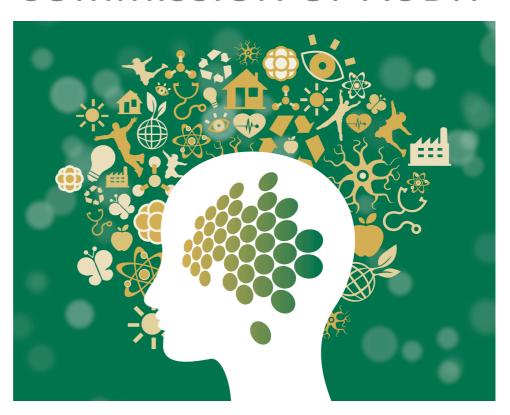


SUBMISSION TO THE AUSTRALIAN COMMISSION OF AUDIT



November 2013

Commonwealth Government funding of health and medical research

ABOUT RESEARCH AUSTRALIA

Research Australia is an alliance of 160 members and supporters advocating for health and medical research in Australia. Research Australia's activities are funded by its members, donors and supporters from leading research organisations, academic institutions, philanthropy, community special interest groups, peak industry bodies, biotechnology and pharmaceutical companies, small businesses and corporate Australia. It reflects the views of its diverse membership and represents the interests of the broader community.

Research Australia's mission is to make health and medical research a higher priority for the nation. We have four goals that support this mission:

- A society that is well informed and values the benefits of health and medical research.
- Greater investment in health and medical research from all sources.
- Ensure Australia captures the benefits of health and medical research.
- Promote Australia's global position in health and medical research.

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SUBMISSION TO THE AUSTRALIAN COMMISSION OF AUDIT

COMMONWEALTH GOVERNMENT FUNDING OF HEALTH AND MEDICAL RESEARCH

INTRODUCTION

Research Australia welcomes the commitment the Commonwealth Government has made to protect funding for health and medical research (H&MR).

The Commonwealth Government has a long history of support for H&MR and this support is provided through a range of different programs. Some of these are dedicated programs specifically for this purpose; others are programs designed to provide support for research more generally, for universities, or for parts of the health system. All are integral to the H&MR enterprise.

The benefits of Commonwealth Government funding to the Australian community and economy have been demonstrated by many reports and reviews over the years. This includes the report commissioned by the Australian Government in 1998 (the Wills Review), which demonstrated the virtuous cycle of Government support leading to an increased investment in research and an expanded industry sector that benefits from, and invests in research¹; and the more recent report of the 2011/12 Strategic Review of Health and Medical Research (the McKeon Review) which recommended a greater strategic investment in health and medical research as a means of curbing the escalating cost of providing health care.²

H&MR is conducted in a range of different types of organisations across Australia- higher education institutions; dedicated not for profit research institutes; hospitals and local health networks; small local businesses and multinational corporations. There is also a range of different funding sources,

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¹ Australian Government, Health and Medical Research Strategic Review, 1999

² Australian Government, Strategic Review of Health and Medical Research, February 2013

including various Commonwealth, State and Territory government programs, philanthropy and private sector investment. All these different components are inter-related and co-dependent.

The purpose of this submission is to draw the Committee's attention to the breadth and nature of Commonwealth Government funding for the H&MR sector, so that the Committee is conscious of the implications that its decisions in apparently unrelated areas may have for Australian H&MR.

Research Australia also wishes to highlight the scope for additional targeted research to improve the effectiveness and efficiency of Australia's health system, and thus help to curb the growth in future Commonwealth Government health expenditure.

This submission provides an overview of Australian health and medical research, identifies Commonwealth government sources of funding and support, the role of State Governments, the importance of the H&MR research sector to the economy, and the role H&MR can play in assisting the Commission in its task of addressing waste and duplication in Commonwealth Government expenditure.

DEFINING HEALTH AND MEDICAL RESEARCH

One of the immediate issues faced in undertaking any review of health and medical research is defining it. Research Australia uses the following definition:

Health and medical research is research that aims to improve the health and well being of people. It draws on our knowledge of the human body and the world around us to find ways to cure and prevent disease, reduce injury and disability, improve the delivery of health services and help us to lead longer healthier lives.

