

South Australian Productivity Commission
GPO Box 2343,
ADELAIDE SA 5001

11 May 2020

Re: 2020 Health and Medical Research Inquiry - Submission from Adelaide BioMed City to the SAPC Issue Paper

Dear Review Committee,

We are delighted that our State Government is conducting an important Inquiry into health and medical research in South Australia.

Adelaide BioMed City brings together health and medical research conducted under the auspices of our partners. As the state's largest dedicated health and life sciences precinct, we feel that we are well placed to provide some important insights into the SA Productivity Commission review process.

The Adelaide BioMed City precinct already delivers outstanding healthcare, education and world-class research in several key areas. Importantly, the Adelaide BioMed City Precinct provides South Australia with an opportunity to create a competitive ecosystem that can contribute to both the health and wealth of the state.

The Partners of Adelaide BioMed City will be providing separate institute submissions, therefore this ABMC submission will focus on precinct wide viewpoint and its overarching role.

On behalf of the full board of Adelaide BioMed City, we present to the Committee the Precinct's submission. We look forward to the Commission's draft report.

Yours sincerely,



Yvette van Eenennaam
General Manager
Adelaide BioMed City Board



SA Productivity Commission Review of Health & Medical Research in South Australia

Adelaide BioMed City – Response to the SA Productivity Commission Issues Paper

May 2020



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Acronyms

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ABMC	Adelaide BioMed City
AI	Artificial Intelligence
AR	Augmented Reality
CAC	Consumer Advisory Committee
CALHN	Central Adelaide Local Health Network
DHW	Department of Health and Wellbeing
EDAC	Economic Development Advisory Committee
HMI	Health & Medical Industry
HMR	Health & Medical Research
HTSA	Health Translation SA
NHMRC	National Health & Medical Research Council
MRFF	Medical Research Future Fund
RAC	Research Advisory Committee
SA	South Australia
SA Gov	South Australian Government
SAHMRI	South Australian Health & Medical Research Institute
SAPC	South Australian Productivity Commission
UofA	University of Adelaide
UniSA	University of South Australia
VR	Virtual Reality



1. Introduction to Adelaide BioMed City

1.1. Introduction

Adelaide BioMed City is the \$3.6 billion Healthcare Innovation and Translation precinct in the heart of Adelaide. It brings together capabilities in research, education, clinical care and industry to drive innovation and translation.

Adelaide BioMed City houses the Royal Adelaide Hospital, one of the most advanced hospitals in the world, providing a comprehensive range of the most complex clinical care. It also includes the South Australian Health and Medical Research Institute (SAHMRI), the state's first independent flagship health and medical research institute, home to more than 600 medical researchers, and in the top 40 of the Times' List of world's best research institutions in 2018. It co-locates facilities for South Australia's three major universities: The University of Adelaide, the University of South Australia and Flinders University. All three are featured in the QS World University Rankings 2020, all within the world's top 450 and partner with Adelaide BioMed City.

Currently, there are more than 2000 medical researchers, 10,000 staff working within the precinct, and approximately 18,000 daily visitors welcomed. And these numbers are increasing with the new development currently known as "SAHMRI II" and planned relocation of the Women's and Children's Hospital. The SAHMRI II building will accommodate Australia's first proton therapy unit which is known as the Australian Bragg Centre for Proton Therapy and Research.

In July 2013, CALHN, SAHMRI, The University of Adelaide (UofA) and University of South Australia (UniSA) entered into a Memorandum of Understanding (MoU), under which they committed to collaborating in respect of the South Australian health and biomedical precinct on North Terrace in Adelaide. In September 2018, all partners, including Flinders University, committed through a Collaboration Agreement on the vision, mission, and goal of the Adelaide BioMed City and it outlined the way in which the parties would work together.

1.2 Precinct Maturity Pathway

Precincts go through different stages of maturity. Adelaide BioMed City was formally launched in September 2018 and is an emerging precinct. The founding Partners have successfully completed the first phase of establishing the precinct and have now turned their focus to developing the precincts infrastructure and value to its stakeholders. Its ambition is to become a globally recognized precinct leading in research, education, clinical care and population health. Figure 1, presented on the next page, shows the maturity pathways of innovation neighbourhoods and highlights the value it creates in different stages of maturity.

Innovation precincts are increasingly seen as key to offering economic and productivity advantages to the involved businesses, investors, employees and its community. I would like to refer to a valuable resource – report attached to this submission – published in September 2018 by the NSW Innovation and Productivity Council. It provides an evidence-based view of what constitutes different types of innovation precincts, requirements for success, with lessons learned from international best practise counterparts.

Precinct maturity pathways

Our Mission is to be a globally recognised partnership leading in research, education, clinical care and population health.

It will need coordinated support from multiple stakeholders and a long term view to succeed

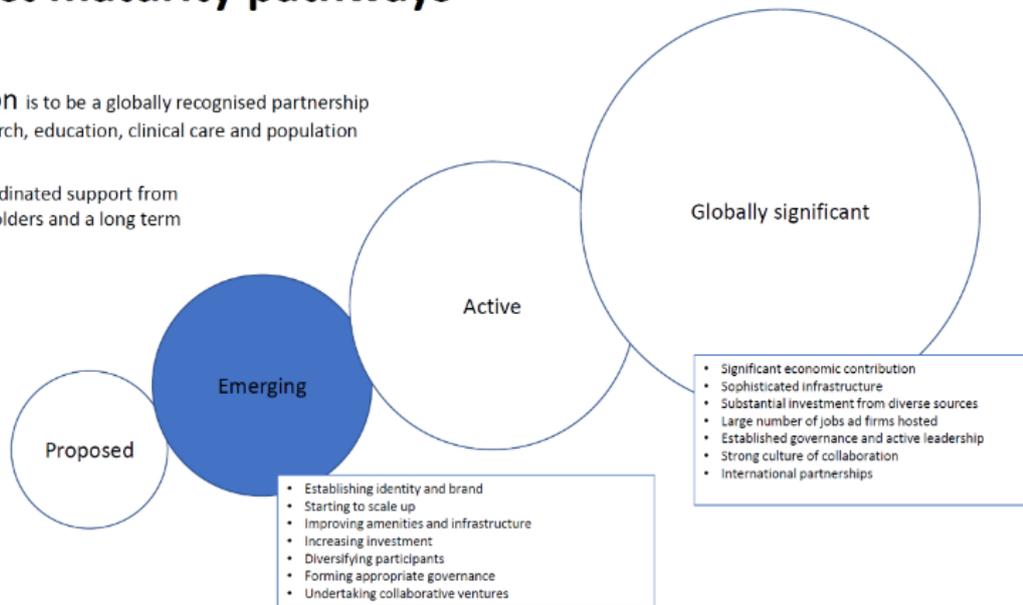


Figure 1. Precinct Maturity Pathways

All around the globe, innovation precincts have been established and developed to leverage the benefits of collaboration. Many examples around the world have shown that co-location combined with a strategy and facilitation of sharing knowledge, services, infrastructure and a culture of collaboration, can lead to accomplishing globally significant precincts that thrive in industry partnerships, innovation and translation.

