health system; and
- teaching, training and learning are priorities that are embedded in our work practices and we continue to strengthen our partnerships with the wider education sector.<sup>7</sup>

The plan only directly addresses HMR in relation to the possible benefits that can be achieved through effective translation, with SA Health committed to:

*...wider translation of research into practice and transfer of innovation across our business. SA Health promotes and enables dissemination of knowledge and experience across the health care system. This will be augmented by initiatives to support innovation and continuous improvement in all areas of our business.<sup>8</sup>*

The Commission understands from a range of stakeholders, including some of the LHNs, that the lack of research-related KPIs in SLAs and chief executives’ contracts has reduced the perceived significance of HMR when weighed against other health priorities. As NALHN pointed out, this adversely affects the position of HMR within the hierarchy of priorities pursued by LHNs:

*Clinical research, whilst notionally embedded into the employment contract, is largely overlooked in rostering clinicians employed 100% by the LHN. The highest LHN priority is the delivery of care. As a result, most research is conducted by clinicians with an interest in their own time. It is particularly difficult for nurses, allied health and ancillary staff to do research...Undertaking education and research activity is a requirement of the LHN and forms part of the calculation of the state funded SLR budget. However the distribution of that budget is at the discretion of the LHN. Similarly, funding clinical research activity is often overlooked in discretionary grant distribution in favour of infrastructure projects. (Correspondence from NALHN)*

Embedding HMR-related KPIs in both SLAs and chief executive employment contracts has been highlighted by a number of stakeholders as an important mechanism to ensure that research performance can be effectively evaluated. Health Translation South Australia (HTSA), for example, argued in its submission that the prioritisation of HMR requires its explicit inclusion in future SLAs. HTSA also maintained that the

*...Chief Executive should also ensure that research is embedded and evidence-based approaches are prioritised in all the other chief positions including the Chief Allied Health*

<sup>7</sup> Ibid 14.

<sup>8</sup> Ibid 15.

*Officer, Chief Nurse and Midwifery Officer, Chief Pharmacist and the Chief Digital Health Officer. (HTSA, DR17, p.12)*

The Commission notes these reforms were also a primary focus of the recent Birch Review into research governance, which made three specific recommendations:

- support for research at the corporate level should be agreed and reflected in the development and application of KPIs in the contracts for DHW and LHN chief executive officers;
- the need for HMR to be reflected in the KPIs which apply to chief executive contracts of employment and the services and funding agreements between the department and the LHNs; and
- develop, maintain and monitor appropriate state-wide KPIs for research to be reported on annually and included in the assessment of LHNs' overall performance.<sup>9</sup>

In a similar vein, SAHMRI's submission recommended:

*...the LHNs, with the endorsement and support of the State Government, should embed health and medical research within their operations, with the aim of seamlessly integrating research into their core business in a manner that is complementary to clinical care, including by creating research-related KPIs for Chief Executive Officers. Research should be viewed as a valuable part of core business. (SAHMRI, DR25, p.11)*

The Commission also notes that several stakeholders, including the Adelaide BioMed City Clinical Trials Expert Taskforce, expressed the view that effectively embedding HMR in the LHNs is predicated on hospitals' senior leadership setting specific and measurable targets in relation to the initiation of HMR projects.

#### **9.2.4 Health Translation SA**

The HMR sector in Australia includes a number of institutions whose chief function is to support high quality HMR research and research translation by facilitating integration of the work of researchers, healthcare providers, peak groups and government agencies to achieve research-led advances in health care. Some of these centres of research collaboration are accredited by the NHMRC through two separate but related initiatives: Advanced Health Research Translation Centres (AHRTCs) and Centres for Innovation in Regional Health (CIRHs), with the latter specifically focused on addressing the needs of Australia's regional populations.

Health Translation South Australia (HTSA) is currently the only organisation in SA accredited under the AHRTC program to undertake a range of partnership functions within the local HMR and health care sectors. HTSA, initially known as the South Australian Academic Health Science and Translation Centre, was established in 2015. The organisation was renamed HTSA in 2018.

HTSA was initially accredited for a period of five years until March 2020, with that accreditation recently extended to March 2022. The Commission notes that NHMRC accreditation does not come with any associated funding, such as an annual operating grant. That said, HTSA has received Australian Government funding to undertake 15 health

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<sup>9</sup> J Birch, *Review of Research Governance in the Department for Health and Wellbeing (SA) and Related LHNs (2018)* 6.

services-based impact projects through the MRFF's Rapid Applied Research Translation initiative.

HTSA currently operates as an unincorporated joint venture consisting of eight partner organisations, each of which has signed a memorandum of understanding (MoU) to formalise its participation in HTSA. The joint venture consists of the following partners:

- University of South Australia;
- University of Adelaide;
- Flinders University
- SA Health;
- Adelaide Primary Health Network;
- Country SA Primary Health Network;
- Aboriginal Health Council of SA;
- Health Consumers' Alliance of SA.

The Commission considers that HTSA can effectively support local HMR by facilitating a community of practice to address a number of interrelated reform initiatives. HTSA is actively engaged in a number of areas of HMR capacity building, discussed further in chapter 6. A benefit of such a senior grouping is the capacity to use the role authority owned by the individual members to reach consensual, collaborative actions on issues of shared interest. This could include providing a collaborative forum for HMR leaders to pursue approaches to improving the translation environment in South Australia and taking responsibility, together with its partner organisations, for identifying and addressing systemic problems that obstruct research excellence.<sup>10</sup>

## 9.3 SAHMRI

### 9.3.1 Shine and Young Review

SAHMRI's current legal structure, governance arrangements and stakeholder relationships are partly legacies of the recommendations contained in the 2008 Review of Health and Medical Research in South Australia (the Shine and Young Review). The Commission notes that a number of subsidiary recommendations contained in the Shine and Young Review, such as the development of a state-wide HMR strategy led by DHW, have not been fully implemented in the years since the review was published. This includes, for example, a range of systemic problems identified at the time, such as the erosion of funding for HMR conducted in the LHNs. Some of these system-wide difficulties, including a reduction in research undertaken in the public hospital system, have arguably persisted into the present.

The Commission notes that the Shine and Young Review concluded that the establishment of an independent flagship medical research institute (MRI) would be the most effective way to address a number of interrelated problems then affecting the state's HMR performance. Chief among these was the view that the state was experiencing an erosion in its capacity to attract Australian Government competitive grant funding, and that this decline would continue unabated without significant 'structural' reform.

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<sup>10</sup> HTSA (FR11, p.1).

In particular, the review largely attributed the deterioration in performance to the loss of effective and high-quality research infrastructure in South Australia. This loss was largely ascribed to budget pressures adversely affecting the universities and hospitals. The review concluded that the most effective way to address the state's lack of high-quality infrastructure would be creating an independent MRI unencumbered by competing demands, such as health service delivery.<sup>11</sup> It also concluded that the MRI would, among other benefits, 'enhance collaborations between existing researchers/research teams' and assist in recruitment and retention of key people. The review argued that the establishment of SAHMRI as an independent MRI would resolve the state's infrastructure deficit and would also create:

*...a new flagship institute free of the entrenched rivalries often seen in other states where such institutes have evolved from different hospital/university environments and now compete for scarce state infrastructure funding.*<sup>12</sup>

The Shine and Young Review complemented its recommendation to establish SAHMRI with the closely related recommendation that the state government should build and maintain the Health and Medical Research Fund (established in approximately 2007). This was intended to ensure that the state would have the capacity to 'invest strategically in health and medical research in South Australia, to build capacity in this area, and to leverage funding received from national sources'.<sup>13</sup>

The government's decision to establish SAHMRI was complemented by a strategic plan based on partnering with other South Australian research facilities, including the universities and public hospitals.<sup>14</sup> This would be achieved by the gradual introduction of a system of SAHMRI 'nodes' into existing HMR institutions. The decision to establish SAHMRI was also strategically linked to the development of the new Royal Adelaide Hospital. The Commission understands that the then government envisaged that SAHMRI would be integrated with the new hospital, with the aim of co-locating clinicians, patients, students and researchers in what has now become the Adelaide BioMed City (ABMC). The integration of SAHMRI with the new Royal Adelaide Hospital formed a cornerstone of the former government's attempt to realise the benefits of an independent MRI:

*The SAHMRI Facility will be integrated with the new hospital, co-locating practitioners, patients, students and researchers in an industry-leading health and medical precinct. The co-location of research and hospital services will create synergies between researchers and care providers, integrating health and medical research and contributing to attracting and retaining key researchers to South Australia.*<sup>15</sup>

One of the government's reasons for establishing SAHMRI as an independent MRI freed from the need to balance competing priorities, such as research and the delivery of health care or undergraduate teaching, was that colocation of the new Royal Adelaide Hospital and SAHMRI would strengthen the links between clinical care and research. The Commission notes that this underlying rationale is consistent with the view, discussed earlier that the creation of SAHMRI would lead to a 'transfer' of responsibility for HMR from DHW and the LHNs to the newly created institute and the subsequent decision to exclude research facilities from the design of the new Royal Adelaide Hospital (RAH).

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<sup>11</sup> Shine and Young (n 3) 2

<sup>12</sup> Ibid 2.

<sup>13</sup> Ibid 3.

<sup>14</sup> SA Health, *The South Australian Health and Medical Research Institute: FAQs* (circa 2009) 1

<sup>15</sup> Ibid 1.

### 9.3.2 Legal structure

SAHMRI was incorporated in 2009 as a company limited by guarantee under the *Corporations Act 2001* (Cth) (the Corporations Act). SAHMRI is also a registered charity under the *Charities Act 2013* (Cth) (the Charities Act) and is regulated by the Australian Charities and Not-for-Profits Commission, pursuant to the *Australian Charities and Not-for-Profits Commission Act 2012* (Cth) (the ACNC Act). Its legal status as a charity means that some of the legal obligations that would normally apply under the Corporations Act do not bind it. Most of the legal obligations that SAHMRI's board must comply with arise from the Charities Act and the ACNC Act, but a number of provisions in the Corporations Act also apply. The Commission notes that SAHMRI's statutory reporting obligations do not include a requirement to report on its research performance.

SAHMRI's constitution specifies a range of central legal and governance arrangements, such as the composition of the board; the process for accepting new members of the company; and the powers of the board. The constitution also covers a range of related and subsidiary matters, such as the delegation of the board's powers and directors' remuneration.

SAHMRI was incorporated with six members, all of whom continue to be members of the company:

- the Minister for Health;
- the Minister for Science and the Information Economy;
- the Treasurer;
- the University of Adelaide;
- Flinders University; and
- the University of South Australia.

The decision to incorporate SAHMRI as a company limited by guarantee established a legal structure that is separate from the constituting members. The Commission notes that the three ministers are members of the company in their capacity as bodies corporate, pursuant to the section 7 of the *Administrative Arrangements Act 1994* (SA). The fact that SAHMRI was incorporated as an independent legal entity makes the board responsible for overseeing the business of the company:

*Subject to the Act and to any other provision of this constitution, the Board will oversee the business of the Company. The directors may exercise all powers of the Company that are not, by the Act or by this constitution, required to be exercised by the Company in general meeting.*<sup>16</sup>

The members of a company limited by guarantee, including SAHMRI, retain a number of rights under the constitution and the Corporations Act, including the right to a financial report, a directors' report and voting rights at general meetings. Any proposal to amend the company's constitution, for example, would require the endorsement of the members at a general meeting. SAHMRI's constitution also specifies that the board must consult the members if it wishes to change the institution's strategic direction. In addition, the members are empowered under the Corporations Act and the constitution to remove a director appointed by the board, subject to an ordinary resolution of the members.

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<sup>16</sup> SAHMRI, *Constitution of South Australian Health and Medical Research Institute Limited*, 13.

That said, despite members' specific rights, SAHMRI's legal structure places a limit on the members' capacity to intervene directly in the management of the company. The board retains responsibility for the management of the company, with the discretion to delegate some responsibilities to executive staff or an appropriately constituted committee. The board is also ultimately responsible for ensuring that SAHMRI achieves the objects set out in its constitution, and that it abides by the applicable statutory requirements under the Corporations Act, the Charities Act and the ACNC Act. The way in which SAHMRI's board is structured and appointed reflects the fact that it is an independent legal entity led by its own governing board.

The Commission notes that sections of SAHMRI's constitution, especially in relation to the composition and appointment of directors to the board, were only in place for an 'initial period' of four years after the company's incorporation in 2009. The initial composition of the board included three directors nominated on the unanimous recommendation of the three Vice-Chancellors and a director appointed by the Minister for Health. This formal requirement is no longer in place, with the board composed of two directors appointed by the Minister for Health, while the remaining members are appointed by the board itself. The Commission notes that the board has continued to appoint representatives of the state's three universities since the 'initial period' ended in 2013.<sup>17</sup> The arrangements that applied during the 'initial period' were likely a mechanism to facilitate a collaborative approach to embedding SAHMRI in the state's HMR sector.

The Commission notes that SAHMRI's legal structure and governance arrangements are broadly comparable to other leading Australian MRIs, many of which operate as companies limited by guarantee and as registered charities. That said, the Commission understands that other MRIs constituted as companies limited by guarantee generally possess more streamlined membership structures than SAHMRI, such as the Walter and Eliza Hall Institute, which only has two members.

A number of other major Australian MRIs, such as the Garvan Institute of Medical Research and the QIMR Berghofer Institute, were established as statutory authorities under state legislation. On the whole, the creation of a public company limited by guarantee provides an institution with greater autonomy from government than is characteristic of a statutory authority under state legislation. The latter can also be established as a body corporate with a board that is responsible for the management of the institution, but the members of the board will generally be appointed by the governor on the recommendation of the minister. This is the case with the QIMR Berghofer Institute.<sup>18</sup> The Commission notes that it is unclear whether different legal and governance structures materially affect research performance.

### 9.3.3 Strategic direction

The fact that SAHMRI was established as a company limited by guarantee, rather than as an authority enacted under state legislation, means that the institute's strategic direction is largely guided by its founding constitution. SAHMRI's legal status as an independent entity also empowers the board to develop and implement a strategic direction for the company. The Commission notes that any strategic direction pursued by the board must be in conformity with the objects for which SAHMRI was established. These are outlined in the company's constitution, and include a range of strategic objects in relation to undertaking and facilitating

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<sup>17</sup> For details on the composition of SAHMRI's board, see *ibid*, ss 9.2, 9.3.

<sup>18</sup> See *Queensland Institute of Medical Research Act 1945 (Qld)* s5.

collaborative HMR in the state, including, for instance, developing a centre of excellence in HMR; facilitating the translation of research; providing and maintaining research facilities and services; and working collaboratively with the universities, the government and other research institutions.<sup>19</sup>

SAHMRI's research strategy and performance are also assessed on a regular basis by the institution's Research Advisory Committee. SAHMRI's current research themes are focused on the following areas:

- precision medicine;
- lifelong health;
- Aboriginal health equity;
- SAHMRI women and kids;
- SAHMRI impact platforms, including;
  - health policy centre;
  - clinical trial and registry science;
- research support services; and
  - the strong partnership with Health Translation SA.<sup>20</sup>

The Commission notes that SAHMRI only became fully research active in late 2014, five years after it was incorporated, and that its research themes were recently reviewed and consolidated.

### 9.3.4 Funding

The Commission notes that the funding model under which MRIs, including SAHMRI, operate is based on dual 'foundations': first, successfully securing Australian Government competitive grants and state government funding and, second, a capacity to attract income from diversified commercial sources and philanthropic contributions from the Australian community.<sup>21</sup> This requirement stems from the design of the Australian Government competitive grant system, which does not fund the full costs of research. This leads to a challenge for the MRI model, which is most acute for independent MRIs that are not part of a parent organisation, such as a hospital or a university.

That said, the Commission understands that SAHMRI currently receives an annual operating grant from the state government, which totalled approximately \$5.8 million in 2019-20.<sup>22</sup> The Commission notes that the funding deed between the government and SAHMRI does not impose any specific conditions, such as HMR performance targets or KPIs, on the annual operating grant. The Commission considers that linking SAHMRI's operating grant to a set of clearly defined performance measures, with a primary focus on achieving excellence in clinical and translational research, would help to ensure that SAHMRI's strategic priorities are more effectively aligned to those of the state government. Appropriate annual reporting against performance measures will need to become an additional prerequisite of SAHMRI's annual operating grant.

As addressed in chapter 3, the Commission notes that SAHMRI also receives funding through the government's Health and Medical Research Fund (HMRF), which added an additional

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<sup>19</sup> SAHMRI, *Constitution*, 3–4.

<sup>20</sup> SAHMRI (DR 25, p.14).

<sup>21</sup> Graeme Samuel, 'Review to Strengthen Independent Medical Research Institutes' (Discussion Paper, 2015) 7.

<sup>22</sup> The Commission notes that the funding agreement expired on 30 June 2020. The Commission is not aware of the status of any negotiations between SAHMRI and the government to renew the agreement.

\$4.2 million in 2019-20 to the state's overall contribution to SAHMRI's funding base. The Commission understands that, at present, SAHMRI's funding from the HMRF represents 80 per cent of the fund's annualised income, with the remaining 20 per cent allocated to other initiatives by agreement between the Minister for Health and Wellbeing and the Premier.

As a way of broadening the effectiveness of the HMRF, which, as outlined in chapter 3, is not expected to grow significantly in future, the Commission considers that the fund ought to be made fully contestable and eligibility should be expanded to include both LHNs and non-government HMR institutions, including universities and research institutes in SA.

In addition, as already raised in chapter 3, the Commission considers that the utility of the HMRF could be bolstered and made more efficient by directing AusHealth's annual operating surplus, if any, into the HMRF. This has the potential to enhance the fund's overall strategic utility to HMR in SA. The Commission was not able to obtain any guidelines for the Fund or any evaluations of its impacts. In the interests of the transparent and effective use of government funds, robust guidelines and procedures for the operation of the HMRF need to be published, as well as the results of a periodic evaluation of the fund.

