Australian Government

National Health and Medical Research Council

# SUBMISSION TO THE PRODUCTIVITY COMMISSION STUDY OF THE IMPACT OF ADVANCES IN MEDICAL TECHNOLOGY ON HEALTH CARE EXPENDITURE IN AUSTRALIA

## Introduction

The National Health and Medical Research Council (NHMRC) welcomes the opportunity to provide a submission to the Productivity Commission for its study of the *Impact of Advances in Medical Technology on Healthcare Expenditure in Australia*. The NHMRC's submission provides input on the definition of knowledge provided in the terms of reference of the issues paper, and the role of health and medical research in contributing to healthcare expenditure.

## Background

The NHMRC provides support for the generation of health and medical knowledge through research and providing evidence based health and medical advice. The mission of the NHMRC is to "ensure that excellence in research, health ethics, and health advice improves the health of all Australians". Its functions arise from the statutory obligations conferred by the *National Health and Medical Research Council Act, 1992* (the NHMRC Act)[1], which requires the NHMRC to:

- raise the standard of individual and public health throughout Australia;
- foster the development of consistent health standards between the various States and Territories;
- foster medical research and training and public health research and training throughout Australia; and
- foster consideration of ethical issues relating to health.

[1] In 2002, the statutory obligations of the NHMRC were expanded with the introduction of the *Prohibition of Human Cloning Act 2002* and the *Research Involving Human Embryos Act 2002*.

## NHMRC support for the generation of knowledge

Good health is fundamental to all other endeavours, both at an individual level and on a broader, societal scale. While Australians enjoy relatively good health, there are many aspects of healthcare where advancements in health and medical research are still sought. Arguably the most important function of the NHMRC is to build human and knowledge capital in health through its support of research and development of advice. The NHMRC is committed to further strengthening Australia's health and medical research community through funding the best ideas of the most talented researchers at internationally competitive levels. NHMRC researchers act in a global context and remain competitive by attaining a high standard of health and medical research. Australia's investment in health and medical research produces a contribution to the world's stock of health and medical knowledge which is internationally recognised.[2]

*Exceptional Returns - The Value of Investing in Health R&D in Australia (2003)*, shows that every dollar invested in health and medical research will be recouped many times over[3]. It highlights, for example, that economic returns to cardiovascular R&D have been 8-fold, to respiratory R&D 6-fold and to digestive system R&D 5-fold[4]. The NHMRC supports the Report's argument to increase and sustain growth in funding for health and medical research. The Report demonstrates that the direct benefits to the companies or industries responsible for producing health and medical technology, as well as indirect outcomes which produce social benefits for all Australians, are significant. It concludes that the outcomes for Australians of continued excellence in health and medical research, namely better health and quality of life and lower costs, will be positive in all regards.

## Definition of knowledge and medical technology

The definition of medical technology used in the issues paper is very broad and potentially poses problems setting boundaries for the review. In particular, the inclusion of knowledge in the definition is likely to be problematic in understanding how advances in medical technology impact on healthcare expenditure in Australia. The scope of the definition does not coincide with what is generally understood as "medical technology" (eg. devices and equipment). Defining medical technology as applied knowledge is more appropriate for the purposes of this study. Both the USA's National Health Institute's Office of Technology Assessment[5] and the Canadian Institutes of Health[6] limit their definitions in this way.

There are also practical implications of including knowledge in the definition of medical technology. The impact on healthcare expenditure of the generation of knowledge leading to innovation and improvement of health is difficult to assess. The practical issues involved with the use of the definition are likely to be quite different when considering different types of medical

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[2] *The Virtuous Cycle – Working Together for Health and Medical Research – Health and Medical Strategic Review – 1999*. This is available on the internet at: http://www.nhmrc.gov.au/wills/contents.htm (accessed Dec 2004).

[3] Access Economics. *Exceptional Returns – The Value of Investing in Health R&D in Australia*. Report for The Australian Society for Medical Research. September 2003. This is available on the internet at: http://www.asmr.org.au/general/Except.pdf (accessed Dec 2004)

[4] Access Economics. *Exceptional Returns – The Value of Investing in Health R&D in Australia*. Report for The Australian Society for Medical Research. September 2003. This is available on the internet at: http://www.asmr.org.au/general/Except.pdf

[5] Okunade, A. and Murthy, V. (2002). "Technology as a 'major driver' of health care costs: a cointegration analysis of the Newhouse conjecture". *Journal of Health Economics*. Vol 21, pp 147-159.

