NSW HEALTH

Submission to
Productivity Commission Study

THE IMPACT OF ADVANCES IN MEDICAL TECHNOLOGY ON HEALTHCARE EXPENDITURE

21 December 2004

Summary of main points in this submission:

- Overall, new medical technology generally increases health costs due to the expansion in treatment population (eg. from better screening and identification of diseases). Most estimates are generally in the range of 2% growth in health spending per annum due to new technology.
- Very few examples of technologies that decrease health system costs can be found. Most do not totally substitute for older technologies.
- Whilst improvement in health outcomes is not always quantifiable, the inability to keep pace with new technology can hamper efforts to improve quality of care.
- The Australian health system has a number of mechanisms which have the potential to enable the assessment of the effectiveness and cost effectiveness of new health technologies. However, there are significant limitations to these systems, and the potential exists for these formal mechanisms to be bypassed.
- Adoption of new technology is influenced by financing systems and different implicit public/private sector controls.
- After adjusting for population and ageing effects, certain population groups have benefited more from new technology in terms of increased capacity to be treated (e.g. young and very old males).

Introduction

Managing growth in demand for, and costs of health services is a requirement of all health systems and requires attention to a broad range of supply and demand related factors. For example there are factors that impact on the cost per unit of treatment (such as inflation and efficiency) and factors that impact on the volume of treatments (namely population growth, ageing and utilisation changes). Whilst population growth and ageing in particular are at the centre of many debates about health system costs, it is the interaction between new medical technology and all of the above factors that is a major cause of increased demand and spending on health services.

Fortunately there is little doubt that today's health technology is more advanced and more effective than in the past and because of that we have achieved extended longevity and enhanced quality of life. But in health care, there is general agreement that technology comes at a cost which tends to be additive rather than substitutive, demonstrated through case studies that have found that the expansion of patient numbers accessing the service is what increases total costs[1,2]. The Wanless Report noted that '...there is general agreement about the overall direction of the overall impact of technology and medical advance in health spending: "*New technologies typically create pressure to increase spending because, although they may allow cheaper treatment per case, they also offer new opportunities for treatment or raise the quality of outcome of treatment and thus increase the number of people who may benefit*."[3]

The "technology dividend" in health care is therefore related to patient benefits (although sometimes this is unclear), rather than overall cost savings. Part of the increased pressure to spend is due to '...a "technological imperative" in medical care that places a bias toward using the more complex, expensive, and challenging tools in diagnosis and treatment.'[4]

This NSW Health submission attempts to expand on these issues and address them in the following order:

- Discussing how new technology widens the treatment population and helps keep people alive longer.
- Estimating the overall impact on health system costs.
- Identifying contributing factors and issues in technology adoption.
- Analysing who benefits from new medical technology.
- Examining existing review mechanisms and gaps in these processes.

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[1] Cutler D.M and McClellan M. 2001, Is Technological Change in Medicine Worth it? Health Affairs, Volume 20, Number 5

[2] Wanless D, 2001. Securing our Future Health: Taking a Long-Term View. An Interim Report. HM Treasury, London

[3] Harrison A, Dixon J, New B and Judge K. 1997, Funding the NHS: Can the NHS cope in future? BMJ 314: 139 in Wanless, D, 2001. ibid p.163

[4] Twaddle A. 1996, Health systems reform - toward a framework for international comparisons, Social Science and Medicine, Volume 43, Number 5, pp. 637-654.