Lessons learned indicate that globally significant precincts generate the following value:

- Substantial investment from diverse sources
- International partnerships and connections
- Increased Productivity
- Innovations leading to improved prevention, diagnostic and treatment
- Large number of firms and associated jobs
- Strong culture of collaboration
- Sophisticated infrastructure

The Health and Medical Industry sector was identified in the Joyce Review¹, released in March 2019, as one of the fast-growing sectors where the state holds comparative advantages. Globally and nationally, the services sectors that are based on R&D, innovation, high productivity and having greater numbers of skilled workers are drivers of economic growth.² R&D activity has been estimated to explain up to 75% of national total factor productivity growth, and has high rates of return: around 10-30% for private return and more than 40% for social return (2018 DIIS OCE Report).³

¹ Review of the South Australian Government's International and Interstate Engagement Bodies and Functions, Hon Steven Joyce, February 2019.

² The State of Science, Research and Innovation Discussion Paper, January 2020. pg 2

³ The State of Science, *ibid.* pg 3



Adelaide BioMed City is often cited as a major asset for South Australia that can provide extensive opportunities in the Health Innovation and Medical Research space and support the State’s agenda to emerge as the Growth State. Health and Medical is a sector with unactualised export potential due to the growing global demand and SA’s competitive advantages⁴. There are extensive opportunities to reduce our health care costs while simultaneously improving health care services. There is increased awareness that healthcare cost will bankrupt Australia’s healthcare budget if we, as a nation, do not commence significant action. Our SA capabilities in AI, Data Analytics and MedTech have the potential to help transform healthcare in Australia over the coming decades.

In February 2020, the Adelaide BioMed City Board decided to commence the development of a strategic plan 2020-2025 to replace the current Strategic Plan (Nov 17)⁵ and further strategize the roadmap towards a globally significant precinct. Co-developed and extensive consultation across Partners and other key stakeholder groups, amongst others State government, ensures the plan underpins the success of the Partners and SA as a Growth State.

Research into successful innovation precincts suggests that there are seven factors of success for growing a globally significant innovation and translation precinct, see Table 1.

7 factors for success	
Market Drivers	Strong market demand for the goods or services; competitive pressure in the sector to innovate; access to markets, skills and investors
Competitive Advantage	Clearly defined market advantage or sector specialisation that is communicated through strong branding to attract and retain talented workers and financial investment, supported by pro-productivity regulatory settings.
Collaboration	Facilities and programs to support collaboration between diverse organisations – from spaces for informal social ‘collisions’ through to commercial frameworks for joint ventures.
Infrastructure	Physical, transport and digital infrastructure that supports research, innovation activity and business connectivity within and outside of the precinct.
Amenity	A vibrant and liveable location that attracts people to work, play and live there.
Culture	Strong entrepreneurial culture of risk taking, collaboration and sharing ideas
Leadership	Robust governance, strong leadership, political commitment and a shared vision.

Table 1. Seven factors of success from globally significant precincts

For our SA leadership, it is important to have visibility on the factors for success utilised by other significant precincts. Decision-makers in the Universities, CALHN, Research Institutes and Government need to provide the right support to help the precinct evolve and generate value for improved Institute performance and improved State performance. It requires a strong partnership and engagement to evolve ABMC from an emerging precinct to a globally significant precinct. This will require involvement from all stakeholders, with an important role for the state government.

This pandemic further discovered our fragility and dependence on others. The COVID-19 pandemic has the potential to radically accelerate and change development within HMI for the better and make our connected SA HMI sector stronger after. The long term impacts on the sector are debatable but global health leaders are starting to share their insights. It is transforming the global health community’s acceptance and use of digital health technologies and health specialists have been adopting technologies that before the pandemic had limited adoption rates. Across the globe, we have

⁴ The State of Science, *ibid.* pg 3

⁵ Adelaide BioMed City Partners Strategic Plan & Governance Arrangements (Phase 2 report), Nov 2017



seen more advanced technologies including AI are being employed to provide insights into complex questions of how individual behaviours impact transmission and identifying which policies are effective for specific groups.⁶ The realization that the economic costs of a pandemic are huge, far surpassing investments in research and prevention, could lead to billions of more dollars of investment in research, vaccines, therapeutics, and non-medical methods of prevention.⁷ One thing is sure, it shows us how interconnected the sector is, and forces us to further develop it with a strong multi-institute multi-disciplinary collective. The precinct would benefit from stronger connections with our innovation neighbourhood Lot14, a critical mass of start-up presence and a push for more private sector involvement.

1.3 Governing and Financial Arrangements

The Collaboration Agreement, signed in September 2018, includes a governance structure, in-kind contributions and financial contributions of A\$1,313,913 over 5 years. The administration office of ABMC is dependent on partner in-kind contributions to operate. The administration office of ABMC is housed in the SAHMRI building. SAHMRI accommodates the ABMC Office and provides support in finance, legal, human resources and marketing. The ABMC Board of Partners comprises an independent chair, Professor Caroline McMillen, SA Chief Scientist, and two representatives of each Partner organisation, a representative from Renewal SA and a consumer engagement representative. From 2017 to March 2020 the Board of Partners was chaired by Professor Steve Wesselingh, SAHMRI Executive Director.

