

**PRODUCTIVITY COMMISSION  
RESEARCH STUDY**

**IMPACT OF ADVANCES IN MEDICAL TECHNOLOGY  
ON HEALTHCARE EXPENDITURE IN AUSTRALIA**

**SUBMISSION BY THE  
SOUTH AUSTRALIAN GOVERNMENT**

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## **Introduction**

South Australia welcomes the opportunity to contribute to this research study which addresses an area of expenditure that is emerging as a very significant contributor to spending on public health.

Advances in medical technology are becoming available at an increasing rate across a broad range of illness categories. The complexity of tracking these developments and their impact on costs of services is challenging. This submission highlights some of the key cost implications of technology development that are impacting on the provision of public health services in South Australia.

The definition of technology provided in the Productivity Commission's Terms of Reference covers South Australia's major areas of interest. This submission refers primarily to technology in terms of surgical and radiological procedures, procedural interventions and pharmaceuticals.

In assessing the impact of different advances in technology on expenditure, a classification system that identifies the impact of new technology innovations compared to enhancements of existing technology, including flow on effects, would be useful. Additionally, a broad commodity group basis also provides relevant information (eg. pharmaceuticals, surgical procedures).

Each of the Terms of Reference is addressed here in turn.

### ***a) Identify the key drivers of medical technology demand.***

Demand for medical technologies is pushed by both new innovations in technology and the expanded reach of existing technologies.

As noted in the Issues Paper, consumer expectation is one of a few drivers of demand. There is a general expectation that no stone will be left unturned when treating the patient. Patients are very aware of new global technologies through the media, primarily news programs. Previously this information was disseminated through traditional peer review journals.

Government influence over these expectations can only occur with debate of social policy regarding the health of community weighed up against the health of individuals including a consideration of who should pay.

Examples of changing consumer expectations over recent years include:

- Availability of access to intensive care services for older people. This facility is now being utilised by a significant proportion of people who are over 70, in contrast to this age bracket representing a small fraction historically.

- Access to very expensive drugs,
- Dialysis services to the very young and old.

The influence of manufacturer and supplier marketing on both consumer preferences and clinicians is another source of demand. Examples of methods used to influence demand include the extensive use of direct marketing to health professionals through visits and conferences, free trials of new technology and for the consumer, promotional stories through the news media.

These mechanisms can result in public hospital system cost pressures. For example, pharmaceutical companies sometimes provide low cost or free drugs to doctors and patients. Once the initial course of treatment ends, it often needs to be continued at the expense of the hospital.

Clinicians demand is also influenced through the availability and clinical effectiveness of technology. New technology is generally accessible once it has been approved by the Therapeutic Goods Administration (TGA). This approval is primarily around efficacy and safety. The technology is then largely available across the public sector, without any further national assessment.

Between the role of the clinician to act as an advocate for the patient and a health system that focuses on cost control, the patient needs will always be prioritised. Once the technology is available and the clinician becomes aware of it, satisfied that it is suitable for the patient, it will be adopted. This can happen prior to any comprehensive cost effectiveness assessment of the technology, adding pressure to hospital budgets. There is no national cost effectiveness assessment for the public systems. South Australia has recently created a new committee to address this gap (see section (d) for more information).

In some cases, it can take time for medical practitioners to change work practices to pick up new technology. This may be due to lack of training or understanding of the options, or very high establishment and/or operating costs. The impact on expenditure is that sometimes there will be parallel versions of technology running, some using the old method and others the new, creating additional costs. A co-ordinated approach to releasing new technology would assist with overcoming this problem.

There is also a scientific endeavour motivation to demand from clinicians. The new technology opens doors for treatments and procedures that were previously not possible. In the absence of cost considerations, moving to the new treatment represents advancement.

Medico legal matters are also inducing demand as the threat of legal action puts considerable pressure on clinicians to make the latest technology available.

