L.E.K.

"Costing Medical Research to Reform Health Outcomes"

The case for increased indirect cost funding for Australian accredited MRIs

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Preface

This report has been written and compiled by L.E.K. Consulting and commissioned by the Association of Australian Medical Research Institutes (AAMRI)

AAMRI represents the majority of Australia's independent medical research institutes (MRIs). AAMRI members are leaders in health and medical research excellence, both in Australia and internationally. All AAMRI members are not-for-profit organisations, are accredited with the NHMRC, and comply with the highest standards of ethical and financial accountability

The funding position of AAMRI members were surveyed for this report. The results were then extrapolated to include the few non-AAMRI independent, accredited institutes in order to represent the sector

The main purposes of this report are:

1. To benchmark the indirect costs of research faced by all Australian independent, accredited medical research institutes
2. To provide a comparison between indirect cost funding for all accredited MRIs and other national and international research sectors, including the Australian university sector
3. To propose a solution in the form of a Federal and State Government joint funding arrangement, to ensure Australian accredited MRIs maintain a pre-eminent competitive position

Executive Summary (1/3)

Medical research delivers significant benefits to Australia

- There are widely accepted direct health and social benefits associated with a vibrant and sustainable medical research sector, including improved health outcomes, new employment opportunities and the indirect "halo effect" of research excellence on the health and medical sector
- The benefits of medical research have been estimated in leading Australian and UK studies. The most conservative of these estimate an extremely healthy internal rate of return of 30 – 40 percent per annum
- Australia's accredited MRIs play a unique role in the medical research sector which is distinct to the research undertaken by universities and hospitals. MRIs are able to focus on health and medical research and therefore achieve high productivity and attract significant talent and philanthropic funding into the sector
- The continued success of Australia's medical research is reliant on transparent investment by Federal and State Governments in the indirect cost of medical research, in addition to providing direct grant funding

The indirect costs of medical research are sizable

- The indirect costs incurred by medical research are significant and integral to successful research. Indirect costs cover essential items critical to successful research which cannot be attributed to an individual research project, for example computing and bioinformatics centres, animal houses, and administrative staff and ethics committees
- L.E.K. conducted an extensive survey of 32 AAMRI member institutes (87% of all AAMRI members) with regards to their indirect costs and funding sources for the years 2005 to 2008 inclusive. These results have been extrapolated to represent all accredited MRIs
- The survey results indicate that indirect costs of research for Australian accredited MRIs are on average 60 cents per dollar of all peer-reviewed research funding

Executive Summary (2/3)

- This level of 60 cents of indirect costs per dollar of research grant is consistent with national and international studies which report indirect costs of research of 50 to 70 cents per dollar of peer-reviewed research income
- The Review of Australian Higher Education ("Bradley review") acknowledged the level of funding required for research and recommended additional funding towards indirect costs for universities. This recommendation was adopted by the Federal Government through the introduction of the Sustainable Research Excellence (SRE) program. The SRE program is a supplement to the existing university indirect cost funding scheme, the Research Infrastructure Block Grants (RIBG). The SRE program, in combination with the RIBG, will provide 60 cents per dollar of competitive research funding to universities by 2014
- In contrast, combined Federal and State funding for indirect costs incurred by MRIs is on average 30 cents per dollar of peer-reviewed funding, which covers only half of total indirect costs

Australian accredited MRIs are more productive than universities and should receive equitable funding

- MRIs should receive an equivalent funding rate to universities, given their significantly higher productivity in the delivery and commercialisation of research outcomes
- The ramp-up of the SRE will create a further funding gap between universities and MRIs of approximately 30 cents per dollar of research income by 2014. The discrepancy between government funding for MRIs and other research sectors needs to be resolved

Executive Summary (3/3)

Australia is a world leader in health research and development, but risks falling behind

- Australia is recognised as a global leader in health and medical research excellence
- However, Australia's private sector investment in medical research is likely to face increased regional competition in the future from a number of Asia-Pacific countries including China, India and Singapore
- Mature markets widely considered 'best practice', e.g. the USA and the UK, currently fully reimburse indirect costs (ranging from 50-70 cents per dollar of peer-reviewed funding), roughly double the level funded by the Australian State and Federal Governments
- There are significant economic and health risks to under-funding research in Australia, including the erosion of investment and talent to overseas countries, and the under-utilisation of new and existing capital works
- It is imperative that the funding of Australian accredited MRIs be maintained at globally-competitive levels to enable Australia to continue to produce excellent research, and attract and retain investment and world-class scientists

The Federal Government must increase its support of Australian accredited MRIs

- The indirect cost funding gap is significant, at 30 cents per dollar of peer-reviewed funding, or half of indirect costs. MRIs are currently funding this gap from sources which would otherwise be diverted into additional research
- The Federal and State Governments must contribute towards closing the gap to ensure MRIs maintain funding parity with universities and competitiveness on an international level
- An increase in Federal Government funding of approximately $140m per year by 2014 will be required to achieve this. An accompanying increase of $130m will be required from the combined State Governments
- This will ensure Australia maintains its international position as a leader in health and medical research excellence

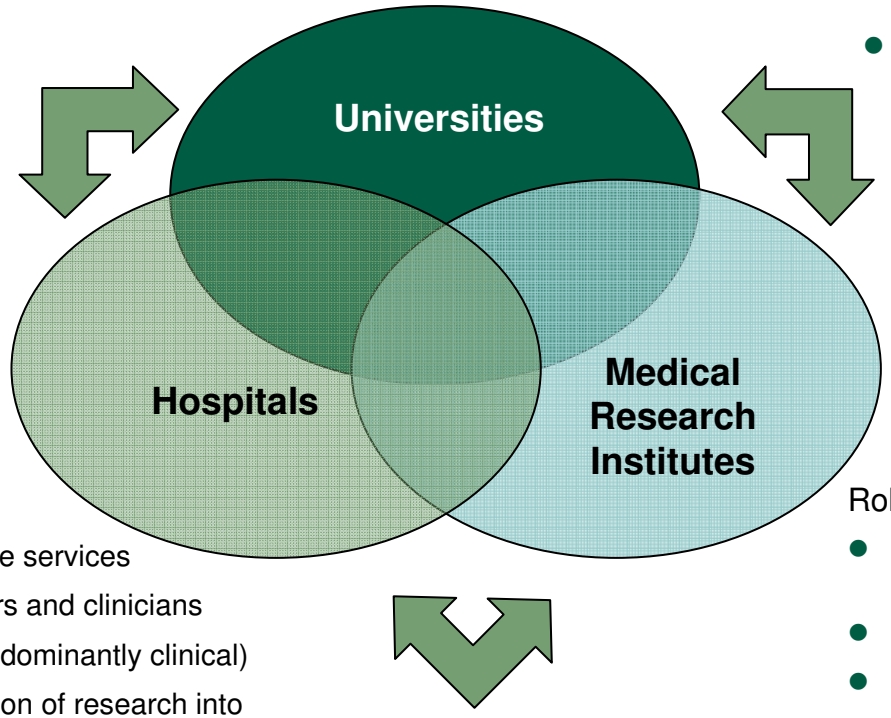
Section 1: Benefits of medical research

Medical research delivers significant commercial and social benefits to Australia

Medical research is carried out by universities, hospitals and medical research institutes (MRIs), with each necessary to the achievement of a productive and commercially innovative medical research sector

Role

- Education of researchers and medical professionals
- Research (predominantly laboratory and public health)
- Source of innovation for commercialisation organisations



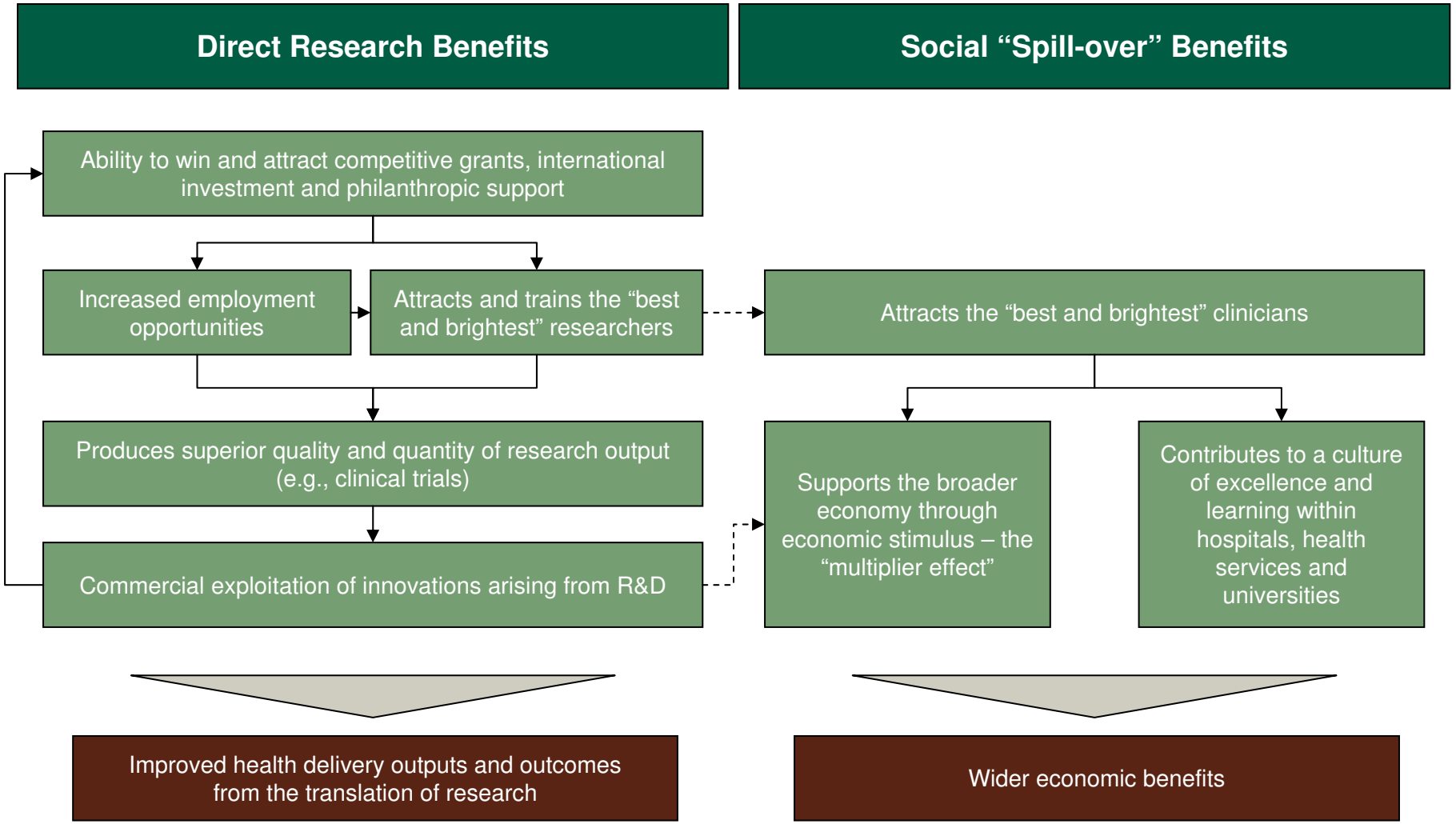
Role

- Provision of healthcare services
- Training of researchers and clinicians
- Medical research (predominantly clinical)
- Adoption and translation of research into clinical practice

Role

- Focused medical research (from laboratory to clinic)
- Research commercialisation and IP capture
- Training of researchers
- Attract philanthropic participation with medical research

The benefits of a healthy medical research community have been widely espoused



Source: Access Economics, 2008, 'Exceptional Returns II'; Wells R. & Whitworth, J. , 2007, 'Australia and New Zealand Health Policy'

Medical research plays an important role in addressing the Federal Government's National Health Priority Areas initiative

National Health Priority Area	Australian accredited MRIs with specific expertise
Arthritis and Musculo-skeletal Conditions	Hanson Institute; Menzies Research Institute
Asthma	Telethon Institute for Child Health Research; Woolcock; Garvan Institute
Cancer	Peter Mac; SVI St Vincent's Institute Medical Research; Children's Cancer Institute Australia
Cardio-vascular Health	HRI Heart Research Institute; Victor Chang Cardiac Research Institute
Diabetes and Obesity	Baker IDI Heart & Diabetes Institute; SVI St Vincent's Institute Medical Research
Injury Prevention and Control	Prince of Wales Medical Research Institute; The George Institute for International Health
Mental Health	Florey Neuroscience Institutes; Mental Health Research Institute

Source: Department of Health & Ageing, AAMRI

Australian accredited MRIs. Indirect Cost Funding.