The Commission heard from stakeholders that the Shine and Young Review envisaged that SAHMRI would be established on the basis of more than capital funding, and that the total government contribution would also include an endowment fund. The Shine and Young Review estimated that SAHMRI would need to generate at least \$10 million per annum in operational funding to become financially self-sufficient. The Commission understands that SAHMRI must currently find funding from other sources to fully support its operational activities. SAHMRI has suggested that the original funding model created a number of deficiencies in its funding base, which it has had to address by developing strategies to diversify its revenue streams, including an increased focus on commercial activities.

The Commission has heard from SAHMRI that approximately 60 per cent of Australian MRIs' revenue is from non-government sources. In 2018, approximately 50 per cent of SAHMRI's total operating revenue of \$65 million came from non-government sources.

The Commission notes that one of the primary reasons behind the decision to establish SAHMRI was the contention that an independent MRI, offering access to high-quality research infrastructure, would help to increase SA's share of national competitive grant funding. A number of stakeholders, including The Hospital Research Foundation (THRF) have questioned the effectiveness of this strategy:

*THRF believes that a significant part of this lack of achievement [an increase in the state's share of national grant funding] may be due to a lack of clarity of purpose and a lack of overall leadership in the sector and in government. (THRF, DR26, p.7)*

The available funding data, as analysed in chapter 3, shows that the state's share of NHMRC funding since SAHMRI's establishment has declined slightly and is in line with South Australia's population share. While causal inferences from the funding data are difficult to draw, it could be argued that the state's share of national grant funding might have been lower without SAHMRI's contribution. SAHMRI contends that it has steadily increased its share of funding at a state level, with 42 per cent of South Australian NHMRC funding being awarded to researchers associated with SAHMRI in 2019.<sup>23</sup>

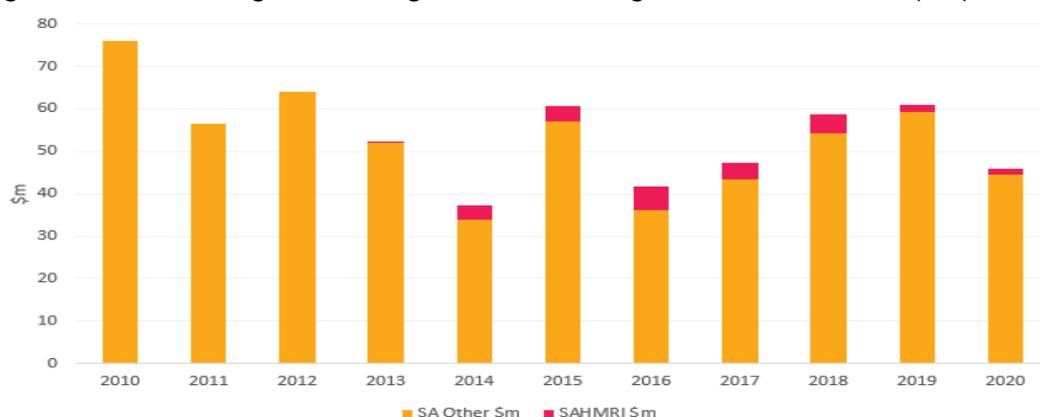
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<sup>23</sup> Ibid 57.

The Commission notes that SAHMRI’s success rate is difficult to report on, given that most of its awarded grants are administered via the universities. A number of stakeholders, including the Association of Australian Medical Research Institutes (AAMRI), have observed that the way in which grant outcomes are currently reported distorts MRIs’ success in attracting competitive grant funding, particularly because a project’s chief investigator might not undertake the research at the administering institution.

MRIs, including SAHMRI, are only infrequently the administering institution for competitive grants, with the majority of funding administered by universities. The available public reporting on funding outcomes therefore tend to under-report the grant funding success of MRIs, with SAHMRI’s actual contribution possibly greater than the public data attests. Figure 9.1 shows SAHMRI’s total grant funding from 2010 to 2020 highlighted against the state’s total for the same time period, but the data only reflects the grants directly administered by the institute.

Figure 9.1: SAHMRI grant funding as administering institution, 2010-20 (\$m)



Source: NHMRC

Note: Data available up to May 2020. Administering institute for projects starting in a given year.

The Commission also notes that, as at October 2020, SAHMRI has received \$13.1 million in funding through the MRFF, which represents 25.8% of the state’s total funding of \$50.9 million (for more details on MRFF funding, see chapter 3).

### 9.3.5 Indirect costs

As noted earlier, Australian Government research funding does not fully cover the total costs of research. AAMRI estimates that, out of every dollar of direct research costs, there are an additional 45–55 cents of indirect research costs that MRIs must meet from other revenue sources. Around 20–25 cents out of every dollar of these costs are covered by grant funds, thereby creating a significant funding gap. As grant income increases, the gap becomes correspondingly larger:

*For every dollar spent on research, it is calculated that there are another 54 cents needed to fully cover the costs of running a research institute. Independent HRMIs receive 23 cents of funding to cover the systemic costs of research (total from all sources), leaving a 31 cent per dollar shortfall. Federal Government funding provides about 20% of what is needed to cover the total systemic costs of research. (SAHMRI, DR25, p.63)*

In 2019, for example, SAHMRI reported a \$4 million shortfall on the \$29 million worth of grants that it was awarded. That said, the gap between the total cost of undertaking research and the available grant funding appears to affect MRIs and universities in roughly equal measure. The Commission understands that universities, following reforms to the Australian Government’s

block funding program introduced in 2016, now receive approximately 23 cents per dollar of research funding to cover their indirect research costs. MRIs generally receive around 22 cents per research dollar to offset the indirect costs associated with undertaking HMR.<sup>24</sup>

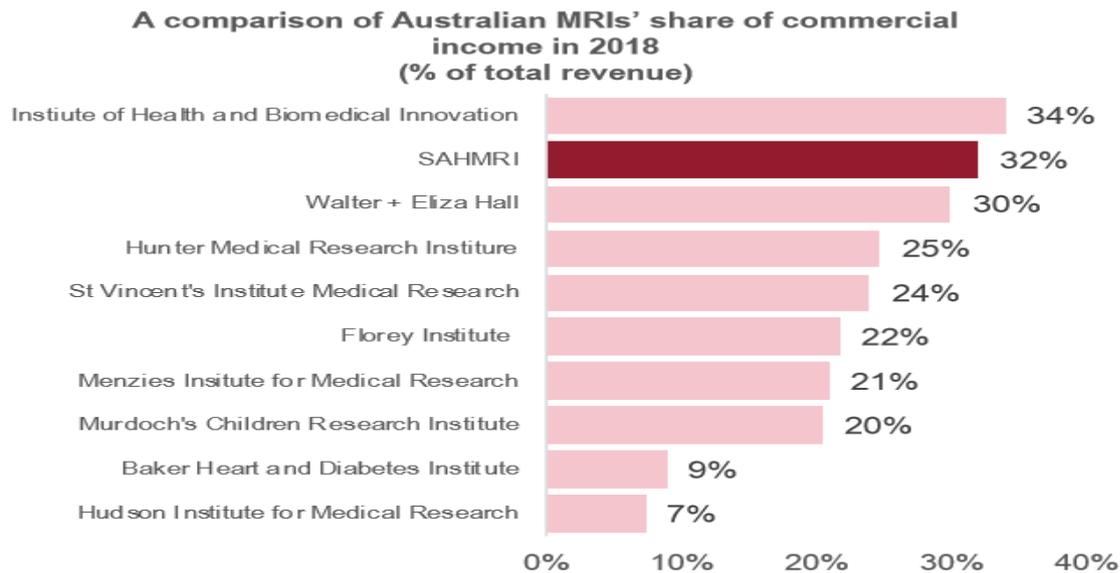
Financial support to defray the indirect costs of research is provided to independent MRIs and universities from different funding sources. MRIs generally draw on initiatives funded by the Australian Government, such as the Independent Research Institute Infrastructure Support Scheme and support programs funded by some state and territory governments (such as Victoria and NSW).

By contrast, support to the university sector is channelled through the Australian Government’s Research Support Program, administered by the Department of Education, Skills and Employment. The broadly equal funding gap affecting MRIs and universities means that both sectors are required to find ways to cover the full costs of research. The Commission understands that universities subsidise the full cost of their research efforts from a range of revenue streams, including fees charged to international students.<sup>25</sup> By contrast, independent MRIs usually bridge the research funding gap by undertaking commercial ventures or turning to philanthropic largesse as a source of additional funding.

**9.3.6 Non – government revenue**

Figure 9.2 below shows that one of the primary sources of non-government revenue for SAHMRI is commercial income, which makes up approximately 32 per cent of its total revenue. This share is amongst the highest for Australian MRIs. The Commission notes that a high reliance on commercial income introduces a range of risks into an organisation’s funding base, some of which might be difficult to mitigate.

Figure 9.2: Commercialisation income for MRIs, 2018.



Source: SAHMRI (Appendix IV), DR25, p.17

As reflected in Table 9.1, the South Australian Government’s direct contribution to SAHMRI’s annual operating costs is broadly aligned with that provided by other governments in percentage terms. A number of other jurisdictions, such as NSW, have adopted a more

<sup>24</sup> AAMRI (FR3, p.7).

<sup>25</sup> Ibid. 7.

structured approach to supporting their HMR sectors, including through dedicated agencies with overall responsibility for implementing the government’s HMR agenda and the creation of specific funds to defray the indirect costs of research, such as the NSW Government’s Medical Research Support Program.

SAHMRI also provides research space to a number of its major stakeholders, including the state’s three public universities and CSIRO, which is a potential source of additional non-government revenue. As at October 2020, SAHMRI’s building was occupied by 364 staff directly employed by SAHMRI, along with 408 staff employed by its partner institutions, 259 students and 19 volunteers. The Commission notes that SAHMRI’s employees occupy 49 per cent of the SAHMRI building, with staff and students from the University of Adelaide occupying 29 per cent. The remaining building space is occupied by faculty members and students of the University of South Australia, Flinders University, CSIRO and other contracted staff.

Table 9.1: Income for indirect costs for independent MRIs, by state and territory, 2018

State	NHMRC (IRISS)	University (via RBG/RSP)	State/Terr Gov	Other sources	Total Income for Indirect Costs	No. HMRI's that reported data
SA	\$676,421	\$1,220,000	\$5,670,000	-	\$7,566,421	1
NSW	\$3,590,495	\$23,952,278	\$42,787,170	\$608,082	\$70,938,026	16
QLD	\$5,231,000	\$5,648,952	\$18,864,000	\$225,622	\$29,969,574	4
VIC	\$18,390,607	\$15,390,517	\$38,342,935	\$845,520	\$72,969,579	14
WA	-	\$4,983,128	\$4,665,214	\$2,846,186	\$12,494,528	3

Please note that the 1 NT institute does not receive funding from the NT government and has been excluded from this Table.

Source: SAHMRI, DR25, p.64.

### 9.3.7 SAHMRI’s impact

The Commission notes that SAHMRI’s contribution to, and impact on, the state’s HMR performance is difficult to determine with a high degree of certainty on the basis of the funding and performance data presented in Chapters 3 and 4. The task of analysing SAHMRI’s impact needs to recognise its comparative immaturity as an MRI as it only became fully research active in late 2014.

That said, the Commission notes that SAHMRI has established itself as a high-performing institution at the national and international levels. Moreover, the available indicators that relate to publication quality at the institutional level, analysed in chapter 4, also indicate SAHMRI’s performance has remained at, or even above, the applicable world standard. This is also true of SAHMRI’s international collaboration performance, which largely outstripped the public universities, with the exception of 2019.

As examined in chapter 3, the state’s share of NHMRC funding appears to have fluctuated around a declining trend, which has continued since the establishment of SAHMRI. That said, the state’s funding share might have declined further in the absence of SAHMRI.

SAHMRI appears to have made a positive contribution to the state's performance over a period where the contribution of other key players, SA Health and the University of Adelaide, has declined. A complete assessment of SAHMRI's net contribution to the state's HMR performance is dependent on a reasonable counterfactual proposition.

## 9.4 Public universities

### 9.4.1 Legal structure and governance

South Australia's three public universities are incorporated under state legislation, with each institution established by its own constituting Act:

- *University of Adelaide Act 1971*;
- *University of South Australia Act 1990*;
- *Flinders University Act 1966*.

The universities' constituting statutes make clear that they are not instrumentalities or agencies of the crown, and also provide that each institution is endowed with 'full juristic capacity and unfettered discretion, subject to the laws of this state, to conduct its affairs in the manner it thinks fit'.<sup>26</sup>

That said, the universities remain subject to a number of statutes that also apply to state government agencies, notably the *Freedom of Information Act 1991 (SA)* and the *Public Finance and Audit Act 1987 (SA)*.

In common with other universities in Australia, the state's public universities operate as registered charities under the *Charities Act 2013 (Cth)* and the *Charities and Not-for-Profit Commission Act 2012 (Cth)*. They are subject to regulatory oversight by the Australian Charities and Not-for-Profits Commission and their annual financial reports are audited by the South Australian Auditor-General.

As research and teaching institutions that grant qualifications under the Australian Qualifications Framework, the universities are also subject to regulatory oversight by the Tertiary Education Quality Standards Agency, the national regulator of registered higher education providers. The Commission notes that the universities' reporting obligations under both Commonwealth and state legislation do not appear to contain any requirement to report on research performance.

The universities' constituting statutes not only establish each institution as a self-governing entity, but also prescribe the major aspects of their governance and decision-making structure. The Acts underlying all three of the state's public universities, for example, establish university councils that function as each institutions' governing body and both prescribe their central functions and their respective membership.

Each university has implemented specific requirements in relation to its governing council, including rules governing the election of members and the conduct of council business. Some of the central functions undertaken and overseen by the universities' councils include:

- approving the mission and strategic direction of the university, as well as the annual budget and business plan;
- approving significant commercial activities of the university;

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<sup>26</sup> See, for example, the *University of Adelaide Act 1971 (SA)*, s 3.

- overseeing and reviewing the management of the university and its performance; and
- establishing policy and procedural principles, consistent with legal requirements and community expectations.<sup>27</sup>

#### 9.4.2 University of Adelaide

The Commission notes that the state's public universities have all developed detailed strategic plans that include measures to deepen and enhance their current research priorities and strengths.

The University of Adelaide's high-level decision making is guided by its current strategic plan, *Future Making*. The plan is based on five interrelated pillars of excellence:

- connected to the global world of ideas;
- a magnet for talent;
- research that shapes the future;
- a 21st century education for a growing community of learners; and
- the beating heart of Adelaide.<sup>28</sup>

In relation to HMR, the strategic plan is focused on supporting research in a range of priority areas, including:

- reproductive medicine and paediatrics;
- cardiovascular disease;
- metabolic disease;
- cancer – solid tumours;
- cancer – leukemia, lymphoma, myeloma;
- health technology assessment;
- Aboriginal health equity;
- infectious diseases;
- medicinal chemistry; and
- innovative imaging tools.

The university's strategic direction includes pursuing significant growth in research income and investment aligned with both industry and community need. The university has recently established a number of Industry Engagement Priorities, one of which addresses the needs of the health and biotechnology sectors.<sup>29</sup> The Commission is not aware of the university's internal processes to determine HMR priorities.

The Commission understands that the university is developing strategies to attract talented and innovative researchers to South Australia. This effort forms part of its current strategic plan, *Future Making*, and is being implemented through its 'Investing in Top Talent' scheme,

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<sup>27</sup> See, for instance, the *University of Adelaide Act 1971* s 9(1)(a)–(h).

<sup>28</sup> University of Adelaide, *Future Making: A 21<sup>st</sup> Century University for Adelaide* 7

<sup>29</sup> *Ibid* 13.

which was introduced in 2019. The plan involves a proactive recruitment strategy to attract a cohort of high-performing, innovative researchers to South Australia, with the aim of generating new or transformational capability. The university recently made three appointments under the plan in different areas of HMR. Each appointment was made jointly with SAHMRI.

### 9.4.3 Flinders University

Flinders University is guided by its *2025 Agenda*, in which research excellence is supported by three fundamental principles:

- be a community of outstanding scholars engaged in world leading research that extends the boundaries of knowledge;
- address challenges of local, national and global significance to deliver outcomes that change lives for the better; and
- embed research and critical thinking as core skills for every Flinders graduate.<sup>30</sup>

Strategic decisions relating to the allocation of research funding are discussed by the University Research Committee, chaired by the Deputy Vice-Chancellor (Research), with representation from each of the university's six colleges and relevant professional support portfolios. Two committees of the Academic Senate – the Research Quality Committee and the University Higher Degrees by Research Committee – respectively assess the success of research strategies in building research quality and advise on approaches to the management of Higher Degree by Research at the university.

HMR is the specific focus of a number of the university's research institutes and centres:

- Flinders Health and Medical Research Institute
- Caring Futures Institute
- Órama Institute for Mental Health, Wellbeing
- Medical Devices Research Institute
- Digital Health Research Centre
- Centre for Marine Bioproducts Development
- Research Centre for Palliative Care, Death and Dying
- Sport, Health, Activity, Performance and Exercise Research Centre (SHAPE).

Flinders University currently has health and medical research space at the Bedford Park Campus, Sturt Campus, Flinders Medical Centre, Sir Mark Oliphant Building and Tonsley Innovation Precinct.

Research excellence in the areas listed above will continue through the consolidation of a significant proportion of HMR under its flagship research institutes and associated centres. This provides not only more cohesive programs of research but, more importantly, opportunities for enhanced collaboration between Flinders researchers and industry and/or community partners and more targeted consumer engagement, all aimed at enabling Flinders HMR to have a greater impact on societal health care and well-being.