Other factors influencing demand include demographics, which is impacting demand in some ways that are well documented and through other, less talked about means. The

ageing population is likely to experience more serious health issues such as malignancies but some conditions, such as heart disease, are now being managed and resulting in longer term monitoring requirements. Other health problems such as replacement therapy, or wear and tear on the joints, are a less advertised but significant source of demand push.

Differences in the uptake of new technologies between providers in the public and private sectors reflect the existence of diverse approval processes. For private medical services, PBS/MBS listing has a bearing but not for the public sector.

Economic growth has provided higher levels of general wealth allowing for more investment in research, supplying many more technology advancements and greater consumer spending power.

The supply of technology is generating demand by enabling a broader section of patients to access treatment. For example, keyhole surgery made treatment an option for many people who would not have been suitable for more invasive techniques.

***b) Identify the net impact of advances in medical technology on healthcare expenditure over the past ten years.***

There have been many advances in medical technology over the past decade and it is difficult to summarise the broad range of innovations and enhancements to access that have been made available. As an indication, some primary examples include:

- Imaging scans including MRI,
- Minimal access techniques for interventions including keyhole surgery, stents and grafts,
- In pharmaceutical technologies: biological agents, rheumatoid arthritis treatments, oncology drugs and new antipsychotics.

As noted in the section above, intensive care medicine is now dominated by people over 70 as community expectations have changed. More intensive care facilities have been supplied over the past ten years. This is a relatively high cost service and has been a significant growth area of expenditure.

The treatment of disease has been and will continue to be influenced by the human genome project, impacting on the reported prevalence and patterns of disease. Previously research and the resulting technology would serve a large patient population such as 100,000 per year. Now the research might be on a population of 30 per year as targeted therapies become possible. The cost per person treated is therefore often higher for the smaller patient population.

Technology has allowed new procedures to be performed where previously there was no treatment option. An example is the case of a providing a prosthetic hip compared to living with an arthritic one, creating new costs to the service provider.

The introduction of technology has resulted in some savings on the patient length of stay in hospital over the last ten years. These expenditure reductions are partially offset by the increased cost of the technology but have allowed patients to avoid hospital stays and overall have resulted in creation of additional capacity in public hospitals.

In reference to measures of health expenditure, while technology innovations differ substantially depending on their type, there is generally a large initial cost of introducing an upgrade. However, the equipment is often cheap in comparison to the ongoing cost of disposables. It is recommended that any cost-impact study that is considered as part of the review should take into account the ongoing unavoidable costs. Additionally, it is worth exploring whether manufacturers may be able to develop some technologies in a way that reduces the consumables.

Research and development expenditure is not viewed as a particularly good mechanism for identifying trends in technology development and likely expenditure patterns. Generally the diseases that are investigated are those where the greatest potential return is, which is in Western diseases. They are not necessarily representative of the broader research effort.

***c) As far as practicable, identify the likely impact of advances in medical technology on healthcare expenditure over the next five to ten years, and identify the areas of significant potential growth.***

The growth in medical technology expenditure over the next decade is anticipated to be at a faster rate than that experienced in the past. Some examples of technology areas where growth is expected or is already occurring are:

- Developments in DNA molecular treatments,
- Technology hybrids which are not so neatly compartmentalised into commodity groups,
- A quickening of replacement time as new developments come on line at a more rapid pace. It is expected that cost effectiveness benefits of use over time will not become available,
- In pharmaceuticals, oncology treatments including gene blocking agents, biological agents and genomics.

New technologies are more likely to be of a molecular nature rather than new instruments. Innovations bringing new technology to the market are expected in addition to the wider application of existing techniques.

The volume of screening for diseases is expected to rise resulting in higher detection rates and costs associated with managing identified conditions. Additionally, diseases that are now being avoided through screening are expected to be replaced by degenerative chronic conditions.