Australian accredited MRIs are involved in many successful translational research programs which address the national health priority areas (1/2)

Examples: Mental Health and Asthma

Telethon Institute for Child Health Research - Asthma

TICHR scientists analysed the way that common allergens can lead to asthma in children

The scientists at the Telethon Institute developed a treatment that can create 'immunological tolerance' which turns off the child's allergic reactions. This 'educates' the immune system to avoid harmful responses, such as asthma attacks

A cost-benefit analysis by the Centre of International Economics stated that the benefits of this program arise from the reduced cost of asthma to the community, including medical costs and lost productivity. The work has attracted R&D and trial funds from overseas

It is expected that the treatment will significantly lower the impact and incidence of asthma in the future

MHRI – Development of Fast-Acting Alzheimer's Drug

The Mental Health Research Institute has studied Alzheimer's disease for more than 20 years. As a result of the research, they have made three major discoveries around the causes of Alzheimer's disease. These discoveries have led to the development of a product, PBT2, which is now in clinical trials

A safety trial (Phase 1) of PBT2 in healthy humans has been completed with satisfactory results; the Phase 2 trial of PBT2 is currently being undertaken in Sweden. This trial will test the drug in people in the early stages of Alzheimer's disease

The development of the drug to market is being carried out by PRANA Biotechnology Ltd, a dual-listed ASX and NASDAQ biotech

Source: Telethon Institute for Child Health Research; Mental Health Research Institute

Australian accredited MRIs are involved in many successful translational research programs which address the national health priority areas (2/2)

Examples: Cancer and Cardiovascular

Peter Mac – New Bone Cancer Treatment

Researchers from the Peter MacCallum Cancer Centre have led an international clinical study to develop a treatment for bone cancer, denosumab. The results of the new treatment have demonstrated substantial improvements in patients with bone cancer

Interim results of the international multicentre trial show 87 percent of patients treated with denosumab demonstrated significant improvement in their giant cell bone tumors after 25 weeks

This study is the result of Melbourne's cancer scientists and clinicians applying modern genomics technologies to unravel the causes of cancer. The study may result in a new and effective cancer therapy

Centenary Institute – National Genetic Heart Disease Registry

The Centenary Institute officially launched the World's First National Genetic Heart Disease Registry. The objective is to increase researchers' understanding of genetic heart disease to provide families of sufferers with information which allows them to initiate measures to prevent sudden cardiac death

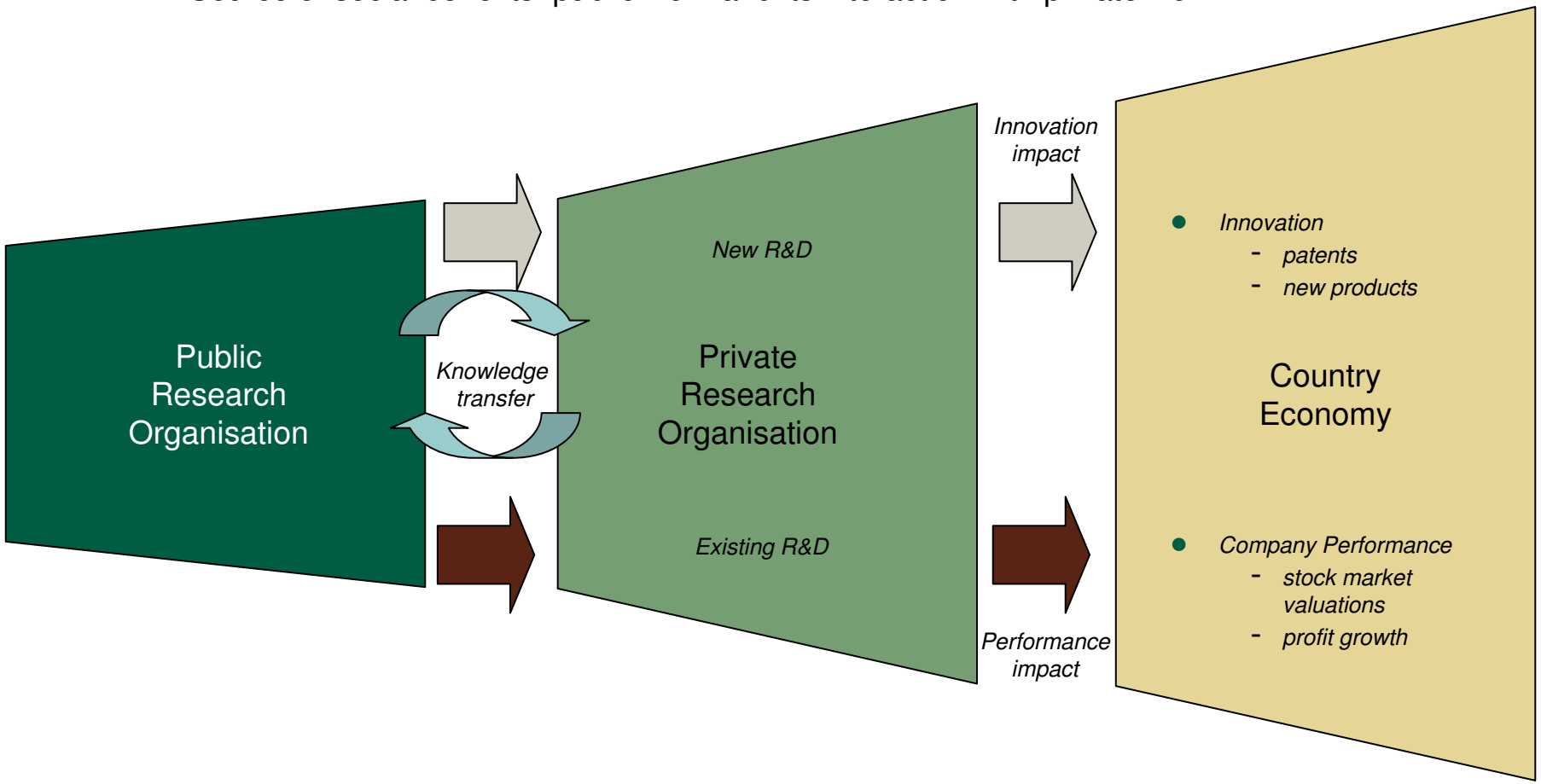
The database will build an accurate picture of genetic heart diseases in Australia. This will provide a key foundation for further research breakthroughs and personalised treatment of patient populations

The National Genetic Heart Disease Registry will lead to significant advances in research into genetic heart diseases, better treatment options and ultimately prevention of sudden cardiac deaths

Source: Peter MacCallum Institute; Queensland Institute for Medical Research

Social benefits of medical research include the value of innovation, and the impact on the performance of the private sector and wider economy

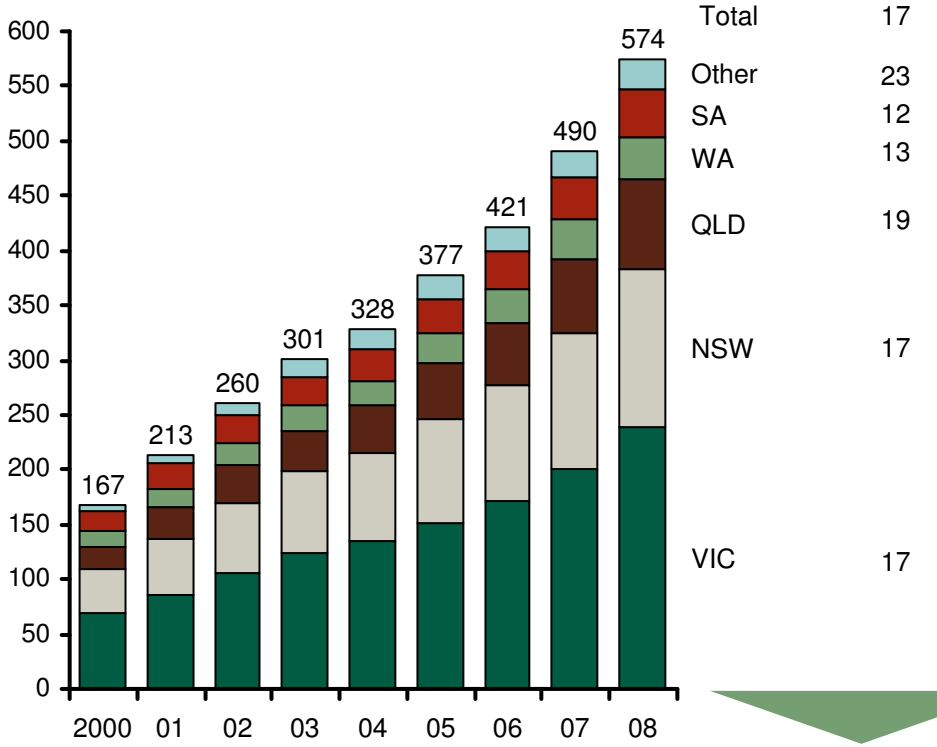
Source of social benefits: public R&D and its interaction with private R&D



Reference: Health Economics Research Group, Office of Health Economics, RAND Europe. Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK. London: UK Evaluation Forum; 2008

Government investment in the NHMRC has resulted in the creation of several thousand new research scientist jobs

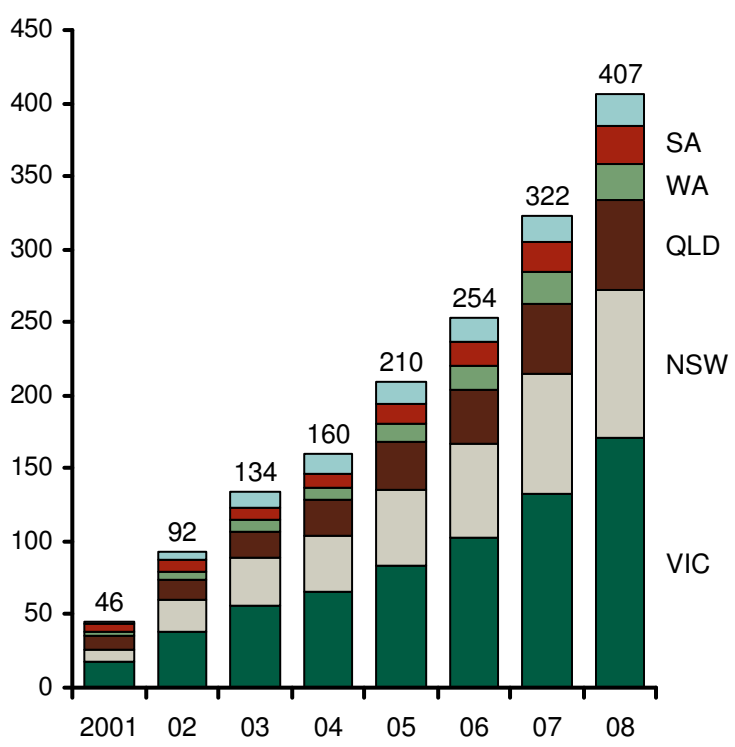
Total NHMRC grant value by state (FY 2000-08)