H&MR embraces a range of different disciplines including biology, physiology, pharmacology, chemistry, engineering, biotechnology, epidemiology, medicine, psychology, nursing, allied health, population studies, IT, mathematics, economics and health services research.

It is concerned with basic discoveries about how our bodies and minds function and respond to disease; the development of new drugs, procedures and therapies, influencing behaviour to improve health, and making our health services more effective and efficient.

As with any definition, there are areas at the boundaries that test it. For example, basic research into cell function is not regarded as health and medical research, even though the discoveries from such research underpin our understanding of human physiology and responses to disease. Similarly, research in nanotechnology may lead to the development of new materials that have application in medical devices, but the basic research is not considered to be health and medical research. (The research required to apply these new material to medical devices would fit the definition.)

At the other end of the scale, health and medical research includes research in disciplines such as health economics and public health. These disciplines, while often far removed from the laboratory and the traditional image of science, nonetheless play a critical part in ensuring the translation of research, the delivery of safer, more effective and efficient health services, and a healthier population.

COMMONWEALTH GOVERNMENT EXPENDITURE ON HEALTH AND MEDICAL RESEARCH

As noted in the introduction, the Commonwealth Government has a long history of support for H&MR and this support has various humanitarian and economic objectives:

- relieving human suffering;
- improving the health and well being of all Australians;
- making the Australian health system more effective and efficient;
- supporting the commercialisation of Australian intellectual property;
- building Australia's advanced manufacturing capability.

Some of these objectives are met through programs that are specific to H&MR; others are met through more general programs and support, such as for higher education or industry. This complexity, coupled with the difficulty of defining health and medical research, makes it difficult to quantify the source and extent of the Commonwealth Government's financial support for health and medical research.

The Australian Institute of Health and Welfare (AIHW) has estimated that the Commonwealth Government expended \$3.86 billion on H&MR in 2011-12.³ The McKeon Review commissioned its own research, which estimated that the Commonwealth Government expended \$2.9 billion on H&MR in 2011-12.⁴ The Department of Industry also undertakes an analysis of the level of Commonwealth Government support for Science, Research and Innovation. It has estimated that the Commonwealth Government's support for the Socioeconomic Objective of Health for 2011-12 was \$1.37 billion.⁵ The variation in these three estimates is an indication of the complexity of the H&MR sector as well as definitional and methodological issues.

Estimates of Commonwealth Government expenditure on H&MR

Source	Estimate of Commonwealth Government expenditure on H&MR
AIHW	\$3.86b
McKeon Review	\$2.9b
Department of Industry	\$1.37B

³ AIHW, Health Expenditure Australia 2011-12, Table A3, p.71

⁴ Australian Government, Strategic Review of Health and Medical Research, February 2013, p.34

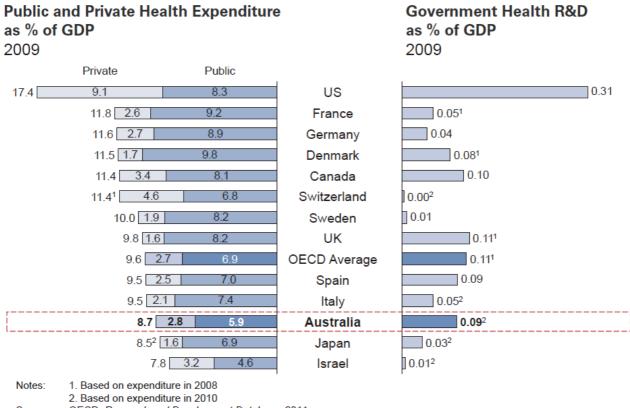
⁵ The Australian Government's 2013-14 Science, Research and Innovation Budget Tables, Table 5. See Appendix 1 for an explanation of Socio Economic Objectives.

Public support for Government investment in H&MR

Polling undertaken by Research Australia indicates that the Australian public both understands and values the role of the Commonwealth Government in funding H&MR. Please refer to Appendix 2 for more detail.

International comparisons

The role of governments in funding health and medical research is recognised globally. More than most areas, H&MR is dependent on government investment and support because many of the products of H&MR, particularly in public health and the translation of best practice in primary care are not amenable to commercialisation. By global standards, the investment by Australian governments in H&MR is relatively modest, as the following tables illustrate.⁶



Source: OECD, Research and Development Database, 2011

Competitive grant programs

The most visible component of Commonwealth Government funding of health and medical research is the National Health and Medical Research Council (NHMRC) grants program, and to a lesser extent the Australian Research Council (ARC) grants programs.

