

## SA Productivity Commission Requests for Information

### Submission by the Faculty of Health and Medical Sciences May 7<sup>th</sup> 2020

#### Background

- In 2018, the University of Adelaide (UoA) earned 68% of the Category 1 income and 60% of Category 1-4 income in South Australia (SA). From the perspective of National Health and Medical Research Council (NHMRC) income in 2019, the UoA earned 43% of the total in SA, with the vast majority earned through the Faculty of Health and Medical Sciences (FHMS), and the remainder in the Faculty of Sciences at UoA.
- From 2014-2018 UoA FHMS HERDC income declined 7% (\$71M to \$66M), and NHMRC income declined 13% from \$30M to \$26M. The UoA NHMRC national share declined 16% from 4.8 to 4.0 percentage points.
- The UoA Faculty of Health and Medical Sciences (FHMS) is a major employer of HMR workforce in SA. The Faculty has the responsibility for training medical, nursing, dental and allied health clinicians. The Faculty employs about 400 academic staff including 53 clinical academics, mostly within the Central Adelaide Local Health Network (CALHN) but also at WCHN and NALHN. Additionally, there are another 1800 clinical affiliates throughout the health system. The HMR workforce in SA universities increased 86% from 472 in 2001 to 876 in 2017 with SA keeping a steady share of the national HMR workforce at about 12%.
- The UoA has 89 staff, 128 HDR students and 15 Honours students housed at least some of the time in SAHMRI.
- Over the 20 years since 2000, the South Australian share of NHMRC funding declined from about 11% to 6.6%, and HERDC total income share declined from 11% to 7.8%. Over the same period, SA's share of national GDP declined from 6.3% to 5.7%.

#### Our Position

- HMR in SA is at a crossroad. As the figures above show, SA used to 'punch above its weight' in HMR on the national stage, but that is no longer the case, as evidenced by two decades of decline in performance. Every 21<sup>st</sup> Century health system in developed economies has research and teaching as part of its core business. HMR brings together the best education, clinical practice, innovation and continuous improvement into health system performance through T1 to T4 translational processes. (Fig 5.2, pg 30 SAPC Issues Paper)
- As one of the major players in HMR in the state, the Faculty of Health and Medical Sciences is aware of the fundamental challenges the funding data described above pose to the way HMR is structured, funded, and conducted in SA and at the UoA. Against a backdrop of funding decline, 'business as usual' is unlikely to deliver a vibrant HMR sector in SA.
- Despite this backdrop of decline, the UoA FHMS believes SA is very well placed to respond to the challenges. Opportunities exist in changing funding environments. One of these opportunities lies in securing foundational research platforms within local health networks (LHNs) and strengthening research

capacity in basic biomedicine and in all aspects of the health system spanning medical, nursing, dental and allied health care, and into population health and health equity.

### **Information request 3.1: policy environment**

- It is difficult to discern an explicit overall HMR policy in the state. 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. For example, the Victorian Government recently invested over \$20M in helping to establish a new birth cohort that will be a platform for HMR funding applications over many years to come. It invested \$60M in cancer platforms. The Qld government has a \$25M co-investment fund for HMR.
- It will be important, that any investment strategy be built on principles of a solid safety net for sustainable operation, planning, and strategizing. Short-termism cripples genuine progress because nothing gets fully operationalised and run for long enough to yield the true benefits that may not accrue for 5-10 years. This has detrimental impacts on talent attraction and retention in the state.
- In HMR, a merger of UoA with UniSA would offer massive opportunity. It is abundantly clear from Australian university performance data that research success tracks closely with university size. The research income performance of the 3 small Go8s (Adelaide, ANU and UWA) clusters together, has similar declining trajectories, and total research incomes are much lower than the big 5 universities. Big 5 universities like Monash have heavily invested in building research capacity (both physical and human) over the last 10 years and the benefits are now evident.
- 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.
- Issues related to ethics processes continue to frustrate the HMR workforce despite some changes. Mutual acceptance, use of the same application forms that are consistent with other jurisdictions and streamlining of processes and timelines, arduous SSA's, and other issues have been well documented by the Birch Review. SA is small enough with a concentration of HMR workforce, to be the slickest ethics process in Australia, while still maintaining high ethical standards of review.

