Productivity Commission Review of Health and Medical Research Issues

Submission from the School of Public Health (SPH), University of Adelaide (UoA).

Introduction: Research Performance and the School of Public Health

The SPH has an effective cohort of productive researchers that are nationally and internationally competitive. The SPH is disproportionally productive and impactful within the Faculty of Health and Medical Sciences (FHMS) in terms of research, given the staffing available. Over the preceding 5 years, the SPH has had: the highest number of international high-cite researchers in the FHMS, an average category 1 grant success rate of 50%, by far the greatest success of any School in FHMS in terms of Category 2-4 grants and contract research (in both quantity and funding amount), the highest PhD completion rate in the FHMS, and the most numerous and best examples of health and medical research impact (which have been used in national Excellence in Research for Australia exercises). Approximately two thirds of recent PhD theses submitted from SPH have received Dean's Commendations for Doctoral Thesis Excellence.

Information request 3.1: policy environment

- *Is the division of policy responsibilities between national and state governments clear?*

We believe that the division of policy responsibilities between national and state governments is reasonably clear.

- *What, if any, areas of duplication, gaps or inconsistencies exist?*

None.

- *Is there alignment between state and national policy and research priorities?*

Broadly, yes.

However, how well the strategic research objectives and activities of SA research institutions align with State/National priorities and global opportunities is very unclear. This matter is worthy of further investigation by the Commission.

- *How should HMR priorities be determined?*

This should be done through clear and transparent processes, involving consultation with a broad range of stakeholders. A proactive, prospective assessment of health needs in the community should be undertaken, with priority given to areas that are currently under-researched but with high burdens of disease, lack of existing treatment or diagnostic options, and potentially in sectors affected by changes in the delivery of healthcare and workforce. This needs assessment should be undertaken systematically, in an evidence-based manner, should be presented to a range of stakeholders for feedback and input, and then considered by a multi-sectoral panel given authority to prioritise the areas for research using pre-determined criteria.

- *How efficiently are regulatory arrangements administered? How significant is the compliance burden on researchers/institutions?*

The regulatory arrangements are administered efficiently. The compliance burden is significant, but no different to other jurisdictions.

- *Have recent reforms to ethics approvals processes, such as the introduction of mutual acceptance, been successful?*

These reforms provide the framework for mutual acceptance. However, it is noteworthy that the Australian Institute of Health and Welfare (AIHW) does not adhere to this framework. The practical implication of this is that any project utilising both jurisdictional and Commonwealth data acquired through AIHW requires multiple full-ethical reviews and approvals. This creates significant additional administrative burden throughout the life of the project, which negatively impacts research progress if differing decisions are arrived at and can defeat the purpose of mutual acceptance processes.

- *What is the potential for further simplifying or streamlining current HREC approval processes?*

Concatenating the local health network HRECs into one centralized Department for Health and Wellbeing (DHW) HREC for SA would be ideal and would eliminate redundant processes and variability between local HRECs.

The current Department for Health and Wellbeing HREC is the only HREC still using the HREA online system (Health Research Ethics Application form) to administer all ethics processes. This system is outdated, not user-friendly and the HREA form itself is not tailored to elicit the information required for research ethical review. The HREA online forms system has been abandoned by NSW, Victoria, Queensland, and the ACT in favour of other systems including Ethical Review Manager and REGIS.

In addition, despite broad mutual acceptance of ethics approvals, when research covers multiple sites there are still differing requirements and templates for annual reports. Uniform annual reporting requirements would greatly reduce the administrative burden on research projects.

Although not an HREC approval, the site-specific approval (SSA) processes can be a major impediment to research and examples of such taking over 12 months to process are common. The SSA can thus be a major additional burden to research. This is especially the case when research spans across different health networks. At times, SSAs seem to be operating as quasi-ethical review (in spite of HREC approvals).