 $^{^{6}}$ Australian Government, Strategic Review of Health and Medical Research, February 2013, p.33

NHMRC

The NHMRC will provide approximately \$850 million in grants for health and medical research in the current financial year. There has been a substantial increase in NHMRC funding since 2004-5, and an even greater increase in research capacity, with grant application success rates actually falling over this period. In the most recent round of NHMRC project grants in October 2013, the grant application success rate fell to 16.9% from 20.5% for the previous round. And the low success rate does not reflect poor quality grant applications- it was reported that more than 55% of applications were deemed to be worthy of funding, 'but there just wasn't enough money to go around.'⁷

Australian Research Council

The ARC will provide approximately \$930 million in grants in the current financial year. While it does not fund 'Medical and Dental Research', a significant proportion of ARC funding is provided to research that fits within a broader definition of health and medical research. The role of the ARC in funding H&MR was highlighted recently in Parliament, by the Hon. Christopher Pyne, Minister for Education:

'The ARC's value here is in its flexibility—for the ARC works in all disciplines. Take for example the Future Fellow Professor Martina Stenzel. Although her background is in chemistry, she has taken her breakthrough work in nanoparticles into the hospital, to help cancer patients. Her unique platinum project, to develop nano-sized drug delivery containers for the targeted delivery of platinum containing anti-cancer agents, bridges a gap between chemistry and medicine in a way that perhaps only an ARC fellowship can effectively support.'9

Research Australia's analysis of completed ARC National Competitive Grant Projects since its inception in 2001 to 2012 suggests that on a conservative estimate, at least 10% of ARC project grants are related to health and medical research. This estimate is consistent with the statement made by the ARC CEO, Professor Aidan Byrne, recently in a Senate estimates hearing, that the ARC currently 'funds roughly 10% to health'. This includes a range of projects from medical device engineering to health economics. On this basis, it is estimated that approximately \$93 million of ARC grants in the current financial year will relate to H&MR.

Higher Education Sector

⁷ The Australian Newspaper, 26 October 2013, http://www.theaustralian.com.au/higher-education/falling-grant-success-rates-will-kill-careers/story-e6frgcjx-1226746104303#sthash.EqqtZkLv.dpuf

⁸ Refer to Appendix 3 for the ARC's definition of 'Medical and Dental Research'.

⁹ The Honorable Christopher Pyne, Minister for Education, Second Reading Speech, Australian Research Council Amendment Bill 2013, 14 November 2013

¹⁰ Hansard, Senate Education and Employment Legislation Committee Estimates Hearing, 20 November 2013, p.43

The Higher Education sector is critical to the conduct of health and medical research, expending \$2.66 billion on H&MR in 2010. Equally, health and medical research is critical to our higher education institutions, with health and medical research accounting for approximately one third (32.4%) of all research expenditure by the Higher Education sector.¹¹

The majority of this funding is derived from the Commonwealth Government. In addition to NHMRC and ARC grants, which have already been described, there are a number of other Commonwealth Government funding programs that are critical to health and medical research in the higher education sector.

Research Block Grants

There are six Commonwealth Government grants programs that support research activities in the higher education sector. These programs are allocated based on criteria related to the conduct of research, such as the value of an institution's competitive research grants and the number of research students. In 2013, expenditure on these programs was approximately \$1.67 billion. ¹² On the basis that H&MR accounts for one third of all R&D expenditure in higher education institutions, approximately \$550 million of the research block grants relates to H&MR.

Other targeted Commonwealth Government funding

Other programs include Co-operative Research Centre (CRC) funding and specific grants and contracts to undertake research in specific areas.