Early identification of potential chronic disease and provision of suitable treatment should extend lives and defer the period of high expenditure. Deferring the onset of chronic disease and disability with a goal of compressing morbidity has been identified in the Intergenerational Review produced by the Australian Government.

New pharmaceutical developments are likely to be more targeted and will therefore cost more for each patient treated. The effectiveness for those patients receiving the drug will be better and this will generate cost savings as the distribution of the pharmaceuticals will be restricted. Genetic testing (pre-disposition or effectiveness testing) is expected to be necessary before the use of some treatments to determine whether the required gene is present. These screening costs are an additional cost of targeted therapies. It is difficult to generalise on the expected balance of these altered cost trends but it is unlikely there will be a net saving.

Price reductions resulting from expiration of patent are not generally providing expenditure reductions because new drugs come on the market at the time of expiration, which make the former one out of date.

Application of digital equipment and internet technologies is expected to produce significant advances in information management providing opportunities such as treatment of patients in remote locations.

Over the next ten years, anticipated cost savings from contracting length of stay due to advances in medical technology are expected to be much lower than over the last decade because many of the procedures are already down to day surgery. The majority of the gains have already been harnessed, leaving less room for shortening length of stay.

***d) Identify existing mechanisms and processes for ensuring cost-effectiveness in the use of medical technology, and any gaps in these processes.***

The mechanism for approving all new technologies for safety and efficacy is the Therapeutic Goods Administration and it applies to both public and private sectors.

A number of national bodies take part in assessment activities for new technology for the private sector that has implications for the public sector. The Pharmaceutical Benefits Advisory Committee (PBAC), Medical Services Advisory Committee (MSAC) and the Private Health Industry Medical Devices Expert Committee (PHIMDEC) and all form part of the private sector assessment and approval mechanisms. National Institute of Clinical Studies (NICS) and Health Policy Advisory Committee on Technology (HPACT) perform functions for both sectors. The Terms of Reference of HPACT is included at Attachment A for reference.

For state public systems there is no national comprehensive centralised system for review of new technologies once they have been passed by the TGA. Smaller reference groups have been created in many jurisdictions to address this need. South Australia has established a Sub-Committee for New Technologies under the Clinical Senate. Terms of Reference are provided at Attachment B.

Private sector approvals through the bodies listed above can result in cost increases within the public system. For example, PHIMDEC has automatic listing procedures that bypass any need for additional assessment where there is an upgrade of existing technology. Once the item is available in the private sector, there is a pressure for it to be adopted into the public system. The move from non-coated to coated stents is a good example, especially as the incremental benefit of the updated technology is small in comparison to the cost. These flow-on effects need to be considered in any recommendation of new processes, as the costs this can create are material.

Nationally Funded Centre's (NFC) are an example of a deliberate attempt to control availability of new technology in the public system. NFC's were created with the intention to improve effectiveness through centralising the development of technology for specified procedures, generally certain kinds of transplants. They allow for the provision of highly specialised medical technologies to all Australians irrespective of the State and Territory in which they live. The approval and administration of NFC's is overseen by the Australian Health Ministers Advisory Council.

Adequate evaluation of cost-effectiveness through Government requires review. A robust and consistent methodology for assessing cost-effectiveness is required. However, there is a limited availability of people with the skills required to undertake these assessments. In addition, it is very difficult to judge the impact of costs of a new technology prior to it being used for a period of time. Pilot testing of technology at a number of sites before it becomes widespread would assist the cost identification process. Clinical guidelines and protocols to guide the use of these technologies also require attention in this process.

The Australian Government needs to address the cost effectiveness impact on the States of their approval decisions for the private sector. For example, Protein Activated C medication is provided to very sick patients in intensive care for septicaemia. The

Australian Government agreed to put it on PBS for the private sector which resulted in mounting pressure on the public system to offer the drug. This is now a public hospital cost pressure.