The current board members are Professor Caroline McMillen (Chair Board of Partners and SA Chief Scientist), Prof. Steve Wesselingh (Executive Director, SAHMRI), Amanda McIlroy (COO, SAHMRI), Lesley Dwyer (CEO, CALHN), Prof. Andrew Zannettino (Pro Vice Chancellor Health Partnerships), Bruce Lines (COO, UofA), Prof. Alan Boddy (Dean of Research and Institute Director, UniSA Cancer Research Institute), Paul Beard (COO, UniSA), Prof. Jonathan Craig (Vice President and Executive Dean College of Medicine and Public Health, FU), Mark Gregory (Vice-President Corporate Services, FU), Matthew Hunt (Director for the Adelaide Riverbank) and Ellen Kerrins (Community Engagement Advisor).

The governance model agreed to in the Collaboration Agreement includes three advisory committees to provide expert advice in the areas of research strategy, community and consumer engagement and economic development being: the Research Advisory Committee (RAC), the Consumer Advisory Committee (CAC) and the Economic Development Committee (EDAC). The role of an Advisory Committee is advisory and no committee has authority to legally bind any party.

The RAC and CAC were established in 2017/2018. New insights led to the dialogue to consider establishing a socio-economic advisory committee converging the existing three advisory committees and place more emphasis on the social and economic development, a holistic view, and to reduce complexity.

⁶ Inside Development, After the pandemic: How will COVID-19 transform global health and development, Michael Igoe, Vince Chadwick, April 2020

⁷ Inside Development, *ibid*



2. Strategic objectives of Adelaide BioMed City

The value that globally significant precincts have brought to their States and cities are well recognized. Section 1 of this report presented those together with research outcomes that sectors based on R&D and innovation are drivers of economic growth.

Our innovation and translation strategy must be informed by the complex changes confronting today’s society, including the pervasive nature of technology disruption. It requires our SA institutes to speed up the transformation from siloed operations towards collective approaches that drive innovation and translation. Execution of that collective strategic agenda will require strong leadership and coordinated support from multiple stakeholders with a long-term view to succeed.

A clear roadmap towards the precincts’ mission to become a globally significant precinct is currently in the planning phase of its development. We would like to present to the Productivity Commission some early insights into what the 5-year strategic objectives and projects could look like, but emphasize that a legitimate analysis and further stakeholder involvement is required for decision making around collective strategic objectives and related projects. The analysis performed by the SA Productivity Commission is likely to accomplish relevant input in the development of ABMC’s strategic roadmap.

Identifying and focusing on areas for which a more collective approach can be beneficial is expected to drive value to both the precinct partners and for investors, collaborators and associated external business partners. These areas include: research infrastructure, larger funding schemes such as MRFF/ARC/NHMRC, clinical trials, talent attraction, industry partnerships, commercialisation, and the convergence of emerging technologies. Table 2 presents an overview of potential strategic objectives and projects, to present some early thinking around strategic objectives.

Objectives	Strategic Projects
Integration of emerging technologies in our biomedical precinct (engineering, AI/ML, AR/VR, Sensors, Robotics, Anthropology)	<ul style="list-style-type: none"> Develop a strategy around “Intelligent Health” with a focus on the local capabilities in the emerging technologies Establish a physical/virtual medical incubator hub/frontier tech capability centre or leverage Lot14 capabilities and infrastructure
Become a “Magnet City” attracting talent and investment	<ul style="list-style-type: none"> Marketing & Communication plan to improve our global, national and local branding and to show our unique capabilities and strengths.
Improve industry engagement and partnerships, global and local	<ul style="list-style-type: none"> Strategy to attract more clinical trials and grow the clinical trial ecosystem Optimizing our commercialisation ecosystem Create an overarching strategy around industry engagement and investment attraction that support the institute’s KPIs
Grow our world-class consolidated infrastructure and research platforms	<ul style="list-style-type: none"> Joint 10 year Research Infrastructure and Technology plan that taps into the \$2.2bn National Research Infrastructure Build a vision and strategize around SAHMRI II
Improve our culture of collaboration and “think big and global, impacting local”	<ul style="list-style-type: none"> Event strategy - Open up and promote all existing events to all Partners, other innovation neighbourhoods and industry and encourage global presence Integration of a “ABMC module” in institute’s existing Leadership Programs
Financial sustainability	<ul style="list-style-type: none"> Develop a financial business model for Adelaide BioMed City Create/leverage political advocacy groups

Table 2. Potential Strategic Objectives and Projects



The precinct comprises five Partners (CALHN, SAHMRI, UofA, UniSA and FU). Notably, a collective strategy for the precinct is complicated by the fact that each of the partner institutes has its own independent (competitive) strategic plan and compete for funding, rankings and students.

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.



3. Opportunities for SA, Adelaide BioMed City, its Partners and Industry

3a. Introduction

In this section, more context will be provided about several areas that can generate further opportunities for our State, Adelaide BioMed City, its founding partners and our sector's industries.

A better understanding of our sectors global megatrends combined with the local health needs and priorities and the precincts unique capabilities will further inform our State about our opportunities. In 2018, The Fay Fuller Foundation commissioned a report on SA Health needs and Priorities. It provides a holistic snapshot of the health system in SA and addressing growing disease burdens or gaps in the current service systems. The research was executed by SAHMRI and The Australian Center for Social Innovation in 2018. Another valuable resource is the Sector Competitiveness Plan 2019, published by MTP Connect in June 2019. It identifies a list of Knowledge Priorities (KPs) across three major areas – areas of science, therapeutic areas, and device / diagnostic areas - where there is a high level of unmet need globally, and where Australia is or has the potential to be a leading contributor globally.

To achieve an accelerated rate of growth within our precinct, the strengths and weakness of the full value chain need to be further identified. One often suggested area with many opportunities is achieving greater success in translation and commercialisation. This will deliver significant economic and jobs growth and improve the health and wellbeing of South Australians and beyond. Implicit in any commercialisation success is the imperative of improved healthcare outcomes.

The areas of opportunities that will be addressed in more detail in this section are emerging technologies, clinical trials, shared research infrastructure and commercialisation.