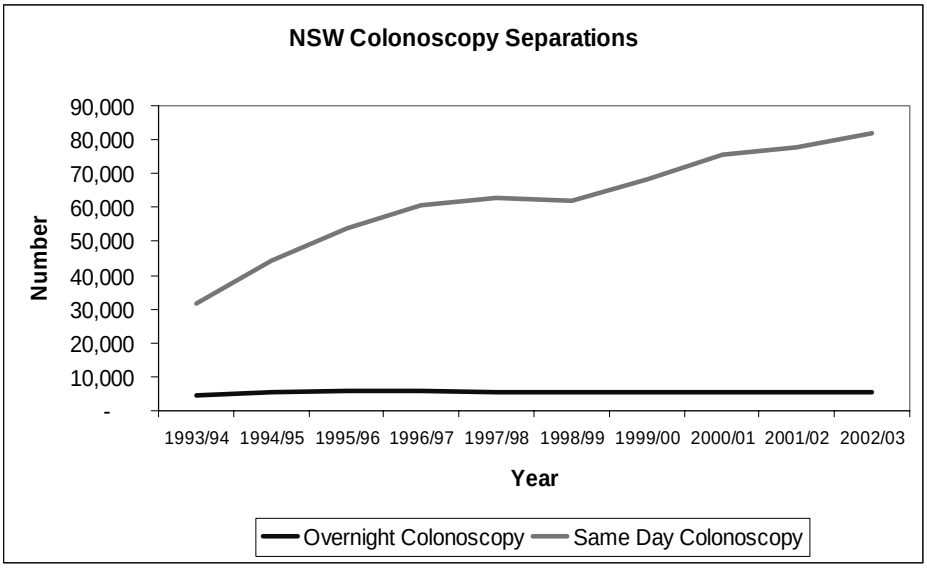
Widening of the treatment population

It is recognised that many new technologies widen the indications for treatment so that the number of patients receiving treatment expands. Technology has enabled growth in demand due to more people surviving events that previously would have lead to death e.g. people with heart failure, heart attack, renal failure and cancer, whose ongoing costs are significant. This effect is often termed "expansion of morbidity" which means people living for a longer time with disabilities. A better understanding of the health risk factors and access to screening also widens the patient population.

An example of how the introduction of a new technology, which is cheaper to perform, can lead to increased overall health costs was reported in the Wanless Report[5] for the UK Government. The report found that laparoscopic cholecystectomy was 25% less expensive than open surgery techniques. However this was accompanied by a 40% increase in usage, and increased costs by 11% overall.

Improvements in relation to better detection and treatment, has resulted in improvements in the five year survival rate for males with prostate cancer from 60% in 1982-86 to 85% in 1994-98.[6,7] For women with breast cancer the five-year survival rate increased from 72% to 85% over the same period. This increases health system costs overall as these people access health services when they previously would not have. Improved diagnostic techniques can contribute to this. For example, figure 3 demonstrates the increased use of colonoscopies is largely attributable an increase in same day procedures:

Figure 3: NSW Colonoscopy Separations



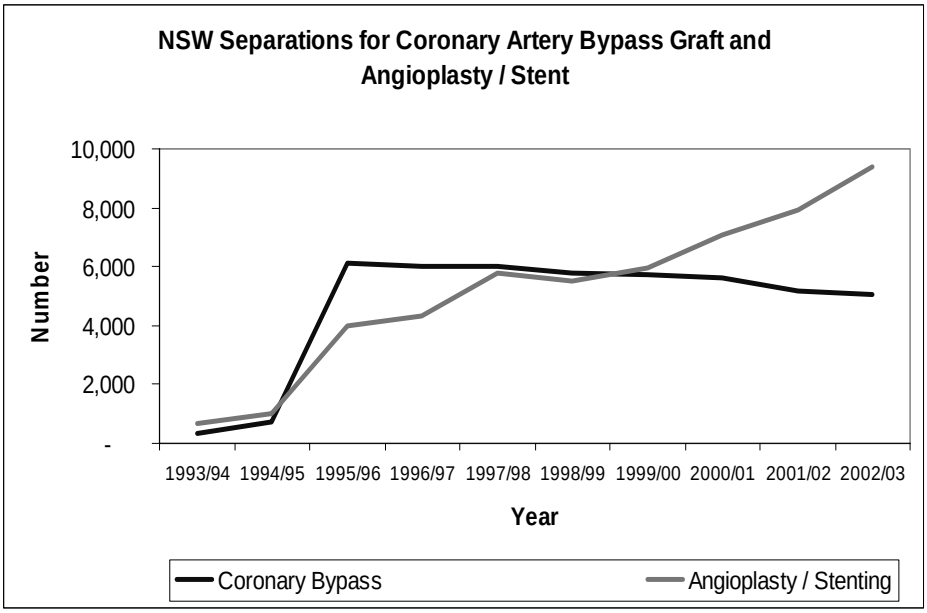
Source: NSW Health inpatient data

[5] Wanless D, 2001. op cit.
[6] AIHW. Australia's Health 2002. pg. 52
[7] Supramaniam et al. 1999. Survival from cancer in NSW in 1980 to 1995. NSW Cancer Council (cited in NSW Chief Health Officer's Report 2002)

Another example is the completion of the human genome project which has resulted in an expectation that much more can now be accomplished with respect to the diagnosis and treatment of disease. It is apparent that the development of first generation targeted therapies for the treatment of a variety of different disorders has resulted in a significant response rate in comparison to previous treatment modalities, and as a result it is anticipated that many new therapies will be introduced in the near future. This has been associated with increased genetic screening tests and interventions in reproductive processes to prevent specific genes from being passed on. Therefore changes to one area can have many flow-on affects.

Table 1 provides some examples of other new and expanding technologies in the NSW Health system. Figure 1 demonstrates the rapid growth in the use of stenting in coronary revascularisation procedures since the early 1990s. The graph shows stenting has largely not substituted for other procedures as these other procedures have only marginally declined. Figure 2 shows the doubling of the number of new cases of people requiring renal dialysis and treatment for End Stage Renal Disease since 1981. Many other examples of new technologies could also be identified.