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<sup>30</sup> Flinders University, *The 2025 Agenda* 10.

The Commission understands that the university has also placed some priority on attracting a cohort of high-performing HMR researchers, with a particular focus on strengthening the number of early- to mid-career researchers:

*Talented health and medical researchers are attracted to research environments that offer a strong intellectual environment, outstanding research infrastructure, capability and support, and the opportunity to engage with clinical activities. Flinders University has strength in all three, in particular through the embedding of the College of Medicine and Public Health in a major teaching hospital. With these advantages, Flinders University has been successful in recently recruiting high trajectory early/mid-career researchers. Flinders' investment in people and infrastructure and access to clinical resources and clinicians through its strong relationship with SALHN are all crucial components of our attractiveness. (Flinders University, DR14, p.4)*

#### 9.4.4 University of South Australia

Following the introduction of the University of South Australia's (UniSA's) current strategic plan, *Enterprise 25*, the university has begun a process to move to a structure comprising seven academic units, which are responsible for delivering study programs and conducting research.

On the basis of its *Research and Innovation Strategic Plan 2016–2020*, the university is committed to engaging in the full spectrum of both research and funding, ranging from fundamental research and competitive grants, such as NHMRC and MRFF funding rounds, through to end-user focused research and research undertaken on a contractual basis for various research partners.

The university's current areas of HMR concentration and comparative strength are clustered around four of its five major research themes: 'an age-friendly world', 'transforming industries', 'cancer' and 'healthy futures'.

These themes drive strategic decision making on UniSA's research direction and resource allocation. They are intended to encourage interdisciplinary research, including, for example, the Research Themes Investment Scheme, research development funding to support PhD projects, and seed funding aimed at supporting early-career researchers.

UniSA's Centre and Institute Strategy: Scale and Focus has been designed to ensure research concentrations at UniSA are of sufficient scale to drive research. Through this strategy, research concentrations of measurable scale are designated as either research institutes or research centres and receive a range of university support and investment.

In addition to these university-level designated research concentrations, there are a range of research groups within the academic schools and divisions.<sup>31</sup> The Commission understands that the university as a whole is focusing on the development of quality and niche research schools and institutes across the entirety of the institution. The Commission heard that the university has a 'bottom-up' approach of nurturing early-career researchers, rather than focusing on attracting international researchers or established academics from elsewhere.

#### 9.4.5 Future outlook

The Commission notes that the university sector in Australia has been adversely affected by the need to impose a range of restrictions to respond to the COVID-19 pandemic. These restrictions have led to a significant downturn in universities' revenue from international student fees. South Australia's universities are likely to experience significant budget

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<sup>31</sup> University of South Australia, Response to SAPC Information Request, 3.

pressures as a result of the downturn in international student enrolments, which could have an effect on their capacity to implement some of the funding and investment decisions outlined in their respective strategic plans, including initiatives aimed at strengthening HMR output and impact. The Commission understands that the consequences of the downturn in international student numbers could have an uneven effect on the state's universities, with some institutions affected to a greater degree than others.

## 9.5 Key relationships

### 9.5.1 Collaboration

A large number of stakeholders, including the LHNs and the universities, have highlighted the importance of effective collaboration, coordination and integration as a precondition for a vibrant and successful HMR sector.

The Commission notes that jurisdictions with high levels of research and development (R&D) productivity, such as Israel, generally owe their success to an effective linkage of high levels of investment with multi-institutional collaboration. Effectively aligning the efforts and priorities of institutions and researchers has been cited, for instance, as a key component of the success achieved by Israel's Herzliya R&D Center.<sup>32</sup>

Stakeholders in both the government and non-government sectors have invariably stressed the importance of HMR in all its forms, including basic research, clinical research and translational research. Many have also expressed their commitment to increasing the productivity of HMR as a key goal of their respective organisations. Many stakeholders have argued that a scientifically vibrant and productive HMR sector is predicated on, and is re-enforced by, the interplay of education, R&D and clinical service delivery. That said, stakeholders have generally highlighted the importance of collaboration without clearly articulating its benefits for the state's HMR output, such as achieving greater economies of scale or achieving higher levels of specialisation in areas of competitive advantage.

SA Health's *Research Focus 2020* and its *Health and Wellbeing Strategy 2020–2025* acknowledge education, research and training as integral components and enablers of the state's public health system. In relation to the local HMR sector, the importance of coordination and collaboration between researchers and institutions is highlighted in Adelaide BioMed City's submission:

*Multi-institute and multi-disciplinary collaborations are essential for success across all research areas and platforms and to be highly competitive nationally and globally. A collaborative approach assists to act more strategically, become more efficient and create scale. It also supports researchers to secure large funding schemes, to build sophisticated infrastructure and to attract world-class talent and attract research/industry partners. Funding schemes increasingly include larger true collaborations as part of the funding criteria. (Adelaide BioMed City, DR1, p.20)*

That said, many stakeholders have expressed reservations about the way in which these aspects of the HMR system currently operate in South Australia. Flinders University's submission raises a characteristic area of concern:

*SA Health and the LHN CEOs, as well as universities, have all stated that they are committed to increasing productivity in HMR. Yet, this often fails to translate into internal operational corporate units, which often lack flexibility in processes to enable collaboration. Differing*

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<sup>32</sup> See, for instance, Aliza Belman Inbal and Asaf Tzachor, 'National Policy and SMEs in Technology Transfer: The Case of Israel' (2013) 15(1) *Climate Policy* 88.

*priorities is also a challenge. Key University and SAHMRI metrics are based on research income, high-quality publications and research impact whereas SA Health and industry have budget, economic and productivity goals, with research understandably considered a lesser organisational objective. (Flinders University, DR14, p.9)*

The Commission heard from several stakeholders, including the University of Adelaide's Faculty of Health and Medical Sciences, that collaboration between institutions and researchers can be difficult to develop in the absence of an agreed upon focus on specific issues and research problems.<sup>33</sup> These inherent difficulties of coordination are intensified by the different strategic priorities pursued by the institutions that make up the state's HMR system, including particularly sharp divisions between the LHNs and the public universities and rivalry between the universities. The lack of a set of collaboratively developed state HMR priorities has the effect of discouraging an environment in which 'collaborations occur and succeed when everyone involved benefits by bringing complementary skills and assets to the table to make a discovery or solve a problem'.<sup>34</sup>

In particular, the absence of a coordinated approach to developing the state's HMR strengths has made it more challenging to promote collaboration between institutions with differing priorities. A number of submissions, such as the University of Adelaide's Faculty of Health and Medical Sciences, suggested that one of the key reasons behind South Australia's performance in Australian Government HMR funding is the fact that institutions do not have strong incentives to collaborate on funding proposals.

Dr Leanna Read argued that SA's current HMR system is often more competitive than collaborative, and that a general unwillingness to collaborate was one of the primary causes of the state's declining share of HMR funding. This is particularly significant in relation to MRFF funding success. According to Dr Read, SA's current share of Australian Government funding is unlikely to increase because of a shift in the Australian Government's funding priorities towards larger-scale projects that demand collaboration between institutions and away from smaller projects that are led by a single researcher. She argued that collaboration and translation are not currently particular strengths of the state's HMR sector:

*the balance of available research funding programs has tilted towards the large-scale projects, with a greater focus on translation (i.e. outcome-driven), rather than 'bottom-up' research typical of smaller-scale projects. This means that increasingly research success and translation will require large collaborative efforts on outcome-based research, linking different expertise and end-users such as industry, clinicians and consumers at the state, national and international level. (Dr Leanna Read, DR12, p.1)*

The Commission notes that many stakeholders consider that the state's HMR system is being undermined by a fragmentation of resources and research effort. According to the School of Psychology, the decision to establish SAHMRI as an independent MRI has created a further barrier to partnerships, collaboration and integration:

*The State Government used to be the key source of partners on grants such as NHMRC Partnership grants and ARC linkage grants which leveraged the contribution several fold and increased the success rates for funding. Since the establishment of SAHMRI, the response from SA Health when approached to be a research partner on a grant is that their research dollars go to SAHMRI and they have no capacity to support other groups. Given that SAHMRI is an NHMRC recognised institution it cannot be a partner, so that creates a barrier to finding*

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<sup>33</sup> University of Adelaide, Faculty of Health and Medical Sciences, (DR28, p.6).

<sup>34</sup> Ibid 6.

*partners for health and medical research in South Australia. (University of Adelaide, School of Psychology, DR31, p.9)*

The need for a mechanism to foster and enhance collaboration between the state's HMR institutions has also been a consistent theme in submissions to the inquiry. Some stakeholders, such as AAMRI, have suggested that the current lack of effective integration could be addressed by expanding the role of HTSA:

*In the last decade, investment in the Adelaide Biomed City Precinct and establishing the AHRTC, Health Translation SA, have greatly increased South Australia's collaborative potential and capability. Health Translation SA has already received direct funding (\$6M) through the MRFF and is connected to the other nine AHRTCs and CIRHs nationally through the Australian Health Research Alliance. This enables access to a national network of research capability. Building strong collaborations between organisations reduces barriers to establishing new collaborations to address new strategic goals in health research. It also facilitates highly competitive funding proposals for major grant schemes and direct bids from the Australian Government. (Australian Association of Medical Research Institutes, DR5, p.21)*

### 9.5.2 Precincts

*Innovation precincts are defined as geographic areas where leading-edge anchor R&D institutions and companies cluster and connect with start-ups, business incubators and accelerators.<sup>35</sup>*

Evidence on innovation precincts both domestically and internationally, demonstrates that the success of precincts is judged by their effectiveness in increasing collaboration between researchers and end users and fostering higher levels of innovation, knowledge transfer and commercialisation to drive sustainable economic growth and job creation.<sup>36</sup>

In the 2018 Statement of Principles for Australian Innovation Precincts<sup>37</sup>, the Australian Government Department of Industry, Science, Energy and Resources (DISER) note four principles required for best practice and successful place based partnerships:

- local leadership in innovation precinct development;
- removal of barriers to align policy;
- building up capability and connections; and
- coordinating skills development within innovation precincts.

In applying the term 'precinct', it is important to draw the distinction between a conventional 'innovation precinct', which includes researchers, commercial end users, commercialisation, start-ups and universities, and 'HMR precincts' that are built around a major hospital and/or LHN and may include commercialisation.

The Commission heard from multiple stakeholders that co-location often produces effective linkages between LHNs and research institutions, such as SAHMRI, if not between research institutions themselves. The SAPC concurrent inquiry into Research and Development has considered evidence from the Brookings Institute that suggests that innovation districts (or

<sup>35</sup> B Katz and J Wagner, *The Rise of Innovation Districts: A New Geography of Innovation in America* (2014) p.1.

<sup>36</sup> Department of Innovation, Industry and Science Statement of Principles for Australian Innovation Precincts Place-Based Partnerships Building on Competitive Strengths (2018) p.14.  
<<https://www.industry.gov.au/sites/default/files/October%202018/document/pdf/statement-of-principles-australian-innovation-precincts.pdf>>.

<sup>37</sup> For more detail see < <https://www.industry.gov.au/data-and-publications/statement-of-principles-for-australian-innovation-precincts>>.

precincts as they are referred to in Australia) facilitate the creation and commercialisation of new ideas.<sup>38</sup>

As recognised in the Commission's current research and development inquiry, collaboration can only be successful in the presence of commitment, both financial and cultural over the long-term, accompanied by clear responsibilities, aims and performance measures.<sup>39</sup>

The University of Adelaide's, supplementary submission proposes:

*A key element to successful HMR commercialisation is the involvement of clinicians (through either leadership or early engagement). Coordination and collaboration across Adelaide BioMed City (ABMC) will provide the opportunity to bring the fundamental research closer to the clinic so that research programs can be directly informed through this level of input from the 'market'. (University of Adelaide – Supplementary, FR18, p.5)*

The role of governments in precinct development can range from peripheral or supportive actions to creating precincts and making significant investments.<sup>40</sup> In the Commission's view, while the government can play an important role in providing long term strategic support and commitment, the actual activity, success, and sustainability will be driven by the businesses, institutions, entrepreneurs and the researchers involved.

South Australia is home to two geographically based HMR precincts. Adelaide BioMed City (ABMC), formalised as a biomedical precinct in 2018 and a long standing southern area including Flinders University, SALHN and more recently the Tonsley Innovation District. There is a research cluster in WCHN, and an emergent cluster in NALHN, both of which are collaborating with several universities, LHN's and SAHMRI.

### Adelaide BioMed City

The Commission notes that the Adelaide BioMed City (ABMC) precinct has the physical, economic and networking assets available to be a successful innovative precinct for HMR. Some submissions have argued that co-location alone does not foster successful collaboration, particularly for universities, but the Commission has heard from multiple stakeholders that co-location often produces effective linkages between LHNs and research institutions, such as SAHMRI, if not between research institutions themselves.

The University of Adelaide's Faculty of Health and Medical Science suggested that more effort is required to drive an active research culture in SA:

*the research environment in SA is perceived as inferior to jurisdictions in eastern states. This impression comes from a collective view among FHMS researchers that applications from SA are downgraded in sections concerning research environment and infrastructure. Initiatives like ABMC have been formed to address these concerns, but it has not overcome the culture and competitive drivers between institutions and does not have the financial backing to make rapid, meaningful change to the current, fragmented research infrastructure in the state. (Adelaide University, Faculty of Health and Medical Science, DR28, p.7)*

The Commission notes that a recent report has argued that a number of leadership deficiencies currently adversely affect the ABMC precinct:

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<sup>38</sup> The Brookings Institution, *Assessing your innovation district: A how-to guide*, The Anne T. and Robert M. Bass Initiative on Innovation and Placemaking (2018).

<sup>39</sup> SAPC Research and Development Inquiry, draft report, p.171.

<sup>40</sup> NSW Innovation and Productivity Council, *NSW Innovation Precincts Lessons from international experience* (2018) 78.

- lack of a single vision that will guide development of the precinct and which would enable integration with local, national and international communities;
- lack of clarity around leadership and governance. Universities and SAHMRI are competing against each other rather than collaborating. Idea sharing is impacted when competitive behaviour is present;
- absence of a comprehensive state-wide health and biomedical research strategy potentially leading to duplication and competition between key partners. NSW, Queensland and Victoria all have strong research strategies offering leadership, funding, support and facilities;
- reduction in research within the LHNs which can affect the available skill capability of the HMR workforce;
- amenities and infrastructure space are now limited so that significant expansion in the precinct will be difficult without a new strategy to support new ventures;
- funding priorities are different for the major precinct participants. For LHNs it is patient care; for universities, it is student numbers, research grants and published papers; and, for SAHMRI, it is research grants, numbers of researchers, outcome and commercialisation; and
- lack of research enablers.<sup>41</sup>

The Commission notes that the issues identified by Richter suggest that the ABMC is yet to achieve its full potential. A number of stakeholders, particularly in the university system, maintain that the ABMC precinct has yet to develop a clear strategic outlook, a supportive research strategy and strong leadership and accountability:

*[ABMC]...has been widely admired within and outside SA. Nevertheless, it is hard to find people involved in HMR in SA who can point to achievements that can be attributed to the precinct so far. They remain largely siloed worlds with their own processes, memberships, responsibilities, benefits, and culture. There are overlapping jurisdictions and processes, and few seem to understand what the Adelaide Biomedical City precinct actually does and what it is meant to achieve. (University of Adelaide, Faculty of Health and Medical Sciences, DR28, pp.7-8)*

The need to realise the precinct's potential by overcoming the obstacles created by competing priorities and overlapping administrative systems was also highlighted by the ABMC in its submission to the inquiry:

*For a precinct to develop and mature it needs to overcome competing priorities, it must enter into a state of co-opetition that is supported by stable governance, a clear collective strategy and a united high-level vision. Precinct leadership could drive this goal, whereby involvement from government and industry is crucial. (ABMC, DR1, p.9)*

An additional limiting factor identified by a number of stakeholders is the lack of high-quality, dedicated research facilities at the new RAH.<sup>42</sup> In particular, it has been suggested that the decision to create the North Terrace precinct, including the construction of the new RAH,

<sup>41</sup> JM Richter Consulting, *Greater than the Parts: South Australian Health and Biomedical Precinct – Vision Strategy and Governance Model* (2017) 5

<sup>42</sup> Ibid 6.

caused a dislocation of the previously strongly developed links between the LHNs (especially CALHN) and the state's universities that had been created around the old RAH precinct. Although the ABMC was intended to replicate this ecosystem at the other end of North Terrace, it has taken some time for these more organic working relationships to be recreated. As the University of Adelaide's Medical School Research Committee observes:

*South Australia has been one of the national and international leaders in the HMR sector since the 1980's...The environment which nurtured considerable research talent to enviable levels (e.g. Prof Fiona Stanley has acknowledged that) was the perfect mix of research, education and health service delivery co-location at specific sites around Adelaide (IMVS, RAH, QEH, FMC). However, over the last 20 years this exemplar mix has been systematically disrupted while other states learned from our success and built similar institutions fusing research, education and health at one physical location. (University of Adelaide, Medical School Research Committee, DR4, p.2)*

The Commission notes that the ABMC is a comparatively young precinct and that multiple stakeholder groups maintain that it has the potential to lift the state's HMR competitiveness and secure a greater share of national grant funding. These potential benefits are more likely to be realised if strong leadership and a developed partnership culture prevail. This would go some way to addressing the duplication of efforts often associated with competing organisational administrations, and would allow the potential benefits of collaboration, particularly between CALHN and SAHMRI, to be realised to the fullest extent possible.

### Southern area

In the south of Adelaide, there is a long history of an HMR collaboration involving Flinders University and SALHN and the potential to develop further. At present, the Commission understands that no formal precinct arrangements exist, although there are a number collaborative arrangements in place between stakeholders in the geographical area and within the Tonsley Innovation District.