CAGR** percent (2000-08)

Total	17
Other	23
SA	12
WA	13
QLD	19
NSW	17
VIC	17

Cumulative increase in Australian NHMRC funding from 2000 levels (FY 2001-08)



Using a multiplier of 10 positions per million dollars of funding*, this has resulted in an annual increase of approximately 400 new positions per year in Australia from 2000-08, or 3,200 new positions over an eight year period

Note: * Based on average ratio of current research staff levels to direct research income in Victorian MRIs
**Compound Annual Growth Rate (CAGR) is the average annualised growth rate over a specified period of time

Source: NHMRC, 2009. NHMRC research funding dataset 2000–2009

A leading UK report has estimated that the total value of the direct and indirect benefits of medical research delivers an annual rate of return of 35 - 40 percent

Direct Health Benefits

- It is possible to measure the direct health benefits resulting from medical research. The value of direct benefits is the opportunity cost for each QALY related to medical research
  - quality adjusted life years (QALY) is a measure of the number of years of improved life resulting from medical intervention
  - the opportunity cost of a QALY is the amount of money an individual would pay to improve the quality of their life for one year
  - the value of direct health benefits is the total QALY value, net of the costs of the medical program
- The direct value is often expressed as a 'internal return' on the investment in the medical research. The internal rate of return (IRR) is the discount rate at which the present value of all the future cash flows from an investment, equals the cost of the investment
- The size of the return differs by therapeutic area

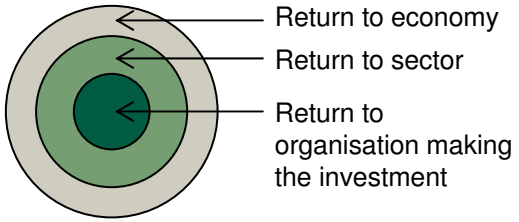
"… For CVD the IRR from the value of UK net health gains alone is just over 9 percent…"
Medical Research: What's it worth? report, 2008

'Spill-over' Benefits

- Publicly funded research provides significant benefits to the wider economy, in particular, private R&D

  "… In one study, 15 of the 21 drugs identified as having had the most impact on therapeutic practice were developed with input from the public sector …"
  Joint Economic Committee, US Senate, 2000

- Public research stimulates growth in other areas, as illustrated below;



- R&D investment in one organisation generates a benefit to itself, to other organisations in the same sector, and to other sectors in the economy

"… The GDP gains…(of) medical research deliver an additional rate of return …of 30 percent…"
Medical Research: What's it worth? report, 2008

Reference: Health Economics Research Group, Office of Health Economics, RAND Europe. Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK. London: UK Evaluation Forum; 2008

The latest Australian Access Economics report has calculated the return on investment (an alternative measure to IRR) of medical research and development to be 117 percent

- The 2008 Australian Access Economics report re-analysed the return on investment (ROI) created by medical research, previously cited in its 2003 review on the value of health R&D. (ROI is the profit, or return, from an investment as a proportion of the total cost of the investment*)

- The report states that the major return on investment is the increase in QALYs, referred to in the report as DALYs (Disability Adjusted Life Year)

  "… The major return on investment (ROI) from health R&D is the gain in wellbeing achieved from lowering mortality rates and associated morbidity, relative to what they otherwise would have been (i.e. in the absence of the R&D)…"
  Access Economics, 2008, Exceptional Returns: The value of investing in health R&D in Australia II

- The study took into account an average 'time lag' of 40 years between the R&D investment and the resultant health benefits. The net benefit was found to be an average of $2.3 billion per year

  "… The ROI analysis compared the value of the wellbeing gains projected to occur with a 40 year lag from the expenditure year, to take account of lags in R&D translation into benefits, and the long period for which benefits from R&D may continue to be realised…"
  Access Economics, 2008, Exceptional Returns: The value of investing in health R&D in Australia II

- The overall return of health R&D was calculated to be 117 percent, much higher than other private sectors, such as manufacturing and agriculture (50 and 24 percent respectively)
  - the return on health R&D was also found to be higher than the average gross rate of return reported by the Productivity Commission in 2007**, of 65 – 85 percent

Notes: * The ROI is a different measure to IRR (used in *Medical Research: What's it worth?*). IRR is a discounted measure, while ROI is reported in nominal undiscounted terms. Therefore, it is expected that the IRR would typically be smaller than the ROI for a particular investment
** Productivity Commission, 2007, Public Support for Science and Innovation, Productivity Commission Research Report

Reference: Access Economics, 2008, Exceptional Returns: The value of investing in health R&D in Australia II

Section One Summary – Benefits of medical research

- Medical research is carried out by universities, hospitals and MRIs. Each sector is necessary to achieve a productive and commercially innovative medical research sector
- There are widely accepted direct research and social benefits associated with a vibrant medical research community
  - medical research plays an important role in addressing the Government's national health priorities
  - innovation and commercialisation bring economic benefits to the private sector and wider community
- Australia's health and medical research has delivered significant health and social benefits
  - significantly increased the amount of competitive grants bestowed
  - increased employment opportunities
  - contributed to many translational research successes, particularly in areas that address the national health priorities
- Medical research contributes many far-reaching benefits to Australia. Leading Australian and UK studies have measured the benefits; of these, the most conservative has estimated the annual, ongoing return of publicly funded medical research of 30 – 40 percent*
- The continued success of Australia's medical research is reliant on the transparent investment of Federal and State Governments to offset the indirect cost of medical research, as well as direct research grants

Reference:* Health Economics Research Group, Office of Health Economics, RAND Europe. Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK. London: UK Evaluation Forum; 2008

Section 2: Indirect costs of medical research; methods and results of Australian accredited MRIs

The indirect costs of medical research are sizable (approximately 60 cents per dollar of research funding) and critical to research quality. The current level of indirect funding covers only half of indirect costs and is not supportive of high quality research

In order to estimate the indirect cost and indirect cost funding for Australian accredited MRIs, a subset of accredited MRIs was selected to represent the wider group

Participant MRIs in the study

- All members of AAMRI were invited to take part in this study. 32 of the 37 AAMRI members agreed to participate and provide details on their breakdown of peer reviewed and other funding, indirect costs, employee numbers and examples of translational and commercial outcomes for 2005-08
  - calculations were undertaken on a calendar year basis to be consistent with the IRIISS funding timeframe

MRI sample

- As the report was compiled within a tight timeframe, fifteen accredited MRIs were chosen as a representative sample for all Australian accredited MRIs:
  - the MRIs were chosen so that their size, geographic location and research areas were representative of the wider MRI group
  - the MRI sample was used to estimate the indirect costs and indirect cost funding as a proportion of peer-reviewed research funding
- The calculated results were extrapolated to represent all accredited MRIs
- Peer-reviewed direct grant funding was compiled from a larger sample size (26 of the participant MRIs) due to the availability of information

Indirect costs of research

- Indirect costs include three key categories: laboratory cost, building and facility costs and administration costs
  - in determining the indirect cost of research, the administrative costs of fundraising were excluded
- Indirect costs were assumed to grow in line with peer-reviewed research funding through to 2014

Definition of peer-reviewed grants

- Peer-reviewed grants are defined as those grants listed on the Australian Competitive Grants Register published by the Department of Innovation, Industry, Science and Research (DIIRD). AAMRI members reported their peer-reviewed research funding based on the grants included in this list

The indirect costs of research across universities, MRIs and hospitals includes general research, building and administration costs which cannot be attributed to a single research program

Laboratory costs

- Laboratory support costs cover the essential service platforms that are essential for medical research. These include technical services (e.g. biotechnicians etc.), laboratory equipment (e.g. microscopes, animal houses, etc.) and analytical services
- Some research and technology platforms, such as analytical and clinical services, cannot be attributed to a single grant and must be supported through indirect costs

Building and facilities cost

- Building and facilities operating costs cover the costs of occupying and maintaining the building. These include rent, services, waste removal, maintenance costs and facilities management staff

  "…Facilities also carry significant longer term maintenance and renewal costs that are not factored into ongoing funding arrangements…"

  Innovative Research Universities Australia, 2008, 'Funding the full cost of research'

Administration costs

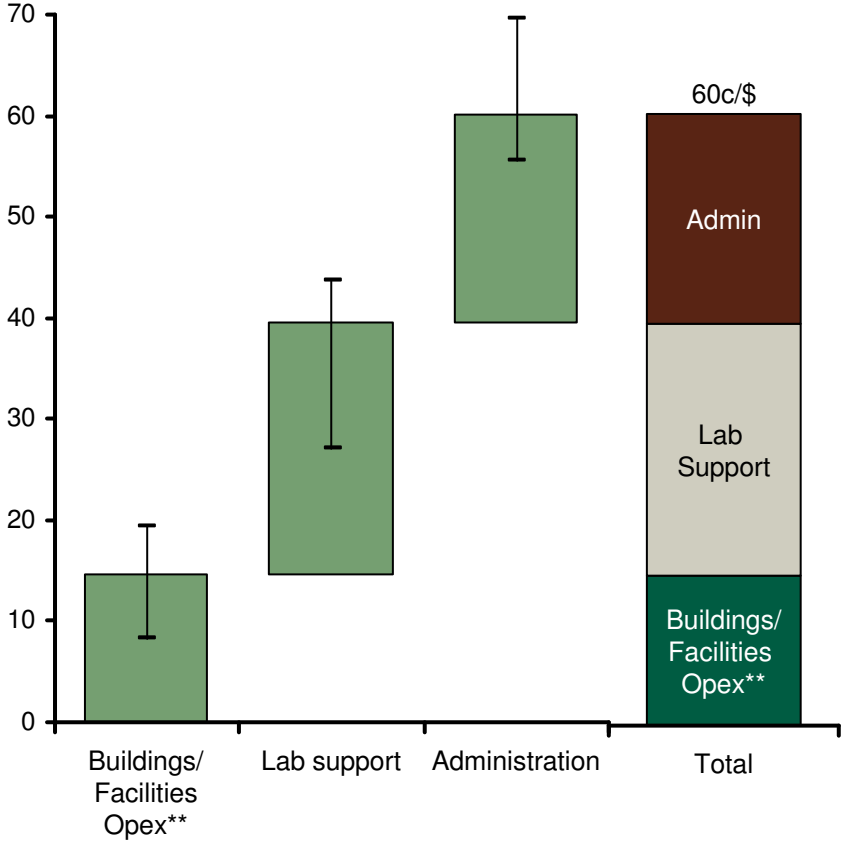
- Administration costs include activities critical to the efficient running of the institutions and impact their ability to attract competitive researchers, and to gain international recognition and commercial income from their research. Examples include administrative staff salaries, IT, OH&S, business development, financial management and HR

Source: The Allen Consulting Group, 2009. The indirect costs associated with university research funded through Australian Competitive Grants; Innovative Research Universities Australia, 2008. Funding the full cost of research