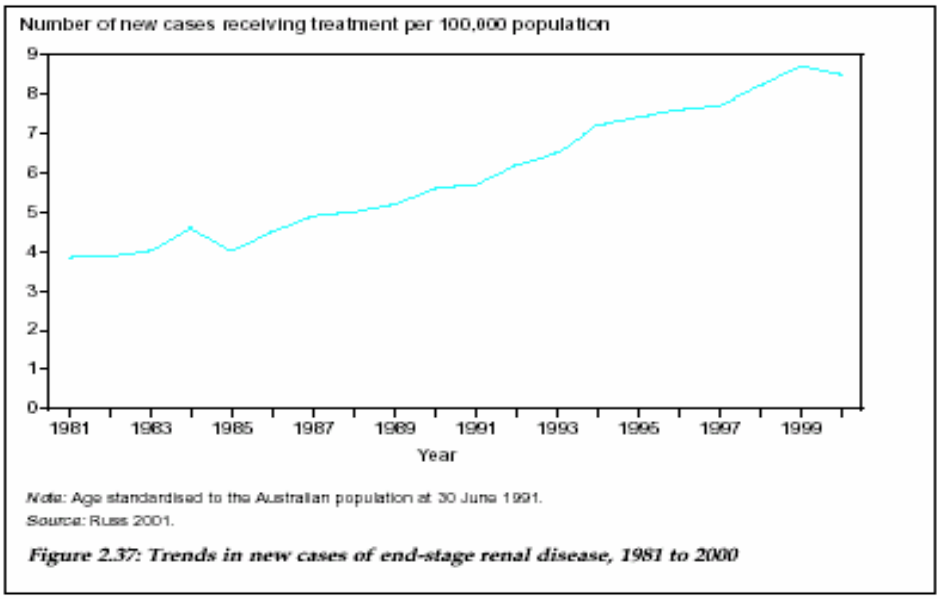
Figure 1: NSW trends in coronary revascularisation 1995-2003



Source: NSW Health inpatient data

[11] Wanless D, 2001. op cit.

Figure 2: Trends in new cases of End Stage Renal Disease 1981-2000



Source: AIHW Australia's Health 2002

Table 1: Examples new and expanding technology

	Procedures in NSW	
New Technologies	**1993-98**	**1998-03**
Coronary Bypass	19,275	27,411
Angioplasty		
- With Coronary Stenting	9,609	31,598
- Without Coronary Stenting	6,189	4,251
Cardiac Pacemaker Implantation	6,212	12,143
AICD Implantation	697	2,062
Transplants	538	891
Cochlear Implants	281	537
Enhanced Techniques		
Colonoscopy		
- Overnight	27,023	27,393
- Same Day	253,171	365,602
Cataract Procedures	156,116	238,847
Hip and Knee Replacement	56,074	83,596

Source: NSW Health inpatient data

It is important to recognise that these data are based on inpatient separations and do not capture the increased activity due to technology in non-admitted (i.e. outpatient) settings. An example where non-inpatient data are available is in relation to radiotherapy which has seen a doubling of courses provided over 10 years.

Estimating the impact on health system costs

The direct cost impact of new technology (including drugs) on the NSW health system is reflected in the expenditure on drugs and medical and surgical

supplies. According to NSW Health Annual Reports, expenditure under these cost items increased an average of 7% and 9.5% per annum respectively during the years 1999/00 to 2002/03, or around a 0.6% per annum increase in total NSW Health operating expenses due to these direct costs alone.

The other indirect costs on top of this growth are difficult to quantify but would include the additional costs arising from treating an expanded patient population i.e. salaries and wages, overheads etc relating to the increased patient activity. Major capital technology purchases are also additional to these costs. Accordingly, some health analysts predict that health technologies have been responsible for real annual increases of around 2% in total health spending.[11,12]

Estimating the impact of technology on expenditure can be calculated in a top-down manner, by first deducting the known contributions of population and ageing from total growth over any given period, with the remaining growth assumed to be explained by these other factors. This factor is sometimes called the "residual" which reflects the combined effect of a number of demand drivers as identified in the IPART[13] report:

- rising community expectations and consequent increases in funding levels;
- expanded age range for surgery because of improvements in surgical techniques and anaesthetics;
- non-invasive surgical techniques;
- growing capacity to treat eg. cancer and HIV;
- better technology and diagnosis;
- legal liability costs.

One of the few identifiable examples of a new technology that may decrease overall costs is telemedicine, however there are contradictory studies on this. The growth of broadband telecommunications for service delivery models like telemedicine will benefit from the establishment of high capacity broadband networks. High speed broadband telecommunications is critical for access and transfer of clinical information within a health system eg. clinical electronic medical records and across health service providers to support patient care eg. electronic health record.