In 2010, the SA Government acquired land at Tonsley and began development of the Tonsley Innovation District. Tonsley was identified as a 'maker' district, bringing together industry, academia and government as an innovation district. There are around 1,800 people working on-site, with 4-5,000 students attending the TAFE Campus. Other original anchor tenants include Flinders University and Siemens. The Flinders University Tonsley campus (Flinders@Tonsley) houses elements of the College of Science and Engineering (the Medical Device Research Institute, AI, Robotics, Automation, and Engineering courses), and the College of Nursing and Health Sciences (the Flinders Digital Health Research Centre).

The Medical Technologies and Pharmaceuticals Growth Centre also has a hub at the Medical Device Research Institute. Business incubators such as Innovyz and the New Venture Institute help provide companies with laboratory and production space that would normally be beyond their financial capacity and the Medical Devices Partnering Program (MDPP) provides a mechanism to develop proof of concept, prototyping, clinical evaluation and commercialisation planning of medical devices.

The planned Flinders University Urban Village (Bedford Park Campus) partners include: Flinders University, Southern Adelaide Local Health Network, Flinders Medical Centre and the South Australian Government. Flinders University is seeking to create a mixed use urban village comprising tertiary education, a health research building, commercialisation and start-ups, business, services and accommodation that will leverage and optimise significant investments by the Australian and State Governments in the Tonsley Innovation District.

Flinders University indicates that stronger ties with the planned Flinders precinct and the existing Tonsley precinct are essential, especially as Tonsley is the home of the Medical Devices Partnering Program (MDPP).

*it is crucial to recognise the strength and importance of clinical, research and industry connectedness of Flinders University, Flinders Medical Centre and the Tonsley Innovation Precinct. (Flinders University, DR14, p.8)*

*The Medical Devices Development Program (MDPP), which has been strongly supported by the SA Government and sits within the Tonsley Innovation Precinct, continues to provide a mechanism to develop proof of concept, prototyping, clinical evaluation and commercialisation planning of medical devices that benefit the community, local industry, entrepreneurs and small to medium-sized enterprises (SMEs). The MDPP is currently being expanded to include other Australian states, placing South Australia as the lead agent in positioning Australia as a global leader in the growing medical devices market. (Flinders University, DR14, p.7)*

Adelaide University supports the concept of a two precinct approach and focusing clinical research primarily around Adelaide's two largest hospitals and its two medical faculties/schools.

*As it is not possible to locate everything within a specific, geographic precinct focused on clinical excellence, it becomes necessary to view the two precincts as being the hubs within a much bigger system that draws all trans-disciplinary capabilities together. For example, the system needs to include the Northern Adelaide Local Health Network (NALHN) as well as CALHN and SALHN. (University of Adelaide FR18, p.4)*

Since publication of the draft report, the Commission received feedback from NALHN and the University of Adelaide indicating a desire to bolster HMR in northern metropolitan Adelaide, which has the largest LHN population base and is adversely affected by its low socio-economic status. NALHN is keen to see the establishment of a population health and wellbeing research hub within the NALHN catchment, embedding researchers with frontline staff.<sup>43</sup> The Commission sees value in co-locating tertiary hospital HMR with the populations in the north and south of the city, especially where research can change clinical practice and lead to innovation in the way that the disease burden in particular populations is managed. These types of innovation and research translation are vital in addressing poor population health as part of total quality improvement.

*Embedding appropriate research resources into the daily operations of NALHN and deeply engaging front line staff is, prima facie, the pathway to significant and sustainable productivity improvement.*<sup>44</sup>

The Commission acknowledges and commends the enthusiasm for pursuing a HMR based continuous improvement culture in NALHN and recognises this could lead to improved public health and health care efficiencies in NALHN.

In summary, there are several views on the role of the state government in the development of precincts. The Commission acknowledges that the ABMC is still in the early and developing stages and that further development would be facilitated by strategic state-wide direction on HMR from the South Australian Government, including articulation of its role with regard to precinct development. The southern area has a longstanding precinct which in its next stage will benefit from formal arrangements and a governance model to achieve the benefits of sharing and collaboration. The Commission recognises the important work which has

<sup>43</sup> Correspondence received from NALHN 4/11/2020, p.3.

<sup>44</sup> Correspondence received from NALHN 29/10/2020, p.1.

commenced by the independent Boards of the LHNs to further embed HMR in teaching hospitals in the south and north to strengthen and improve health outcomes for the populations they serve.

### 9.5.3 SAHMRI

A wide range of stakeholders, particularly in the university sector, have argued that the strategic objectives which SAHMRI was established to achieve have not been fully realised.

The Commission notes that the then government from 2010 appeared to have adopted the position that SAHMRI would act as a 'keystone' around which greater collaboration in the HMR sector could develop. This position appears to have morphed into SAHMRI being the primary 'mechanism' with which the government sought to support and develop HMR in South Australia. The creation of SAHMRI as an independent MRI was intended to act as an institutional 'magnet' with which to attract higher levels of Australian Government funding, increase collaborations within the state, and raise the state's international profile in the multiple fields that comprise HMR.<sup>45</sup>

The Commission is aware that the then government formed the view that HMR in the state would begin to shift away from the public hospital system and towards SAHMRI. In late 2010, the then Health Minister gave a clear overview of the government's expectation that SAHMRI would become one of the primary vehicles for the expansion of HMR in SA. The Minister's second reading speech in support of the Bill to create the Health Services Charitable Gifts Board referred to the changes that SAHMRI would bring to HMR in South Australia:

*In the future, much of this research will be undertaken by the South Australian Health and Medical Research Institute (SAHMRI) and far less so in individual hospitals... As the focus of health and medical research shifts to the SAHMRI, the belief the hospital is the best place to undertake the research may be misplaced.<sup>46</sup>*

A number of stakeholders, such as WCHN, have observed that the government's shift towards emphasising SAHMRI's role has adversely affected the overall competitiveness of the research workforce in the public health system:

*SA has seen a decline in research funding over the last 10+ years, and this decline is linked to a corresponding decline in the Hospital/Health Network research workforce... The SA Government has not provided specific support to help researchers access Australian Government funding and there is no 'Research Champion' in the Department of Health and Wellbeing to oversee it. This lack of investment in research over the years, in particular since the establishment of SAHMRI, has reduced the competitiveness and number of HMR researchers that is necessary to successfully compete for funding. (Correspondence from Women's and Children's Health Network)*

A range of stakeholders, particularly the university sector and the LHNs, have consistently argued that the government's emphasis on SAHMRI's role as a cornerstone of the state's HMR capacity has also contributed to the lack of HMR strategic leadership from DHW. The department has itself highlighted the fact that it is no longer in a strong position to support the state's HMR efforts:

*It is further recognised that the DHW is no longer able to provide funding support for research in the manner it once was able to. Arguably, this has created a gap in HMR funding in the State especially in areas that may not attract strong national funding and has limited local researchers*

<sup>45</sup> SA Health *The South Australian Health and Medical Research Institute: FAQs* (circa 2009) 1.

<sup>46</sup> South Australia, *Parliamentary Debates*, House of Assembly, 24 November 2010, 3, (John Hill, Minister for Health, Mental Health and Substance Abuse).

*being able to engage with the DHW as a potential industry partner to seek support for key national research partnership grants. Restoring some or all of this funding is considered an important step forward in supporting South Australian health and medical researchers in the years ahead. (Correspondence from the Office of Research, Department for Health and Wellbeing)*

The view that the way in which the government established SAHMRI has adversely affected the wider HMR system is also linked to the contention that SAHMRI's presence has had the paradoxical effect of reducing the incentives for HMR institutions to collaborate. The University of Adelaide argues in its submission that the university's relationship with SAHMRI is marred by a number of difficulties that create obstacles to full and effective collaboration.

One of the most significant of these hurdles, according to the University of Adelaide, is that the state's universities have contributed significant support to SAHMRI, including research staff. This has limited the extent to which SAHMRI has added to the overall HMR research capacity in SA, despite being an independent institution established with the aim of maximising the state's HMR potential.<sup>47</sup> It also raises the possibility that SAHMRI has had the effect of duplicating, rather than expanding, the HMR capacity in the state.

The Commission notes that the University of Adelaide recently undertook an internal review of its own HMR activity. It concluded that SAHMRI has largely duplicated the university's research themes:

*SAHMRI has established a number of themes which reflect a mirroring of the University of Adelaide's strengths, themes and sometimes Research Institutes, often using the University's own staff, and the Review recognised the challenge this presents and the need for both parties to work harder on a more nuanced approach. (University of Adelaide, DR29, p.18)*

The University of Adelaide went on to argue that SAHMRI's current structure has placed a hard limit on the extent to which it can be a 'genuinely additive' contribution to HMR in the state.<sup>48</sup> The University of Adelaide's Faculty of Health and Medical Sciences, for instance, argues that the decision to establish SAHMRI has generated the unintended consequence of creating an additional competitor, rather than an integrator, within the state's HMR sector:

*Unfortunately, the HMR environment in SA remains more competitive than collaborative. One of SAHMRI's roles was to facilitate collaboration but the experience has been largely one of having another competitor in SA. This is despite SAHMRI's governance structure representing different institutions and interests. (University of Adelaide, Faculty of Health and Medical Sciences, DR28, p.6)*

That said, the available evidence on funding outcomes, as analysed in chapter 3, does not support the claim that SAHMRI has been a competitor to the universities in the state's HMR system. That contention remains unproven. The Commission also notes that an alignment of themes is not necessarily duplicative under a collaborative research model and could be interpreted as a way of building scale. Moreover, all three public universities are members of SAHMRI and have been represented on the board continuously since SAHMRI was incorporated. The fact that the state's universities are members of SAHMRI does not appear to have reduced the tension between these key players in the HMR system, but it remains true that the universities have been in a position to influence SAHMRI's strategic direction through their status as members and their representation on the board. Whether this might have been an effective mechanism for resolving such frictions is a moot point.

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<sup>47</sup> The University of Adelaide (DR29, p.4).

<sup>48</sup> Ibid 14.

The Commission notes that SAHMRI has questioned the contention that it acts as an explicit or implicit competitor to the universities and other HMR institutions. SAHMRI's submission argued consistently that the high number of joint publications between SAHMRI and the universities is evidence that the relationship between the state's public universities and SAHMRI is both collaborative and effective.<sup>49</sup> As SAHMRI made clear in its submission:

*The SAHMRI model is very different to other independent health and medical research institutes across Australia – a collaborative venture with all three Universities and the State Government as partners. Given this, a flexible model was created whereby SAHMRI employees and partner staff from the Universities and CSIRO work alongside each other in our world-class facility. This provides benefits to both SAHMRI and our partners in relation to collaborative opportunities, access to infrastructure and animal house services, co-supervision of students and subsidised rent (at around the third of the cost of rent when benchmarked against office space in the Adelaide CBD). Furthermore, this co-location brings multidisciplinary teams together across 'bench to bedside' translational research and facilitates innovative approaches to research practices. (SAHMRI, DR25, p. 14)*

SAHMRI's submission suggests that the state's HMR performance could be strengthened by enhancing the relationship between SAHMRI and the public health system. This is particularly significant in relation to the potential for greater integration with research pursued in the LHNs (as originally envisaged in the Shine & Young report). The strengthening of collaborative links between these areas of the state's HMR system is likely to enhance SA's performance in future funding rounds, particularly in relation to the MRFF:

*The NHMRC and MRFF have quite different strategic objectives and fund projects based on different criteria. The MRFF aims to transform health and medical research and innovation to improve lives, build the economy and contribute to health system sustainability. Successful projects must demonstrate the ability to meet all three of these criteria. Essential to this therefore are clinical researchers – an area already identified as a growth area for the State. With a state-wide recruitment and retention strategy in this area, South Australia would have the capacity to increase receipt of MRFF funding. (SAHMRI, DR25, p.60)*

#### **9.5.4 Clinical academics**

The Commission notes that many stakeholders highlighted the declining number of clinical academics as one of the most significant 'structural' factors affecting the key relationships between the major HMR institutions. The University of Adelaide Clinical Academics have observed that clinical academics make a significant contribution to HMR leadership and research output. Senior clinicians provide an 'essential strong role-model for clinical research for students and trainees'.<sup>50</sup> The Commission notes (see particularly chapter 6) that terms like clinical researcher and clinical academic must be defined in broad terms to include HMR in nursing, midwifery, allied health and public health.

Clinical academics function as a critical 'hinge point' between the universities and the public health system, but their employment arrangements have become increasingly complex and prohibitive:

*Clinical Academics embody the connection between hospital and university. The dual employer arrangement is essential but adds complexity since there must be agreement between the two parties despite both having different agendas...The frequent changes in both hospital & university executive, causes considerable exasperation amongst clinical researchers since inevitably there are corresponding changes in executive policy to research structure and priorities; with essentially no corporate memory or apparent concern. Moreover, if there are financial difficulties with one of the partner institutions, then predictably it is the vacant*

<sup>49</sup> SAHMRI (DR25, p.26).

<sup>50</sup> Correspondence received from University of Adelaide Clinical Academics.

*academic position that is not filled. (Correspondence from University of Adelaide Clinical Academics)*

The structural difficulties affecting clinical academics also have the effect of reducing retention rates among established clinicians and discouraging younger clinicians from pursuing a clinical research career.<sup>51</sup> The Commission notes that several submissions agreed with the University of Adelaide Clinical Academics that the connections between universities and the public health system have deteriorated over time, which has negatively affected research performance within the state's HMR system.

The Commission has heard from a number of stakeholders, including the state's public universities, that the difficulties adversely affecting clinician researchers' roles have been compounded by substantial policy-driven changes in the way that major parts of the state's HMR system currently interact. These include system-wide structural reforms, such as the Transforming Health initiative, the de-emphasis of the department's role in the HMR system, the decreased priority for HMR in hospitals (driven in part by budgetary constraints in SA Health) and the decision to position SAHMRI as the state's major independent MRI. The University of Adelaide's Clinical Academics argued that successive policy reforms have produced unintended consequences:

*The SA Health initiatives looked good in principle on the 'whiteboard' (such as 'Transforming Health') but were disastrously destructive to many successful collaborative cultures and structures, from which we will take a very long time to recover. In particular, the dismemberment of services and physical proximity (ie. to the main University campus departments to attend meetings, seminars and translational collaborative ventures, often done at lunch times and in brief spare moments). This has delayed research outputs and disrupted much progress (clinical & academic) through distracting influences of having to re-engineer many aspects of the work environments by Clinical Academics and others. (Correspondence from the University of Adelaide's Clinical Academics)*

The Commission also heard from stakeholders in both the public hospital and university systems that HMR (previously often led by clinician researchers) has suffered from a lack of connection between, and integration of, the bureaucratic systems and 'culture' of SA Health and the public universities. The available evidence also suggests that the decline in clinical academics has been caused by a deterioration in the connections between the universities and SA Health.

*Not only are there fewer Clinical Academics but those who are employed are frustrated by the excessive and often conflicting bureaucracy within the University and SA Health, as well as the disconnection between the two institutions that is hindering their ability to do their jobs. The consequential job dis-satisfaction not only impacts on retention but also contributes to the increasing attraction of young medical graduates to private medical practice rather than a public hospital clinical academic career. (Correspondence from the University of Adelaide's Clinical Academics)*

The Commission considers that clinician researchers form a vital 'hinge' that links the universities to the public health system, especially in the context of a noticeable shift in the funding priorities pursued by both the NHMRC and the MRFF. The overall deterioration of key relationships in the sector is particularly apparent in the decline of jointly appointed clinical academics within the university and public health systems. This has arguably been a factor in the state's capacity to win competitive grant funding, especially in respect of the strategic priorities targeted by the MRFF. The issue of clinical academics' role in the state's HMR system is discussed further in chapter 6 as part of an analysis of the workforce issues.

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<sup>51</sup> Ibid.

## 9.6 An improved institutional architecture for HMR

### 9.6.1 Stakeholder views – HMR architecture

In its draft report, the Commission developed an evidence-based assessment of the state's HMR sector and put forward a provisional view of the essential elements of an improved institutional architecture, including potential reforms to the structure and role of SAHMRI.