### **Information request 4.1: measurement and data**

- There are a myriad of potential indicators of research performance that ought to span different dimensions including income (total HERDC, Cat 1, NHMRC), outputs (such as publications, reports, IP, commercialisation, etc), research training and mentoring of HDRs, collaborations, and research culture and leadership. The general experience is all single measures are flawed and so a suite of indicators in each of these areas is required to give different 'views' of performance.
- It is also important to consider performance metrics applicable to the needs of LHNs. The standard array of metrics relating to research performance even using multiple 'views' may not capture what is the most important result of research activity in terms of adoption of better evidence-based practices feeding through into patient care and eventually population health. The metrics used to monitor HMR in SA need to encompass follow through of research income and publications etc, to impacts on patient care and population health.

- The UoA and Faculty of Health and Medical Sciences have recently developed a much greater capacity to understand its research performance ecosystem along the dimensions described above, and this could be extended collaboratively to developing a state-wide view of SA's HMR assets.

### **Information request 5.1: workforce**

#### *Recruit and Retain Talent*

- There have been various approaches to attracting new researchers to SA. At UoA we currently have the "Top Talent" scheme that is initially sponsored through the DVCR office, and then reverts to Faculty funding over subsequent years. We have recently attracted several Top Talent researchers to UoA.
- Attracting high performing researchers is expensive. It is even more expensive to attract whole research teams but this may be more efficient in that run-up times to high productivity are shorter than having to build research teams from scratch. Internationally competitive, high profile researchers receive offers from leading universities overseas that can be 10 or more times what is typically offered in SA. Nevertheless, excellent researchers have been attracted but the overwhelming view is that many do not stay. There are several examples of high-profile researchers attracted to UoA (e.g., Professor Ben Mol recruited from the Netherlands and is now at Monash) and SAHMRI (Professor Stephen Nicholls recruited from the USA and now at Monash) who have moved on after a relatively short stint. Some of this happens because the initial recruitment packages may be attractive, but they are not sustained, and large research teams populated by Level B and C academics are hard to retain in funding environments where success rates are below 10%. SA has not found the balance between security/stability and pushing for development of competitive financial independence, and SA does not, at present, demonstrate adequate critical mass and sustainable infrastructure to support competitive, cutting edge research at scale.
- 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.
- There is little data on the turnover and loss of high performing researchers in SA vs other Australian jurisdictions. SA is unlikely to be able to compete in every field of HMR and so we have to be strategic in research focus, have honest communication about where true strengths lie, understand research areas where SA can make a nationally distinctive contribution, and invest in those areas. That is the process the UoA Faculty of Health Medical Sciences is following in its current research performance strategy.

#### *Concentration of income generating potential*

- High research performance is heavily concentrated within a very small number of researchers and research groups who earn a large share of institutional income. For instance, 25 researchers out of a 400+ HMR workforce in the UoA Faculty of Health and Medical Sciences earn over 60% of the total Faculty research income. That means 6% of the workforce generates 60% of the income. A very large proportion of these top 25 researchers are clinical researchers. These data are limited because they only include researchers who appear as CIA and that means contributions by others as CIs are not being counted here. These are the limitations of the data systems we use to understand HMR performance. Nevertheless, this means income generating potential is highly concentrated. Any disruptions to the performance of this very small number of researchers and their teams makes the institutional income generating potential rather fragile.