3b. Emerging technologies

The World Economic Forum publishes every year a list of Top 10 Emerging Technologies. These emerging technologies must fulfil strict criteria, such as its potential to positively disrupt the existing order, be attractive to investors and researchers, and be expected to achieve considerable scale within the coming 5 years. In 2018, six of the top 10 emerging technologies were medical technologies: advanced diagnostics for personalized medicine, AI-led molecular design, implantable drug-making cells, electroceuticals, gene drive and plasmonic materials. Three areas out of 10 can be adapted to our medical sector or impact it indirectly: augmented reality, algorithms for quantum computers, AI that can argue and instruct.

As a State, we need to leverage our high-quality research in frontier technologies for translation and commercialisation. Fields such as precision medicine, drug design and rehabilitation harness the convergence of R&D outcomes from AI, robotics, sensors, software engineering and material science to develop earlier, cheaper diagnostics and interventions.⁸ Significantly, it is the combination of these skills that makes us unique and give us an edge.

⁸ The State of Science, *ibid.* pg 8



AI is one of multiple examples of South Australia's capabilities that has potential to transform all sectors, in particular healthcare in Australia with implications across the board, impacting genomics, proteomics, metabolomics, medical imaging research, but also improving drug development, prevention, diagnostic, treatment, and also precision medicine strategies. From a commercialisation perspective, it is one of the most attractive markets. The global healthcare AI market is expected to hit \$13 Billion in 2025 and the European healthcare artificial intelligence market witnessed 41.8% growth throughout the analysis period.⁹ One of the best examples South Australia has world-leading Artificial Intelligence (AI) research capabilities. The Australian Institute for Machine Learning (AIML) at The University of Adelaide is number 3 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, which is likely the result of our leadership in this field. 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,

Another example of one of the most promising areas for Healthcare is Virtual Reality (VR) and Augmented Reality (AR), which could be game-changing in healthcare and in particular surgery, training, rehabilitation and patient experience. In 2018, the World Economic Forum projected the total market for AR to grow to \$100 billion by 2020 and the Health AR/VR to be \$11 billion by 2025. Notably, SA Universities employ professors that are ranked No. 1 and No. 7 in the world based on the number of published papers (Scopus), led by the Australian Research Centre for Interactive and Virtual Environments (IVE) at the University of South Australia (UniSA). A world leader in AR, VR and Mixed Reality IVE possesses one of the largest concentration of researchers within this field. Maintaining a strong focus on industry engagement, IVE is currently building a full-scale industry immersion centre which will combine state of the art immersive technologies with world-leading researchers and industry partners to develop new products and services.

In SA, the number of shared projects and publications are growing. A successful cross-disciplinary research partnership has been set up between the SAHMRI, the Centre for Nanoscale Biophotonics, Flinders University and the Australian Institute for Machine Learning, but also and many others. However, although growing, it is not yet happening on a large scale, and is very much dependent on a very small number of individual innovative and collaborative researchers with limited funding. As a collective, SA has the opportunity to develop more effective models and infrastructure to collectively stimulate collaboration between emerging technologies, Health and Medical researchers and Health Industry at large. If we encourage professional friendship and collaboration between our remarkable engineers, AI experts, AR/VR experts and our Health & Medical researchers, it will lead to innovative research projects, better grant success, higher rates of tangible translation and consequently benefits for healthcare.

3.3 Clinical Trials *(Information request 5.10)*

3.3.1 Opportunities in Clinical Trials

There are significant benefits to the community and the economy from facilitating clinical research. Clinical Trials are the foundation of evidence-based medicine, improving our understanding of clinical disorders and are one of the key accelerators of therapeutic medical advances. The global clinical trials market size is expected to reach USD 70 billion by 2027. In 2015 Clinical trials provided A\$1.1b to the

⁹ Healthcare Artificial Intelligence Market to Hit \$13 Billion by 2025, Global Market Insights Inc, February 2018

Australian economy according to Austrade’s Clinical Trials Capability Report. Jurisdictions are competing for a larger share of the national market. Currently, SA is only capturing a tiny percentage of the available market share available to Australia

Australia’s perceived advantages for clinical trials often vary depending on the perspective of the company looking to conduct these trials. For example, Chinese companies often look to Australia for transparent approval processes that produce clinical results that are acceptable by the US Food and Drug Administration (FDA), while US companies look to Australia for cost efficiency and approval timeliness. There are a lot of advantages of Australia that go beyond just the R&D tax refund - with the streamlined fast regulatory process being one.

South Australia has an excellent reputation and has been highly competitive on quality, cost and speed, nevertheless, there is a significant lack of easily accessible reliable data to confirm the current status and how SA compares with other States. Statements have been made that our performance and reputation in clinical trials is diminishing. One of the efforts towards improvement is an urgently needed new Research Management System that will be implemented in 2020 which will provide significant standardisation of processes, a single-entry point for researchers and a method to track and evaluate services performance across the State. This will streamline the collection of public health sector data. In 2019, HTSA attempted to create a baseline on the numbers of trials in SA. It is an understatement to say it has been a challenge and time consuming to gather and present reliable data. We have tried to get an SA report from the SA NAS data 2018-2019 that has been provided to the national office in October 2019. CALHN Research Services will provide a submission to SAPC and will include a summary of their annual report, including the relevant data about trials within CALHN. Figure 2a shows the CALHN Clinical Trials Research Activities 2018-2019 and Figure 2b shows the CALHN Clinical Research revenues 2017-2019. Within the precinct, the clinical trials within CALHN are the largest chunk.