Indirect costs for Australian accredited MRIs are significant. Our results show that in 2008, indirect costs were approximately 60 cents per dollar of peer-reviewed research expenditure

Weighted average Australian MRI* indirect costs as a proportion of peer-reviewed research funding (2008)

Cents per dollar



- The range of lab support costs at individual MRIs can broadly be explained by the different types of research carried out in each

  "…There are good reasons for this variation among institutions. First, research is more expensive in some subjects than in others. Second, there are marked regional differences…"

  May, R.M., Sarson, S.C., 1999, Revealing the hidden cost of research

- MRIs incur high costs for procedures involving expensive technical or analytical services and for animal research. 'Dry' research (involving computer modelling) is usually lower in cost than 'wet' (laboratory-based) research. For instance, epidemiological research is often less costly than laboratory-based research

- Buildings and facilities costs are often higher for MRIs with new buildings due to larger depreciation costs. Buildings and facilities operational expenditure (opex costs) are usually lower for those MRIs that have long-established facilities

- Differences in administration spend are often due to deviation in salary expenditure due to organisational structure. For example, the total administration salary spend is higher in MRIs that have commercialisation or business development teams

Note: * Sample of 15 Australian accredited MRIs, range represents lower and upper quartile; ** Includes depreciation

Source: May, R.M., Sarson, S.C., 1999. Revealing the hidden cost of research, AAMRI member data; Westmead Millennium Institute, 2004. Submission to the Investment Review of Health and Medical Research; L.E.K analysis

Indirect costs of research for Australian accredited MRIs are continuing to increase across the board

- Budgetary pressures have resulted in universities and hospitals increasingly shifting costs onto co-located MRIs where previously these services were provided free-of-charge

  "… The hospital stopped funding the service of our fire safety systems a few years ago. Although we are an independent MRI, we are located on a hospital campus and our building is part of the hospital fire safety system. We are now invoiced $20,000 each year ..."
  AAMRI member A

  "… Audit fees were previously paid by the State government and IT services were provided free of charge by the University, but are no longer paid by them …"
  AAMRI member B

- New regulation and legislation have made the compliance costs of medical research more costly

  "… animal ethics committees and OH&S compliance are making research increasingly expensive …"
  AAMRI member C

- Additionally, recent building upgrades have significantly increased operational costs for some MRIs

  "… We moved into a new building in 2008. It is a fantastic building, but the knock on effect is that our indirect costs for rent, cleaning, waste disposal etc. went from about $50,000 pa to $460,000 pa almost overnight. This has placed a huge burden on our infrastructure budget …"
  AAMRI member D

- New research projects can also increase the laboratory component of indirect research

  "… Over the past 18 months, we have had to purchase eleven -80°C freezers to meet the demand of increasing cold storage requirements. In total we have spent $233,690 on these eleven units…"
  AAMRI member E

Source: AAMRI member data, L.E.K. interviews

Australian and international studies* have confirmed that the indirect costs of medical research in universities and MRIs are between 50 and 70 percent of peer-reviewed research funding

- A number of sources indicate that required funding levels are in the order of 50-70 percent of direct research costs and research funding (direct research costs are assumed to be equivalent to direct research grants)

  "… Studies around the world have found from both individual university studies and studies of national systems that administrative/overhead costs and research facility costs are between 50 percent and 60 percent of direct project costs…They are a little higher in science/engineering…"
  Australian Technology Network of Universities, 2008, 'Quantifying the full cost of research'

  "… There is general agreement that the average indirect cost is around 50 per cent of direct project costs…indirect cost payment / reimbursement rates vary from 35 per cent to more than 70 per cent…"
  The Allen Consulting Group, 2008, 'Recognising the full costs of university research'

- The results of the studies are consistent with the findings of the L.E.K. report into the funding of the Victorian Medical Research Institutes

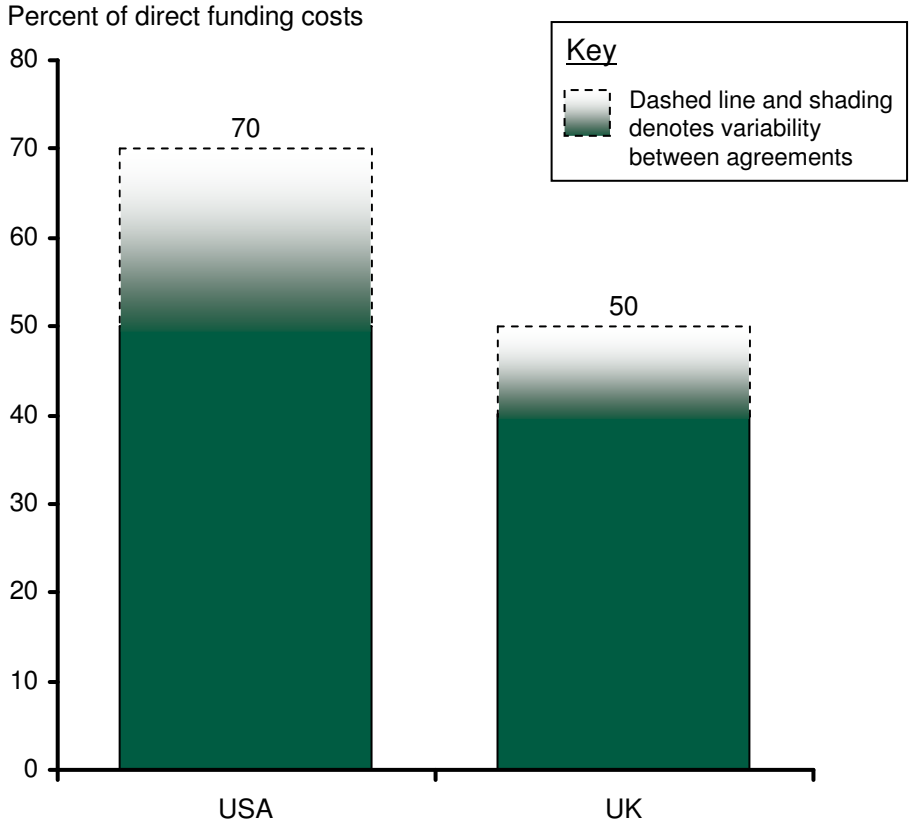
  "… Indirect costs of research for Victorian MRIs currently average 65 cents per dollar of direct research costs…"
  L.E.K. Consulting, 2009, Funding for the Future

Studies confirm that the indirect costs of research are around 50-70 cents per dollar of direct research income. This is in line with the cost structures of AAMRI survey participants

Source: * Australian Technology Network of Universities, 2008. Quantifying the full cost of research; The Allen Consulting Group, 2008. Recognising the full costs of university research; L.E.K. Consulting, 2009. Funding for the Future

Best practice countries, such as the UK & USA, provide close to full economic costing under a negotiated audited approach. This approach takes into account the variable cost bases of research organisations

Estimated total indirect funding as a proportion of peer-reviewed research funding



USA

US universities individually negotiate a fixed cents per dollar indirect funding rate with the Office of Naval Research and the Department of Health and Human Services

The rate varies depending on the cost structure and takes into account the efficiency of the institution

This rate is then applied to all federally-funded grants for a four-year cycle and is intended to be representative of all indirect costs incurred

United Kingdom

In 2005, the UK government and research councils pioneered the support for the full economic costs of research by building indirect cost support into the grant

Institutions measure the full costs of research through the Transparent Approach to Costing (TRaC) process. This then forms the basis for grant funding

Funding levels are dependent on the source. Government grants fund 100 percent of the full costs of their grants. Research councils fund 80 percent

Source: The Allen Consulting Group, 2008. Recognising the full costs of university research; Research Councils UK; Investment Review of Health and Medical Research; L.E.K. analysis

It is widely accepted that the indirect costs of research for universities and MRIs are significant and integral to research success

- Adequate indirect funding is essential to achieve desired research outcomes

  "… There is complete agreement that the lack of funding of indirect research costs has led to deterioration in basic research infrastructure and research training …"
  National Health and Hospitals Reform Commission, Dec 2008 , 'A healthier future for all Australians'

  "… One issue of increasing significance is that external competitive project funding usually only partly covers full costs…This increases the danger that the objectives of funding programmes will not be fully met because universities fear they will not recover the full costs of activities …"
  Financially Sustainable Universities, 2008, European University Association

- A number of reports commissioned by the State and Federal Governments have highlighted the problems associated with providing insufficient indirect funding

  "… The more successful a university is in obtaining national competitive research grants, the more it must subsidise such research from other revenue sources. This is a perverse incentive …"
  Bradley et. al., 2008, Review of Australian Higher Education Report

  "… The absence of full-cost funding is also contributing to inadequate spending on the maintenance of research infrastructure and the commissioning of world-class new infrastructure …"
  Cutler et. al., 2008, Venturous Australia Report

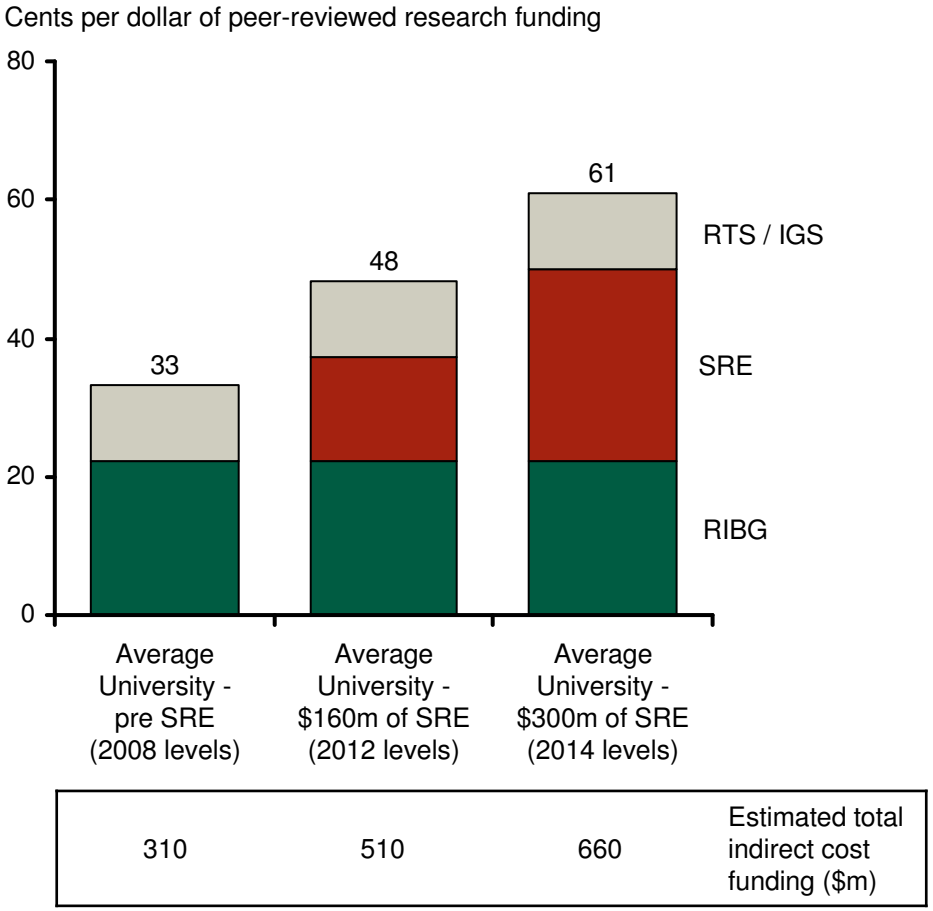
  "… The pressures on research in the state will not abate. If NSW capacity is not strongly supported, it could wilt, with the potential loss of some of the best of the state's scientific leadership …"
  NSW Government, 2004, 'NSW Research: A Prescription for Health'