Stakeholders generally agreed with the Commission's analysis of the institutional reforms needed to enhance the state's HMR performance, especially the need to enhance SA Health's capacity to support HMR in the public health system. Flinders University supported the Commission's position on the steps required to improve the state's HMR performance, but cautioned that SA Health as a whole is currently insufficiently resourced to implement the proposed reforms:

*Flinders University is generally supportive of draft recommendations 1a and 1b in providing focus and accountability to improve long term performance of the public health system. We welcome the focus on working closely with research collaborators and partners including universities, alongside the decluttering of policies and simplification of regulatory frameworks. This will establish an environment which is ideal for outstanding research outcomes and will drive a strong collaborative research culture required for translational outcomes... The current resourcing within each of the Department for Health and Wellbeing (DHW) and the LHN's is not likely to be adequate to deliver on expectations. (Flinders University, FR9, p.6)*

Dr Leanna Reed, chair of HTSA, also agreed with the Commission's analysis of the key reforms required to enhance the effectiveness of the state's HMR architecture, but argued the proposed reforms will only be effective if highly developed collaboration pathways and networks are in place. She also considered HTSA, given its unique position in the state's HMR sector, could become a key proponent and enabler of a thriving 'community of practice':

*I agree strongly with the major recommendation of the report – "The South Australian Government make achieving excellent clinically based health and medical research with translational impact a priority for SA Health. In addition to the proposed changes in SA Health leadership and operations, a critical feature for successful implementation of this recommendation will be effective collaboration and networks with external research organisations, industry and other stakeholders. In essence there is a need to establish a thriving Community of Practice for health and medical research (HMR) in SA. As articulated in the HTSA submission, HTSA is ideally positioned to be a key driver through its role as a statewide facilitator of HMR collaboration and translation. (Dr Leanna Reed, FR7, p.1)*

AAMRI generally agreed with the Commission's analysis of the challenges currently facing the state's HMR sector. It also agreed that the Commission's approach to strengthening SA Health's role in, and accountability for, the state's HMR performance would effectively address many of the interconnected problems that have hindered HMR in SA. That said, AARMI argued for some additional steps to improve overall HMR performance, including the development of a statewide HMR strategy. AARMI summarised its preferred approach under three separate recommendations:

- *Developing a South Australian Health and Medical Research Strategy to set state-wide priorities for investment*
- *Establishing an office of health and medical research within the Department of Health and Wellbeing to implement the strategy and coordinate the activities set out in Draft Recommendation 5.1, 1b.*
- *Appointing a Minister for Medical Research in South Australia who would oversee the activities of the office of health and medical research. (AAMRI, FR3, p.4)*

The University of Adelaide's School of Public Health supported the Commission's analysis of the long-term reforms needed to reinvigorate the state's HMR performance, especially within the public health system, but argued that the Commission placed insufficient emphasis on public health as a central aspect of HMR:

*We concur with the Commission's view that a set of sustained long-term reforms is needed, including creating a better institutional architecture to achieve close alignment of HMR incentives among the key institutions, beginning with the state government setting HMR as a priority for South Australia...The SAPC report is clinically focused, and the words public health has limited presence in the entire document\*, except with regard to the 'public health system' and with reference to the name of our School (when citing our original submission). We feel that this is a significant and self-defeating shortcoming of the report, if the genuine aim is to improve community health and improve the efficiency of the health system. (University of Adelaide – School of Public Health, FR17, p.2)*

The Commission's position that HMR ought to be a core function of the public health system, with a particular focus on clinical research, was supported by CALHN. CALHN's submission emphasised the urgent need for the LHNs, supported by DHW, to take on a strategic leadership role in HMR:

*There is an urgent requirement for SA Health to provide strategic leadership in HMR. The focus of the Department of Health and Wellbeing (DHW) should continue to provide state-wide policy on research governance. The LHN's are best placed to provide strategic research leadership within their jurisdiction. (Correspondence from CALHN)*

SAHMRI agreed with the Commission's assessment that comprehensive action is necessary to ensure that HMR is re-established as a core function of the state's public health system, rather than remaining a peripheral activity vulnerable to budget savings measures. It also highlighted the need for a state-wide HMR strategy that effectively connects the research activities of SA's major HMR institutions, including the universities, LHNs and SAHMRI itself. That said, SAHMRI emphasised that any state-wide strategy should not seek to determine areas of priority unilaterally, but ought to focus on enhancing competitiveness and identifying options for optimum resource allocation:

*A State-wide Health and Medical Research Strategy must be a priority, based on strengths of the State as well as community need. The Strategy must demonstrate the commitment of the State Government to health and medical research excellence in the state health system. The Strategy should not outline the priority research areas for the State, nor the research that should be undertaken; rather it should be based on the promotion of excellence, a commitment to increasing competitiveness and identification of and recommendations for optimum resourcing and implementation plans... While the Department for Health and Wellbeing could commence work on this Strategy, it must be developed as and 'owned' as truly state-wide. (SAHMRI, FR15, p.22)*

SAHMRI argued that an effective overarching HMR strategy needs to be supported by a significant increase in collaboration between major HMR institutions. The development of a state-wide HMR strategy would also require, as a first step, that DHW assume responsibility for actively engaging with affected stakeholders throughout the sector. SAHMRI also observes that an expanded co-ordination and engagement role for the department requires a corresponding increase in the resources, capacity and institutional remit of DHW's OFR.

### 9.6.2 Institutional architecture

The Commission starts from the position that South Australia's health and medical research is an essential element of South Australia being a vibrant, modern and competitive state. The direct benefits come from HMR that, across short to long-term timeframes:

- improves health care and the state's system for South Australians; and
- is an essential foundation of a health and medical industry sector.

Moreover, it encourages excellence and growing capability in the state's medical, nursing and allied health workforce beyond the HMR workforce itself. And the recent, and ongoing, experience of the pandemic has amply illustrated a rapidly deployable HMR capacity and quality health and medical workforce is an enormous asset to the state.

These considerations make the basic case for retrieving the state's former position in HMR and also for considering HMR's place in a wider strategy for lifting the contribution of R&D in the state to higher living standards, employment and productivity. The Commission notes this second point is being explored further in its concurrent inquiry into research and development in South Australia and is outside the terms of reference for this inquiry.

The Commission considers that local collaboration is not an objective in its own right.

Pursuing a competitive edge in HMR necessarily means prioritised choices and limiting areas of focus. Excellence in every area of medicine, allied health and nursing is not practical for South Australia, nor any other Australian jurisdiction for that matter.

The Commission considers HMR in general, and in the public health system especially, must be both purposeful and accountable. It requires budgets (including money, people and time), quantitative targets and performance measures, together with the necessary scope and authority for outstanding research leaders and their collaborators to do their work. Importantly, this also requires the boards of LHNs to embed HMR as an essential component of improvement within their strategic and business plans, and to hold executive management accountable for it. A research-driven culture in LHNs is an integral element of this change.

SA Health has some funding for HMR. The Australian Government provides block grants for teaching, training and research (see chapter 3). Currently this funding appears to be buried in overall budgets, is not identified separately by LHNs and, to the Commission's knowledge, is not established as a dedicated budget for research. The Commission considers these funds need to be identified, quantified and allocated to explicit HMR budgets as a key part of a step change in focus and accountability for HMR in the LHNs.

A key question is how the choices on research priorities are made to achieve higher productivity in research and better outcomes for the state.

The Commission proposes a 'tight-loose' approach based on the South Australian government setting a tight overarching framework of goals and targets (such as success in grant funding, impact, evaluation of HMR performance and development of the HMR workforce) and enabling a 'loose' framework for the HMR protagonists to identify and pursue HMR excellence that aligns with the state's interests.

There are two principal reasons for such an approach. The first is that a set of centrally determined and directed specific specialised areas of HMR is unlikely, in the Commission's view, to be credible with the HMR practitioners, including universities, medical research institutes and LHNs. The second is that the HMR practitioners have the capability and

knowledge to exercise their judgement on contestable, accountable decisions about the areas of HMR that are important to them, while aligning with the state's interests. That said, it is important that there is consultation on these matters among policy advisers and decision makers, and the HMR institutions and leading practitioners.

The Commission considers sustained HMR excellence is built on joining strong clinical practice with strong research, led by world-class research leaders jointly appointed to a hospital and university and/or medical research institute. The scope encompasses a range of health professions including medicine, allied health and nursing. Clinical research is a key element in high-performing hospital networks in Australia and overseas. Their cultures value innovation and improvement based on clinical research that is translated into improved practice and better health outcomes. As outlined in chapter 8, translational research has the potential to act as a catalyst for continuous improvement and innovation in standards of health care, including in the overall efficiency and quality of the health care provided in hospitals.

Such successful hospitals and their research partners focus on a small number of areas where outstanding HMR performance is achievable (at least at a national level) and collaborate seamlessly. Together they compete effectively for grant funding, often in collaboration with other groups that have complementary strengths. They are not strong across the board and de-emphasise areas where leading performance is not a plausible aspiration. They choose strategically, including with an eye to national and international collaborations.

Given that, the decisions on specific strategic priorities and focus need to be made jointly by the local health networks and their research collaborators. They see the opportunities in a practical context, understanding success can have a visible impact on both the hospital and its collaborating research institution.

Accordingly, the LHNs and their boards would be explicitly accountable to the minister for making choices, applying objective and quantifiable performance targets to those choices, for using resources and for achieving outcomes in terms of translation and commercialisation. Leadership at all levels, both in the LHN and in the research collaborators, who see the value of 'best in class' HMR to their organisations is a prerequisite. Being held accountable for the HMR by the minister is another prerequisite.

A clear and ambitious strategic framework, developed with strong input from the LHNs and research institutions, would provide a pathway to guide the narrowing of HMR focus to areas of actual or potential state research strength.

The Commission considers an aspiration to secure a share of national grant funding in excess of South Australia's population share would be an appropriate component of this framework, along with other quantitative targets for, among other elements, headcount, budget, outputs and outcomes. This narrowing of focus will enable an increase in the scale, productivity and competitiveness of research. It does also involve making difficult choices: for LHNs and the public health system about the degree of specialisation and consolidation of clinical activity; for research institutions, about the weighting given to HMR compared with other fields of research among other considerations.

There is a natural cluster of activities, buildings and personnel in North Terrace, including SAHMRI, the RAH, the University of Adelaide, the University of South Australia and Flinders University. Other institutions are planned to locate in that area. The Commission notes that the HMR interests between the two universities appear to be significantly complementary – one largely focuses on medicine, while the other largely focuses on nursing and allied health. The

Commission notes all areas are within the scope of clinical research and clinical academics as defined in this report.

This geographic cluster is the basis of the Adelaide BioMed City precinct. Stakeholders have identified scope for better utilisation of facilities and infrastructure and reduced overheads through better usage arrangements among the parties. These arrangements may also enable simpler approvals and data access, among other matters. Such potential efficiency gains may provide a virtuous cycle of freeing resources that can be deployed to HMR areas of excellence or opportunity.

The Commission notes that the precinct partners have recently entered into a collaboration agreement which aims to achieve a collective approach to research infrastructure, grant funding bids, talent attraction, commercialisation and industry partnerships. An essential early priority is to pursue efficiencies in utilisation of resources and facilities; streamline approvals, access to data and other necessary HMR support processes; and economise on administration, with savings to be deployed to support HMR. The Commission considers that these gains can be best achieved by the leadership of the various institutions in the ABMC incentivising their representative executives to search for, deliver and report on, precinct synergies, efficiencies and general value.

There is a second, less formal, precinct comprising Flinders University, SALHN and the Tonsley Innovation District. It makes sense for Flinders University and SALHN to focus principally on developing this second network into a vibrant HMR research precinct for the state, while growing the current relationship with SAHMRI. The emerging southern precinct will have slightly different strategic priorities than its North Terrace counterpart, although both precincts will need to privilege investments in people over infrastructure. The SA Government, through SALHN, has a strong strategic interest in the future of the southern HMR precinct. The Commission considers that the government, through SALHN's natural connection with the southern precinct, is in a strong position to contribute to the precinct's success by working collaboratively to develop an effective governance structure.

DHW would play an important role in this strategic framework. It would provide an enabling service and support function to the LHNs, including:

- a framework of key performance measures for HMR;
- tracking and reporting metrics on HMR activity across the LHNs (budgets, resources, staff, spending, outputs) for LHN boards and the overall public health system;
- fit-for-purpose policies, including on intellectual property, approvals, data access, staff development and talent management, and complementary efficient, streamlined processes;
- maintaining and tracking key HMR talent, including succession planning; and
- SA Health's digital strategy.

While these proposed functions and accountability are not inconsistent with existing high-level governance structures in SA Health, they would be a step change in the focus for the performance expected from HMR, define roles clearly, require some LHNs to greatly strengthen their clinical research and greatly sharpen the accountability for action.

### 9.6.3 Stakeholder views – SAHMRI reform

The Commission's provisional assessment of SAHMRI's position within the state's HMR architecture focussed on the essentially inherent tension between achieving research excellence and facilitating collaboration between stakeholders. The three options for reform presented in the draft report were intended to highlight, and stimulate stakeholders' thinking on, structural and governance changes that could redress the tensions that affect SAHMRI's capacity to realise its strategic objectives.

The Commission developed three options to highlight possible reform pathways to establish a structure which would support research excellence as the primary, if not sole, objective of SAHMRI:

Option 1: incorporate SAHMRI into an LHN with close attachment to the Royal Adelaide Hospital;

Option 2: incorporate SAHMRI into one of the state's CBD-based public universities; and

Option 3: modify SAHMRI's current structure, purpose, constitution, governance and membership to enable a stronger alignment of member interests in HMR.

The Commission's thinking on the options for SAHMRI was informed by a series of interconnected considerations:

- clear purpose in pursuing excellent HMR in South Australia that creates value to the state through one or both of translational impact and commercialisation;
- enabling excellence in clinical research in the hospitals in the ABMC precinct;
- close alignment of the interests of its members and its board;
- capacity of the members to shape direction;
- building on SAHMRI's (competitive) strengths and successes to date; and
- financial robustness and sustainability.

A broad range of stakeholders, including government and non-government institutions, supported a combination of structural, governance and membership reforms to facilitate a focus on achieving research excellence. These stakeholders were also supportive of strengthening SAHMRI's collaborative links with the LHNs as a way of fostering excellence in clinical research and translation.

Flinders University supported maintaining SAHMRI as an independent MRI, but argued that governance reforms are necessary to ensure that SAHMRI's research activities are fully integrated with the universities and LHNs. The university observed that any structural and governance reforms must aim to achieve synergies between the state's major HMR institutions:

*We therefore propose a modified option 3 for SAHMRI by revisiting structure, including role and governance, to create greater synergies between the major HMR institutions within South Australia. In particular, we propose that the future model must integrate the SAHMRI facility with HMR activities across all three universities and with clinical research activities across the entire LHN network, noting that the Northern and Southern networks are the demographic regions of growth. As such, the governance and management structure(s) should be designed to work*

*collaboratively with the universities (as principal drivers of HMR) to identify key research priorities to be delivered in partnership with LHNs to maximise outcomes. (Flinders, FR9, p.10)*

By contrast, the University of Adelaide took the view that SAHMRI is in need of greater structural reform. The university argued that a number of interstate MRIs, such as the Walter and Eliza Hall Institute, possess legal structures and governance arrangements that could usefully guide the reform of SAHMRI:

*While we have worked collaboratively with and within SAHMRI, and will continue to do so, the University is of the belief that the central obstacle to SAHMRI delivering on its original intent is that with three university partners, no single partner has been willing to make a full commitment to the success and sustainability of this joint institution... In this regard, we believe that the models of the Walter and Eliza Hall Institute and the Murdoch Children's Research Institute, which both involve an exclusive model of linking to a single university partner (i.e. the University of Melbourne), are widely seen as preferable to the current SAHMRI model. (University of Adelaide, FR16, pp. 6-7)*

The Commission notes that the University of South Australia refrained from explicitly supporting any of the proposed options for reform. The university argued that structural change is premature in the absence of a clear conception of SAHMRI's strategic purpose – form must follow function and focus:

*The preference of the University of South Australia is that each of the major component elements of the system—the LHNs, SAHMRI and the universities look to international data to identify where local performance in health and medical research is of global standing, and where multi-institutional partnerships might be strengthened or built to tackle ambitious research agendas. These should be oriented at larger-scale grant schemes, business partnerships, and at international collaborations. (University of South Australia, FR19, p.1)*

The University of South Australian and Flinders University have subsequently jointly recommended a governance structure for SAHMRI involving university members and LHNs.

SAHMRI agreed there is scope for organisational reform, especially in relation to board structure and composition, but also argued that maintaining its status as an independent MRI is the most effective way of supporting its contribution to research excellence:

*SAHMRI is confident that our existing structure - as a separately incorporated, independent health and medical research institute (HMRI) - is the right one. Only as an independent HMRI can SAHMRI effectively contribute to the state-wide objectives of increased health and medical research funding and translational output as identified and recommended by the Commission. Our successes since establishment are testament to the appropriateness of our structure – SAHMRI could not have achieved what we have achieved, had we been part of a Government entity or part of a university. It is however timely in this current instance to review and change our governance model to enable it to be more contemporary. (SAHMRI, FR15, p.41)*

SAHMRI argues that its effectiveness as a dedicated research institution with a focus on clinical research would be enhanced if the current members of the company were replaced by a membership consisting solely of the relevant government minister (likely the Minister for Health) and the board members. Board membership ought to be skills-based, rather than representative of the company's membership.

The Commission notes that there was a divergence of views between the LHNs on the options for SAHMRI's reform, with SALHN supportive of maintaining SAHMRI as an independent MRI, albeit with a greater focus on collaboration to achieve critical mass. By contrast, WCHN argued in favour of incorporating SAHMRI into one of the LHNs (with the definite involvement

of WCHN). WCHN observed that a number of successful MRIs interstate, including the Murdoch Children’s Research Institute, are co-located with major paediatric hospitals:

*The current SAHMRI model appears to not be working effectively in arresting the decline in the state’s share of national research funding and has a focus on buildings rather than people... Of the three options currently proposed, Option 1 with the definite involvement of WCHN (rather than “perhaps” as currently written) would be supported... Successful models of co-location in the paediatric space include the Victorian model of having the Royal Children’s Hospital co-located with campus partners, namely the Murdoch Children’s Research Institute and the University of Melbourne. Together the campus partners are known as the Melbourne Children’s with research being a collaboration between scientists, researchers and doctors, allowing research findings to be quickly put into practice. (Correspondence from WCHN)*

CALHN did not express a preference for one of the models developed by the Commission, but emphasised that SAHMRI requires a skills-based board, and that a closer relationship between SAHMRI and CALHN would provide an effective pathway to reinvigorate clinical research in the public health system:

*CALHN strongly supports increased engagement with SAHMRI to conduct world-class research that will deliver evidence-based research that contributes to real improvements in patient outcomes. CALHN believe that a closer working relationship/investment in SAHMRI will provide an opportunity to enhance SA’s health system by reinvigorating clinical research. Importantly, meaningful and impactful clinical research must be underpinned by discovery research, through CALHN/SAHMRI’s relationship with the UoA and UniSA. (Correspondence from CALHN)*

#### **9.6.4 Commission’s conclusions – SAHMRI reform**

SAHMRI’s strategic purpose, legal structure and governance arrangements reflect the particular circumstances of its foundation over a decade ago. The Commission considers that SAHMRI’s contribution to the state’s HMR architecture is hampered by institutional and governance arrangements that unnecessarily complicate its role and detract from its capacity to achieve research excellence.