#### *HMR - think small business entrepreneurs*

- Successful researchers and their groups are best thought of as small business entrepreneurs who seek a space in a highly competitive external funding environment. The source of ideas and innovations and funding success is very local and embedded in the specific research area. Innovation and success will not come from centralized institutional control and clumsy bureaucratic processes. Instead an ecosystem that

supports HMR through sensible coordinated efforts where success is shared, reduces barriers, and facilitates interdisciplinary collaboration has a much greater chance of success. Perhaps collaborative framework that was part of the original vision for SAHMRI but it seems that a productive HMR ecosystem concept has yet to emerge in SA.

#### *Clinician researchers – a key*

- UoA has about 53 clinical academics (CALHN, NALHN, WCHN) where salary is paid by both the University and the health system. There are an additional 1800 clinical affiliates who are connected to the university through research, teaching and mentoring relationships.
- Clinician researchers are key to future HMR success in SA. 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.
- As pointed out above – clinician researchers are already highly successful, pivotal players in generating research income in SA. 21<sup>st</sup> Century HMR cannot be done without foundational partnerships that embed research into the day-to-day business of health systems. A constant theme among clinician researchers is that the health system doesn't care about research. There is simply no time for research in the face of providing clinical services to patients. Many talented clinical researchers undertake research in their 'spare time'. Clinical research is successful in SA but it could be a powerhouse rather than a cottage industry, and build a national reputation as an ideal place to conduct clinical trials because we have the best recruitment, retention and supportive processes to successfully conduct trials.
- 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. Many clinician researchers argue for that a 0.4 or 0.5 FTE should be standard as devoted to research. These sorts of arrangements do exist in other jurisdictions. Such devoted research time would also enhance the ability to engage even more fully in the essential role clinicians play in teaching, training and mentoring next generations of clinicians across all health and medical disciplines.
- If SA is to build better performance in MRFF funding, improving and simplifying the connection between academic research and clinician research in the LHNs is central. There are too many different and confusing institutional procedures and players to deal with for 'time poor' clinicians.
- Research positions could be funded by SA Health into LHNs so that research is embedded in core operations in the health system – not as some additional functionality added on. CALHN has 19 research support (CALHN Research services) staff, with few of these positions are funded by CALHN operating budget but via the HSCGB and income from clinical trials.
- The Faculty of Health and Medical Sciences is currently undertaking a project to build genuine collaborative research partnerships with NALHN. We have provided in person supports for building research capacity through research design and analysis in NALHN precincts at Modbury and Lyle McEwin hospitals. Over the last 12 months we have made significant gains in supporting new NHMRC and MRFF bids. Much remains to be done but the potential is enormous. NALHN has long been the 'poor cousin' of the LHNs partly perhaps because of a more general bias toward the disadvantaged communities in the Northern Adelaide suburbs. It is now the fastest growing LHN in SA and will soon surpass CALHN in size.

#### **Information request 5.2: access to data**

- SA already has several, nation leading assets to support greater access to HMR relevant data. There is no reason SA cannot lead the nation in accessing and using a variety of HMR relevant data. Used cleverly, this could be a major factor in better HMR performance.
- It is clear that the national environment for greater data sharing is improved. SA already has the most advanced data sharing legislation of any jurisdiction. In addition, we already have SANT DataLink – arguably the best data linkage agency in Australia.
- Research performance would be enhanced by access to a wide array of patient relevant data including medical records, imaging, pathology, and outcomes spanning hospital re-admissions to patient quality-of-life indicators. All of these data already exist so why can't SA lead the nation in digitally-smart use of data?
- Concerns over privacy need to be carefully considered and managed but there are many examples of where this has been achieved already. The question for SA around data is how to take this to scale while still ensuring privacy protections.
- Another key asset in SA is the UoA's Australia Institute for Machine Learning – the premier AI centre in the country. Surely the presence of these data and analytics assets demands we leverage the data that already exists in the system for HMR.
- SA already has prize winning examples of what is possible. In 2019 the SA Early Childhood Data Project led by Professor John Lynch at the UoA School of Public health won the national award for Data Innovation from Research Australia. It is a linked data platform of over 500,000 children and their families born in SA from 1991. It is the one of the richest data platforms of its type in the world and the best in Australia. And we have excellent registries, with the Registry of Older Australians (ROSA) and the Bone and Joint Registry housed in SAHMRI.