A whole-of-Government approach is required to look at the impact of technology in the acute care environment taking into account flow-on and other effects outside of the hospital cost assessments. Equity considerations also need to be included in the reviews. There are more technology options available in some locations than others.

***e) Examine the impact of changes in medical technology on the distribution of costs and financial incentives across different parts of the health system, including whether advances in one technology area result in reduced costs in others.***

Approvals of new technology for use by the private sector can have an impact on the public system as outlined in section (d) above. The lack of a unified national process for assessing new technologies for their short and long term impacts and for consideration of the distribution of these costs/benefits across the population is contributing to unanticipated costs occurring across sectors.

The adoption of advancements in technology for prevention of illness is a possible area of under-use as the saved costs involved in treating patients once they develop a condition are generally not adequately factored into cost analysis.

Incentives from manufacturers to take on new products are widespread and represent a significant source of growing cost pressure across a range of areas. Items of technology provided free of charge as an introductory offer to the clinician are easily accepted and can quickly require additional consumables, diagnostic tests or staff training needs as examples.

In some, less common, cases new technology may allow savings in other areas. For example, MRI scans provide information that previously may have only been obtainable through surgical procedures. Ultrasound technology replaced the use of dyes for many diagnostic tests.

***f) Investigate the net impact of advances in overall and individual health technologies on:***

- ***economic, social and health outcomes, including exploring which demographic groups are benefiting from advances in health technology***

It is very difficult to identify influences of technology on health outcomes as the advanced technology represents only one of a range of factors that contribute to the health outcome, including factors outside of the health sector.

In general, some measures of health outcomes are not being focused on or cannot be determined early. For example, it took 20 years of medication to prove that cholesterol management reduces heart conditions and enables people to live longer.

There are significant effects from the adoption of technologies for the ageing population. People are living longer with managed conditions, particularly around cardiovascular disease. This can then lead to a general increase in the prevalence of a number of other illnesses that the person may not have survived to contract (eg. cancers).

Equity of access to technology is an area of concern. Medical technology advances in the future will benefit people more remotely located through providing services without the need for a physical visit to the doctor. However, other advances in technology may provide most benefit to those who live close enough to a centre of health specialisation. Additionally, the uneven distribution of technology, particular the more expensive items, does not allow equal access to all members of the population.

People who are more socially advantaged are not only more able to afford to purchase technologies not yet available to the general public but are also more aware of the availability of a choice of treatments and more able to articulate and advocate for their interests.

- *the overall cost effectiveness of healthcare delivery*

Cost effectiveness is difficult to measure and depends on what type of subsequent interventions become necessary.

The impact of reducing marginal cost of a technology over time has usually resulted in improvements in cost-effectiveness the longer the technology is utilised. The expected rapid replacement of technology in the future is likely to eliminate these benefits. Similarly, where advancements service smaller population groups, a reduction in cost effectiveness of each treatment can be expected.

In some instances, new developments are adopted by clinicians while the existing technology is retained for use by some staff members or for certain patients. Where the old method is not dispensed of, the running of two parallel treatments leads to greater costs.

The South Australian Government has constructed a model of hospital system costs that, as one component, is trying to quantify the impact of technology on demand and

expenditure. This is an attempt to tackle this difficult area of splitting out the contributors to cost and is an ongoing process of refinement.

## **Health Policy Advisory Committee on Technology (Health PACT) Roles and Functions**

### **Purpose**

The purpose of Health PACT is to advise AHMAC and MSAC on the implications of the introduction of new technology into the Australian and New Zealand health care system. In so doing, the Health PACT will oversee the operation of the HSU.

### **Membership**

One representative from each of the following organisations:

- Commonwealth Department of Health and Ageing
- Northern Territory Department of Health and Community Services
- Victorian Department of Human Services
- South Australian Department of Health
- Tasmanian Department of Health and Human Services
- NSW Department of Health
- New Zealand Ministry of Health
- ACT Department of Health and Community Care
- Western Australia Department of Health
- Queensland Department of Health
- Medical Services Advisory Committee (MSAC)
- Australian Safety and Efficacy Register of New Interventional procedures Surgical (ASERNIP-S)

Representatives will attend the meetings/teleconferences and provide administration support their respective organisations including the coordination activities.