The growth in genetics also has the potential to reduce long term health costs. Genetic testing provides the ability to predict both disease likelihood and also patient responses to common treatments. The identification of persons at increased risk of disease allows targeted surveillance and early intervention for people at risk and reduces surveillance costs for low risk people who need not access specialist medical services. Therefore the screening and

[12] Commonwealth Department of Health and Aged Care, 2000. Technology, Health and Health Care. Occasional Papers: Health Financing Series. Volume 5. DHAC, Canberra.
[13] Independent Pricing and Regulatory Review Tribunal (IPART), 1998. A Review of NSW Health. Report to the NSW Treasurer and the Minister for Health. IPART, Sydney.

intervention costs currently incurred by individuals of low risk could be rediverted.

The true net cost of new drug technology is difficult to estimate as the costs avoided in terms of other forms of treatment are likely to be significant. For example as noted by the Commonwealth '...medicines are subsidised, priced and prescribed with the aim of avoiding higher treatment costs that may otherwise be incurred through people's use of hospital and medical services. It could therefore be expected that growth in the PBS might be accompanied by lower rates of growth in these other areas of health. The comparatively higher growth rate of the PBS, sometimes noted unfavourably, may in reality be its virtue.'[14]

Nevertheless, generally the emergence of new technologies is acknowledged to be the most significant factor driving health care costs upwards, with most estimates being around 60-80% of the growth in spending.[15,16,17,18]

There are a number of examples where new technologies do not necessarily substitute for older technologies. Newer technologies rarely "replace" an existing technology but have an additive effect as applications widen, or are in tandem to delay/defer a more invasive procedure. For example, coronary stenting may delay the need for an individual to undergo bypass surgery, or enable individuals who are ineligible for bypass surgery to be treated, therefore broadening the population.

However technology growth should not be seen as a burden but rather a requirement – the inability to keep pace with the growing complexity of science and technology in health has been cited as a major cause of poor quality health care.[19] The growing evidence is that initiatives to address quality issues require significant investments e.g. implementation of electronic prescribing to reduce errors in medication require significant IT and practice changes.

[14] Commonwealth of Australia, Parliamentary Library, 2004. How much will the PBS cost? Projected trends in Commonwealth expenditure. Research Note No 19.
[15] IPART, 1998. op cit.
[16] Various NSW Health analysis of growth rates in inpatient admissions after accounting for demographic change
[17] Commonwealth Department of Health and Aged Care, 2000. op cit.
[18] Wanless, 2001. op cit.
[19] Institute of Medicine. 2001. Crossing the Quality Chasm: A New Health System for the Twenty First Century. Washington, National Academy Press.

Contributing factors and issues in technology adoption

It is suggested that Australia has been a late adopter of medical technology, which indicates that 2% growth for technology might be a conservative estimate if Australia moves to a quicker rate of adoption in the future.[20] When combined with increased consumer-oriented promotion and knowledge of new technologies and occasional media involvement, this is a possible outcome.

For example the temptation to introduce high technology treatments in the face of pressure from anxious staff and family has been noted in the literature, especially in the case of seriously ill newborns.[21] Another example is implantable cardiac defibrillators which have been shown to increase the life expectancy of 28% of patients who have suffered a heart attack. There is therefore strong clinical and patient expectations to access this technology.

Generally though, the largely capped public hospital budgeting approach used in Australia may act as a constraining factor in the adoption of new technologies, as health technology must compete with other areas of expenditure for the limited funding available. Also, the combination of largely public financing and capped budgets for public hospitals with a salaried doctor workforce avoids the inflationary consequences normally associated with fee-based health systems where expensive technology is duplicated across hospitals and cost-shifting occurs amongst multiple private payers driving up costs.

An exception to this is drugs and in particular those paid for under the open-ended PBS. For example, contrast the 7% annual growth in drug expenditure in NSW public hospitals referred to above (which operate largely under capped budgets) with the 12.6% annual growth in the open-ended PBS[22] over the same period. One could speculate that the different growth rates reflect the different financing systems but it could also reflect tighter control over drug expenditure in major hospitals through drug committees. The impact of different financing systems in the public and private hospital sectors could also explain why males and females in private hospitals are 2 to 5 times more likely to receive a revascularisation procedure (such as angiography or stenting) than in a public hospital.[23]

In the NSW public sector implicit rationing is used rather than more explicit approaches, by devolving responsibility to doctors for deciding who gets access to services and by issuing guidelines for the planning of specialties in local hospitals. As the gatekeepers, GPs play a crucial role in ensuring

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[20] McClellan M, Kessler A et al. 2001, Technological change around the world: evidence from heart attack care. Health Affairs. 20(3), pp.25-42.

[21] Henderson-Smart DJ, Osborn D, Evans N, Beeby P, Jeffery H. 2003, Do we practice evidence-based care in our neonatal intensive care units? Clinical Perinatoly. Jun;30(2):333-42

[22] AIHW, Australia's Health 2004, p238

[23] Robertson IK and Richardson JRJ, 2000. Coronary angiography and coronary artery revascularisation rates in public and private hospital patients after acute myocardial infarction, MJA 173: 291-295

patients are offered the treatment they need and that they will not be treated on a more specialised level than necessary.