Source: Bradley et al, 2008. Review of Australian Higher Education Report; National Health and Hospitals Reform Commission, Dec 2008. 'A healthier future for all Australians'; European University Association, 2008. Financially Sustainable Universities; NSW Government, 2004. 'NSW Research: A Prescription for Health'

The Federal Government has already accepted the costs of indirect research are approximately 60 cents per dollar of peer-reviewed funding, and has introduced the SRE scheme to support universities

- The existing funding system for universities offered indirect support under the Research Infrastructure Block Grant (RIBG). The grant contributes approximately 21 cents per dollar of peer-reviewed research funding. Other grants, such as the RTS/IGS can also be used by universities to cross-subsidise indirect costs
- However, both the Productivity Commission (2007) and the Allen Consulting Group (2008) reported that funding had not kept pace with growth in competitive grants from FY2001-07 and had become inadequate. Universities had also reported cross-subsidisation of funding from other sources to support research grants, resulting in a negative impact across both research and teaching
- The Bradley review addressed the level of indirect support required for research, reporting international benchmarks of 50 cents per dollar in 2006, which would require additional funding of $300m per annum
- This recommendation was adopted by the Federal Government through the introduction of the Sustainable Research Excellence (SRE) program, to supplement the RIBG. Funding is expected to increase from 2010 to the full value of 61 cents per dollar of peer-reviewed research funding by 2014

Estimated average university indirect funding



Source: Bradley et al, 2008. Review of Australian Higher Education Report; University of Melbourne

MRIs receive indirect cost funding from state and federal sources. There are a variety of Federal and State departments involved

Government Indirect Cost Funding

Federal indirect cost funding

Directly allocated

- MRIs which administer their own NHMRC grants receive IRIISS funding from the Department of Health and Ageing (DoHA)

Indirectly allocated

- MRIs for whom the grants are administered through an affiliated university receive a portion of RIBG funding from the university (via the Department of Innovation, Industry, Science and Research). The amount received by the MRI is individually negotiated with each university

Other allocations

- Some MRIs may receive additional funding from universities (RTS or IGS through DIISR) in exchange for supporting university research students and publication citations. The amount provided is entirely based on individual negotiations

State indirect cost funding

State	Program	Department
VIC:	OIS	Department of Innovation, Industry, and Regional Development (DIIRD)
NSW:	MRSP	Office for Science and Medical Research (OSMR)
QLD:	SSHMRF	Office of Health and Medical Research (OHMR)
WA:	MHRIF	State Health Research Advisory Council (SHRAC)

Source: DoHA; DIIRD; OSMR; OHMR; SHRAC; AAMRI; L.E.K. interviews

There are a range of state schemes to support indirect costs. The majority of these are independent of the source of peer-reviewed funding

	Name of Scheme	Description	No. of MRIs	Annual value (2008-2009)	Funding criteria & eligibility
VIC	Operational Infrastructure Support (OIS)	Indirect cost support for MRIs	13	$25.7m	Two components, growth (2/3 of OIS) and innovation (1/3 of OIS); Growth component is applied to peer-reviewed grants. If funding required exceeds the pool, the OIS is allocated on a pro-rata basis Innovation component is available to projects which provide evidence of 'added value' to Victoria
NSW	Medical Research Support Program (MRSP)	Indirect cost support for MRIs	13	$20.3m	Pool is allocated based on share of eligible grant funding over last 3 years
QLD	Queensland Department of Health	10-year overhead funding support	3	Est.$5-10m (confidential contracts)	Individually negotiated between MRIs and the QLD Dept. of Health with the aim to reach commercial self-sufficiency by the conclusion of the program
	Smart State Health and Medical Research Fund (SSHMRF)	Indirect funding support	2	Approx. $0.7m	Specific contract for Mater and Wesley only
	QIMR	Indirect funding support	1	Approx. $6.3m	Specific contract for QIMR only
	Fellowships	Fellowship program	n/a	Up to $5m	Competitive awards based on the quality of candidate's proposal Spend is at discretion of Fellow
WA	Medical and Health Research Infrastructure Fund (MHRIF)	Indirect support for MRIs, unis and hospitals	3	$5m	Wide range of eligible grants for funding support

Source: DoHA; DIIRD; OSMR; OHMR; SHRAC; AAMRI; L.E.K. interviews

Australian accredited MRIs. Indirect Cost Funding.

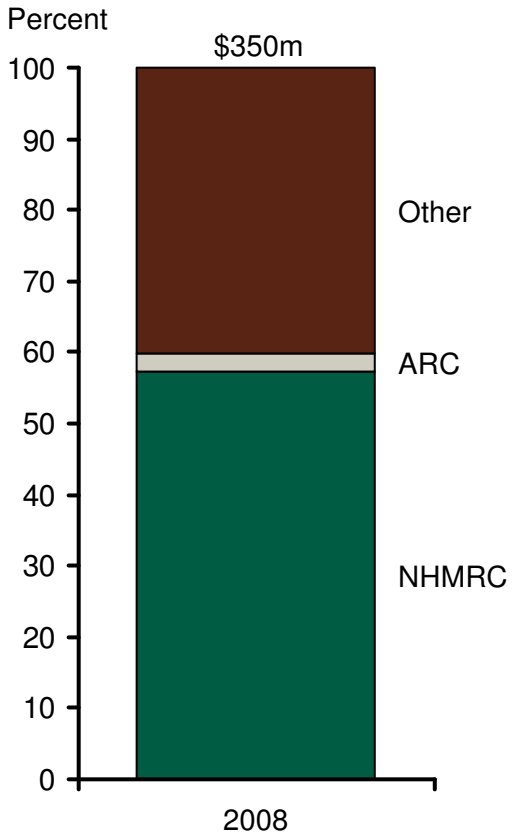
The Federal IRIISS scheme was established to provide indirect cost funding to place MRIs on a similar footing to universities. However, funding is only available for NHMRC grants

- In 2008, Australian accredited MRIs received a combined total of approximately $350m in direct peer-reviewed competitive research grants from national and international funding bodies
- The Federal Government introduced the Independent Research Institute Infrastructure Support Scheme (IRIISS) scheme in 2005 to support medical research institutes in maintaining research competitiveness with universities

  "… This measure will allow the NHMRC to fund overhead infrastructure costs for independent medical research institutions awarded NHMRC research grants. This will allow these institutions competitive access to overhead infrastructure support on a similar footing to that provided to universities …"

  Federal Budget, 2004-05
- However, the scheme only provides indirect cost support for NHMRC-funded projects, which represent less than 60 percent of total peer reviewed funding for accredited MRIs
- Given indirect costs of research are on average 60 cents per dollar of research income, the absence of federal funding for non-NHMRC grants is not supportive of research excellence
- The variance has significant equity implications for MRIs that are weighted towards non-NHMRC grants

Estimated Australian accredited MRI competitive peer-reviewed funding by type



Note: See slide 29 for detailed calculation methodology
Source: AAMRI member data; Federal Budget, 2004-05; L.E.K analysis

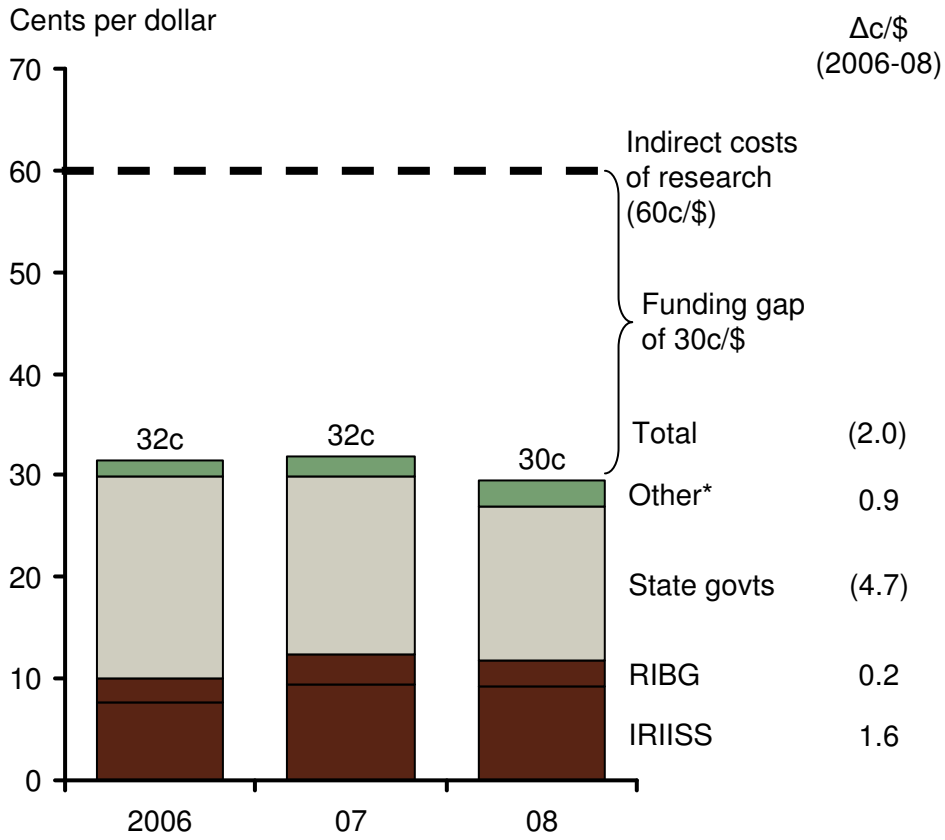
An estimation of the indirect cost funding gap has been built bottom-up from a range of sources

	Value (CY08)	Description and source
Total indirect cost funding	$100m	• Aggregate of the State (MRSP, OIS, SSHMRF, MHRIF) and Federal (IRIISS) indirect funding program amounts (2006-08) • Aggregate of RIBG/RTS/IGS funds distributed to participant MRIs† (2006-08). The funds received by MRIs not participating in this report have been estimated using the average funding rate of the participant MRI funds
÷		
Participant MRI † indirect cost funding rate	30 cents per dollar*	• The average proportion of indirect funding per dollar of peer-reviewed funding has been calculated from the participant MRI sample† (2006-08)
Total peer-reviewed funding	$350m**	• Total peer-reviewed funding has been calculated by applying the average participant MRI† indirect funding rate to the total amount of indirect funding • Peer reviewed funding has also been cross reconciled to the survey information provided by 26 of the participant MRIs
X		
Participant MRI † indirect cost rate	60 cents per dollar*	• The average indirect cost per dollar of peer-reviewed funding has been calculated from the participant MRI sample † (2008)
Total indirect cost	$210m	• Total indirect cost has been calculated by multiplying total peer-reviewed funding by the average indirect cost per dollar of peer-reviewed funding
Funding gap	$110m	• Total indirect costs less indirect funding

Note: *Cents per dollar of peer-reviewed research funding
**Totals may not equal due to rounding
† See Appendix for list of participant MRIs who have contributed to this study. See slide 18 for details on the MRI Sample

This analysis shows that current government schemes fall well short of the funds required. State Governments currently provide over half (56%) of the total current government indirect cost funding

Total indirect funding for independent MRIs as a proportion of peer-reviewed research funding (CY2006-08)