- *What impacts have South Australian Government policy initiatives over the last two decades had on the state's HMR sector?*

[redacted]

Information request 4.1: measurement and data

- *What are the limitations of the Commission's suggested measures?*

Research productivity is notoriously difficult to measure. The Commission's focus on bibliometric indices, research publications, grant success and grant income, economic outcomes, and qualitative impact is probably the best that can be accomplished in terms of measures at present.

- *What other definitions and data could be used for measurement of inputs, outputs, productivity and impacts in HMR?*

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?

In terms of measuring impact, the role of grey (unpublished) literature becomes important. Technical reports and policy briefings submitted to decision-making bodies, summarising research that has been undertaken to address a decision-problem, should be counted as research outputs that have impact, even though they might never be cited or converted to publishable outputs. Research that is commercial- or committee-in-confidence is often undertaken by research organisations. This research might never see the light of day but can have an enormous impact on policy and practice decisions, particularly by governments, and affect access to, and delivery of, health care and with consequent impacts on the economy. This type of impactful and translated research should be encouraged and to do that there must be provision for it to be measured appropriately.

Information request 5.1: workforce
(Please provide relevant supporting examples or case studies, where available).

- *What strategies are being used by institutions to attract talented researchers and postgraduates and how successful have they been?*

    1. *Support for postgraduate students*. SPH has created a supportive environment for the post-graduate student cohort. The Head of School and Post-graduate Coordinators regularly meet with HDR student representatives, discussing and acting on initiatives that students themselves value. These have prompted additional guidance and training for supervisors, increased opportunities for students' input to governance processes, and social activities (for the whole school) that create a sense of school cohesion, belongingness, and pride amongst the student cohort. Less than 10% of candidates commencing within the SPH since 2017 have discontinued their studies, and of those graduating, as noted above, approximately two-thirds have received Dean's Commendations, a testament to the high-calibre of SPH students and supervisory support.

    2. *Support for research fellows.* The level of support for researchers at the end of awarded fellowships who have been unsuccessful in securing additional or alternative funding has been limited to date. There have been limited funds available to support these researchers that are critical to the current and continued research success of the University. The lack of secure funding means that we lose a pipeline of early and mid-career researchers who instead turn to other professions that provide more security.

    3. *Lack of seed funding opportunities for early- and mid-career researchers.* These schemes used to exist at the UoA but do not anymore. These were critical opportunities for early- and mid-career researchers to secure their first grant and to establish key collaborative links. The effects of the lack of such grants has become increasingly acute as the success rates for conventional Australian grant schemes have lowered.

    4. *Loss of staff.* The UoA, and SA more generally, has a significant attraction/retention problem. Within the SPH, we have lost a number of senior staff with rare skills in health economics, ethics, and statistics – and who, compounding the loss, have not been replaced.

- *Are there barriers to clinicians participating in research? How can any barriers be addressed?*

There are barriers to clinicians participating in research. In general, these are not attributable to the academic/university stance, but rather, due to issues within SA Health. These include:

1. *System related.* Budget cuts and the search for efficiencies means that the physician work environment is frantic, hurried and most of the workload to ensure clinical care is delivered appropriately falls on the clinician. This means there is minimal time for teaching the registrars and medical students - which is essential - and even less time for research. The introduction of the EMR has led to even more demands on physicians for typing etc and printing out letters and prescriptions. This is even more difficult in the COVID-19 era with antiquated telephone systems and software, as well as poor platforms for video conferencing. Clinicians are always learning and trying to deliver quality health care without appropriate administrative or high-level support from the organization they work for.
2. *System related.* At times, it appears to many clinicians that research is not appropriately valued in the SA Health environment. The lack of resources in SA Health no doubt compounds this problem. Research may be unappreciated by SA Health administrators, as they often do not see that it is their core business and is viewed as diverting resources from areas of clinical care. In addition, administrative staff exhibit an understandable reluctance to support research given competing priorities, particularly as research

is not within their core business. This is a major barrier to clinicians doing research. While there is lip service paid to the importance of doing research within SA Health, in the current climate it appears that there is little capacity and hence little priority to support research within SA Health.