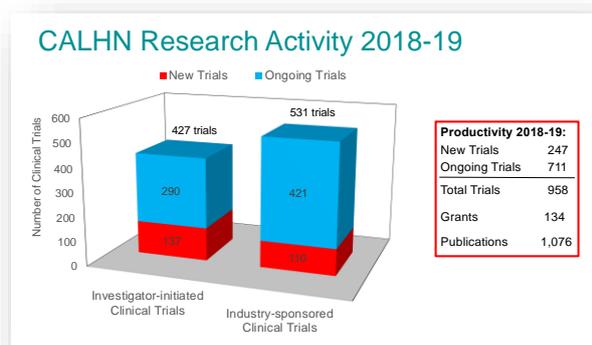


Figure 2a. CALHN Research Activities 2018-2019

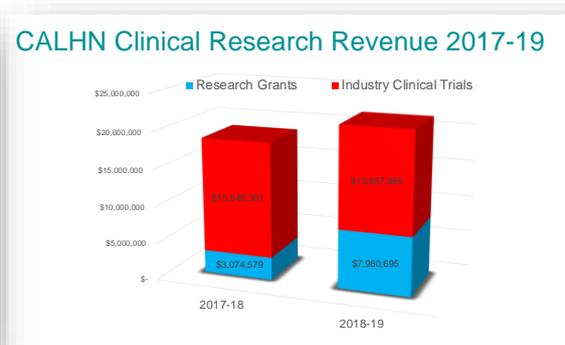


Figure 2b. CALHN Clinical Research Revenues 2017-2019

The clinical trials researchers, which have established networks and relationships with global pharma, have identified a recent increase in the number of trial requests, with weekly requests coming in. Establishing those trusted relationships are very important for generating more trials. Often, it is not the title of a professor or an academic appointment within an Adelaide based Uni that attracts this type of industrial work - often it is simply built on good relationships that have developed over time based on quality work, and also by being actively part of the international pharma community (not the Australian pharma community, as the business is not aimed at bringing in more Australian



companies). Limited numbers of SA medical professionals are part of the international pharma community or have the required networks in order to bring this type of work into the state.

One of the SAH Research Office milestones for the Commonwealth project, Encouraging more clinical trials in Australia, is to launch of a web portal to promote clinical trials in SA and generate more traffic (sponsor-led trials) to SA. This program is led by the State-Wide Research Coordinator from DHW. Feedback from stakeholders within the state is that it is not easy to find researchers and capabilities. This web portal aims to be a landing page for parties who are interested in learning more about clinical trials in SA and will communicate the value proposition to perform Clinical trials in SA, show SA statistics and will link to external organisations involved in clinical trials within the State, such as the ABMC Clinical Trials website (<https://adelaidebiomedcity.com/clinical-trials/>). Adelaide BioMed City keen to understand the feedback that has been gathered from global companies around the desire of a portal and the information need, as that will support ABMC in its marketing efforts. To increase traffic to the SA landing page and the value of it, we hope a promotion campaign is part of the scope of the project. End of 2019, it has been communicated that it would depend if there was any available budget. We assume the International Trade Offices will be a key player in marketing our clinical trials expertise globally, together with the international business missions.

Web portals are good to have, and Adelaide BioMed City is evolving its clinical trials landing page, but the question is how significant networks versus portals are to attract more trials. Our experts have different opinions about this matter. Over the next few years, it would be valuable to create a clear understanding as to which pathways SA is attracting more trials, so that we can adapt our efforts accordingly. The web portals should be established and improved but if it might not lead to a significant increase, other pathways such as becoming part of that international network should be considered. In general, SA can improve in leveraging its data and create dashboards for improved decision making.

3.3.2. Measures of success

Measures of success for industry-sponsored trials could be an objective increase in the market share of trials coming into SA. This should be divided by trial type (Phase 1, 2, 3), lead site conducting the trial, and therapeutic area. Other measures of success are quality of trials, trial start-up times, and costs. Another way to look at the types of trials is the alignment with “areas of need” in the State. Overall, SA would benefit if there were more incentives in the system that support collaboration.

3.3.3. Adelaide BioMed City involvement in Clinical Trials

Adelaide BioMed City Clinical Trials Expert Task Force

The precinct offers a range of clinical trial facilities providing a variety of services. The Adelaide BioMed City Partners established the ABMC Clinical Trials Expert Taskforce in 2018 with the objective to ‘facilitate a collaborative and coordinated approach in attracting and undertaking clinical research studies in the clinical trial facilities of Adelaide BioMed City Partners’. The Taskforce committee has representatives from CALHN, SAHMRI, UofA and UniSA. The representatives have expertise in both industry & investigator-initiated clinical trials, as well as research governance. The ABMC Expert Task Forces will put in a separate submission that includes its achievements, focus areas and capabilities in the precinct. This submission will therefore not elaborate on these topics.



SA Clinical Research Governance Project

This State Government commissioned project was established to implement the recommendation from the report ‘Research Governance in the Department of Health and Wellbeing (SA)’ and related LHNs by Jim Birch (the Birch Review¹⁰) published in July 2018. Concerns were expressed by Health Translation SA (HTSA), ABMC and SAHMRI about the delay in the implementation of the Birch Review recommendations. The mandate was given to HTSA by The Minister to lead this scope of work. It is The implementation of the recommendations that are crucial for evolving our current clinical trials ecosystem to a high performing ecosystem, enabling significant innovation and translation to take place. Adelaide BioMed City is a member of the projects Steering Committee. This project is a best practice of how we can organize and collaborate to improve our ecosystems. Nevertheless, its scope is only covering a part of the full spectrum needed to optimize our clinical trials ecosystem. It is therefore recommended that after successful completion of this project, this successful collaboration model will be duplicated for a State-wide program to optimize the clinical trials ecosystem and grow the clinical trials sector in SA. One of the reasons for the success of this project is the role of the executive level project manager, the former CEO of CALHN, Jenny Richter. It is our view that a flexible “unbiased” pool of senior project managers should be considered to drive collective projects. Expertise in project and change management seems to be limited in the Health and Medical Research (HMR) sector and more extensive use of senior project managers will support successful outcomes of collective initiatives.

Clinical Trials Business Concept

Clinical Trials Network Business Concept - A proposal has recently been developed to establish a clinical trial network by two respected and passionate SA clinical research leaders, and together with Aushealth a business case has been developed. The developed model is similar to the successful Linear Clinical Research model. A strong industrial interest and certain flow of trials into SA already exist, however, due to the lack of centralised professional expertise most trials do not find an appropriate place and suffer from limited access to quality resources, expertise and processes. As a result, most clinical trials end up being conducted by interstate hospitals and clinical research units. The concept has recently been placed on hold until further notice, due to the inability of the CALHN board will not being able to review the proposal, as a result of the COVID-19 pandemic. CALHN and its specialised PARC facility ((Phase-I, high acuity monitoring facility adjacent to RAH ICU) are key partners for the continuation of the project. Adelaide BioMed City is not a legal entity and does not have the foundation and resources at this stage to establish or house an entity like this, nor run this business, and therefore Aushealth has been contacted to drive this. There are Health & Medical precincts that have successfully built effective and profitable models within the precinct administration structure and use industry-driven trial profits to fund investigator-led trials.