In health care a challenge is to control the growth in new technologies largely through health technology assessment but also through funding mechanisms. As pointed out by the Commonwealth 'Examination of a range of individual technologies would seem to confirm the results of analysing the effects of technology on aggregate health expenditure: Technology increased health expenditure. However, the introduction and use of technology is amenable to control...raising at least the prospect of being able to control the cost impacts of technology'. [24]

New technologies in health care must first be shown to be better for the patient than the technology it is supposed to replace and be cost effective. Unfortunately many new technologies, such as drug-eluting stents, are used before long-term evidence on patient outcomes is available from clinical trials. Additionally, the cost effectiveness aspect of many health technology assessments is often the last consideration in reviews of new technology. It is recognised that the review process has not been able to keep pace with the speed of introduction of new technologies. However, progress has been achieved in the objectivity of the assessments, introduction and evaluation of new technology, although it is acknowledged that this approach remains narrow. Further discussion of the current review processes in Australia occurs in a later section of this submission.

Another general weakness of health technology assessment is that it does not help in choosing who should have access to technologies and how much to provide. Improving the rigour of the assessment process, which is largely a Commonwealth responsibility, is seen as one way of reigning in the growth of health technology. In the future, better ways of managing consumer expectations in relation to access to new technology may also be required, to inform and to create realistic expectations of health care services.

Who benefits from new medical technology?

In terms of who benefits most from the introduction of new medical technology (measured as increased capacity to be treated rather than health outcomes), an analysis of NSW age/sex utilisation rates for acute inpatient care between 1994-95 and 1997-98 has demonstrated that utilisation rates for older people on a per capita basis increased more than for other age groups. These estimates are after controlling for population growth, ageing and cost weight changes over the years. Figure 4 shows this utilisation increase for the older age groups. Unfortunately any associated improvement in health outcomes is not readily quantifiable.

This effect has sometimes been termed "utilisation drift" and results from the increased admissions for certain age groups who previously would not have been treated without the more recent advances in drugs and surgical

[24] Commonwealth Department of Health and Aged Care, 2000. op cit. p.18

techniques. Rising expectations amongst the elderly would also explain some of this increased utilisation. The utilisation of angioplasty in NSW provides a good example of this:

Table 2: Angioplasty procedures in NSW by age

	1993-98	1998-03	Growth p.a.
20 to 49 years	2,701	5,173	14%
50 to 69 years	9,811	20,617	16%
70 to 74 years	2,005	5,141	21%
75 to 79 years	990	3,248	27%
80 to 84 years	261	1,318	38%
85 and over	30	351	64%
Total	15,798	35,848	18%

Source: NSW Health inpatient data

Figure 5 shows that between 1994-95 and 1997-98 men aged between 15 and 30, men aged over 80 and women aged 30-50 have had a higher per capita increase in utilisation rates than other ages after the controls referred to above. These figures are based on absolute change over the period (i.e. cost weighted separations per capita). Figure 6 shows the change expressed as a percentage over the same period. The difference in Figure 6 is that older females have had a relatively higher growth in utilisation rates than older men due to "technology". However this is probably explained by the fact that older females have lower utilisation rates (up to 40% lower) than older males to start with so some catch up could be expected.

One possible reason for the increased utilisation for women in the 35-50 age group could be lifestyle decisions to delay childbirth combined with improved access to assisted reproduction technology. Hence not all of the growth can be due to technology. Very young children also appear to have benefited. The negative growth for males aged 30 to 50 may not necessarily be unfavourable, but could in fact reflect better access to other technologies (such as drugs) which have prevented hospital treatment.

Figure 4: Utilisation rates for NSW public and private hospital patients 1994-95 to 1997-98 by age (casemix weighted inpatient separations per capita), after controlling for demographic and cost weight changes