Representatives will provide a policy and planning advisory role to both the Health PACT and to the HSU staff.

The Commonwealth Department of Health and Ageing will provide administrative support to the Health Research Unit, and Secretariat support to Health PACT.

ASERNIP-S, and other Agencies as required, will provide specialist horizon scanning advice to Health PACT. ASERNIP-S to conduct surgical horizon scanning in Australia.

A small Executive team will progress issues regarding the day to day operation of the HSU and consist of the Chair, Deputy Chair and Secretariat of Health PACT. Other members may be asked to participate, as required.

### **Functions**

In general the Health PACT provides the interface for the exchange of information between stakeholders, to maintain a register of health technology policy and planning issues and agree a work plan for the HSU.

Specific functions include:

- Oversee the scanning for new and emerging health technologies and identify possible investigations.
- Prioritise investigation list of health technologies to be reviewed.
- Commission policy and planning implications review of MSAC Health Technology Assessment reviews
- Oversee the monitoring of new technology developments
- Liaise with relevant agencies in this field such as MSAC and ASERNIP-S
- Research and report on implications of horizon scanning briefs
- Advise MSAC and AHMAC
- Refer full health technology assessments to MSAC, or other relevant agencies as required
- Monitor and evaluate the impact of the introduction of new health technology into Australian health systems.

### **Meeting Times**

The Health PACT will meet once a year and teleconference at other times as necessary.

### **Horizon Scanning Unit**

The tasks of the HSU consist of:

- Horizon scanning & identify new health technologies
- Maintain register of new health technologies and monitor progress
- Prepare Horizon Scanning Technology Priority Template
- Conduct scientific horizon scanning evaluation of new health technologies as required
- Evaluate implications of new health technologies for the Australian health system
- Prepare horizon scanning and implications brief
- Report findings to Health PACT
- Liaise with international horizon scanning organisations
- Liaise with Health PACT members

### **Implementation Issues**

In the first instance, the HSU is to develop the methodology for conducting scientific horizon scanning evaluations, and for researching the implications for the Australian health system. Further, the development of in-house data systems, information collection methods and communications website design and maintenance would be necessary. The unit will consist of at least two staff, one senior researcher officer and one research assistant.

**Attachment B**

**Sub-Committee for New Technologies under the SA Clinical Senate**  
**Terms of Reference**

- Advise on relevant new health technology referred to the group, as required.. This includes machines, therapeutic agents or new ways of doing things. The efficacy and cost effectiveness of the technology should be considered<sup>1</sup>
- Evaluate new technologies based on national and international evidence of Best Practice.
- Equity of access should guide all decisions or recommendations on the adoption of, or support for new technologies.
- Provide advice to the Department on the impact of new technologies on clinical service planning and provision.
- Review submissions for new health technology referred to the group, including machines, therapeutic agents or techniques
- To provide advice to the Department on future upcoming technologies that may have demand and cost influences on health delivery
- Monitor the progress of approved applications
- Following evaluation, to make recommendations for ongoing recurrent funding.
- Develop policies that lead to improved health outcomes when new technology is used in the clinical setting
- Participate in expert working groups, advisory panels and strategic advisory committees at a State and Federal level. Examples include, DHS Research Ethics Committee, SA Health & Medical Research Advisory Council, Commonwealth Health Policy Advisory Committee on New Technology, SA Medical Research Council, ASERNIP-S<sup>2</sup>.

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<sup>1</sup> For this purpose, therapeutic agents include therapeutic devices and substances.

<sup>2</sup> ASERNIP-S: The Australian Safety and Efficacy Register of New Interventional Procedures - Surgical.