3. <u>*Clinician related*</u>. *"Why do research when it doesn't get you anything?"* Workload in the public hospital system is ever increasing and clinicians do not usually have any protected time for research. Clinical duties always take precedence. Further, clinicians are not inherently trained to be researchers— they do not know what research questions to ask or appropriate ways to answer them. Thus, clinicians have invaluable awareness regarding gaps in knowledge, but may lack skills in how to adequately design a study to address these gaps. Clinicians additionally possess, however, well developed skills in reviewing current and emergent clinical knowledge to inform clinical decision-making. This is an excellent foundation on which to partner with academic researchers, to build additional research skills, and to increase the capacity for, and relevance of, health and medical research.

The barriers to research outlined above can be addressed by:

1. Changing the culture at SA Health to value research and give examples of how good clinical research can lead to better outcomes for patients.
2. Resources to free up clinician time so they have protected time for research
3. Research support for clinicians in the form of research assistants/epidemiologist/statisticians who can help to write ethics applications, collate data and write papers in a mentoring fashion to develop research capability and skills. Public Health is well placed to assist with this as we are methodologists with expertise is study design and appraisal, epidemiology, qualitative and quantitative data collection and data management and statistics.
4. Structured opportunities for discussions between clinicians and researchers to identify shared interests and complementary skills.

- *What connections are there between SA Health and university workforces and how do these affect recruitment and retention of HMR researchers?*

There are strong connections between academic staff in the SPH and SA Health. A number of our graduates and titleholders are in current key leadership positions in SA Health, e.g., Prof Nicola Spurrier and Prof Katina D'Onise. SPH is a Public Health Partner Authority with the SA Department of Health and Wellbeing (DHW) with a workplan that includes opportunities to facilitate student and staff research that is relevant to both organisations. SPH also has a Memorandum of Understanding with SafeWork SA, The South Australian Metropolitan Fire Service, The Environment Protection Authority and the Commissioner for Consumer Affairs that includes provision to create new opportunities for research and innovation in the area of reducing adverse human, environmental and economic impacts of the use or presence of hazardous materials and associated products. In theory, such interactions serve to enhance the recruitment and retention of HMR researchers. In practice, other factors at the institutional level can override this consideration including funding, time and other resources needed to conduct projects that are of joint interest.

- *How does the current situation in SA compare with other Australian jurisdictions?*

The current situation in the SPH is similar to that in other Australian jurisdictions.

<u>Information request 5.2: access to data</u>
(Please provide relevant supporting examples or case studies, where available).

- *Is the current regulatory environment at the national level conducive to data generation and sharing?*

No, although it is improving. A persisting challenge for SA researchers is that the State does not have any privacy legislation, which creates barriers to accessing Commonwealth linked administrative data.

- *What types of data are important to share in HMR?*

In epidemiology, public health and genetic epidemiology, data sharing is essential to research success. Data types include: research data actively acquired from consenting research participants and research data acquired passively via linkage to government administrative data, including data on hospitalisations, mortality, morbidity, PBS and Medicare data.

- *What barriers are there to sharing data for HMR?*

There are seldom legal or ethical barriers to the sharing of de-identified data. Data ownership and privacy can be a problem for identified data. Secure platforms are in place to facilitate this interstate eg SURE, but are difficult to work with. There are also barriers due to lack of adequate resourcing available to data custodians in SA government departments to enable them to share service (linked administrative) data.

- *What data related bottlenecks constrain HMR and what can be done to remove them?*

Many elements of SA Health and other administrative data are available to researchers via SA NT DataLink. However, some key elements are not. In particular, very little data from SA Pathology and SA Medical Imaging (SAMI) have been added to the linkage spine maintained by SA NT DataLink. Adding these datasets would greatly and at minimal cost increase the value of the linked administrative data for HMR in SA.