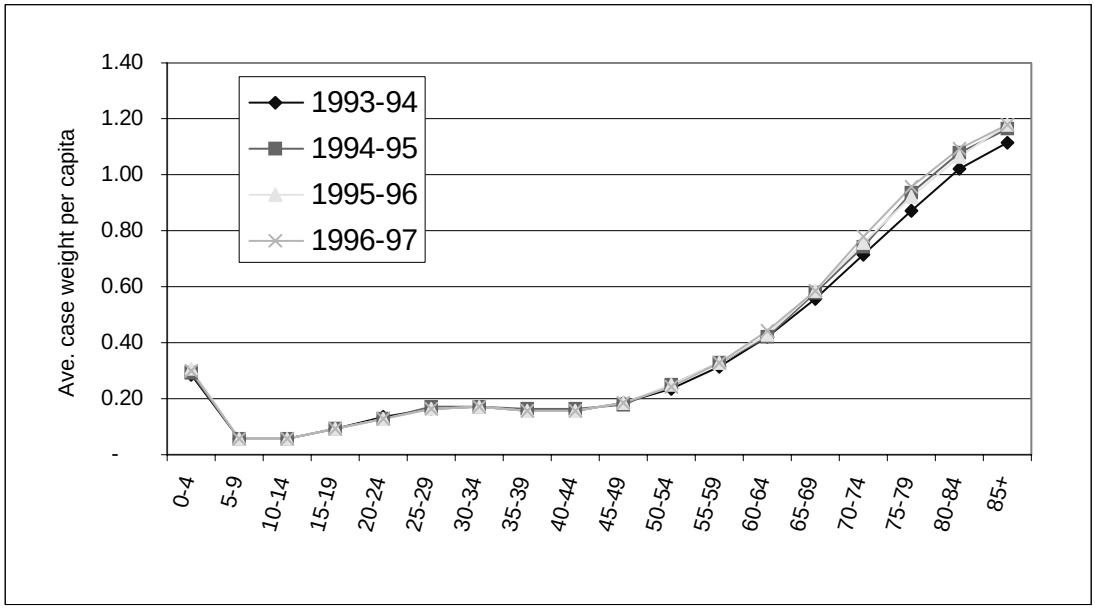


Figure 5: Absolute change in utilisation rates of NSW public and private hospital patients between 1994-95 and 1997-98 by age and sex (casemix weighted inpatient separations per capita), after controlling for demographic and cost weight changes

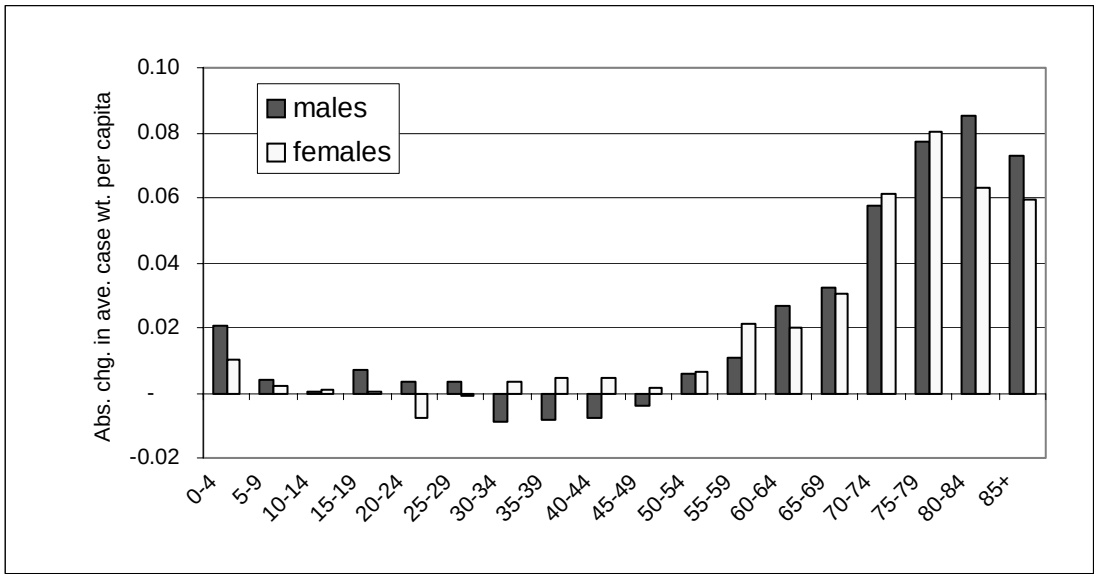
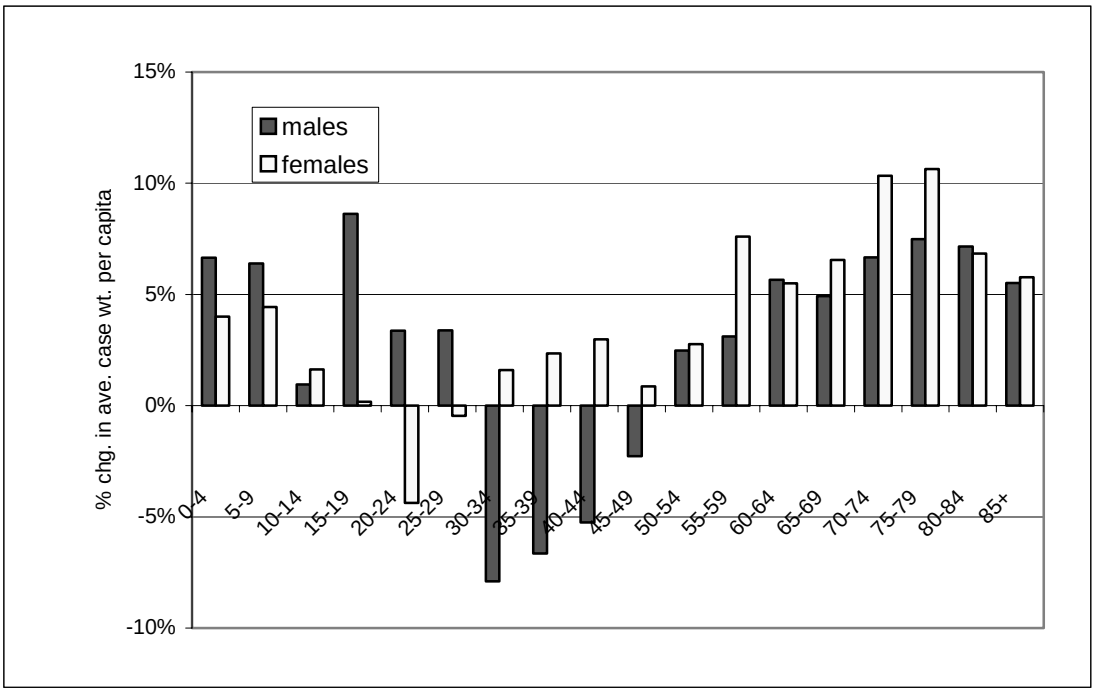