### **Information request 5.3: infrastructure**

- SA has some impressive HMR infrastructure in terms of buildings. However, the decision not to include research facilities in the RAH was an opportunity lost. New hospitals must have research facilities.
- Although crucially important, HMR infrastructure also needs to be thought of beyond buildings and specific facilities. There appear to be many overlapping responsibilities in the fragmented HMR infrastructure in SA. It's not clear whose job it is to do what. HMR infrastructure needs foundations in LHNs that provide a pipeline from basic to applied clinical and population health research. Existing 'precincts' and SAHMRI are yet to generate clarity around who does what.
- There is potentially a role for SA Health to take research leadership more seriously to turnaround years of divestment. Perhaps there needs to be a central research office in SA Health to take leadership of research infrastructure from ethics to shared facilities to opening opportunities for collaboration. They could provide the glue to ensure infrastructure support and better link researchers with LHNs. This would require imaginative leadership to create a more productive HMR ecosystem in the state. We believe this coordinating infrastructure role should be played by someone with 'skin in the game' and SA Health is the peak body for health in SA. It would serve to reduce the current lack of role clarity and duplication.
- SA has not been able to build sustainable infrastructure around both Bioinformatics and Biostatistics support. These are different roles and there has been progress in bioinformatics support. That is not the case in biostatistics support. This requires long term core funding and should include supports to research within hospitals. Every hospital should have an in-dwelling clinical epidemiology and biostatistics unit to support clinical and population health research. Such arrangements exist in other jurisdictions and internationally. Such units are best placed to be supported by the universities where the statistics

expertise already exists, not as another added-on short term function to an agency that sits outside the universities and the health system.

- There are a number of initiatives within the state that have sought to coalesce research infrastructure. For the University of Adelaide, 2 major ones have been SAHMRI and the Adelaide BioMed City (ABMC). These have the stated intent to bring together the state research activities to produce non duplicative research infrastructure to make the state research 'greater than the sum of its parts'. That said, SAHMRI and ABMC appear to have introduced duplication, and both structures rely on financial and human resource input from the Universities and SA Health. The financial support arrangements are at times complex to fund and duplicative of existing capabilities. Added to this, the agendas of the sponsoring institutions are not the same and have not been aligned, limiting the ability for these initiatives to achieve much of their stated aims.

#### **Information request 5.4: collaboration**

- Research is a highly competitive business at the institutional, group and individual level. There are winners who are celebrated, and losers who are put under pressure to perform. Collaboration is not an easily created entity. Collaborations occur and succeed when everyone benefits by bringing complementary skills and assets to the table to make a discovery or solve a problem.
- If HMR in SA had at least some focus on solving agreed specific problems, it might be easier to find collaborations. That is part of what is required to be successful in the MRFF but it requires leadership and good will across often competing institutions and arrangements including universities, LHNs, SAHMRI and ABMC, as well as at the level of individual researchers and clinicians who are sometimes reluctant to collaborate.
- 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.
- This has been exacerbated by the changes to NHMRC funding rules, which have an unintended consequence of being anti-collaborative though the introduction of caps in at least 2 of the biggest funding schemes – Investigator and Ideas Grants.

#### **Information request 5.5: funding**

- See comments made above.

#### **Information request 5.6: translation of research**

- 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. Creating a 'learning health system' has not been realized so far in SA because we have not yet been able to fully support the foundational research platforms within the health system.

- Perhaps the government could help create an environment to encourage biomedical and pharmaceutical companies to set up bases in Adelaide. There is limited local health industry in SA that could be a partner to research in SA.

**Information request 5.7: competitive advantage – location**

- Our impression is that 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.