One solution would be for the SA Government to direct SA Health to release a copy of all historical and new public pathology and radiology data to SA NT DataLink.

There is a specific issue relating to data held by private medical hospitals and other private medical providers in SA. Such providers have been approached numerous times by SA NT DataLink over the preceding decade to share their core summary data (e.g., ICD-coded hospital separations). The responses to these approaches have made it clear that private providers in SA will not share data unless required to do so.

One solution may be to modify the legislative framework so that private medical providers in SA are required to report key data to SA Health, as is the case in most other Australian jurisdictions.

Information request 5.3: infrastructure
(Please provide relevant supporting examples or case studies, where available).

- *How well is existing SA public and private HMR infrastructure being utilised?*

There are few examples of common, 'core' resources that would systematically enable HMR in SA. For instance, there are no core informatics resources or biobanking facilities for the storage of human biospecimens.

- *Could existing HMR infrastructure be better utilised or shared more effectively to deliver improvements in HMR performance?*

SA NT DataLink has become 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.

- *What role do precincts, neighbourhoods and physical proximity play in promoting collaboration?*

People working within the same building or on different floors may not know what research is being undertaken adjacent to them. The key is having spaces or activities where researchers can mix and that are not to difficult to attend (in terms of distance and duration).

Information request 5.4: collaboration
(Please provide relevant supporting examples or case studies, where available).

- *How important is collaboration to securing research funding and to the achievement of HMR outcomes – both between researchers and between research institutions and industry, nationally or globally?*

Collaboration is essential to securing research funding and achieving HMR outcomes. There are many challenges to collaboration in SA:

1. *Leadership and confusion.* Although there are elements of apparent research strategy and direction within HMR stakeholders in SA, there is often confusion as to who is responsible for what and an overarching lack of policy. Even when there is clear strategy/policy, the operational aspects of this are unclear. For example, SPH staff often feel that they have no idea and no clear understanding of who is doing what among local HMR stakeholders or how to achieve the growth targets in HMR. There is duplication of effort and lack of coordination between institutions and government in SA. For instance, on the HMR front it is clear that there are often researchers working independently on exactly the same issues. Skilled leadership would involve finding mechanisms to identify research synergies and bring together diverse fields of knowledge to craft compelling and comprehensive research programs in order to address wicked problems.

- *Are current levels of collaboration by SA researchers/institutions optimal?*

1. The heterogeneous nature of the discipline of public health means that SPH academic staff are engaged sufficiently with other health and medical institutions and researchers at the local, national and international level to leverage effectively significant funding opportunities. This is reflected in the funding success of the SPH.
2. We have worked to position the Faculty better with NALHN; SPH has placed academic and support staff at hospitals in the northern suburbs and that may serve us well in terms of research collaboration in the future.
3. More broadly, the levels of collaboration within and between institutions in SA are not optimal and the networks less rich than those evident in other Australian jurisdictions.

- *What steps could be taken to enhance collaboration amongst research institutions, including universities, and between research institutions and industry?*

Core skills capabilities in research design, statistics, health economics and data management are lacking in SA. Capacity is fragmented and institutions compete with each other to gain access to these skills as they enable good quality research to be conducted. Adelaide Health Technology Assessment (AHTA) in SPH has a large contingent of people with these skills and could grow further in its consultancy activities to become a hub or enabler for research undertaken across the State

Information request 5.5: funding
(Please provide relevant supporting examples or case studies, where available).