General University Funds

Universities typically have discretion as to how these funds are allocated between teaching, research and other activities. In addition to private income such as fees bequests and donations, this includes some funding from the Commonwealth Government. For 2012-13, The Commonwealth Government contribution to General University funds is estimated to be \$1.7 billion.¹³

Other Commonwealth Government expenditure

Department of Health

The Department of Health funds a number of programs directly from its own budget; examples are the Adult Stem Cell Research Centre, Cancer Clinical Trials, and the National Public Health Communicable Disease Control Research Centres. In 2012-13, the estimated actual expenditure on these programs was \$77.9 million.¹⁴

¹¹ ABS 8111.0, Research and Experimental Development, Higher Education Organisations, Australia 2010, Table 9 SEO Health (\$2,657,700,000) divided by total expenditure (\$8,202,999,000); Table 4, by source of funds

¹² Dept. of Industry website, 20 Nov. 2013 www.innovation.gov.au/Research/ResearchBlockGrants/Pages/default.aspx

¹³ The Australian Government's 2013-14 Science, Research and Innovation Budget Tables, Table 5.

¹⁴ The Australian Government's 2013-14 Science, Research and Innovation Budget Tables, Table 3, Department of Health and Ageing (excluding NHMRC)

CSIRO

The CSIRO undertakes research across a wide range of areas, including health. No official estimate of the expenditure on health and medical research is available although an analysis suggests it was 15-20% of 2011-12 research expenditure.

Commercialisation Australia

Commercialisation Australia is an initiative of the Commonwealth Government. It is a competitive, merit-based assistance program offering funding and resources to accelerate the business building process for Australian companies, entrepreneurs, researchers and inventors looking to commercialise innovative intellectual property. As at 10 October 2013, Commercialisation Australia had accepted a total of 469 participants with grant support of \$198.5 million. 15 101 of the grant recipients' products (21%) are in the 'health and medical' market.

In addition to Commercialisation Australia there are other industry assistance programs which may also benefit organisations undertaking and/or commercialising health and medical research.

R&D Tax Incentive

The R&D Tax Incentive is a Commonwealth Government program that helps businesses offset some of the costs of doing R&D. Introduced in its current form for the 2011/12 financial year, its two core components are:

- a 45 per cent refundable tax offset (equivalent to a 150 per cent deduction) to eligible entities with an aggregated turnover of less than \$20 million per annum; and
- a non-refundable 40 per cent tax offset (equivalent to 133 per cent deduction) to all other eligible entities.

While the program is still in its infancy, there is some evidence that it has been very successful, with the Commonwealth Government's August 2013 financial statement upgrading the estimate of expenditure on the measure by \$304 million for 2013-14, and to \$1.2 billion of the four years to 2016-17. Anecdotally, the R&D tax incentive has encouraged additional investment by the private sector in H&MR, including in clinical trials and new manufacturing facilities to support clinical trials and other research; no official statistics on the expenditure are currently available.

Infrastructure Funds

Facilities for health and medical research have benefited from funding allocations made from two of the Future Funds- the Education Investment Fund and the Health and Hospitals Fund- through

¹⁵ Commercialisation Australia website, 20 Nov, 2013,

http://www.commercialisationaustralia.gov.au/OurParticipants/Pages/default.aspx

¹⁶ Australian Treasurer and the Minister for Finance and Deregulation, *August 2013 Economic Statement*, p.36

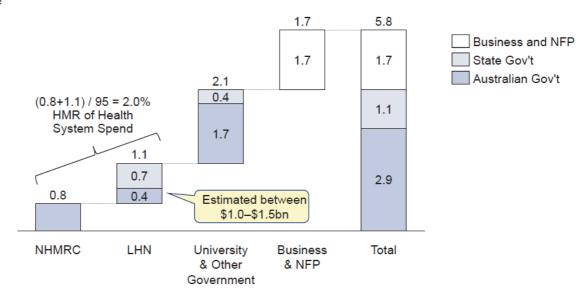
their association with higher education and health institutions respectively. (These allocations are outside the normal budget cycle and processes.)

STATE AND TERRITORY GOVERNMENT INVESTMENT IN H&MR

State and Territory Governments also provide financial support for H&MR. The report of the Strategic Review of Health and Medical Research estimated that in 2011-12, the State Governments invested \$700 million in H&MR through Local Health Networks and a further \$400 million through other avenues.¹⁷

Estimate of different sectors' contributions to H&MR¹⁸

Total HMR Investment¹ \$bn 2011-12e



This investment takes a number of different forms. State and Territory governments:

- support the participation of hospital and other parts of the health system in clinical trials and other research activities;
- make significant contributions to the building of research facilities, particularly where colocated with health infrastructure such as hospitals; and
- provide additional funding to medical research institutes to help meet the infrastructure costs and overheads associated with research funded by Commonwealth competitive grant schemes.