Accordingly, and in line with the reforms outlined in recommendation 9.4, SAHMRI’s position in the state’s HMR architecture requires reframing to ensure that it remains fit for purpose. This is particularly true of SAHMRI’s strategic priorities, its governance structure and its role, in conjunction with the LHNs and the universities, in increasing the quantity and productivity of clinical research (including allied health and nursing research) in the LHNs.

The Commission sees a particular and inherent conflict between the pursuit of research excellence, especially in clinical research with translational impact, and a commitment to facilitating collaboration between local universities as an objective in itself. More than a decade after its establishment, SAHMRI’s role in the state’s HMR institutional architecture must come to reflect the fact that excellence in clinical and translational research is separate from, and not always compatible with, a co-equal focus on facilitating collaboration between various competing stakeholders. At present, the Commission notes that SAHMRI functions as an independent MRI and a ‘research hotel’ in which the universities occupy significant laboratory space.

An amended strategic purpose also needs to clarify that collaboration with universities and other research institutions, whether in SA or elsewhere, ought to aim to strengthen SAHMRI’s primary purpose of achieving research excellence. This will entail a streamlined focus on clinical research, translational research and research commercialisation that builds on

SAHMRI's research strengths in areas like aboriginal health equity research, women's and children's HMR and nutritional and metabolic research.

The Commission considers that one of the principal sources of tension within SAHMRI's current structure, which effects its capacity to achieve greater research excellence, is the fact that the public universities, despite being members of the company, are dissatisfied with the returns that they receive from their membership. While the Commission has not received a joint submission from the universities detailing their collective concerns, it made significant efforts to understand the causes of this dissatisfaction which it concluded had several interrelated factors.

In particular, the Commission's assessment is that the universities are dissatisfied with the idea that SAHMRI's principal purpose is research excellence, which they view as central to the role of universities. In the Commission's view, SAHMRI has the potential to support the LHNs through clinically relevant R&D and contribute to the development of new South Australian companies founded on internationally competitive R&D. That said, it is clear that SAHMRI has invested considerably and successfully in establishing its research 'brand', which is an important step in ensuring an ongoing flow of funding from both public and private sources. The universities appear to consider that, on the whole, their specific and significant contributions to SAHMRI's research success have not been sufficiently acknowledged by SAHMRI's board.

On a related matter, the universities have expressed significant concerns about their relative lack of clarity about, and capacity to influence the strategic direction of SAHMRI. The Commission considers that the universities' collective dissatisfaction with SAHMRI's performance suggests that the board has not given due recognition to their contribution to SAHMRI's success and has not sufficiently engaged with its university members on questions of strategic direction. This is despite all three public universities having representation on the Board since SAHMRI's establishment. That said, the Commission considers that each university is likely to have competing strategic priorities, which it would expect makes it difficult to reach consensus at the board level.

Given universities' apparent concerns about their role in SAHMRI and the fact that members of companies limited by guarantee are afforded relatively few rights under the Corporations Act, the Commission is of the view that the universities gain limited benefit from their membership of SAHMRI. In particular, the Commission considers that SAHMRI's capacity to achieve greater research excellence can be achieved most efficiently by the three public universities resigning their membership of the company. This would create a streamlined and consolidated membership structure, placing SAHMRI in a stronger position to focus on research excellence.

In place of the current membership structure, and subject to legal advice, SAHMRI as a company could be constituted by the three government members, all of whom are currently members in their capacity as body corporates under the *Administrative Arrangements Act 1994*. Alternatively, SAHMRI's membership structure could be reformed along the lines of other Australian MRIs constituted as companies limited by guarantee, such as the Harry Perkins Institute of Medical Research (Perkins Institute).

The Commission understands that the Perkins Institute's membership is largely made up of its board of directors, each of whom serves as a member of the company for the duration of their membership of the board. In SAHMRI's case, this structure could be augmented by one of the current government members, such as the Minister for Health and Wellbeing, retaining

membership of the company, with board directors becoming members of SAHMRI for the duration of their service on the governing board.

While there are other ways of streamlining SAHMRI's legal and governance arrangements, including reconstituting the institute as a statutory entity under state legislation (as originally envisioned by the Shine & Young Review), the Commission considers that reforms to the current membership structure, mutually agreed between the six current members, will achieve the necessary consolidation with a minimum of disruption.

To further enhance SAHMRI's independence and improve its governance arrangements, membership of the board needs to become entirely skills-based, moving away from the current arrangement where board members are appointed, in part, to represent SAHMRI's member institutions.

These structural reforms must be bolstered by a range of precisely focussed strategic affiliations with the state's other major HMR institutions, principally the LHNs and universities. These agreements would cover, among other things, issues related to funding, staffing arrangements, including joint appointments, intellectual property arrangements, performance reporting and performance attribution, especially in relation to grant funding performance and publications. The Commission considers that these arrangements could be usefully enhanced by the creation of a Research Advisory Committee consisting of senior executive staff from SAHMRI, the LHNs and the universities, meeting on a monthly basis.

## 9.7 Conclusion

The Commission considers that driving a significant improvement in the productivity, effectiveness and performance of HMR in SA is dependent on a long-term plan containing a number of focussed reforms to the state's underlying institutional architecture. The Commission's analysis has focused mainly on four aspects of the HMR architecture:

- the state government-influenced parts of the high-level HMR architecture;
- the North Terrace precinct;
- Flinders University and the Southern Adelaide Local Health Network (SALHN); and
- SAHMRI.

The Commission notes that a number of reforms have already been implemented, including within SA Health, such as the higher priority accorded to HMR as a result of governance changes, key leadership appointments in the hospital networks and the establishment of the CEIH, among other reforms.

Notwithstanding these important reforms, the Commission considers that DHW must take on a leadership role in the development of the overarching strategic framework. This must guide local decision-making on areas of HMR focus, as well as provide a 'blueprint' with which to guide the building of scale and productivity through collaborations and the allocation of the government's funding for HMR. DHW's enhanced role in the state's HMR architecture would need to include the provision of a range of enabling service and support function to the LHNs and the wider HMR system, including:

- a framework of key performance measures for HMR;
- tracking and reporting metrics on HMR activity across the LHNs (budgets, resources, staff, spending, outputs) for LHN boards and the overall public health system;

- fit-for-purpose policies on intellectual property, approvals, data access, staff development and so on;
- maintaining and tracking key HMR talent, including succession planning; and
- SA Health's digital strategy.

In addition, the Commission also considers that system-wide architecture issues are particularly relevant to the biomedical precinct on North Terrace (the ABMC precinct). This is particularly relevant because of the previously high level of investment in constructing modern buildings and facilities within the precinct, with a corresponding lack of attention to the type of facilities to enable clinical research in the Royal Adelaide Hospital, which has been partially addressed, and a weak, essentially voluntary accountability framework linking the institutions in North Terrace that attempts to better enable clinical research and translation.

The Commission considers that the southern HMR precinct around Flinders University and the Flinders Medical Centre is marked by a number of differences, principally because its area of HMR operations is largely separate from the North Terrace precinct (although it has and wishes to retain significant links with SAHMRI). The Commission sees merit in explicitly accommodating that reality in the state's developing institutional HMR architecture.

The Commission considers the role SAHMRI was given on its establishment contains intrinsic conflicts and gaps relative to the Commission's analysis of the causes of the state's HMR performance and the steps needed to revive it. In particular, while it was established with a mission for excellent HMR the role also emphasised collaboration among the state's research institutions as an intrinsic purpose, rather than collaboration where it contributed to HMR excellence (which also importantly includes national and international collaborations).

Notwithstanding the best intentions of the board and leadership of SAHMRI, in addition to ambiguity in its purpose, the Commission suggests it is also challenged by:

- a flawed and at times conflicting membership model that has been unable to resolve some basic differences of purpose and incentives for HMR among its members;
- the inherent structural weakness of the medical research institute model arising from competitive research grants not covering the full costs of research activity; and
- potentially unrealistic financial expectations associated with the independent MRI model.

Given the flaws in its membership structure and related governance arrangements, a reorientation of SAHMRI's strategic focus towards research excellence can be achieved most effectively by the three public universities resigning their membership of the company. Members of companies limited by guarantee are afforded relatively few rights under the Corporations Act, and the Commission is of the view that the universities gain limited benefit from their membership of SAHMRI. SAHMRI as a company could be constituted by the three government members, all of whom are currently members.

Alternatively, SAHMRI's membership structure could be reformed along the lines of other Australian MRIs constituted as companies limited by guarantee, such as the Harry Perkins Institute of Medical Research (Perkins Institute). Importantly, the Commission considers that effective collaboration between SAHMRI and the universities does not require the universities' to be members of SAHMRI as a company limited by guarantee, but is based on shared

priorities in HMR. SAHMRI and the universities would continue to collaborate, where mutually beneficial, on the basis of market driven facilitation agreements.

## 9.8 Recommendations

### Recommendation 9.1

To improve the performance of the public health system and provide an essential foundation for sustainable growth of the health and medical industries, through increased high quality and competitive HMR and translation, the Commission recommends that:

1. The South Australian Government establishes long term state-wide goals for increasing the volume, productivity and health and economic impacts of HMR; sets quantitative targets such as state share of national grant funding and numbers of HMR researchers, to guide progress towards those goals; and transparently and regularly reports performance against those targets.
2. Framed by the foregoing state-wide goals, the South Australian Government make achieving excellent clinically based health and medical research with translation impact a priority for SA Health, backed up by performance measures and clear accountabilities for:
  - a) **The boards and chief executives of local health networks** for
    - i. establishing explicit budgets for HMR in their organisations (links to Recommendation 9.1.3.a);
    - ii. establishing clear accountability for quality, performance, use of resources and measuring performance;
    - iii. doing all things necessary, including with their research collaborators, to deliver excellent research, such as establishing focus and priorities, developing the research workforce and ensuring the translation of the research into local practice;
    - iv. instilling a research-based improvement and innovation culture in their health network and applying part of the dividends from efficiency improvements to increasing resources available for HMR; and
    - v. collaborating with research partners including universities, SAHMRI and industry in excellent clinical research and translation and in consolidating support services such as commercialisation.
  - b) **Department for Health and Wellbeing (DHW)** for advising the Minister on HMR and for supporting the local health networks in their health and medical research, including by:
    - i. measuring and monitoring the resources applied to HMR by the department and the LHNs;
    - ii. providing management information to support accountable HMR leadership, including resources for the development of HMR researchers;
    - iii. tracking the performance of HMR, including HMR inputs and outputs to understand the return to the state from its investment in HMR and advising the minister accordingly;

- iv. decluttering HMR policies and support services provided by the department to simplify regulatory frameworks (such as data access, approvals and intellectual property), streamlining all essential approvals and unnecessary impediments to achieving excellence in clinician-based research;
    - v. strengthening relationships with the Australian Government on HMR, including promoting South Australia as a location for Australian Government funded HMR; and
    - vi. the minister holding the chief executive of DHW accountable for implementing the department's HMR role in an effective and efficient matter.
3. Noting the current difficulties in obtaining basic information on the resources applied to HMR in the public health system such as expenditure, research budgets, numbers of research staff in LHNs and performance, DHW immediately:
  - a) establish, with each LHN, a specific budget for HMR which includes grant funding from the Australian Government, including the HMR component of the block grant funding for teaching, training and research; any proceeds from HMR commercialisation due to each LHN according to the SA Health IP policy; and all funding from South Australian Government sources (links to Recommendation 9.1.a.i);
  - b) assemble existing information held by the department on the level of its expenditure in HMR, both within SA Health and externally, for which it is accountable;
  - c) identify gaps in that information and address them;
  - d) develop performance measures, in conjunction with LHNs, for the performance of HMR that the state government funds; and
  - e) assist the minister in holding the LHNs accountable for their HMR efforts and outcomes.

## Recommendation 9.2

To provide state-wide strategic direction and an enabling framework to support the state's health and medical research (HMR) institutions to excel in their areas of competitive HMR advantage and achieve greater success in national competitive grant funding, the Commission recommends that:

1. The minister appoint an expert group, including experts from outside South Australia, to provide advice on developing the critical goals and targets for a state-wide strategic framework, put forward in recommendation 9.1.1;
2. DHW, in conjunction with stakeholders including LHNs, universities and medical research institutes, develop a state-wide HMR enabling strategy to achieve these goals and targets and raise the volume and quality of HMR in the state's public health system. The enabling strategy would:

- a) be based on local decision-making on research priorities by LHNs, universities and research institutions to shape HMR in South Australia consistent with the government’s objectives;
- b) build scale, productivity and excellence of HMR through collaborative and complementary, rather than duplicative and competitive, approaches to HMR; and
- c) guide, and increase, the allocation of the South Australian Government’s contestable HMR funding.

Key elements of the enabling strategy would include:

- a) reforming the policy and regulatory environment for HMR;
  - b) maintaining and making accessible to researchers SA Health data resources;
  - c) monitoring state-wide HMR key performance measures (KPIs) developed consistent with the goals and targets recommended in 9.1.1 and 9.2.1;
  - d) regular systematic evaluation South Australian HMR policies and programs; and
  - e) building a high performing HMR workforce in SA Health, including through attracting, retaining and developing HMR talent.
3. The functions and resources of the Commission for Excellence and Innovation in Health, the Health Performance Council and the DHW Office for Research be merged and augmented to strengthen DHW’s capability to develop, implement, assess and advise on the strategy.
  4. After one year, review the adequacy of the identified funding and budgets for HMR to achieve the South Australian Government’s goals for HMR as developed from Recommendations 9.1.1 and 9.2.1.

**Recommendation 9.3**

To support the implementation of the state-wide HMR strategy, the Commission recommends that:

1. The minister reform the operation of the Health and Medical Research Fund (HMRF) to support the achievement of the state’s health and medical research (HMR) strategic goals as set out in Recommendations 9.1 and 9.2 by:
  - a) making it fully contestable and available to all eligible state-based HMR institutions, including public universities, research institutes and LHNs, in the state;
  - b) developing a robust and transparent process and guidelines for the administration and regular evaluation of the HMRF; and
  - c) directing the operating surplus of AusHealth into the HMRF;

2. The South Australian Government incentivise both re-building research capability and the search for efficiencies to fund HMR funding in the LHNs by allowing the LHNs to retain part of the dividends from efficiency improvements to fund their HMR.
3. The South Australian Government amend the deed for the SAHMRI operating grant to require the recommended change in focus and behaviour of SAHMRI as a condition of the grant and to provide for ongoing public reporting by SAHMRI against appropriate KPI's.

#### **Recommendation 9.4**

To enhance the contribution, accountability and transparency of key partners in the state's HMR architecture, the Commission recommends the South Australian Government:

1. strongly encourage the leadership of the respective member institutions of the Adelaide BioMed City (ABMC) to incentivise their representative executives involved in ABMC to search for and deliver precinct synergies, efficiencies and general value. This may start with regular reporting by the ABMC Board of its tangible and verifiable achievements; and
2. require the local health networks, SAHMRI and the state's universities to commit to public reporting on key aspects of their HMR performance consistent with Recommendations 6.1 and 9.2, including research funding and outputs and HMR workforce development, in their annual reports.

#### **Recommendation 9.5**

To lift the contribution of the South Australian Health and Medical Research Institute (SAHMRI) to the state's health and medical research strength, the Commission recommends:

1. the South Australian Government, through its membership of SAHMRI, work collaboratively with the existing members of SAHMRI to establish a streamlined and consolidated membership structure to enhance SAHMRI's capacity to achieve research excellence through the resignation of the state's three public universities from membership of the company;
2. to maximise SAHMRI's contribution to research output, productivity and translational impact throughout South Australia, the South Australian Government members of SAHMRI encourage SAHMRI's board to complete the following tasks by December 2021:
  - a) adopt research excellence, consistent with the state's purpose and directions for HMR set out in Recommendation 9.1 and 9.2, as the principal purpose of SAHMRI;
  - b) establish a skills-based board, including representatives from key LHNs;

- c) develop a long-term research strategy for SAHMRI focussed on a targeted number of actual or emerging research strengths based on an assessment of capabilities residing in SAHMRI, the three public universities and all LHNs, in consultation with those institutions;
- d) increase the transparency of SAHMRI's operations as an MRI, distinct from its "research hotel" role, to its stakeholders including on funding sources, staff allocation, research performance and translation impact incorporating appropriate KPIs, and provide more transparent public reporting on these matters;
- e) agree overarching affiliation agreements between SAHMRI, the public universities and LHNs which cover joint staffing arrangements, cost sharing, use of grant funding, attribution of research publications and grant success, signage and acknowledgement at SAHMRI and sharing of any income from commercialisation;
- f) agree appropriate changes to the constitution; and
- g) establish a business model to support research excellence as SAHMRI's core business, including divestment of any extraneous activities.