Introducing concepts and networks to the Clinical Trials Community

- *Member of CT IQ*
Bellberry, ACTA, NHMRC CTC and The George Institute have formed a consortium and initiated ‘Clinical Trials: Impact & Quality (CT:IQ)’. The mission is “to develop and implement recommendations that will improve the impact, quality and efficiency of clinical trials, leading to more rapid, lower cost and higher quality evaluation of healthcare interventions in Australia”. The mission is to get Australia Thinking Smarter about the design and conduct of clinical trials. Adelaide BioMed City has become part of the CTIQ steering committee to encourage collaboration between national nodes and to bring back knowledge to the SA clinical trials community. The 2019 CT IQ

¹⁰ Birch, J, *Review of Research Governance in the Department for Health & Wellbeing (SA) and related LHNs*, July 2018



programs were E-consent, Early Phase Best Practice, Guidelines for biomarkers-directed therapies in personalized medicine, Consumer Involvement, Guidelines to Recruitment, Examining, Experience at clinical Trial Site.

- Adelaide BioMed City facilitates introductions to stakeholders across the precinct to new concepts such as ClinTrial Ref App, a national funded application or TrinetX a big pharma funded network of federated databases of healthcare data.

3.3.4. Barriers to growth

Barriers to growing industry-led clinical trials in the precinct and reasons for losing trials to the other States:

- The Birch Review presents all challenges within the governance and ethics area, and highlights the importance of improving our inefficient HREC processes. SA will become more attractive when we approve our HREC processes and the trial start-up time.
- Lack of easy accessible reliable data for improved decision making.
- Not a clear understanding, or a unified view of which areas the most significant growth opportunities are.
- There seems to be scarcity in principal investigators available to lead a new study which causes capacity constraints. No fact-based information available or understanding of the magnitude of this limitation and the economical losses deriving from it. Highly experienced and respected experts tell us we are losing significant numbers of trials to other States.
- Challenge to recruit experienced clinical research coordinators. No data available to back this up.
- For external parties, it is difficult to navigate the system. SA becomes more attractive if we make it easier to navigate.
- SA has a low clinical trial participation rate, and fast recruitment of healthy volunteers and patients has been mentioned as a challenge. ABMC has not seen the data to back this up.

A more collaborative strategy, supported by the cross institutes leadership, is required to gain a greater market share and to further develop high impact investigator-led trials. Some respected and highly experienced research clinicians state that SA has all of the ingredients to be successful, and some even say, SA could actually lead the trial space in Australia. Overall, there is a lack of insights and a lack of understanding of how this industry actually works, or at least there are many different views on that.

3.4 Research Infrastructure *(information request 5.3)*

Another area in which a more collective approach will drive value to all partners in the precinct and more generally to researchers in SA, is research infrastructure. Easy access to high-quality research infrastructure enables our researchers to compete at the highest levels and scale-up. Developing a 10-year Precinct Research infrastructure Plan informed by a State's Research Strategy should be considered to deliver a competitive capability. There are still many opportunities to act as a collective to become more attractive and better in securing competitive infrastructure funding. A very recent success story in which all parties agreed to consolidate and partner is the South Australian Genomics Centre (SAGC), a collective of Health, Agriculture and Environmental genomics and bioinformatics experts and leaders.

A long term view, a united vision and a significant plan for research infrastructure, increases efficiency to drive partnerships and consolidations between research facilities. In the case of the SAGC, it could



have been a much more time and cost-effective process had a united vision and high-level plan already been in place.

Information request 5.3 request input about the utilisation of HRM infrastructure.

- If stakeholders across SA decide to develop a 10-year HMR infrastructure plan it will start with an analysis of the needs, issues, opportunities, the current utilisation rates, funding opportunities etc. At the moment, Adelaide BioMed City does not have the operational capacity to lead the gathering of relevant information and data in this space and will leverage the data collected by the SAPC. It is expected SA can better capitalise on the infrastructure investments. In general, transforming to more data-driven decision making would benefit the sector and more end-user surveys could be leveraged to receive input about needs and issues.

There seems to be an appetite for more collaboration between researchers of the different institutes. Researchers operating in different areas are approaching Adelaide BioMed City to support them to facilitate dialogues between facilities and experts to create a vision and plan for an improved ecosystem. The complex landscape and the many stakeholders make it that proper project management support should be assigned to facilitate those potential collaborative structures.

- The new Women's and Children's Hospital is analysing its HRM infrastructure requirements and seeking partnerships across the precinct for shared infrastructure.
- ABMC has looked at utilisation of genomics equipment. The recently approved SA Genomics Centre will overcome unnecessary duplication of infrastructure/equipment, improve utilisation, arrange easier access to equipment and services and importantly, build collaborative and business partnerships, both nationally and internationally.

Information request 5.3 request input about infrastructure gaps (building and equipment)

Successful precincts have the right facilities and programs to encourage collaboration between diverse people and organisations – from spaces for informal social 'collisions' through to commercial frameworks that support joint ventures.¹¹

Physical space to encourage innovation and collaboration – Few shared physical open-access spaces available that provide an opportunity for employees working in the precinct, and external parties, to interact. Most buildings have limited access because of security and do not encourage or welcome external people. The precinct should be more welcoming to industry representatives and research experts from other innovation precincts in Adelaide, such as the AI specialist, AR/VR experts, and make it easy for them meet with our clinicians, students and researchers within appropriate workspaces. SAHMRI opened up level 4 Café to the community several years ago, but there is no open access to meeting rooms or shared desk space.

A purposed innovation and collaboration space is based in the Health Innovation Building of UniSA, the Innovation and Collaboration Centre. It is a start-up incubator and provides office space for start-ups from all industries. However, it is not open access and it houses limited Health & Medical related start-ups.

Industry presence – Innovative businesses, from start-ups to more established firms, contribute to the diversity and health of the innovation ecosystem. They provide important network, knowledge and can spot demand-side opportunities to ensure the precinct remains responsive to changing trends¹².