Figure 6: Percentage change in utilisation rates of NSW public and private hospital patients between 1994-95 and 1997-98 by age and sex (casemix weighted inpatient separations per capita), after controlling for demographic and cost weight changes



Existing review mechanisms and gaps in these processes

Compared to international levels, the emergence of health technology within Australia has occurred on a smaller scale. However, the states and national jurisdictions have undertaken a collaborative approach to the assessment of health technology. This has enabled membership of international health technology organisations allowing access to data which would not have been available to individual jurisdictions.

The Australian health system has a number of local mechanisms which have the potential to enable the assessment of the effectiveness and cost effectiveness of new health technologies. However, it is evident that there are limitations to these systems, and the potential exists for these formal mechanisms to be bypassed. The existing mechanisms are outlined as follows:

Therapeutic Goods Association
The Therapeutic Goods Administration (TGA) is a unit of the Australian Government Department of Health and Ageing. Therapeutic goods include medicines (prescription, non-prescription and complimentary), medical devices, and blood and tissue products. The TGA also regulates gene technology and the licensing of the manufacturers of therapeutic goods. The TGA carries out a range of assessment and monitoring activities to ensure that therapeutic goods available in Australia are of an acceptable standard with regard to their quality, safety and efficacy, and aims to ensure that the

Australian community has access, within a reasonable time, to therapeutic advances.

It appears that the process for obtaining TGA approval may not include an assessment of the cost effectiveness of a technology, the impact on health spending, or provide direction for the appropriate diffusion of the technology.

Medical Services Advisory Council (MSAC)
Historically, Australia has monitored advances in health technology, with groups such as the National Health and Technology Advisory Programme (NHTAP) and the Australian Health and Technology Advisory Council (AHTAC). These bodies reported to the Australian Health Ministers' Advisory Council (AHMAC) informing of directions in health technology. The Medical Services Advisory Council Committee (MSAC) undertook this role following the dissolution of these groups.

MSAC provides advice to the Australian Minister for Health and Ageing, and the AHMAC on evidence relating to the safety, effectiveness and cost-effectiveness of new medical technologies and procedures. This advice informs the Australian Government on public funding for new, and in some cases existing medical procedures.

Although the MSAC process for obtaining Medicare Benefits Schedule (MBS) eligibility is clear, the timeframes for the review process do not align with the speed that new applications are taken up.. For example, the applications of MRI continue to expand, and although many are clinically appropriate and well supported by strong evidence, they have yet to obtain MBS eligibility. In these cases, the MSAC process fails to match the rapid, but clinically appropriate, expansion of technology into the public sector.

This review process may therefore be perceived as a financial constraint. For example the Australian Government has constrained the expansion of PET until the outcome of a national evaluation program is known. This program has experienced significant delays, however due to clinician and community pressure for the wider expansion of PET technology, an earlier 'roll out' of this technology is likely to occur without the financial support of the Australian Government. It is also apparent that the expansion of MBS eligible MRI services has also been limited by financial constraints. This is despite the acknowledged role of MRI in the hospital management of acute patients.

It should also be recognised that the introduction of technologies to the public sector prior to the completion of a full MSAC review may be necessary, particularly if patient safety may be compromised by the continuing use of a technology. For example, a broadening of the applications of MRI may be required to replace the use of CT scans in the paediatric population in order to reduce the radiation exposure caused by CT.