# Appendices

## Appendix 1: Submissions in response to the HMR draft report

Organisation Name	Submission number
<a href="#">Adelaide BioMed City</a>	FR 1
<a href="#">Adelaide Health Innovation Partnership</a>	FR2
<a href="#">Association of Australian Medical Research Institutes</a>	FR3
<a href="#">Basil Hetzel Institute</a>	FR4
<a href="#">David Banham</a>	FR5
<a href="#">Dr Adam Badenoch</a>	FR6
<a href="#">Dr Leanna Read</a>	FR7
<a href="#">Emeritus Professor Peter McDonald</a>	FR8
<a href="#">Flinders University</a>	FR9
<a href="#">Flinders University - Caring Futures Institute</a>	FR10
<a href="#">Health Translation SA</a>	FR11
<a href="#">Public Health Association of Australia</a>	FR12
<a href="#">Robinson Research Institute</a>	FR13
<a href="#">SA NT DataLink</a>	FR14
<a href="#">South Australian Health and Medical Research Institute (SAHMRI)</a>	FR15
<a href="#">The University of Adelaide</a>	FR16
<a href="#">The University of Adelaide - School of Public Health - Faculty of Health and Medical Sciences</a>	FR17
<a href="#">The University of Adelaide - Supplementary</a>	FR18
<a href="#">The University of South Australia</a>	FR19
<a href="#">Vaxine Pty Ltd</a>	FR20
<a href="#">The University of Adelaide - Adelaide Medical School Research Committee - Amended</a>	FR21
<a href="#">Australian Nursing and Midwifery (SA Branch)</a>	FR22

## Appendix 2: Key state government HMR support initiatives

	Research	Translation/commercialisation
<b>New South Wales</b>	<p><b>Medical Research Support Program –</b> Established in 2003, the Medical Research Support Program is the major source of infrastructure funding for eligible independent medical research institutes across NSW. The program, to which the NSW Government allocates approximately \$200 million annually, provides support for the indirect costs of research, based on success in competitive NHMRC grant schemes.</p>	<p><b>The Medical Devices Fund –</b> Established in 2013, the fund has awarded approximately \$55 million for commercialisation activities to date.</p> <p><b>The Medical Devices Commercialisation Training Program –</b> Initiated through the NSW Office for Health and Medical Research in 2014, this program was expected to provide learning opportunities for up to 200 NSW-based researchers a year over the next four years.</p> <p><b>Translational Research Grants Scheme –</b> Funds research projects that will translate into better patient outcomes, health service delivery, and population health and wellbeing. The proposed research may be relevant to clinical, health service or population health practice.</p>
<b>Victoria</b>	<p><b>Operational Infrastructure Support Program –</b> The government has committed \$400 million over a decade to provide operational funding to independent medical research institutes that undertake, as their primary area of research concentration, fundamental or clinical biomedical research.</p> <p><b>Aikenhead Centre for Medical Research –</b> The government has committed \$60 million to the centre, which is conditional on a further \$60 million in matched funding from the Australian Government.</p> <p><b>Better Care Victoria Innovation Fund –</b> Established in 2016, a \$10 million investment in public hospital-led improvement and innovation projects, which is designed to enhance access to hospitals, and improve quality of care and hospital performance. 37 projects funded to date.</p>	<p><b>Bio Curate Venture –</b> The Government has invested \$10 million as part a ten-year collaboration between Monash University and the University of Melbourne to facilitate early stage bio-medical translation.</p> <p><b>Victorian Medical Acceleration Fund –</b> Launched in 2016 to support the health and medical research sector and researchers to improve health and well-being outcomes for Victorians. The fund provides up to \$3 million in research grants per round to help address current market research gaps and develop collaborative partnerships between health services, industry, medical research institutes and universities, both nationally and internationally to provide a collective impact for research projects.</p>
<b>Queensland</b>	<p><b>Queensland Advancing Clinical Research Fellowship Program -</b> intended to support Queensland Health clinician researchers (including doctors, nurses, dentists, allied health practitioners and clinical scientists) undertake research linked to their practice. Forms part of the government’s broader ‘Advancing Health Research Strategy 2026’.</p>	<p><b>Bio-venture fund –</b> The Queensland Government committed \$25 million, beginning in 2010, to support the development and commercialisation of HMR from across the globe.</p> <p><b>Translational Research Institute (TRI) –</b> Supported by Australian and Queensland Governments, TRI is a joint venture between Queensland Health, the University of QLD, QUT and the Mater Hospital.</p>

<p><b>Western Australia</b></p>	<p><b>Medical and Health Research Infrastructure Fund</b> – Established in 1997, the fund is designed to support the state’s best medical and health researchers with funding for the indirect (infrastructure) costs of research. MHRIF grants provide support for the indirect costs of HMR. In independent HMR institutes, the grants meet additional needs such as electricity, maintenance, rates and minor capital works.</p> <p><b>Research Institute Support</b> – The program was established in 2014–15 to provide research infrastructure support to eligible HMR institutes. The funding complements the Medical and Health Research Infrastructure Fund. Funding is allocated on the basis of an institute’s capacity to attract research grants from national and international sources. This is designed to ensure that funding is distributed commensurate with demonstrated research success/excellence.</p>	<p><b>Future Health Research and Innovation Fund</b> – The fund was established in 2017. It includes two funding streams: research and innovation and commercialisation. The government has committed an additional \$52 million between 2020–21 and 2022–23.</p> <p><b>Research Translation Projects (RTP)</b> – Established in 2007, the RTP seeks to support high-quality research projects that have the potential to demonstrate improved cost effectiveness and/or efficiencies that can be delivered to WA Health while maintaining or improving patient outcomes, with a focus on translation of research outcomes into healthcare policy and practice in WA.</p>
<p><b>South Australia</b></p>		<p><b>Research Commercialisation and Startup Fund (RCSF)</b> – A \$28 million fund launched in February 2019, the RCSF supports researchers, entrepreneurs and businesses to accelerate commercialisation.</p> <p><b>South Australian Venture Capital Fund (SAVCF)</b> – A \$50 million fund which intends to help build early-stage companies to accelerate their growth to a national and global scale.</p>

### Appendix 3: Non-government funding for HMR in South Australia

In addition to the National Health and Medical Research Council (NHMRC) and the MRFF, which provide the bulk of HMR funding to South Australia, the Commission notes the contribution from key philanthropic sources including the Cancer Council of South Australia (CCSA), the Hospital Research Foundation (THRF) and the Health Services Charitable Gifts Board (HSCGB). Funding details from these sources are discussed below.

#### The Cancer Council, SA (CCSA)

The CCSA is a registered charity in South Australia and since 2011 has partnered with SA Health, the South Australian Health and Medical Research Institute (SAHMRI) and the SA universities to fund the Beat Cancer Project. In the past eight years CCSA has been able to contribute over \$15 million towards research initiatives including project grants, fellowships, scholarships and infrastructure and travel grants.<sup>1</sup>

The CCSA funding data for South Australia between 2011 and 2020 by sector are presented in Table A3.1. During this period, the annual funding amounts awarded have fluctuated from a high of \$20.4 million in 2011 to \$0.5 million in 2016. South Australian universities have received a total of \$29 million while a further \$27 million was awarded to ‘other’ institutions.<sup>2</sup> The CCSA has also provided considerable funding to medical research institutes (MRIs) between 2011 and 2016 (\$9.3 million).

Table A3.1: Total CCSA HMR funding by sector (\$m), 2011–20.

	MRI	University	Hospital	Government	Other	Total
	\$m					
2011	0.7	9.6	0.4	7.3	2.4	20.4
2012	2.9	5.5	0.5	0.1	0.1	9.1
2013	4.1	3.2				7.3
2014	0.3	2.0	3.0		0.2	5.5
2015	1.2	3.0			0.2	4.4
2016	0.1	0.2	0.2			0.5
2017		4.0		0.8	2.3	7.1
2018		1.5			7.3	8.8
2019					9.2	9.2
2020					5.3	5.3
<b>Total</b>	9.3	29.0	4.1	8.2	27.0	77.6

Source: CCSA. Data up to May 2020.

Note: ‘Other’ sector includes grants where administering institutions were not identified in the data.

Table A3.2 provides a description of the type of grant funding awarded by the CCSA during the period 2011–20. The CCSA has awarded \$13 million for research chairs and a further \$12.4 million for principal cancer research fellowships. The CCSA also funded \$12.1 million in infrastructure grants over the same period, which help with indirect costs of research.

<sup>1</sup> For more details, see

[https://impact.cancer.org.au/?gclid=EAlaIqobChMlpMPknMDQ6gIVB1ZgCh1B7ACIEAAYASAAEgJP8\\_D\\_BwE](https://impact.cancer.org.au/?gclid=EAlaIqobChMlpMPknMDQ6gIVB1ZgCh1B7ACIEAAYASAAEgJP8_D_BwE).

<sup>2</sup> The ‘other’ category includes grants awarded where the administering institution was not identified in the data.

Table A3.2: Total CCSA HMR funding by grant type (\$m), 2011–20.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
	\$m										
Datalink	7.3										7.3
Infrastructure grants	0.9	1.0	4.3	0.3	3.7			1.4	0.3	0.2	12.1
Micro array and data managers		1.1									1.1
Other CCSA external funding	2.4			0.2				0.7			3.3
Australian Cancer Research Fund									2.8		2.8
Cancer Council Registry							1.8				1.8
Clinical Trial Enhancement Grants								0.8			0.8
Datalink – SA NT Datalink							0.8				0.8
Early-career Cancer Research Fellowships								1.4	0.5	1.0	2.9
Fellowships	1.9										1.9
Hospital Packages				4.5							4.5
Mid-career Cancer Research Fellowships									1.2	1.2	2.4
PhD scholarships				0.1							0.1
Principal Cancer Research Fellowships		5.2						2.4	2.4	2.4	12.4
Research Chairs	7.5						4.0	1.5			13.0
Travel grants		0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0		0.3
Blue sky		0.7	2.4								3.1
Project grants	0.5	1.0	0.7	0.3	0.6	0.5	0.5	0.4	0.4	0.6	5.4
Translational research grants								0.1	1.7		1.8
<b>Total</b>	<b>20.4</b>	<b>9.1</b>	<b>7.3</b>	<b>5.5</b>	<b>4.4</b>	<b>0.5</b>	<b>7.1</b>	<b>8.8</b>	<b>9.2</b>	<b>5.3</b>	<b>77.6</b>

Source: CCSA. Data up to May 2020.

### The Hospital Research Foundation (THRF)

The THRF’s key role is to support the medical and health research conducted at the Queen Elizabeth Hospital and the Basil Hetzel Institute for Translational Health Research.

The foundation supports medical research through major program grants, research grants, the purchase of laboratory equipment, and by providing financial support and scholarships to postgraduate, honours and vacation research students.<sup>3</sup> Major areas of revenue to support medical research are donations, lotteries, fund-raising events and bequests. The Commission understands that the THRF has and continues to fund large-scale, impactful research projects in the state.

*The Hospital Research Foundation Group has provided more than \$110 million in grants over the past 15 years for world leading medical research and patient care initiatives across all public hospitals, universities and medical research centres in SA.<sup>4</sup>*

Table A3.3 presents the total HMR grant funding by THRF between 2018 and 2020. While the bulk of their funding was to South Australia, several other states have also received a small amount of funding during this period. THRF provided \$34.3 million for HMR research to South Australia between 2018 and 2020.

<sup>3</sup> <<https://www.hospitalresearch.com.au/research>>.

<sup>4</sup> The Hospital Research Foundation, *Impact Report* (2019) 4.

Table A3.3: THRF HMR funding by state (\$m), 2018–2020.

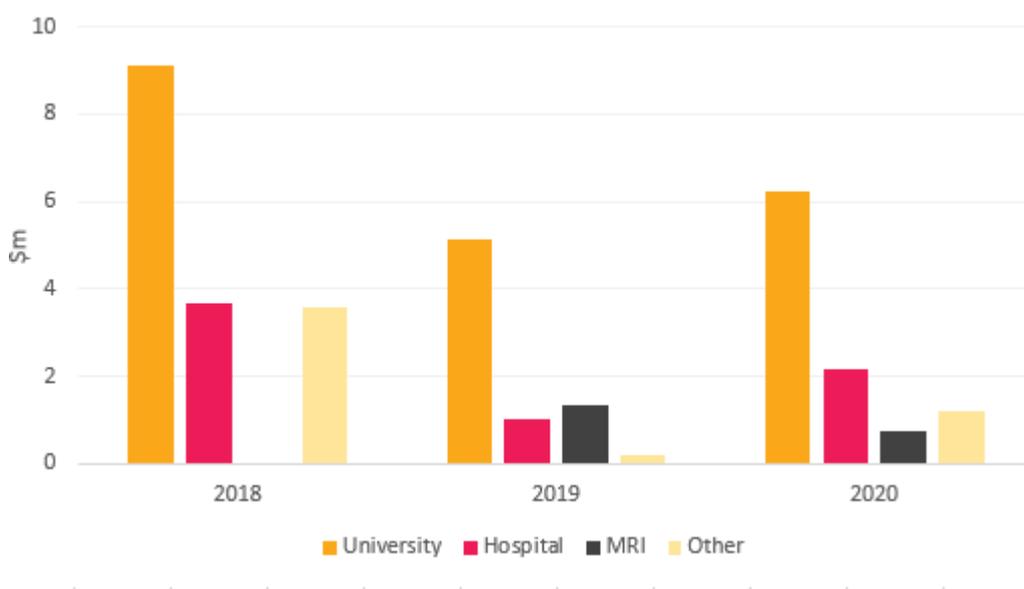
	2018	2019	2020	Total
ACT			0.2	0.2
NT		0.2		0.2
QLD		0.01		0.01
SA	16.4	7.7	10.3	34.3
VIC		0.01	0.2	0.2
<b>Total</b>	<b>16.4</b>	<b>7.9</b>	<b>10.6</b>	<b>34.8</b>

Source: THRF, Data up to May 2020.

Figure A3.1 illustrates the distribution of THRF grant funding to South Australia by sector between 2018 and 2020. As evident from the figure, universities have been the largest recipients of grant funding, with a total of \$20.5 million being awarded during this period.

In 2020 (up to May) universities collectively received \$6.2 million from THRF, while the hospital sector received \$2.1 million. SAHMRI received a total of \$2.1 million during the same period.

Figure A3.1: THRF funding to South Australia by sector (\$m), 2018–20.



Source: THRF, Data up to May 2020.

Table A3.4 presents THRF funding awarded by the type of grant for the period 2018–20. Approximately one third of funding during this period was for translational basic science research (\$10.7 million). \$7.1 million was awarded to clinical medicine and science and a further \$3.1 million to health services research. Additionally, THRF has contributed to indirect costs of research including \$1.7 million for equipment and \$1.4 million in infrastructure support during this period.

Table A3.4: THRF HMR funding to South Australia by type of award (\$m), 2018–2020.

	2018	2019	2020	Total
	\$m			
Administrative support	0.1	0.1		0.2
Basic science - advancement of knowledge/conceptual	0.9	0.1	0.9	1.9
Basic science - translational	3.6	3.2	3.9	10.7
Capacity development	0.5	0.2	0.1	0.9
Clinical medicine and science	4.6	0.4	2.0	7.1
Equipment		0.1	1.6	1.7
Health services research	1.1	1.2	0.8	3.1
Infrastructure support	1.4			1.4
Non-research project (program or patient initiative)	0.2	0.5		0.7
Public health research	0.3	1.7	0.9	2.8
Research - basic science - translational			0.1	0.1
Salary	0.5	0.1		0.6
Other	3.2			3.2
<b>Total</b>	<b>16.4</b>	<b>7.7</b>	<b>10.3</b>	<b>34.3</b>

Source: THRF, Data up to May 2020.

### The Health Services Charitable Gifts Board (HSCGB)

The HSCGB was established by the SA Government to hold gifts, donations and bequests received by public health entities including QEH, SA Pathology Lyell McEwin and the Women’s and Children’s Health Network (WCHN).<sup>5</sup> The board ensures that funds are applied in accordance with donors’ intentions, such as supporting volunteers and medical research. The Commission notes that funds are tied to respective hospitals and are dependent on community donations. Table A3.5 presents the total HMR grant funding by the HSCGB between 2017–18 and 2019–20.

The HSCGB holds funds for PHEs that are declared under the HSCG Act, which means that there are no specific funds set aside for SAHMRI, given that it is a prescribed research organisation (PRO) under the act. The Commission understands that the Board has discretionary authority, under section 18 (1) of its enabling legislation, to apply funds as it sees fit, but places greater emphasis on the intentions behind donors’ bequests as set out under section 18 (3).

Table A3.5: HSCGB HMR expenditure, 2017–18 to 2019–20 (\$m).

	2017–18	2018–19	2019–20
Research	5.9	6.0	5.1
Research support	0.76	0.64	0.57
Other	5.1	5.2	5.1
<b>Total</b>	<b>11.76</b>	<b>11.84</b>	<b>10.77</b>

Source: HSCGB.

Note: totals based on approved grants only. ‘Other’ includes volunteer support, operating costs, clinical equipment and salary support.

Additional philanthropic funding sources available to SA HMR include:

- Beyond Blue;

<sup>5</sup> For the full list of public health entities see <<https://www.hscgb.com.au/>>.

- Channel 7 Research Foundation;
- CSL Limited Diabetes Australia;
- Fay Fuller Foundation;
- Ian Potter Foundation;
- Australian Cancer Research Foundation;
- James and Diana Ramsey Foundation;
- Leukaemia Foundation; and
- Women's and Children's Hospital Research Foundation.

Beyond the research funding sources identified, there are a number of industry research institutions that support targeted HMR into specific medical conditions. There are also opportunities to win international research funding.<sup>6</sup>

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<sup>6</sup> International sources: Duke Clinical Research Institute, European Commission, Health Research Council of NZ, Bill and Melinda Gates Foundation, EMBL A\*STAR Singapore. Industry sources: AMGEN Incorporated, AtheroNova, Bristol Myer Squibb, CERENIS, Glaxo Smith Kline, Fonterra Co-operative.