[6] Canadian Institutes of Health Research, E-Health Thesaurus. This is available on the internet at: http://www.hc-sc.gc.ca/ohih-bsi/res/thesaurus/thesaurus_alpha_e.html#HEALTHTECHNOLOGY (accessed Dec 2004)

technology. Some stakeholders may miss the significance and breadth of the review, because their understanding of "medical technology" is likely to be traditional rather than broad.

However, if the Commission retains knowledge in the definition of medical technology, the role of the NHMRC in improving the utilisation of research findings in health through the work of its Health Advisory Committee (HAC) is important. HAC manages and coordinates the development of health advice in various forms including clinical practice guidelines and public health guidelines, and in areas including health procedures, health promotion and infection control. In this way it contributes to the advancement of medical technology. As well as producing guidelines it updates and promulgates standards for the development of evidence-based guidelines and advice for other organisations.

One of the key ways the NHMRC aims to improve the health of all Australians is by contributing to the development of evidence based advice. This assists in translating research into better health practice and outcomes. The impact of these evidence based guidelines – that is, the impact of improvements in knowledge – can be examined in two ways. Firstly, the impact of the guidelines could be examined by evaluating the impact of the treatment paths they propose. In an environment of scarce health resources, both the effectiveness and the cost to the health care system of a proposed treatment path are important. This can be reduced to two key questions: "Is the proposed clinical practice cost effective?" and "Is the proposed clinical practice economically feasible?" The reasons for undertaking the evaluations and mechanisms for answering these questions are described by NHMRC[7] to aid guideline creators in confronting the complex evaluation process that is required.

Secondly, by evaluating costs or savings as a result of the uptake of guidelines into practice, their impact on healthcare expenditure can be examined. While the body of literature exploring the effectiveness of the uptake of clinical practice guidelines is still developing, the NHMRC continues to aid research translation by developing guidelines and advice. Some studies question the effectiveness of guideline uptake[8], while others attempt to quantify the benefits to patients and healthcare systems as a result of implementation of evidence-based clinical practice guidelines.[9]

**Understanding the interaction between research and technology implementation**

Research, supported by the NHMRC or any other organisation, adds to the international stock of health and medical knowledge. Through further development, utilisation, and possibly commercialisation, research outcomes generated in Australia or overseas can be transformed into health and medical technologies, which may be utilised in a number of ways, including informing policy and practice, and improving health and medical procedures and devices. In all cases, the desired effect of the way health and medical knowledge is used is to improve health outcomes for consumers.

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[7] National Health and Medical Research Council. (2001). *How to compare the costs and benefits: evaluation of the economic advice*, Commonwealth of Australia, Canberra.

[8] Lockwood, S. "Evidence of me in evidence based medicine?" *British Medical Journal*, Vol. 329, no. 7473, 2004, pp. 1033-1035.

[9] Hunter, E., Brown, J., & McCulloch, B. "Encouraging practitioners to use resources: evaluation of the national implementation of a resource to improve the clinical management of alcohol-related problems in Indigenous primary care settings". *Drug and Alcohol Review*. Vol. 23, no. 1, Mar 2004, pp. 89-100.

White, V., Pruden, M., Giles, G., Collins, J., Jamrozik, K., Inglis, G., Boyages, J., & Hill, D. "The management of early breast carcinoma before and after the introduction of clinical practice guidelines". *Cancer*, vol. 101, no. 3, 1 Aug 2004, pp. 476-485.

It is possible that advances in medical and health technology arising from the knowledge generated by research may result in increases in health care costs for the individual and/or the nation. At a higher level however, expenditure on health care is influenced by factors such as the supply and demand for health care, and the many influences on these forces such as income levels, inflation and work force levels. If any relationship exists between increasing health care expenditure and advances in medical technology it cannot simply be attributed to the effects of health and medical research and its subsequent outcomes. Rather, the creation of knowledge through research supported by the NHMRC benefits Australians by delivering improved health outcomes and economic gains. These benefits impact on individuals through advances in health and medical technology and practices. Financing and access or eligibility arrangements in relation to the provision of new technologies, are all factors that need to be considered in evaluating the relationship between medical technology and health expenditure, as are commercialisation and intellectual property rights, increased human and institutional capacity for further research and the utilisation of advances in health care practices.

Although in some quarters there is the perception of an adverse relationship between technology and health care costs, it is often the case that advances in medical technology arising from the knowledge generated by research often results in decreases in health care costs (eg. laparoscopic procedures; pharmaceuticals to reduce rejection after organ transplantation).