¹⁸ Ibid, p.33

¹⁷ Australian Government, Strategic Review of Health and Medical Research, February 2013, p.34

Appendix 4 provides a recent example of funding for health and medical research by a State Government.

H&MR also benefits from State and Territory government programs designed to achieve strategic goals such as supporting specific industries and skill development.

As significant providers of health services it is important that the State and Territory governments continue to participate in H&MR; particularly in its translation and in research to improve the safety and efficacy of the provision of health services. The funding for H&MR provided by State and Territory governments tends to complement rather than duplicate the funding provided by the Commonwealth.

ECONOMIC BENEFITS OF GOVERNMENT EXPENDITURE ON HEALTH AND MEDICAL RESEARCH

Research Australia recognises that the Commission's role is to identify areas of waste, duplication, and areas where government support is no longer needed, rather than the broader economic benefits of Government expenditure in particular areas. Nonetheless, Research Australia submits that it is important to consider the wider economic benefits of Government support for H&MR and the benefits it provides to the broader Australian economy.

As noted above, to a greater extent than most areas, H&MR is dependent on Government investment and support because many of the products of H&MR, particularly in public health and the translation of best practice in primary care, are not amenable to commercialisation.

Australia has world class health and medical researchers, engaged in a global, high value and information intensive industry. Australian H&MR supports a burgeoning biotechnology industry and a sophisticated pharmaceutical manufacturing sector. The biomedical sector is Australia's largest high value exporter, with around \$4 billion per annum in exports over the last two financial years. ¹⁹ Numerous reports and studies over the last decade have highlighted the economic benefits of the investment of governments in health and medical research. While there is insufficient space to address these in this submission, the following publications are listed for further reference:

- Deloitte Access Economics, commissioned by the Australian Society for Medical Research,
 Returns on NHMRC funded Research and Development, October 2011
- National Health and Medical Research Council, Health and Medical Research and the future in NHMRC's 75th Year The virtuous cycle and the economic benefits of health and medical research, 2011
- Lateral Economics, commissioned by Research Australia, The economic value of Australia's investment in Health and Medical Research: Reinforcing the Evidence for Exceptional Returns, 2010
- Access Economics, commissioned by the Australian Society for Medical Research, Exceptional Returns II: The value of Investing in Health R&D in Australia, 2008
- Access Economics, commissioned by the Australian Society for Medical Research, Exceptional Returns The value of Investing in Health R&D in Australia, 2003

Improvements in health over the last century have been driven by H&MR, and there is more to be achieved. One of the greatest challenges facing the Australian community and economy over

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¹⁹ Australian Bureau of Statistics, Cat. 5368.0, *International Trade in Goods and Services*, quarterly

coming decades is the ageing of the population, and increasing the workforce participation of older workers. The greatest threat to the participation of older workers is disability, particularly resulting from chronic disease. Economic modelling by Monash University estimates that

'health improvements for 10% of the unhealthiest older workers can have strong macroeconomic effects; we estimate that (with such an improvement) employment can rise by 0.13% and real GDP by 0.1% over the period 2011-2030.

This is just one example of the economic benefits of improving the health of Australians. The key to achieving this is reducing the impact of chronic disease, through new discoveries and the better application of existing knowledge to individuals. This requires a strategic approach to health and medical research in fields as diverse as population health and the study of normal and abnormal cell formation.

²⁰ Verikos G, Dixon P, Rimmer M, Harris A, *The Impact of Changes in Health Status: An Economywide Analysis for Australia*, The Centre of Policy Studies, Monash University, 2012, page 25

AUSTRALIAN HEALTH FXPFNDITURE

The AIHW estimates that in 2011-12, Australian Health expenditure was \$140.2 billion, and that it has grown from 8.4% of GDP in 2001-02 to 9.5% of GDP in 2011-12.²¹ The largest single contributor to this expenditure is the Australian Government; the AIHW estimates that it was responsible for 42% of all health expenditure in 2011-12.²²

Curbing future increases in health expenditure

One of the key findings of the McKeon Review was that H&MR has the potential to significantly slow the rate of increase of the cost of health care; a relatively small ongoing increase in well-targeted expenditure on H&MR has the capacity to deliver significant ongoing savings.