- *Why has SA's share of Australian Government HMR grant funding been falling?*

This is a complex question with a complex, multifactorial answer. Some of the factors relate to issues raised elsewhere in this document (see redacted section above). Some of the factors not raised elsewhere and apparent from the SPH (university academic) viewpoint include:

1. *Gaps in grant funding.* Granting bodies like the NHMRC do not pay for the full costs of research projects, including salary gaps and oncosts. This means that Universities have to shoulder the cost difference, or the researchers hired to conduct the project need to be appointed at a lower level or for a shorter fractional time. Research funding is limited, even in Universities, so the ability to supplement these gaps in costs for research-intensive staff is affected. This has knock-on effects of reducing the ability for research staff to progress into higher paid research roles and demonstrate career progression (unless they are successful with obtaining one of the very limited number of fellowships available). It also limits the type of projects submitted for funding as we are unable to afford highly paid (and experienced) research support staff.

2. *Declining infrastructure funding.* To undertake the research that we do (often involving very large data sets that require analysis), we need high performance computers. As there are no alternative SA-based small-scale infrastructure funding sources available, we have had to apply for the small pool provided by the University each year. As there is limited funding, in some circumstances this has not been granted.

3. *Lack of philanthropic funding of research activities.* The University of Western Australia (UWA) ran a "New Century Campaign" between 2013 and 2017, which resulted in over 12,000 donors contributing more than $400 Million to the University. Similar types of philanthropic funding for research in SA does not appear to occur. It would make sense for the Universities and Institutes to collaborate and secure philanthropic funding for the State, rather than competing against each other. This pool of philanthropic funds could then be applied for by each of the Universities and Institutes.

4. *Increasing teaching and administrative burden on academic staff.* It is hard to overlook the increased teaching and administrative burden placed upon staff who are potentially those submitting competitive grant applications. Like clinicians, there is a need to find 'protected time' in order to conduct research. However, as research intensive universities are effectively cross-subsidised by teaching revenue (as the full costs of research are not covered by existing HMR granting schemes (with the exception of MRFF)) then teaching will always have priority. Until the University has a sufficient number of research intensive and teaching intensive academics, the tension between teaching and research will remain and the research (which is less immediate) will always be short-changed. *Structural barriers to collaboration.* Even within the FHMS, there are barriers to collaboration and interdisciplinary research. Within the University, there are structural barriers to working across Faculties.

- *What role has the South Australian Government played in assisting public and private researchers to access Australian Government funding?*

Unknown.

- *What are the key factors which influence SA's success rate in securing NHMRC and MRFF funding?*

1. Our ability to attracting and retain high-quality researchers in both the university and public hospital spaces.
2. The availability (or lack of) host institutional support.
3. Ongoing access to world class datasets
4. A culture of research leadership and translational research

- *How efficient are processes for applying for and reporting on use of NHMRC and MRFF funds in terms of information requirements, complexity, administrative effort and timeframes?*

NHMRC processes are efficient and relatively easy to understand and operationalize. MRFF processes, on the other hand, have been minimalistic regarding guidance, execution and, until recently, there has been a lack of transparency as to how they are awarded. Improvements in MRFF processes have been seen recently, although the timeframes are often very short.

- *What challenges, if any, do SA researchers/institutions face, compared to other jurisdictions, in securing Australian Government research funding?*

See elsewhere in response for the various challenges facing SA HMR researchers and institutions.

- *Do the processes for ethics and governance approval have an adverse effect on the ability of South Australian researchers to secure Australian Government funding?*

Sometimes (see above). In general, this is a positive and enabling feature of SA. For instance, it is apparent that access to linked administrative data in SA is much easier than in the Eastern States.

Information request 5.6: translation of research
(Please provide relevant supporting examples or case studies, where available).

- *Is there potential to enhance translation of SA based research into health care policy and practice in SA and how can this be realised?*

There is outstanding potential to enhance the translation of SA based research into health care policy and practice. Part of the realisation relates to the prioritisation process discussed earlier. If HMR research is being done on health care issues that are a priority for the State then it is much more likely to be translated into policy and practice. Close involvement of end-users of the product of any research project should be the norm and occur from research conceptualisation onwards.