The Organisation for Economic Cooperation and Development (OECD) recognises the challenge of creating policy which encourages the uptake of efficient and effective healthcare technologies and has assembled an Expert Group on New and Emerging Technologies. Initial work by this group highlights that across the spectrum of OECD member countries there is much variation in how and where decisions about technology uptake are made, who is involved in the decision making, the range of choices available to decision makers, and what evidence is used in the decision making process. It recognises that at some level, policy should be developed and implemented to encourage accountability and value-for-money in making decisions about how new medical technology is used in healthcare systems.

To assist in the provision of evidence to inform health care policy and practice, the NHMRC recently announced funding of $11 million over five years for successful applications under its *Health Services Research Grants - Economics and Financing of Health* scheme.[10] This scheme aims to develop increased expertise and capacity in policy and service delivery-related research and promote effective linkages between researchers, policy makers and service providers, with particular focus on health economics. To achieve this, the scheme provides long-term and substantial funding to enable the development of programs of health care policy and practice relevant research, and encourages the integral involvement of policy makers, health service providers and consumers in the identification of research questions, conduct of the research and uptake of the findings. The research supported will provide crucial evidence to inform policy and practice in a way that offers the potential for enhanced utilisation of research knowledge and implementation of medical technology to reduce health care costs.

[10] Further information concerning the successful applications under the *Health Services Research Grants - Economics and Financing of Health* is available on the internet at: http://www.nhmrc.gov.au/funding/hlthserv.htm

**Implementation and evaluation of health and medical technology**

The effects of health and medical research outcomes on increasing health care expenditure are determined not by the funders or producers of research outcomes, but by those responsible for the utilisation of the knowledge in the form of medical technology. While the NHMRC plays an important role in supporting excellent health and medical research in Australia, other Australian Government agencies are responsible for evaluating the value of health and medical technologies, the economic impacts of these technologies, and the way they could be best implemented in Australia.

The Australian Government aims to limit the growth in the health care expenditure by evaluating new technologies against those that exist already and only subsidising those that provide cost-effectiveness, efficacy, and improved patient outcomes. For example, health care expenditure on pharmaceuticals by the Australian Government is influenced largely by evaluation of pharmaceuticals by the Pharmaceutical Benefits Advisory Committee (PBAC) and provision through the Pharmaceutical Benefits Scheme (PBS). The PBAC takes into account a number of factors when considering the inclusion of a new medicine on the PBS, including:

- the conditions for which the drug has been approved for use in Australia by the Therapeutic Goods Administration;
- the conditions in which use has been demonstrated to be effective and safe compared to other therapies;
- the costs involved with including it on the PBS;
- other factors such as costs of hospitalisation or other alternative medical treatments, patient quality of life, community usage, maximum quantities to be used per individual;
- economic evaluation (by the Economics Sub-Committee of the PBAC); and
- patterns of drug utilisation in Australia (by the Drug Utilisation Sub-Committee of the PBAC).

Similarly, the number and type of procedures supported by the Australian Government is decided by the Medical Services Advisory Committee (MSAC). MSAC ensures that new and existing medical procedures attracting Medicare benefits are supported by scientific evidence as being safe, clinically effective and cost effective.

The implementation of knowledge and outcomes from health and medical research could involve similar evaluation to ensure implementation meets the goals of the health system such as safety and cost effectiveness. While some medical technologies may contribute to increasing health care expenditure, evaluation could highlight the range of costs associated with some technologies which have the potential to deal with the same problem.

The uptake of medical knowledge and advice at the health service provision level is an important determinant of the impact of technology on Australia's healthcare expenditure. Understanding the process by which knowledge and advice is transformed into health practice and medical technology is difficult because it involves a complex decision making process involving social, political, financial, professional and institutional factors. The NHMRC's role in this process is to peer evaluate the most current knowledge and present it in more accessible forms such as guidelines and advice. Its statutory obligations however limit its involvement in the decision making process beyond this stage.

## Conclusion

Health and medical research plays an essential role in improving health outcomes for Australians. The NHMRC leads the way in this area and supports most of the health and medical research conducted in Australia. The research outcomes produced can be utilised in many ways, some contributing to higher health care expenditure, but others giving cost-effective solutions for health and medical problems. Increasing health care costs and having the capacity and tools to evaluate medical technologies for their efficacy and economic impacts is a problem currently faced by many countries. The Australian Government has excellent systems for evaluating the costs and benefits of new and existing pharmaceuticals and some medical technologies. It needs to continue to meet the challenge of developing policy and practices for evaluating other forms of new medical technology to ensure that more evidence is available on cost-effective use of these technologies.