## Appendix 4: Models of industry research and development in other jurisdictions

### Overseas models

#### Canada

A 2019 article authored by MacNeil et al and published in the journal *Health Policy*<sup>1</sup> outlined the barriers in policy and regulatory processes to enabling health technology in Canada. The article cited Canada as having a strong reputation in clinical trials, health services research, and evidence-based medicine, but less so in successfully implementing new knowledge in practice and summarised the following as barriers:

- Canada has an aging population and more individuals being diagnosed with frailty and multiple chronic conditions in a complex environment comprising thirteen different jurisdictions with different pathways and priorities and an absence of national standards and strategic priorities in the health innovation sector.
- Entrepreneurs across Canada are finding it difficult to introduce, sustain and scale up their innovations in the healthcare system due to policy gaps, jurisdiction issues, and an emphasis on pilot projects that do not transform promising and valuable healthcare innovations and technologies nationally.
- Adoption of innovations is more likely for those that require the least amount of financial and infrastructure investments and normally occurs through a procurement procedure that is extremely risk averse, disconnected from innovation activities, and focused on cost-containment rather than on value generation.
- A lack of resources constrains technology innovation and adoption, particularly during the early, high-risk stages of technology development, when there are very few public and private seed capital options available to innovators.<sup>2</sup>

Several strategies were identified to better facilitate the flow of resources to innovators and thus improve the adoption of health technologies in Canada:

- developing a national medical devices partnership fund (a public private enterprise);
- creating research and development tax credits, and optimising existing innovation-oriented tax credits to incentivise and better accommodate innovators working in the health science sector;
- scaling up and increasing investment in existing successful funding programs;
- adopting the Triple Aim philosophy to mobilise health resources around the three goals of: population health, improved patient experience, and reduced or stable per capita costs;
- considering an alternative funding model where health funding is tied to achieving regional innovation goals; and
- introducing, at the consumer level, programs which combine government funding with private pay to increase accessibility of technologies and facilitate their adoption.<sup>3</sup>

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<sup>1</sup> M MacNeil et al, 'Enabling Health Technology Innovation in Canada: Barriers and Facilitators in Policy and Regulatory Processes' (2019) 123(2) *Health Policy* 203. doi: 10.1016/j.healthpol.2018.09.018.

<sup>2</sup> *Ibid.*

<sup>3</sup> *Ibid* 210.

Overall, Canada faces the same issues and barriers as Australia but without the geographic and time zone complications faced in Australia. Government policies are similar to those already in place in Australia.

## Ireland

With a population only expected to reach 100,000 in 2020, the Irish city of Galway is a worldwide recognised example of a successful biomedical precinct in a country with a relatively small population. The medical technology sector in Ireland is recognised as one of five global emerging hubs and eight of the world's top ten med-tech companies are based in Galway. The MT&P sector in Ireland is now responsible for €12.6 billion worth of exports created by over 300 companies employing over 29,000 people. Fifteen of the top 20 global medical device companies operate in Ireland.<sup>4</sup> Irish HMR, including the Galway biomedical precinct, has been supported by an extensive and detailed research policy for HMR in Ireland. The most recently updated example is the 'Action Plan for Health Research 2019–2029'<sup>5</sup> in which the Irish Government's aim is to be a key driver for research, evidence-based practice and data-informed decision making in order to:

- achieve optimum care by improving the quality and process of care;
- attract and retain the best healthcare staff;
- increase levels of productivity and efficiency;
- deliver a more effective and comprehensive service;
- increase patient engagement and satisfaction; and
- inform decision making to optimise healthcare service delivery and improve population health and well-being.<sup>6</sup>

A 2018 review of research governance and support structures identified gaps and the resultant action plan focused on six main areas:

- develop and implement a robust governance framework for research activity in the context of evolving healthcare structures to protect and promote the interests of patients and the public in health and social care research;
- create research support and management roles, and develop the infrastructure required to underpin, enable and manage the research activity in the HSE;
- build research capacity in terms of human and financial capital to enable the sustainable growth of research activity into the future;
- implement institutional measures to facilitate the translation of research and innovation into policy and practice and increase dissemination of knowledge;
- support and promote the involvement of patients and the public in all levels of research activity; and

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<sup>4</sup> <<https://www.nuigalway.ie/medtech/>>.

<sup>5</sup> HSE Action Plan for Health Research 2019–2029 <<https://hseresearch.ie/wp-content/uploads/2019/12/10-Year-Action-Plan.pdf>>.

<sup>6</sup> Ibid 7.

- establish strong collaborative working relationships with key external stakeholders and contribute to the national health research system in a meaningful way.<sup>7</sup>

While Ireland has many of the same size-related issues as South Australia, a comprehensive research strategy including goals and commitment to industry has seen substantial growth of the biomedical industry over the last 15 years. Galway now produces over 80 per cent of the world's stents and Ireland is the second largest exporter of medical devices in Europe.<sup>8</sup>

## United Kingdom

The United Kingdom identified a need to embed translation and industry partnerships into the research portfolio over ten years ago and the Medical Research Council's 'UK research and innovation delivery plan 2019' claims that ten years of targeted funding has firmly entrenched translation into research.<sup>9</sup>

*Ensuring the UK stays at the forefront of health R&D investment worldwide, supporting multidisciplinary collaboration and maximising the impact of discovery research for the health and wealth of the nation are key priorities for us that align fully with the government's Life Sciences Industrial Strategy.<sup>10</sup>*

To progress this strategy, the Medical Research Council (MRC) in collaboration with Innovate UK has created the 'Biomedical Catalyst'.

The Biomedical Catalyst (BMC) is:

*a unique partnership between the Medical Research Council and Innovate UK, providing responsive and effective support to the most innovative life sciences opportunities regardless of scientific approach. The BMC aims to de-risk innovative science and commercialise ideas arising out of academia and industry helping UK SMEs to develop into competitive and sustainable organisations. This accelerates the progress of novel products to market, facilitates onward investment and bridges 'the valley of death'.<sup>11</sup>*

The MRC also supports two translational schemes:

- Efficacy and Mechanism Evaluation Programme: Supports late stage clinical evaluation of therapeutics, devices and diagnostics where proof-of-concept in humans has already been achieved. It is funded by the MRC and managed by the National Institute for Health Research (NIHR);<sup>12</sup>
- Methodology Research Programme (MRP): In partnership with the NIHR, the MRP funds methodology research to underpin biomedical sciences, experimental medicine, clinical trials, population health sciences, health services research and health.<sup>13</sup>

The MRC strategy focuses on industry alignment and claims to be successful with continued commitment to develop and sustain close and productive collaborations with companies in the UK.

<sup>7</sup> Ibid 21.

<sup>8</sup> <<https://www.nuigalway.ie/medtech/>>.

<sup>9</sup> Medical Research Council: UK Research and Innovation Delivery Plan 2019, 31.

<sup>10</sup> Ibid.

<sup>11</sup> For more information see <<https://mrc.ukri.org/funding/science-areas/translation/biomedical-catalyst/>>.

<sup>12</sup> For more information see <<https://www.nihr.ac.uk/explore-nihr/funding-programmes/efficacy-and-mechanism-evaluation.htm>>.

<sup>13</sup> For more information see <<https://mrc.ukri.org/funding/browse/mrp/methodology-research-programme-june-2020/>>.

*MRC has promoted partnerships with more than 500 companies, ranging from the large pharmaceutical companies to small and medium sized healthcare companies. To date, collaborative efforts have resulted in the development of 518 products and interventions, with 23 of these currently in wide-scale adoption.*<sup>14</sup>

## Israel

Israel is an acknowledged leader in health innovation, and this is documented in a book *Start-Up Nation: The Story of Israel's Economic Miracle*<sup>15</sup> published in 2011. The centre of this success is the Sheba Medical Centre which has produced many success stories over the years. Sheba will commence opening its new ARC Innovation Centre in 2020, a result of the Accelerate, Redesign, and Collaborate strategy. The strategy is based on four principles and considers future mega trends in the data industry:

- invest in digital health;
- welcome start-ups;
- focus on collaboration; and
- build a facility to stimulate further innovation.<sup>16</sup>

20 years ago, Sheba opened an office to commercialise its research. The initiative has been successful, generating substantial income for the government-run hospital. Part of this effort includes a financial incentive for those who develop ideas. For example, when physicians' innovations are commercialised, they receive 35 per cent of the income that Sheba earns. Many have become millionaires, creating a strong incentive to innovate.<sup>17</sup>

Like the Australian market, the Israeli market is very small and according to the Sheba Chief Innovation Officer, 95 per cent, if not more, of start-ups in Israel are aiming for the US market.

## Texas Medical Centre (TMC), USA

Today, TMC in Houston claims to be the largest medical city in the world, yet it was only in 2014 that TMC created its first campus-wide strategic plan with the intention to identify key areas for collaboration. Functioning as a well-established biomedical precinct, TMC members have recently committed to an extensive project, TMC<sup>3</sup>, which includes space for industry partners, retail and restaurant space, and a hotel and conference centre. The intention of TMC<sup>3</sup> is to:

*translate fundamental discoveries into commercial solutions to advance human health. The campus integrates leading researchers with a host of top-tier expertise from the private sector.*<sup>18</sup>

Australia has set up a Bio-Bridge Initiative with Texas Medical Centre, a program that encourages health care companies in Australia to apply directly to the TMC Innovation Institute, and, if accepted, join other start up health care companies in TMC, Houston.

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<sup>14</sup> For more information see <<https://mrc.ukri.org/innovation/working-with-industry/partnerships-with-industry/>>.

<sup>15</sup> D Senor and S Singer, *Start-Up Nation: The Story of Israel's Economic Miracle* (Twelve, 2011).

<sup>16</sup> For more information see <<https://www.healthleadersmedia.com/innovation/how-israel-does-healthcare-innovation-insiders-look-americans>>.

<sup>17</sup> Ibid.

<sup>18</sup> <<https://www.tmc.edu/tmc3/>>.

According to the TMC CEO ‘Helping Australian firms establish a presence in Texas is a victory for both places’.<sup>19</sup>

In 2019, the SA Government set up a new trade and investment office in Houston which has the potential to provide a pipeline for HMR commercialisation opportunities in the TMC.

*The office will facilitate US foreign direct investment into South Australia and act as a first point of contact for business introductions, leads and matches to help South Australian exporters expand into the US market.*<sup>20</sup>

## New Zealand

The New Zealand Health Research Strategy states that New Zealand produces a very small fraction of global health research and that:

*New Zealand lacks frameworks and mechanisms for translating research findings into policy and practice. No one agency or part of the system has overarching responsibility for this task.*<sup>21</sup>

New Zealand has set a strategic priority in the strategy to: ‘Build and strengthen pathways for translating research findings into policy and practice’.<sup>22</sup> Whilst recognising the need for capital investment, the strategy also promises the government will:

*strengthen platforms for commercialising new innovations and strengthen connections internationally to tap into capital and specialist expertise.*<sup>23</sup>

Private sector investment in research and development is relatively low, and New Zealand has few independent health research organisations compared with many other OECD countries.

The strategy outlines the following responsibilities for government and funding agencies along with industry to provide a model that will increase research translation:

- provide strategic leadership;
- coordinate and align policy settings and investments, simplifying funding arrangements where appropriate;
- support necessary infrastructure;
- provide incentives for excellent research and pathways to impact;
- use research findings;
- regulate to protect research participants and users and to ensure good clinical practice;
- enable the different parts of the system to share information and data;
- monitor and evaluate the whole system robustly;
- cooperate to avoid duplication of research and unnecessary complexity;
- invest in research and development;
- partner with academia, communities and the health sector; and

<sup>19</sup> <<https://www.tmc.edu/news/2018/06/presidents-perspective-building-bridges/>>.

<sup>20</sup> <<https://dti.sa.gov.au/news/south-australia-has-lift-off-in-houston>>.

<sup>21</sup> NZ Ministry of Health, *New Zealand Health Research Strategy 2017–2027* (2017) 21.

<sup>22</sup> Ibid 19.

<sup>23</sup> Ibid 25.

- market validated and cost-effective innovations.

The strategy has set performance indicators to monitor and evaluate progress using international benchmarks where possible to measure performance. In summary, New Zealand recognises the importance of simplifying funding and policy arrangements in their strategy. The New Zealand strategy also stresses the importance of strategic leadership in research, a point made in most of the submissions received in response to the Commission's issues paper.

## State models

### Victoria

In 2018, ACIL Allen was engaged to conduct an evaluation of the medical technologies and pharmaceutical (MT&P) sector in Victoria.<sup>24</sup> The Victorian Department of Economic Development Jobs, Transport and Resources reported on the ACIL evaluation and found that twenty years of sustained Victorian Government support for the sector has resulted in \$39.6 billion in additional revenue and delivered more than a three-fold economic benefit on public investment.<sup>25</sup>

From 1999–2000 to 2016–17 the Victorian Government invested over \$2 billion into the MT&P sector through 15 programs. The revenue of the MT&P sector increased from \$7.5 billion (1999–2000) in current prices to over \$21 billion in 2016–17, representing an average growth of 6.4 per cent a year.<sup>26</sup>

It is estimated that, over the eighteen-year period analysed, cumulative MT&P sector revenue of nearly \$39.6 billion (in current prices) would not have been possible without the government funding to the sector implying that the sector would have grown by 4.5 per cent a year instead of the observed 6.4 per cent a year.<sup>27</sup>

One such outcome is BioCurate, established as an independent organisation in 2016 by Monash University, Melbourne University and the Victorian Government, to accelerate and improve commercialisation outcomes for new drug therapies. BioCurate specifically aims to address the barriers that limit the translation and commercialisation of early stage research during a period often referred to as the 'valley of death' due to the high rate of project attrition. Recognising that both universities are world class, with investments of billions of dollars each year in medical research, yet there existed an inability to translate that research into commercial products and health outcomes, led to the creation of BioCurate operating as a venture catalyst and technology accelerator. This model, uniting two universities with support from the state government, is one of only a small number of similar initiatives globally.

Whilst Victoria's research strategy is due for updating, the 'Healthier lives, stronger economy: Victoria's Health and Medical Research Strategy 2016–2020' identifies four objectives:

- embed health and medical research into the Victorian health system;
- accelerate the translation of research into clinical practice;

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<sup>24</sup> ACIL Allen Consulting, *Medical Technologies and Pharmaceuticals Sector Impact Evaluation* (December 2018).

<sup>25</sup> <<https://acilallen.com.au/projects/economic-modelling-and-analysis/medical-technologies-and-pharmaceuticals-sector-impact-evaluation>>.

<sup>26</sup> ACIL Allen Consulting (n 342) 3.

<sup>27</sup> Ibid 8.

- advance Victoria's position as the lead national jurisdiction for health and medical research; and
- build economic growth.<sup>28</sup>

The six key strategic directions that form the basis of the strategy are:

- integrating research, education and health care;
- developing an advanced convergence science capability;
- enhancing a world-leading clinical trials system;
- optimising big data and informatics;
- developing the next generation workforce; and
- stimulating research/industry engagement and innovation.

Information and submissions received by the Commission recognise the lack of strategic direction in HMR in SA and raise the issues addressed in the Victorian strategy as current barriers to success in SA.

### **New South Wales**

Recognising unfulfilled potential in the area of HMR, the NSW Government commissioned a review published in 2012, which listed points of concern very similar to the issues identified for SA in the Commission's issues paper:

- NSW attracts less than its population share of National Health and Medical Research Council funding.
- There is a perception that the NSW Government and health services have not placed the same high value on health and medical research as their counterparts in other states, and as a consequence, NSW has a less robust research culture.
- Although NSW Government research infrastructure funding is valuable, there is strong dissatisfaction with the quantum and inconsistent application of this funding within the research sector.
- The lack of career pathways, poor remuneration for research workers in relation to other health and medical careers, lack of support for early- to mid-career level researchers and job insecurity were identified by many stakeholders as pressing issues; and clinician researchers are a limited resource and there is a perception that the time that clinical staff specialists dedicate to research has been eroded over time.<sup>29</sup>

The review focused on two strategies with a 10-year horizon:

- foster translation and innovation from research; and
- build globally relevant research capacity.

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<sup>28</sup> For more information see <<https://www2.health.vic.gov.au/about/health-strategies/health-and-medical-research-strategy>>.

<sup>29</sup> NSW Health and Medical Research Strategic Review, ii.

With reference to commercialisation, the review identified the following recommendations:

- align NSW research with Commercialisation Australia processes to increase the 'pipeline of ideas'.
- establish a pilot medical device seeding program.
- develop and implement an intellectual property framework for multiparty publicly funded research.
- enhance researchers' knowledge and understanding of commercialisation resources.
- promote greater capability in commercialisation offices for use by multiple institutes, universities and LHDs.
- improve opportunities for researchers to acquire business and commerce skills.
- require research hubs to develop strategic plans that foster translation and innovation and build research capacity.
- provide ongoing analysis of NSW current areas of research excellence and competitive advantage to drive strategic investment decisions.<sup>30</sup>

The review provides a vision of success, outlining the changes that should have occurred and how the new HMR landscape should be operating ten years on. A mid-term review was recommended but does not seem to have occurred; however the NSW Government was quick to release a response to the initial review and provided over \$70 million in extra funding to key initiatives highlighted in the report for the first four years.

### **Western Australia**

The WA Government has released their 'Health and Medical Research and Innovation Strategy Discussion Paper' with a closing date in June 2020. In addition to competitive Australian Government funding, the WA HMR environment has access to the dedicated Future Health Research and Innovation (FHRI) fund supported by the WA Government and this represents a significant difference to the SA HMR landscape. The discussion paper looks to identify opportunities to increase WA competitiveness for national grant funding and to make WA a preferred destination for the conduct of clinical trials by using the FHRI fund to invest in research and infrastructure. The expected benefits include:

- the health and well-being of Western Australians;
- the quality of the WA research and innovation ecosystem;
- sustained employment and economic growth; and
- the reputation of WA as a leader in research, innovation and commercialisation.<sup>31</sup>

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<sup>30</sup> Ibid xii–xiii.

<sup>31</sup> WA Dept. Health, 'Health and Medical Research and Innovation Strategy Discussion Paper' (2020) 3.

## For more information

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