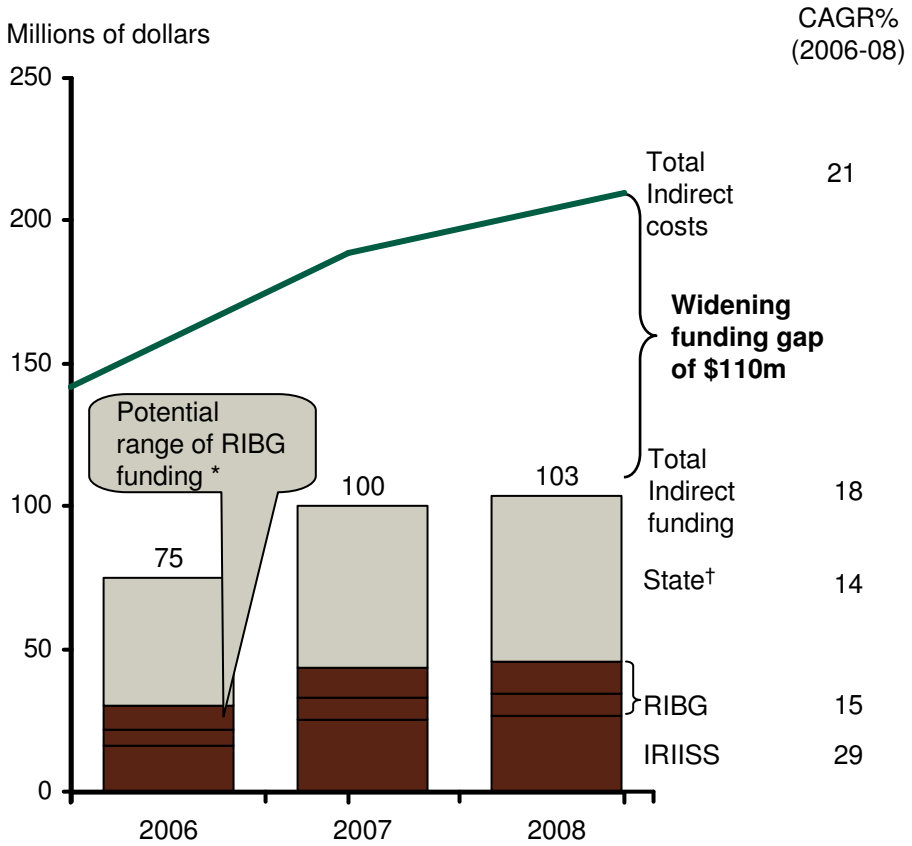


- Total funding for the indirect costs of medical research currently covers only half of total indirect costs
- Of the funding supplied by governments, total Federal Government funding (IRIISS, RIBG plus other) comprises less than half the total amount (44%)
- Indirect cost funding has declined over the last three years
  - federal funding levels have slightly increased on a cents per dollar of peer-reviewed research basis. However, the increase in federal funding has not been sufficient to offset the decline in state funding
  - total state funding has declined by nearly 5 cents per dollar of peer-reviewed funding

Note: * Other funding includes federal funding received through affiliated institutions
Source: AAMRI member data; L.E.K. analysis

Australian accredited MRIs have experienced a considerable increase in competitive grants, but there remains a significant and widening indirect cost funding gap

Australian accredited MRIs IRIISS and other indirect cost funding (CY2006-08)

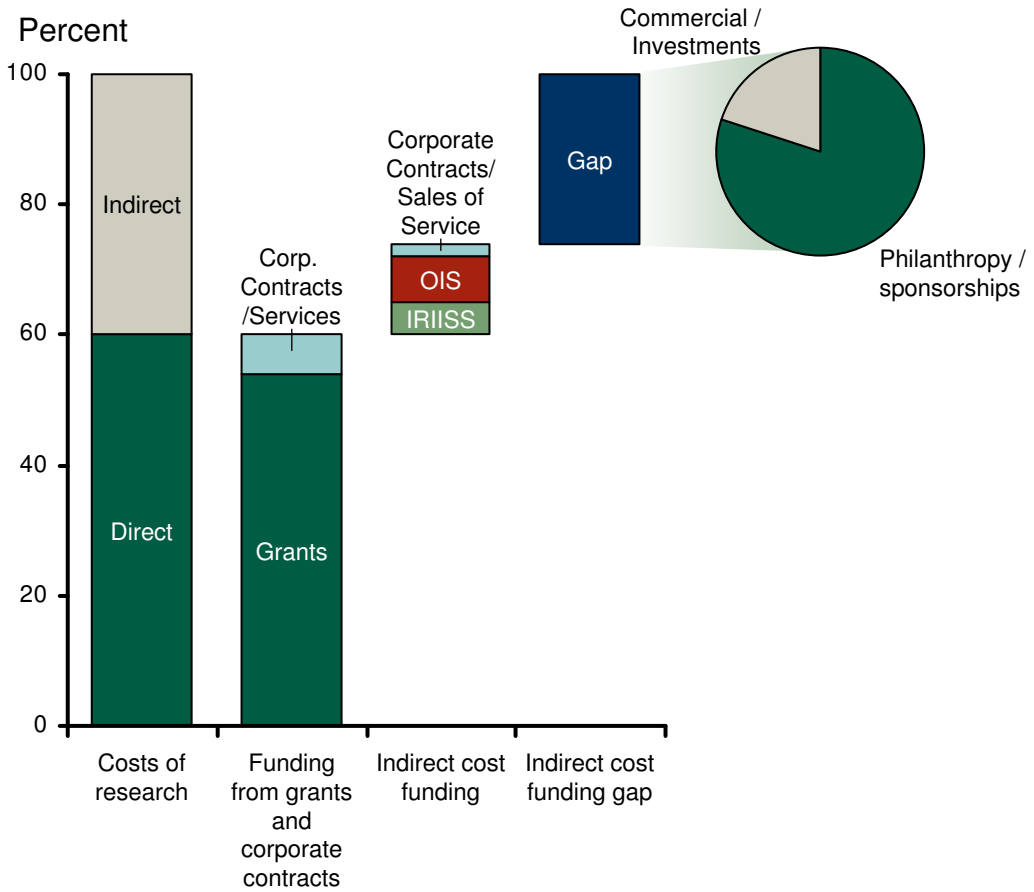


- MRIs in total received an estimated $103m towards their indirect costs in 2008. Of this, the combined state governments provided $58m, and the Federal Government schemes provided $45m
- MRIs' indirect funding position has declined on an absolute basis. MRIs currently only receive half of the funds necessary to cover their indirect costs
- The Federal Government has provided an increasing share of indirect cost funding. However, IRIISS is only applied to NHMRC grants
- Many states' total funding have remained relatively static year to year, resulting in the decline on a cents per dollar of peer-reviewed research funding basis. Although some effort has been made in NSW to address this, WA and Victoria still lag behind
- The total value of the funding gap in indirect costs was estimated to be $110m for MRIs in 2008. If the value of indirect funding plateaus as direct funding increases, the gap will widen
- Over time there is a risk that the growing gap will result in compromised research outcomes

Note: * Includes federal funding received through affiliated institutions; † MRSP is distributed on a FY basis. Funding commenced in FY2007
Source: DoHA; DIIRD; OSMR; SHRAC; AAMRI member data; L.E.K. analysis

Australian accredited MRIs are currently covering the funding gap for indirect costs through several sources, the majority of which were not intended to be spent on indirect costs

Illustrative – MRI costs of research and funding sources



Sources of cost-subsidisation	Pressures
Philanthropy / Sponsorships	The amount of philanthropy and sponsorships varies substantially between different MRIs This source of funding is not reliable year to year, and economic conditions have negatively impacted endowments and donations Additionally, most philanthropic funding cannot be applied to indirect costs
Commercial / investments	Includes royalties, investment income, rental income and other assorted income groups. These sources of income can be volatile from year to year and between MRIs
Corporate contracts/ Sales of services	Corporate contracts and sales of services contribute to direct research costs. While they typically cover their own indirect costs, they make limited, if any, contribution to covering indirect costs from grant funding

Source: Victorian MRI DIIRD survey submissions

Section Two Summary – Indirect costs of medical research: methods and results

- The indirect costs incurred by medical research for universities and MRIs are significant and integral to successful medical research outcomes
- Indirect costs of research for Australian accredited MRIs are approximately 60 cents per dollar of peer-reviewed research funding
- This level is consistent with international studies which report indirect costs of research for universities and MRIs are 50 to 70 cents per dollar of research income. These studies argue that inadequate indirect cost funding leads to compromised research outcomes
- The Federal Government has already recognised that the indirect costs of medical research are 60 cents per dollar of peer-reviewed funding, and introduced the SRE scheme to support universities to this level
- In contrast, combined federal and state funding for indirect costs incurred by MRIs is on average 30 cents per dollar of peer-reviewed funding, less than half of total indirect costs
- The Federal IRIISS scheme was established in 2005 to provide indirect cost funding to place MRIs on a similar footing to universities. However, IRIISS funding is only allocated for NHMRC grants (less than 60 percent of peer reviewed grants)
- Most state based funding systems have also failed to keep pace with growth in grants
- Australian accredited MRIs have funded the indirect cost “gap” through a number of sources, which would otherwise be used to fund additional research and therefore deliver incremental health outcomes

Section 3: Comparison with university indirect cost funding

Despite their higher level of productivity, Australian accredited MRIs are under-funded with regards to indirect costs compared to universities. The funding difference is as high as 30 cents per dollar of research funding

Indirect cost funding for universities undertaking research is administered by the Federal Government under an entirely different system to MRIs

	Description	Annual value*	Cents per dollar of total grants †	Funding criteria
RTS (Research Training Scheme)	Block grant to support research training for doctorate and masters degrees by research	$592m	2-4 cents	Student completions, research income and bibliometrics and is distributed across faculties at the discretion of the HEP
IGS (Institutional Grant Scheme)	Block grant made to HEPs (Higher Education Provider) to support research and training activities	$311m	8-16 cents	Research income, student load and publications and is distributed across faculties at the discretion of the HEP
To be replaced by				
JRE (Joint Research Engagement)	Replacement to IGS from FY2010, designed to encourage collaboration between universities, industry and end-users	$311m**	8-16 cents	Diversified income streams such as industry, community partners and public sector research agencies
RIBG (Research Infrastructure Block Grant)	Block grant for indirect cost support for HEPs	$210m	21 cents	Share of Category 1 Australian Competitive Grants Income over the last two years
To be supplemented by				
SRE (Sustainable Research Excellence)	Designed to supplement the RIBG, with the aim of providing a total of 50 cents per dollar of peer-reviewed research funding by 2014	$300m by FY2014	30 cents by FY2014	20 percent of funding is based on the existing formula-based allocation 80 percent is activity-based costing measures as well as specified performance targets