¹¹ NSW Innovation Precincts, Lessons from International Experience, NWS Innovation and Productivity Council, September 2018, pg 33

¹² NSW Innovation Precincts, *ibid*, pg 71



Connecting business workers to research and education staff through formal partnerships can drive collaborative innovations where there is a strong focus on IP management and research commercialisation¹³.

At the moment, limited office space and hot desks for industry are available in the precinct. Several SMEs have been reaching out to discuss a presence in the precinct. A recent example of a smaller company that was seeking office space for 4 FTE and a shared meeting room, has been trying to find space in one of the three North Tce buildings. While the m2 price was not an issue, this request could not be supported owing to the limited available space. SAHMRI II might still be able to fill that gap but it is currently unclear if there will be dedicated allocated space for industry. Additionally, for many start-ups or smaller companies, the m2 price of SAHMRI II would be too high and other options would be considered. Precincts that maintain affordable commercial rents as they grow do better at retaining diverse startups and entrepreneurial tenants¹⁴.

Thebarton Bioscience precinct, situated three kilometres from the Adelaide BioMed City, is home to the Thebarton Business Incubator and Tech Hub buildings. It provides office and wet-laboratory space and has GMP clean rooms. It played an important role of an incubator for Bioscience sector and co-located office space for the sector, but it is unclear what its future is. There are different opinions if its functionality needs to be reinvigorated. Thebarton precinct was relying heavily on the UofA, and co-investment models could be explored to reinvigorate.

Equipment gaps - Two specific areas have indicated to Adelaide BioMed City to have an urgent gap; high-performing computing infrastructure and genomics equipment. The institutes could provide further insights into this.

Data - Access to data has been a recurrent issue within health & medical research in SA. The Commission on Excellence & Innovation in Health, HTSA and SANT Data Linkage are leading efforts in this space. Big data can be harnessed to significantly improve diagnostics, dramatically reduce costs, overcome skill shortages, and systematically affect lifestyle decision making. The data can be a practically inexhaustible source of knowledge to fuel a learning health care system. Issues around data quality, accessibility and linkage should be urgently addressed, and capabilities that can give meaning to the data, advanced analytics and medical AI, should be scaled up. South Australia is uniquely positioned in terms of datasets and registries because our healthcare services are interconnected, unlike any other state.

3.5 Commercialisation

In Australia, collaboration is associated with a 70% increase in the likelihood of new-to-world innovation and a 32% increase in the likelihood of new-to-Australia innovation¹⁵. Australia's performance on metrics of collaboration between industry and research institutions is below international counterparts¹⁶.

¹³ NSW Innovation Precincts, *ibid*, pg 33

¹⁴ NSW Innovation Precincts, *ibid*, pg 35

¹⁵ Office of the Chief Economist, Department of Industry (2014) Australian Innovation System Report, Commonwealth of Australia.

¹⁶ Office of the Chief Economist, *ibid*



The NSW Innovation Precinct report¹⁷ stated the following most common barrier to investment and commercialisation: Restrictive intellectual property controls, academic funding arrangements that focus on peer-reviewed publications have not historically incentivised researchers to create startups, a closed academic culture and a tendency for industry to under-invest in research.

Monash University, Melbourne University and the Victorian Government have founded an independent organisation BioCurate 2016 to accelerate and improve commercialisation outcomes. They recognized that the university strengths are world-class with investments of billions of dollars each year in medical research, but there was an inability to translate that into commercial products and health outcomes. Although Adelaide BioMed City does not have the facts and data, it can be assumed that SA performance on commercialisation success metrics have significant space to improve and collaborative models should be considered. The CEO of Biocurate indicates that excellent IP and commercialisation experts are very scarce in Australia, and consolidating part of the services and a more aligned IP ownership strategy would benefit Adelaide. Currently, each institute has its own Tech Transfer Office, and collaboration is happening but limited. Adelaide BioMed City is working within this space with commercialisation workshops that involve all partners and encourage the discovery of shared agendas and collaborative potential.

Adelaide BioMed City would recommend a deep-dive and root cause analysis into barriers to commercialisation and pathways to optimize it. The complexity is that the institutes are competing in this space and the economic value of IP. There have been several efforts to optimize parts of the cross-institutes commercialisation value chain in the past, but is it a challenging space. The first step needs to be a clear vision from leadership in this space and significant leadership support.

4. Role of Government in the precinct

Innovation precincts rely on collaboration between governments, research, education and health institutions, industry, entrepreneurs, investors and landowners. The significance of different stakeholders in the leadership of the precinct may vary as it develops and matures. This section brings attention to two of those stakeholder groups to emphasize the importance of closer collaboration with these groups and what could be considered to improve collaboration and partnership between these stakeholders.

Section 6.7 of the NSW Report describes the roles national and local governments have played in successful innovation precincts. The report states:

“Governments are instrumental in creating the pro-enterprise and pro-productivity reforms that can protect IP, reduce the regulatory time and cost burden on innovative businesses, and reduce barriers to investment that are critical for innovation precincts as well as the broader innovation economy.

The role of governments in precinct development can range from peripheral or supportive actions to instigating precincts and making significant investments. While the government has an important role to play, the actual activity at the core of a precinct, its level of success, and its sustainability will ultimately be driven by the businesses, institutions, entrepreneurs and researchers present. However, creating a successful innovation precinct is a long-term undertaking and requires sustained effort,

¹⁷ NSW Innovation Precincts, *ibid*



patience and coordination. The long-term political support and commitment that governments can provide is often decisive.”

SA Government’s role in the creation of the vision and to make it happen has been vital. The precinct’s governance model developed in 2017 included SA Government being one of the key stakeholder groups, but no formal board or advisory positions were provided. At the beginning of 2020, SA Chief Scientist accepted the invitation to become the chair of Adelaide BioMed City Board. The current governance model will be reviewed during the strategic development process and if necessary revised to better support the execution of the next phase in its maturity pathway towards the achievement of a globally significant precinct.

The State would benefit from a closer working arrangement between Adelaide BioMed City and the Government. The State needs to understand the unrealized potential and leverage the capabilities. Adelaide BioMed City needs to understand the statistics and industry analysis of SA Health & Medical Industries and leverage the State’s capabilities.

In many successful international precincts, including the well-known Herzliya in Tel Aviv, sustained support and leadership from local government has been essential to ensure a precinct becomes competitive and remains relevant through ever-changing landscapes.