- *Is there potential to increase the quantity and quality of clinical trials conducted in SA?*

Yes. SA has a number of advantages for conducting clinical trials, particularly if the disease/condition is common, including close relationships between the universities and teaching hospitals where patients can be recruited. However, the ability to properly design, conduct, and analyse the findings from these clinical trials depends on adequate resourcing of people with clinical trial expertise. As mentioned earlier, Adelaide Health Technology Assessment (AHTA) in SPH has this capability, with clinical epidemiologists, statisticians, ethicists, data managers etc who support researchers with developing clinical trial ideas, collecting data and analysing it. AHTA does not provide trial coordinators as there are other groups/agencies that can do that. AHTA supports a number of clinical trials – including the State-based meningococcal vaccine Be Part of It study - but capacity and growth depends on external funding and grant funding is inadequate and insecure and so the ability to ramp up such activities is constrained.

- *What steps can be taken to remove or reduce these barriers?*

Establish an independent body with responsibility for approvals and policy for all commercialization activities using SA Government data.

- *What have been the impacts of current national and state government initiatives to promote domestic commercialisation?*

Small.

- *How is HMR effort split between basic and applied research in SA?*

In the SPH there is an applied and translational research focus. More broadly, HMR at the UoA seems to be split roughly evenly between basic and applied HMR.

- *Does the South Australian Government's Intellectual Property Policy, including the monetary rewards framework, encourage or hinder the translation of HMR undertaken in the public health system?*

This is unclear, as we have no knowledge of the South Australian Government's Intellectual Property Policy. In general, data custodians within SA Health such as SAMI and SA Pathology have historically been very reluctant to share data due in part to their belief that somehow this will mean that they will relinquish IP.

Information request 5.7: competitive advantage – location
(Please provide relevant supporting examples or case studies, where available).

- *Is South Australia perceived as an attractive location globally or nationally for investment in HMR and commercial innovation? If not, why not?*

This is unclear. In general, most groups internationally have not heard of SA institutions.

There are, however, advantages from the location as SA is a small, closely linked, relatively inexpensive and easy to navigate. It could act as a crucible for research, particularly population-based research.

Information request 5.8: competitive advantage – population
(Please provide relevant supporting examples or case studies, where available).

- *Are there particular characteristics of South Australia's population that may create competitive advantage and opportunity in any fields or phases of HMR compared to other jurisdictions?*

We have an older population than the rest of the country. This might have benefits in terms of ageing and frailty research, as well as for diseases in the aged.

Information request 5.9: competitive advantage – areas and phases of research
(Please provide relevant supporting examples or case studies, where available).

- *Does South Australia have areas of research excellence of national or global renown? What are they?*

Yes. The research areas within SPH are:

1. Child health and development research (BetterStart). South Australia has internationally leading and competitive linked data platforms and research programs, such as the SA Early Childhood Data Project led by Prof John Lynch and the BetterStart child health and development research group in the SPH. SA has multiple advantages that have led to greater capacity to produce high quality research using linked data.

A. Competitive Advantage 1: SA services are primarily statewide and government run which has had positive flow on effect to the availability of linked data for research and directly improves our ability to conduct relevant research due to whole-population service coverage.

B. Competitive Advantage 2: The SA Public Sector (Data Sharing) Act 2016 has provided an enabling platform for the sharing of health and other data that was not previously been available. The *Act* has also led to broad adoption of the "five safes" (the *trusted access principle)* across government. This has

helped create a common language between the research and data custodian community and helped move previously challenging data sharing environments from “why” to “why not”.

C. Competitive Advantage 3: SA NT Datalink is a nationally leading data linkage agency which has led the way with developing the most comprehensive Master Linkage File in the country. Their investment in a broad spectrum of data sources, extensive clerical review processes, and an ability to update historical data linkage research programs positions SA NT Datalink as an agency capable of supporting multiple diverse research programs that have the potential to be world-leading in novelty and impact.