Achieving this, however, requires greater investment from, and better co-ordination between, Commonwealth, State and Territory governments. The Review has identified that 'Australia needs a comprehensive strategic plan to ensure it optimises government investment in HMR', and the Australian Government needs to take the lead. Doing so will require specific additional funding.

Research Australia recommends that the Commission of Audit consider the McKeon Review and the adoption of its recommendations as a means of reducing cost, waste and inefficiency in the health system. In particular, an investment in health systems and health services research has the potential to identify improvements and efficiencies in the health system and to reduce and redirect expenditure. A greater investment in public and preventive health provides significant opportunities to reduce demand for health services.

²² Ibid

²¹ AIHW, Health Expenditure Australia 2011-12, Summary, p.viii

CONCLUSION

In areas as large and complex as the Australian health system, higher education, and government support for industry, there are inevitably inefficiencies and duplication of effort. There is, therefore, an opportunity to generate savings and improve both efficiency and effectiveness.

In identifying and evaluating such opportunities, Research Australia urges the Commission to be mindful of the potential impact these changes can have on H&MR in Australia, which is a delicate web of programs and support that have been developed over time and are interwoven through the health, higher education, not-for-profit and business sectors.

More positively, as has been identified by the McKeon Review, Australian H&MR has not only the potential to deliver future improvements in the health and wellbeing of the Australia population, but to reduce the rate of increase in health expenditure.

H&MR leads to new discoveries about how our bodies and minds function and respond to disease; the development of new drugs, procedures and therapies; and behavioural and lifestyle changes that improve our health. All of these discoveries help make Australians healthier and more productive, reducing the demand for health services.

Research to improve the translation of discoveries into practice and the delivery of health services has the potential to make our health system safer, more effective and efficient. With a total annual cost of more than \$140 billion, even relatively small improvements in the efficiency of the health sector can lead to significant savings in Commonwealth health expenditure.

Research Australia urges the Commission to consider the improvements, efficiencies and savings H&MR can deliver to Australia's health system, and to see it is a tool that can be used to further the Government's objectives.

Research Australia thanks the Commissioners for the opportunity to make this submission and would be pleased to provide further information or answer any questions that this submission may have raised.

SEO of Health

The Socioeconomic Objective (SEO) is one of three components of the Australian and New Zealand Standard Research Classification (ANZSRC), which is jointly produced by the Australian Bureau of Statistics (ABS) and Statistics New Zealand (Statistics NZ).

This SEO classification allows R&D to be categorised according to the **purpose** or **outcome** of the R&D.

The SEO is divided into five broad sectors:

- Sector A: Defence
- Sector B: Economic Development
- Sector C: Society
- Sector D: Environment
- Sector E: Expanding Knowledge

These sectors are further subdivided into categories. 'Health' is one of the four categories under 'Society':

Sector C: Society

- 92 Health
- 93 Education and Training
- 94 Law, Politics and Community Services
- 95 Cultural Understanding.

For further information, refer to the following ABS publication, available on the ABS website: Cat.1297.0 - Australian and New Zealand Standard Research Classification (ANZSRC), 2008

Research Australia, What do Australians think about health and medical research? 2013 Opinion Poll- views of 1000 Australians

What are our top priorities for the Federal Government?

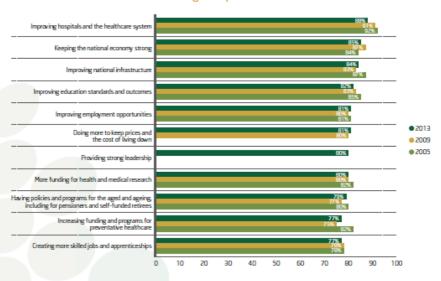
- Improving Hospitals and the Healthcare System remains No 1
- More funding for Health and Medical Research moves up to equal 6th
- Increasing funding and programs for Preventative Healthcare is equal 8th

Looking after Australians' health features in 3 of our top priorities for 2013. 88% of respondents gave 'Improving Hospitals and the healthcare system' a rating of 7 or more, the highest of all the listed priorities (For the purposes of analysis, a score of 7 or more on a scale of 0 to 10 is considered to be a rating of 'Important' to 'Extremely Important.) The ranking is consistent with Research Australia's polling over previous years, in which this has been the highest priority of an extensive list of issues. although the score is a little lower than in recent years. This year's results are compared to the 2005 and 2009 surveys in the table below, and reflect fairly consistent priorities over that period.