Another example that is mentioned in that NSW report is the Westmead Alliance in NSW. It dedicates itself to progressing a strategic vision for the Westmead Health and Education Precinct. The City of Parramatta Council is a member of the Westmead Alliance and plays a key supporting role in providing secretariat and planning services for the group. Melbourne BioMedical Precinct also has its local government, The Victorian Government, as the administration office. The pros and cons of such a model in SA could be analysed.

There is a leadership role for SA government to play with the public investments made that have the potential to change the innovation landscape. SA Government roles in successful precincts have mainly been:

- To enable activities to make the precinct business-friendly and investor-ready. Local government is crucial for creating a regulatory and business climate that supports firm growth and economic activity.
- To be a primary investor in R&D.
- To be a key stakeholder to amenity, connect key innovation precinct to key locations in the region and help to build the vibrancy and liveability of the location.
- To support land redevelopment.
- To ensure effective coordination across government department portfolios. A facilitator of inter-agency and inter-government collaboration.
- To facilitate the development of and manage a SA capability platform that connects and promotes the HMR research and industry capabilities in our State.
- To connect the existing innovation neighbourhoods; Adelaide BioMed City, Lot Fourteen, Flinders Precinct, Tonsley Innovation District, Technology Park, the Thebarton Precinct
- To lead the development of a State-wide capability mapping, including the Adelaide BioMed City capabilities.
- To facilitate the interaction between industry and research

- To promote and market SA innovation precincts internationally and provide them with valuable credibility and exposure to potential investors. The International Trade Offices will need to play a significant role in this.
- To be the entree point for global industry partners, knowledgeable about the capabilities
- To lead the build of a SA Health & Medical Research Strategy and act as one of the stakeholders in determining the research priorities.
- To be the administration office.
- To anchor a second cycle of precinct growth and take a longer-term view, particularly when there are additional public benefits.

5. Collaboration and Culture *(Information request 5.4)*

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.

The current level of collaboration has been improving over the last year, however not yet optimal. There are many great examples, such as in the genomics space, where the collective arranged buy-in, funding and approval for a consolidated genomics centre. Another good example is the Clinical Research Governance project that implements the recommendations from the Birch Review. Key to its success is a senior project manager that applies excellent project-, change- and stakeholder management, such as a cross-sector steering committee, ministerial support, and multi-stakeholder workshops.

For SA to be highly competitive on a national and global level, a culture of collaboration and large precinct and state-wide transformation programs need to become the norm. To drive translation of research and impact to the community, consumer engagement should be part the transformation programs. The following could further enhance collaboration within the precinct:

A. Enhancing collaboration between employees in the precinct:

- A clear and shared agenda, goal, vision/purpose.
- Leaders as role models. Leaders that show collaborative behaviour and make decisions accordingly. Leaders make it very explicit to their staff that a culture of collaboration is the norm and is expected from all.
- Facilitation – often underestimated, but collaboration requires facilitation. A pool of “unbiased” project managers that have change management skills to lead the collective projects.
- Fact-driven decision making, removing history, personalities and personal agendas from the decision making process.
- Joint appointments and more clinical researchers.
- Shared Events - networking events, research showcases, workshops.
- Shared infrastructure and research facilities.
- Open access innovation and collaboration spaces.
- Capability Mapping – make it easy for staff and external parties to find relevant information, expertise and equipment/technologies.



- Integrate Adelaide BioMed City module in institutes' leadership programs – build relationships and trust between young upcoming leaders. Create a better understanding of each others' organisations and the value of collaborations & a place-based innovation cluster.

B. *Enhancing research-industry collaboration*

- The development of a SA Capability platform will support collaboration. Feedback indicated that it is very challenging for Industry to create a picture of the research capabilities in the State and for researchers to easily access relevant capabilities of our SA Industry.
- A better understanding of the top 3 research strengths and top 3 SA HMI sectors, could be leveraged by the government to facilitate a targeted approach to encourage collaboration and establish partnerships. The association MedTEC SA indicates that the Digital Health sector is the most significant and promising subsector. What are the specific research capabilities the SA companies could leverage?
- DTI and the International Trade Offices play a key role in enhancing research-industry collaboration

Co-location – being geographically co-located is often underestimated. Proximity, if facilitated, accelerates collaboration which in-turn accelerates innovation. Place-based concentration also creates market visibility and gives the industry an identity. Companies are attracted to innovation precincts because they offer one-site access to larger pools of skilled workers and knowledge-sharing opportunities. In the US and Canada, firms in the biotechnology industry are eight times more innovative when located together¹⁸

6. Translation of Research (*Information request 5.6*)

HTSA has been established to enhance the translation of SA based research into health care policy and practice. Adelaide BioMed City partners with HTSA and a long-term close relationship between the two collectives will contribute to the success of both. HTSA has a SA remit driving translation of research. ABMC has a precinct remit fostering a thriving innovation and translation neighbourhood. There is a fine line between agendas and responsibilities of both Partnership collectives, for example, the roles they take in Clinical Trials and Commercialisation. A clear remit and aligned strategic agendas will ensure that the two collectives are complimentary and will not have overlapping accountability.

7. Competitive advantage – Location (*Information request 5.7*)

DTI, the Health Industries Department and the Institute's Tech Transfer teams will be best positioned to answer the question if SA is perceived as an attractive location globally or nationally for investment in HMR and commercial innovation. There are several recent investments in HMR that could indicate it is perceived as an attractive location. In December 2019 the \$45m The Adelaide China Biotech Investment Fund was launched, in 2019 South Korean pharmaceutical giant Yuhan established a subsidiary in Adelaide and more recently the announcement that Amazon will open its Amazon Research Australia office in Adelaide.

The perception is that Adelaide with the new Medical and Innovation precincts has welcomed more delegations from Asia, Europe and the US in recent years. Though it is conceivable that a more

¹⁸ Won Sonn, J. & Storper, M. (2008) 'The increasing importance of geographical proximity in knowledge production: an analysis of US patent citations, 1975-1997', Environment and Planning, vol. 40, Pion Ltd and its Licensors.



centralised and collaborative approach could result in substantially more delegations ear-marking Adelaide as a destination of interest for HMR, generating more partnerships and investment opportunities.