2. Machine learning applied to medicine (MLIM). The MLIM team is based jointly in the SPH and the Australian Institute for Machine Learning. The team is multidisciplinary, and includes epidemiologists, clinicians, geneticists, and computer scientists. MLIM encompasses extensive local, national, and international collaborations. The program is explicitly focused on applications of medical AI and the translation of medical image AI to practice. Over the past 5 years the MLIM program has focused on:

A. Clinical engagement and workforce preparation. The program currently has 5 PhD scholars with backgrounds in clinical medicine or biology. We have incorporated AI training into the radiology training program at the Royal Adelaide Hospital (RAH) and are supporting the first AI-focused clinical fellowship position in Australia at the RAH. We are active participants in the development of a new AI training program with RANZCR. We have actively engaged undergraduate medical students at the University of Adelaide, and in 2019 had 25 medical students and junior doctors working on various medical AI projects. Importantly, our clinical training program – at all levels – involves ‘hands on’ training in programming and in the development and assessment of machine learning models.

B. Constructing large and comprehensive medical image datasets for AI research. We have collated large and high-quality image datasets in SA. These include: digital image datasets from the RAH radiology archive (n~100,000 studies); all digital screening mammograms from BreastScreen SA (n~280,000 women, n~2.5M images); and numerous smaller clinically focused datasets. These local datasets have been supplemented by large international imaging datasets from UK Biobank, the US NIH, and elsewhere. Team members are closely integrated with key SA data infrastructural elements, e.g., are involved in leading SA NT DataLink and the Clinical Improvement and Advisory Committee of the SA Commission for Excellence and Innovation in Health.

C. Constructing high quality AI models for selected clinical applications. We have constructed a number of AI models for clinical applications using cutting-edge AI methods. Our applications cover a range of areas, including: orthopaedics, ophthalmology, oncology, vascular surgery, and neurology.

D. Conducting methods research in AI. We have conducted methods research into various aspects of AI models critical to translation.

E. Conducting pre-clinical testing. We have developed a ‘pipeline’ for pre-clinical testing and have applied this in the context of a hip fracture detection AI model.

F. National engagement. The Precision Healthcare Flagship of the Australian Alliance for AI in Healthcare is led from the MLIM Program. Team members sit on various national committees, including: the AI working groups of I-MED radiology and the Royal Australian College of Radiology, the Community Engagement and Safety and Quality Flagships of the AAAIiH, and the Clinical Informatics Committee of the Australasian Institute for Digital Health.

3. Adelaide Health Technology Assessment (AHTA). Adelaide Health Technology Assessment (AHTA) is a research centre of approximately 30 highly skilled staff with expertise in health technology assessment (HTA). As HTA is a multidisciplinary field, AHTA staff have qualifications and experience in clinical epidemiology, clinical trials design, research methodology, health technology assessment (HTA) methodology, biostatistics, clinical sciences, pharmacy, social sciences and health economics/modelling.

AHTA's vision is "Informing health decisions with high quality evidence" and its mission is to provide:

- Expertise in health technology assessment by:
    - Evaluating the safety, effectiveness and value for money of health interventions
    - Predicting the impacts of these health interventions on individuals and society
    - Contributing to best practice, locally, nationally and internationally.
- To provide leadership, education and capacity building in the generation, evaluation and interpretation of evidence, and
- Expertise in study design and conduct, statistical analysis and interpretation, supported by systems that enable high quality data collection and management

AHTA has an international reputation as one of the leading agencies in HTA and is a member of the International Network of Agencies for Health Technology Assessment (INAHTA) which is a network of 51 not-for-profit agencies from 30 countries. The Director of AHTA, Professor Tracy Merlin, is the Incoming Chair of INAHTA.