'More Funding for Health and Medical Research' is the equal 6th priority, together with 'Providing Strong Leadership'. 'Increasing Funding and Programs for Preventative Health' care is the equal 8th priority, with Skilled Job Creation.

Question detailed on next page. Base: All respondents n=1000





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For further information, including the full report, please refer to http://www.researchaustralia.org/advocacy-publications/public-opinion-polls

Definition of Medical and Dental Research²³

In December 2011, the ARC revised its definition of Medical and Dental Research. This definition aims to further clarify the eligibility of Proposals seeking ARC funding for research within this area.

Medical and Dental Research means research and/or training primarily and substantially aimed at understanding or treating a human disease or health condition.

Schemes that do not support Medical and Dental Research

A research proposal will be deemed ineligible for funding under the *Discovery Projects*, *Discovery Indigenous*, *Discovery Early Career Researcher Award* (DECRA), *Australian Laureate Fellowships*, *Future Fellowships*, *Linkage Projects* and *Centres of Excellence* schemes if it is primarily and substantially aimed at understanding or treating a human disease or health condition. This includes, but is not limited to, Projects that use established protocols or research tools that involve any of the following:

- a. late pre-clinical or early human trials of a human therapeutic agent, material or diagnostic test or device; or other interventional research involving humans;
- using material collected from human subjects for the primary purpose of studying the underlying causes, prevalence, epidemiology or mode of inheritance of a disease or human condition; or
- c. using established animal models or established cell lines for the purpose of studying the underlying causes, prevalence, epidemiology or mode of inheritance of a human disease or human health condition.

Under the above listed schemes, the ARC will not recommend for approval, and the Minister will not approve for funding, any Proposal that fails to satisfy the "eligibility criteria" set out in those Funding Rules, including if the ARC determines that a proposed project would fall within the area of Medical and Dental Research.

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²³ ARC Website, on 20 November 2013, http://www.arc.gov.au/applicants/md_research.htm



Jillian Skinner MP

Minister for Health Minister for Medical Research

MEDIA RELEASE

Wednesday, 20 November 2013

\$3.5 MILLION EQUIPMENT BOOST FOR CANCER RESEARCH

Medical Research Minister Jillian Skinner today announced \$3.5 million in funding for equipment to enable NSW cancer researchers to better understand cancer cells and discover new, targeted treatments.

Mrs Skinner said the 11 successful grant applicants will bolster cancer research, including brain cancer in children, advanced lung cancer, melanoma, profiling the DNA of cancer patients and mobile breast cancer imaging.

"NSW is home to some of the best cancer researchers in the world and arming them with innovative technologies is vital to further our efforts to fight and beat this terrible disease," Mrs Skinner said.

"This \$3.5 million investment in equipment and infrastructure will assist our cancer researchers to enhance the quality and scope of their work.

"By 2021, almost 51,000 people in NSW per year will be told 'you have cancer'. There really is no time to waste when it comes to supporting our researchers to undertake their life-changing and potentially life-saving work.

"As the state's first Minister for Medical Research I believe medical research is not just an after-thought - it is at the very heart of modern health care and has potential to profoundly impact lives for the better."

Mrs Skinner said four of the 11 research grant recipients have received close to \$1.5 million for projects which will allow greater understanding of cancer at cellular and genetic levels.

The new technology includes a storage facility for the Garvan Institute, which will house tens of thousands of patient genomes, allowing new patients to be compared with other patients who have similar genome profiles and for whom information exists, such as how they responded to different therapies.

Also being funded is a cutting-edge mass cytometry device at the University of Sydney which will allow researchers to simultaneously measure more than 40 characteristics of individual cells, greatly increasing their ability to understand and identify cancer cells and discover new targets for cancer treatment.

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