**Information request 5.8: competitive advantage – population**

- SA's population is largely representative of Australia and concentrated in a small number of city and regional centres. That means it is a microcosm of the country. This, combined with the fact that we have many state-wide services, means we often have a single source of health services while other jurisdictions can face a maze of different levels and organizations involved in service delivery. This ought to provide an excellent place for large scale, systematic HMR research.

**Information request 5.9: competitive advantage – areas and phases of research**

- The UoA has world class research capacity that extends from basic biomedical discovery research to highly applied translational research in clinical practices.
- In the UoA FHMS we have undertaken various processes to identify areas of research strength and areas of specific opportunity. Such exercises invariably risk generating long lists that encompass every research field. Nevertheless, we have analysed our own data, consulted widely, and have arrived at a number of areas that we can objectively justify as strengths. Once identified these areas become priorities for various forms of FHMS resourcing. e.g., Top Talent appointments, direct cash, equipment, priority review of grant submissions, EMCR development, co-funding, fellowship bridging support, etc.

<i>Reproductive Medicine and Paediatrics</i>	<i>Cancer – leukemia, lymphoma, myeloma</i>
<i>Cardiovascular Disease</i>	<i>Health Technology Assessment</i>
<i>Metabolic Diseases</i>	<i>Aboriginal Health Equity</i>
<i>Cancer – solid tumours</i>	

- We have also identified areas where we believe we have research opportunities.

<i>Aging and Palliative Care</i>	<i>Precision oncology and cancer immunotherapy</i>
<i>Complex comorbidity</i>	<i>Immunology, infection, inflammation and immunity</i>
<i>Epigenetics, stem cells and cellular reprogramming</i>	

- The SAiGENCI initiative is a major opportunity for HMR growth to support some of these strengths.

**Information request 5.10: competitive advantage – clinical trials**

- The partners of the ABMC are attempting to coordinate trial (CT) activities and facilities, but limited resourcing has led to only small advances towards a coordinated network of CT facilities that could attract many sponsored trials based on the information already outlined above in relation to the State's size and organisation.

**Information request 5.11: competitive advantage – collaboration and precincts**

- The western end of North terrace has been transformed with massive investments in the buildings of UniSA, UoA, SAHMRI and the RAH. This precinct ought to be physical platform to foster greater collaboration given the close proximity. It 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.

- Indeed, SA had a similar structure at the east end of North Terrace, where the RAH, SA Pathology (formerly IMVS), UniSA and UA were tightly co-located, with much higher interconnection with University staff embedded in the SA Health facilities and alongside the clinical and pathology service providers. The decision to move the RAH served and construct SAHMRI in the western end of Nth Tce served to dislocate and erode this once, highly interconnected precinct. Unfortunately, this is yet to be replicated within the ABMC. The current performance of SA Pathology to manage COVID19 testing is a legacy of the past clinical academic investment into a pathology service and it led to the innovation that provided incredible community benefit. A great number of the most impactful clinical and basic science researchers in Adelaide today have emerged from the IMVS/RAH/UA/UniSA site in East terrace that was a sustainable research infrastructure that built a collaborative research and innovation culture across all 4 institutions.
- There is also a somewhat 'North Terrace' focus to the idea of a biomedical precinct. There is a good deal of HMR in the south led by Flinders and opportunities need to be considered across multiple precincts and campuses, especially the fastest-growing communities served by NALHN. There is a need to connect existing investments in the South with major investment in North Terrace precinct and growing need in the Northern communities, which will likely require new investment. Perhaps ABMC could be re-cast as Adelaide Biomedical Research which places focus on function rather than not location. Placing all the expectations on ABMC to deliver HMR growth may be the wrong way to frame the problem and the ABMC role.
- In some people's eyes SAHMRI was meant to have a small core and many hubs where they facilitated collaborations and HMR productivity. That vision appears to remain a work in progress.