Over the last two decades, AHTA has brought in $58 million in contract research funding, primarily from Commonwealth Government sources but now expanded to include the Singapore Ministry of Health. AHTA has been conducting research evaluating the safety, effectiveness and cost-effectiveness of medical services on behalf of the Medical Services Advisory Committee (MSAC) for the last 19 years, and developing reports on medicine/vaccine submissions to the Pharmaceutical Benefits Advisory Committee (PBAC) since 2005. These have had direct policy impact in terms of influencing Medicare and PBS funding of these interventions. AHTA has been contracted to conduct many fit-for-purpose evaluations and health technology assessment methodological research, including the recent review of ATAGI processes, options for an immunoglobulin HTA pathway, and development of the demonstration reviews of MBS specialty items, amongst others. AHTA also housed the national horizon scanning unit, assessing new and emerging medical technologies, for many years. AHTA expanded in 2016 to conduct medical device and oncology drug evaluations on behalf of the Therapeutic Goods Administration (TGA). AHTA also develops clinical practice and public health guidelines on behalf of the NHMRC.

Locally, AHTA has had strong involvement with SA DHW technology assessment committees including SAMEP and SAPACT. Local research funding, however, has been limited.

In addition to contract research in health technology assessment, AHTA provides technical support for several clinical trials conducted within – and external to – the University of Adelaide. In this aspect, AHTA is an enabler of other people's research – assisting them with randomisation/web randomisation services, study design advice, web-based data collection and data management services, statistical analysis and advice, ethics advice, and health economic evaluation capacity.

4. Environmental health and climate change. The Environment and Health Research Group conducts domestic and internationally significant research that has a pragmatic approach to public health problems. Led by Professor Peng Bi, who has received 22 Category 1 grants in the last 15 years, this group are dedicated to providing translational evidence to the public, to decision-makers, and to the broader research community.

Their research interests are in environmental health, climate change, emergency public health event response (such as heatwaves) and population health. They also explore how risk, adaptation and preparedness messages and practices can provide coping mechanisms for environmental and climatic stresses within communities.
The group has excellent collaborations with government organisations and also convene the National Climate Change Adaptation Research Facility Vulnerable Community Network, which is funded by the Australian Government Department of Environment.

- *What are South Australia's competitive strengths and weaknesses in various fields and phases in HMR?*

The SPH is strong in the following areas and phases of research:

1. Knowledge generation.
2. Knowledge synthesis.
3. Implementation and Evaluation science.
4. Knowledge translation.

Information request 5.10: competitive advantage – clinical trials
(Please provide relevant supporting examples or case studies, where available).

- *What type of clinical trials are being undertaken in South Australia?*

  Trials that we have seen undertaken are on a variety of topics including maternal and child health, vaccines and herd immunity, nutritional supplements, point of care testing, smoking cessation, and pharmacy review of medicine use in the aged.

- *What proportion of clinical trials are sponsored by industry and what proportion are investigator driven?*

  Most of the ones we see are investigator initiated, although some have had industry or CSIRO funding, in addition to the usual grant funding. Reductions in grant funding have reduced the number of clinical trials undertaken.

- *Does South Australia have any competitive advantages in conducting clinical trials?*

  Yes. The ability to collect long-term outcome data via the data linkage system (SA NT DataLink).

Information request 5.11: competitive advantage – collaboration and precincts
(Please provide relevant supporting examples or case studies, where available).

- *The size and culture of South Australia and Adelaide is said to make collaboration easier. Does this apply in HMR?*

  In theory, this should be true. However, the reality is a highly fragmented landscape with lost opportunities for collaboration across sectors with aligned or complementary interests/skills. Collaboration does occur but the research landscape in SA is inherently competitive.

- *How competitive is South Australia in attracting leading researchers and talented postgraduates to HMR?*

  Uncompetitive. It appears to be a common experience that, even when world-class researchers can be attracted, they often appear to stay only a relatively short time before moving on to other opportunities.

- *Do Adelaide's innovation precincts provide it with a competitive edge in HMR and translation?*

  No. See response to Information Request 3.1 above.