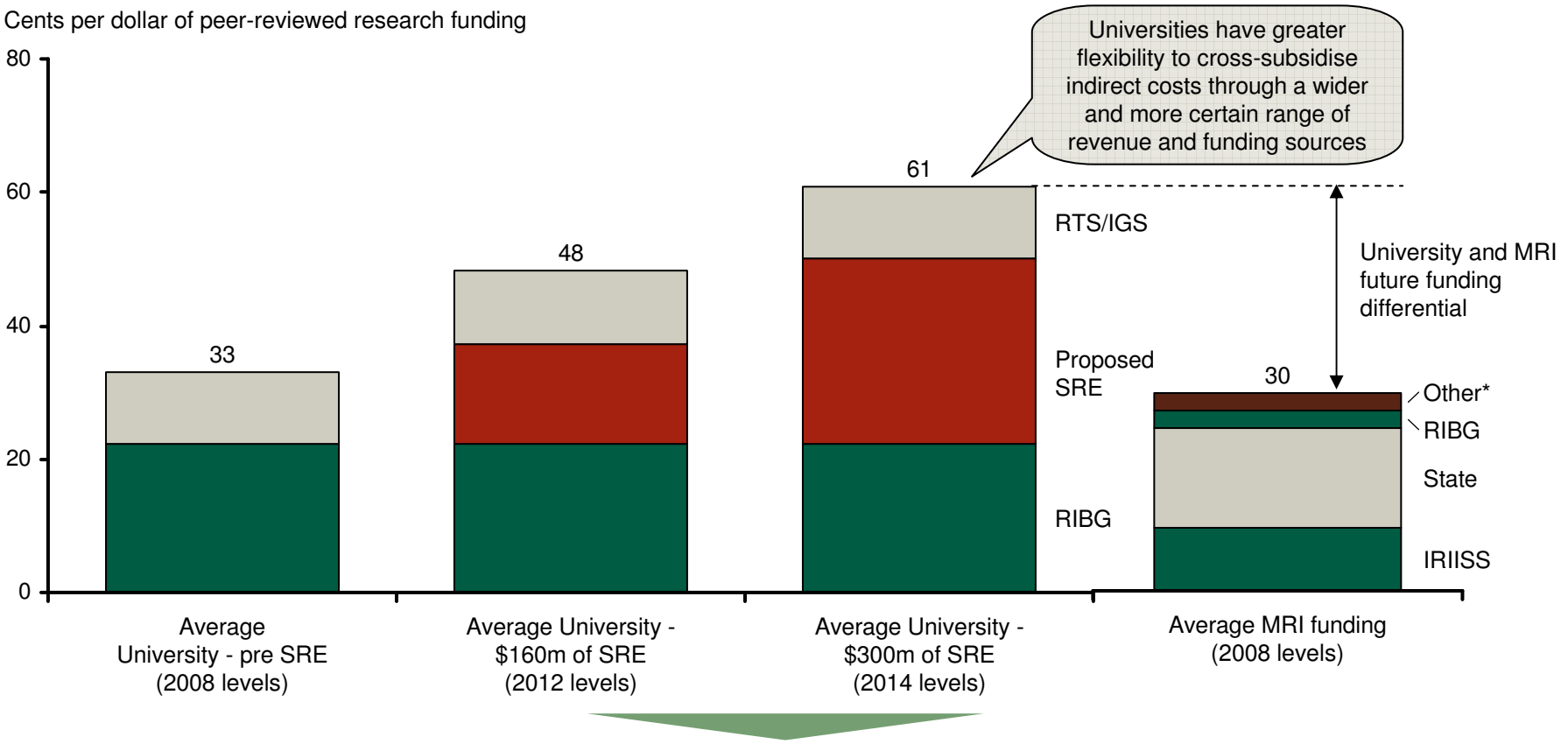
Current fund Proposed fund

Note: * FY2009; **Reallocation of IGS funding; † May vary due to research income mix

Source: Department of Education, Employment and Workplace Relations; Department of Innovation, Industry, Science and Research

MRIs are under-funded with regards to indirect costs comparison to universities; this will be greatly exacerbated by the introduction of the SRE program

Indirect cost funding on average for Universities vs Australian accredited MRIs†



This discrepancy is impacted by university and MRI funding being handled by different Government portfolios

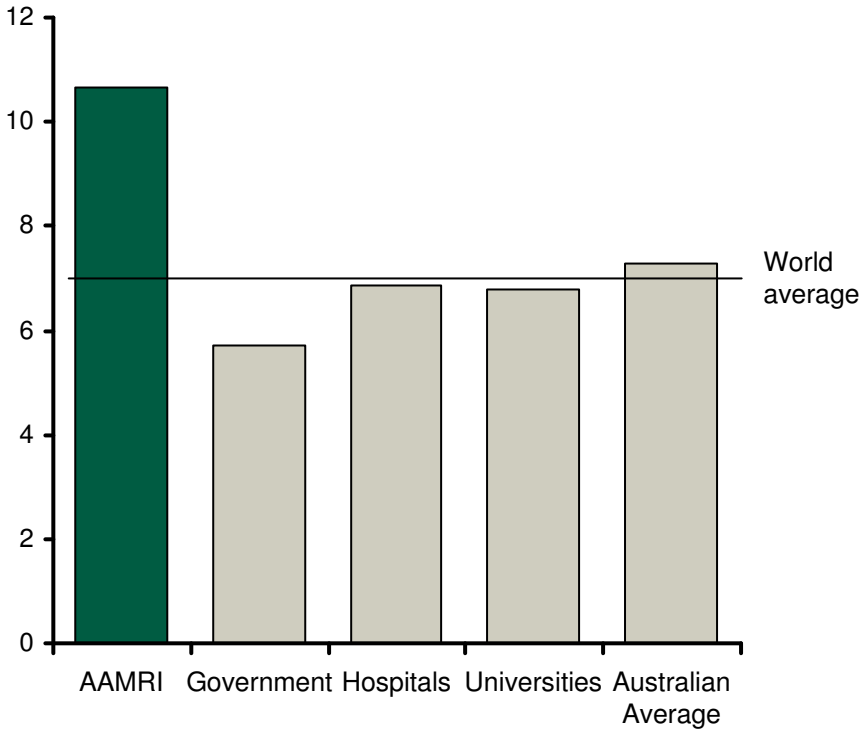
Notes: * Other funding includes federal funding received through affiliated institutions. † Based on findings of the Cutler review

Source: Victorian MRI DIIRD Survey submissions; NHMRC; Department of Innovation, Industry and Regional Development; Cutler and Company Pty Ltd, 2008. Venturous Australia

Australian accredited MRIs have higher rates of citations than equivalent local and global research organisations

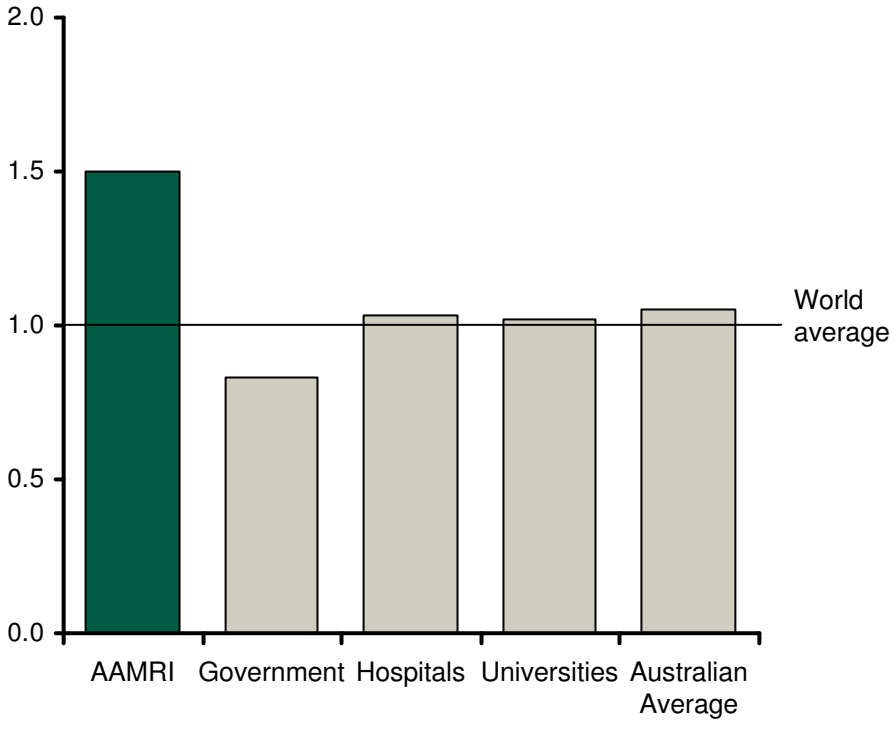
Citation rate of research organisation biomedical publications (2002-06)

Number of citations per publication



Relative bio-medical citation impact* (2003-07)

Citation rate relative to world citation rate



Research published by AAMRI members is cited on average 10.6 times per publication (CPP), ahead of the world average of 6.9 and ahead of universities, who have a CPP of 6.8

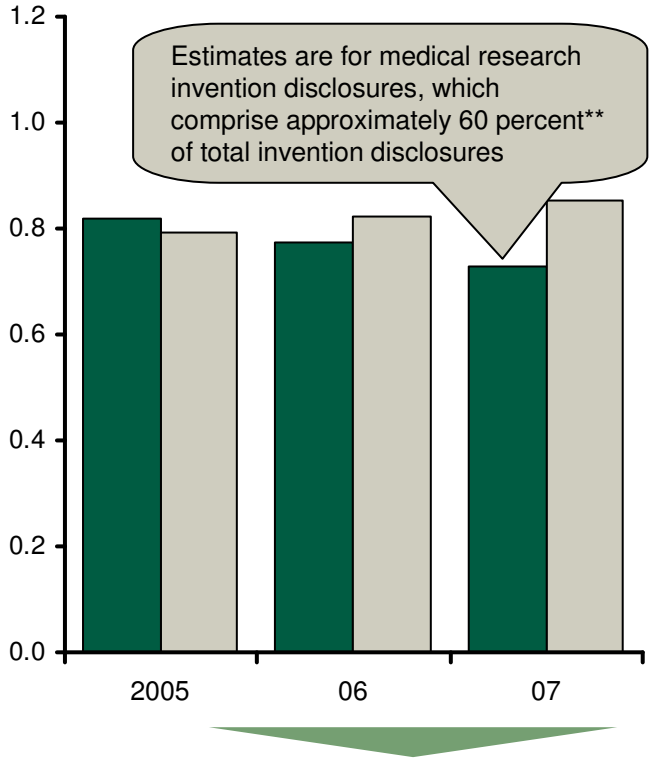
Note: * Average number of citations per sector publication in a given field divided by the average number of citations for all publications in that field

Source: Henadeeera, K. and Biglia, B., 2009. A Bibliometric Analysis of Biomedical Research in Australia. Sydney; AAMRI

Australian accredited MRI invention disclosures and patents are on a par with the leading universities

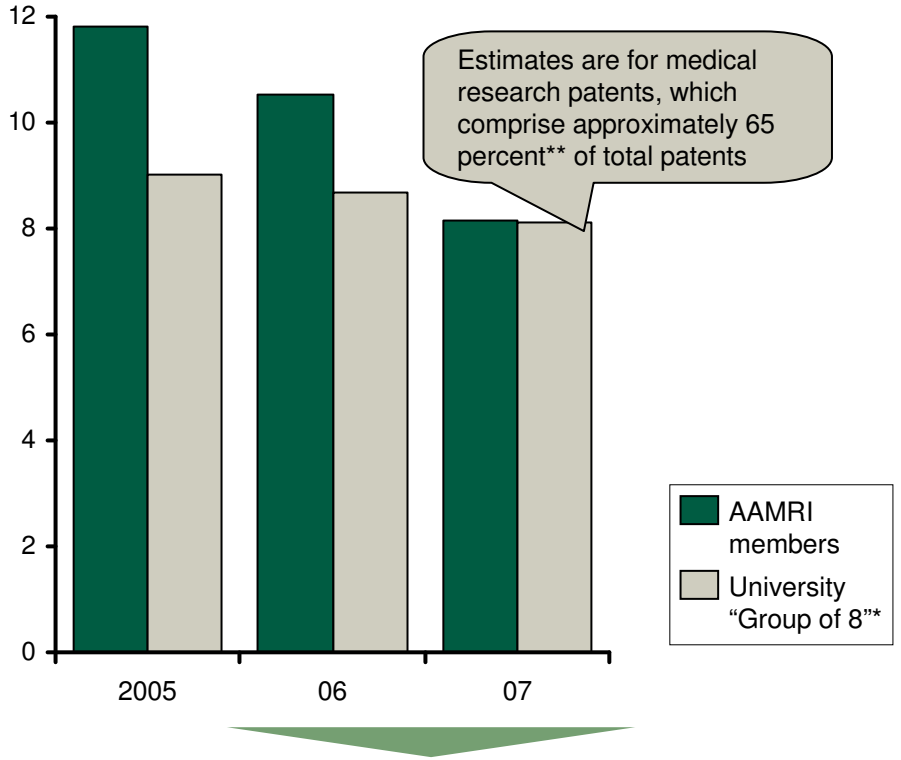
Invention disclosures per million dollars of funding received* (2005-07)