The diffusion of a technology within the private sector may also increase clinician and community expectations. This exerts pressure for the expansion of the technology to the public sector, irrespective of the effectiveness and

cost effectiveness of the technology or previous service planning. Once *a* technology diffuses into the private sector, and has attracted significant attention, it is often too late to undertake a formal assessment and will put further pressure on the public system.

However, it is understood that the Australian Government is currently reviewing the process by which items are placed onto the *Schedule 5 – Benefits Payable in Respect of Surgically Implanted Prostheses, Human Tissue Items and Other Medical Devices List*. This is a list of items which health funds must fund for privately insured patients. Previously, once items were approved by the Private Health Industry Medical Devices Expert Committee (PHIMDEC), they were then available to the private sector.

PHIMDEC was established by the Department of Health and Ageing (DHA), and liased with the TGA, MSAC, the Medicare Benefits Branch and the Pharmaceutical Benefits Branch within the DHA. However the level of evaluation and monitoring undertaken by PHIMDEC was not considered as robust as that conducted by other health technology assessments. It is understood that the revised process will involve a technology review by MSAC if the new technology is not aligned with an existing MBS number.

It is also understood that existing MBS items are regularly reviewed to determine whether they have been made redundant by a newer technology. Although strategies, such as lower rebates, may be utilised to discourage the use of older technologies, it may result in cross professional issues as higher rebates are transferred to the newer technologies. HIC data may also be used to analyse trends and utilisation rates, against gold standards of practice. Another factor influencing the cost effectiveness of a technology is the cost of disinvestment, particularly the cost of technology replacement and resource redistribution.

Horizon Scanning

More recently the establishment of the Australia and New Zealand Horizon Scanning Network (ANZHSN) has provided advance notice of significant new and emerging technologies to Health Departments in Australia and New Zealand. It also enables the exchange of information and the evaluation of the potential impact of emerging technologies on their respective health systems. ANZHSN conducts Horizon Scanning reports, which provide short, rapidly completed, 'state of play' documents. These provide current information on technologies to alert planners and policy makers of the advent and potential impact in terms of safety and cost, before they are introduced into the health system. They also aim to assist in the prioritisation and allocation of resources to ensure maximum utilisation of resources at least cost. A similar group, ASERNIP-S also exists for the evaluation of surgical procedures.

The Horizon Scanning process is continuing to evolve, and has the potential to significantly impact on the early identification and introduction of new technology, although the system for implementing the findings from the Horizon Scanning reports is yet to be finalised. Currently recommendations

for full Health Technology Assessments and items for consideration for MBS eligibility are directed to MSAC, although issues of timeframes and the ability to constrain technology are still uncertain. It is also evident that some of the technologies identified would be suitable for consideration under the Nationally Funded Centre (NFC) program. This mechanism for the controlled introduction and evaluation of new technologies is undertaken through AHMAC. However, there have been few NFC proposals considered recently, and the structure for assessing new proposals is currently being reviewed.

In addition to the formal mechanisms for technology assessment, local assessment processes are also utilised at a State level. For example obtaining expert local or international clinical opinion, literature reviews, and the sharing of information between states in forums such as the ANZHSN. However, these systems generally do not have the capacity to undertake rigorous cost effectiveness studies.

Nationally Funded Centres

The Nationally Funded Centre (NFC) program provides for a small number of super specialty services for new and developing medical technologies and procedures on a national basis. All states, territories and the Australian Government contribute funding to finance the NFC program. By obtaining funding as a NFC, the technology is subject to rigorous assessment to evaluate the long-term benefits and cost effectiveness of this procedure. The NFC program is the optimal method of evaluating a technology prior to broad diffusion, as it enables the use of a technology, in sufficient volumes, to allow an effective comparison of the new technology with the current gold standard of clinical practice.

There have also been no NFC programs established since 1996. In 2003 the responsibility for NFC funding arrangements was transferred from the Australian Government to the States, and it is currently sited in South Australia. Advice received from the AHMAC secretariat in August 2004 indicated that no timeframe has been set for the reconvening of the NFC review committee. Therefore the NFC program is currently inactive, and no mechanism exists for the controlled evaluation of high cost new technology.

Conclusion

The growth in medical technology should not be seen as negative, but rather as an important requirement of a comprehensive and responsive health system. The introduction and diffusion of medical technology continues to be influenced by clinician and community expectations, and financial incentives within the health system.

However the diffusion of a technology needs to be balanced by a formal assessment of cost effectiveness. Various processes exist to enable the evaluation of technology such as MSAC and the NFC program. While the process regarding the introduction of MRI and PET reflect a considered and evidence based approach, the implementation and expansion of these technologies is not occurring in a timely enough way to keep abreast, and therefore to inform and influence clinician and community use. This

responsiveness is critical to the process in being able to influence technology diffusion, and direct health policy. Investment in the development of formal processes for the diffusion of medical technologies may result in overall lower costs to the health system, when compared to the current situation where the expansion of medical technology occurs in an ad-hoc manner.