Number of invention disclosures per million dollars of NHMRC funding



Patents per million dollars of funding received* (2005-07)

Number of patents per million dollars of NHMRC funding



In 2007, Australian universities and AAMRI institutes produced over 0.8 invention disclosures and 8 patents per million dollars of competitive peer-reviewed grant funding received

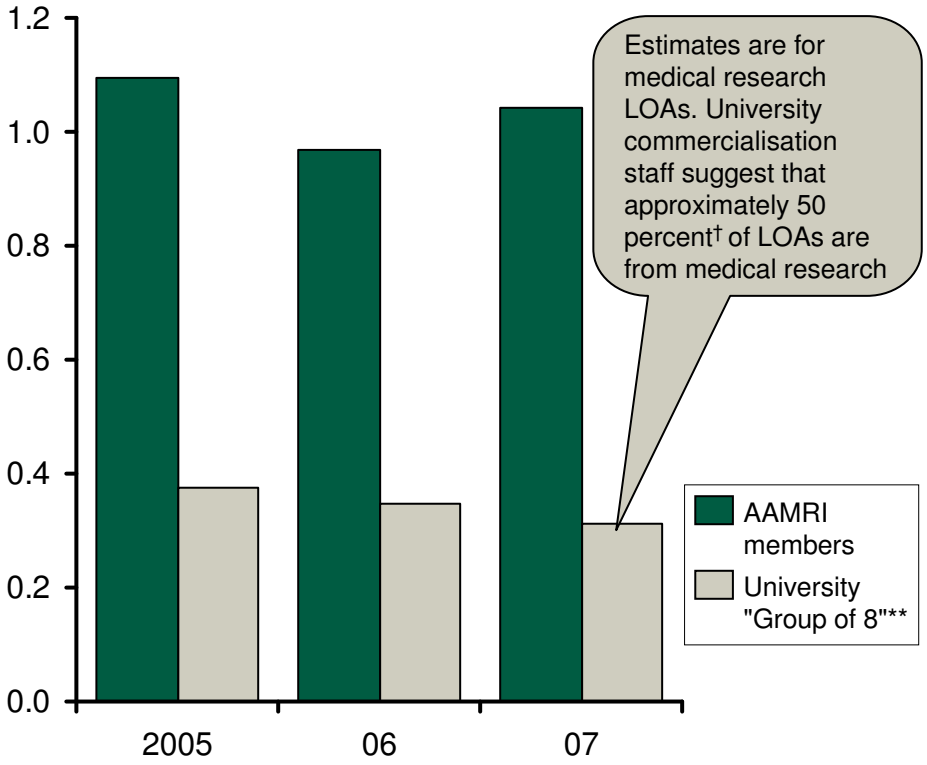
Note: * Includes USYD, UniMelb, Uni of Adelaide, UWA, ANU, UNSW and Monash (the Group of Eight universities). UQ has been excluded from this analysis as it has internalised the MRIs (e.g. IMB, Nanotech etc.); ** Based on surveys of UNSW, USyd, Monash, Melbourne

Source: Department of Education, Science and Training, 2009. National Survey of Research Commercialisation; NHMRC, 2009. NHMRC research funding dataset 2000–2009

Australian accredited MRIs generate greater commercialisation income than leading universities. In 2007, AAMRI members generated $75,000 in LOAs for every million dollars of grants

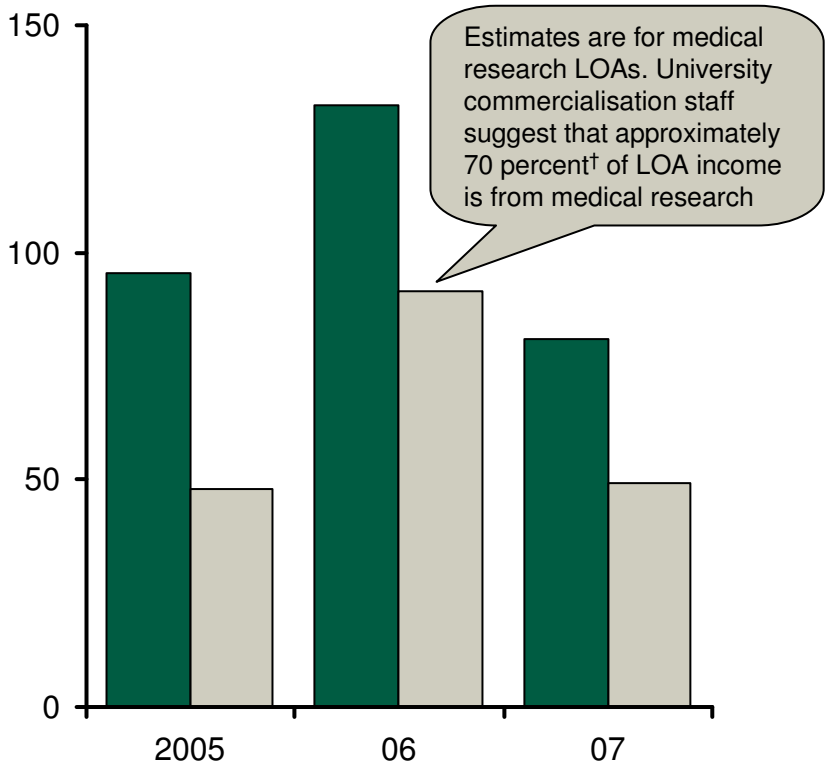
Total number of LOAs yielding income per million dollars of funding received* (2005-07)

Number of LOAs per million dollars of NHMRC funding



Total value of LOAs that yield income per dollar of funding received* (2005-07)

Thousand dollars of LOAs per million dollars of NHMRC funding



Note: * LOAs are Licenses, Options and Assignments, a measure of commercialisation output; Excludes Monash income from sale of IVF business of $100m
** Includes USYD, UniMelb, Uni of Adelaide, UWA, ANU, UNSW and Monash. UQ has been excluded from this analysis as it has internalised the MRIs (e.g. IMB, Nanotech etc.), † Based on surveys of UNSW, USyd, Monash, Melbourne

Source: Department of Education, Science and Training, 2009. National Survey of Research Commercialisation; NHMRC, 2009. NHMRC research funding dataset 2000–2009

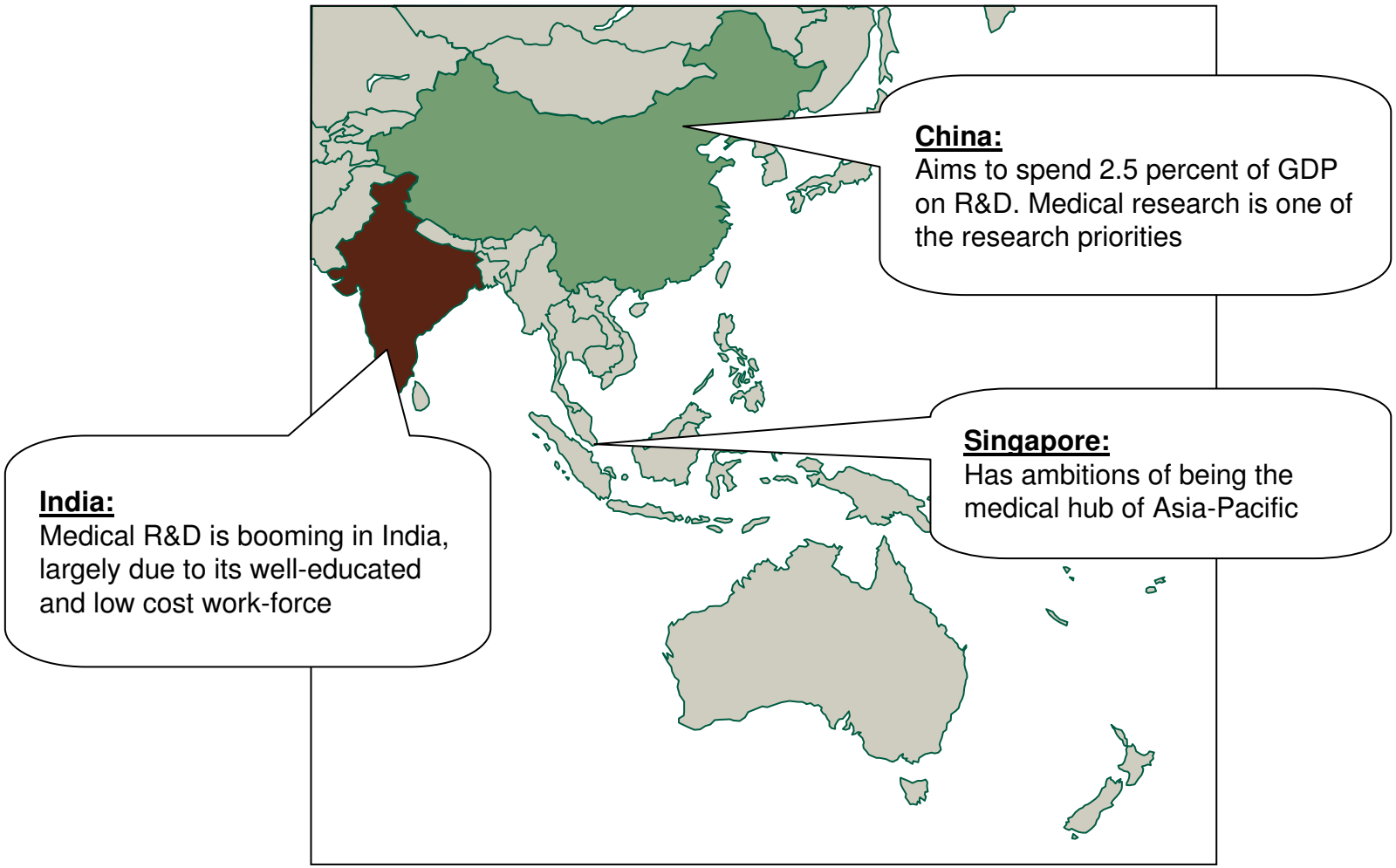
Section Three Summary – Comparison with university indirect cost funding

- Funding for indirect research costs for universities is federally administered under different programs and criteria to MRIs. In 2008, the Federal Government provided indirect cost funding of 30 cents per dollar of grants awarded to universities
- The Review of Australian Higher Education Final Report (2008) recommended that the Federal Government address the quantum and allocation of funding for research indirect costs in universities. Accordingly, the Government has introduced the Sustainable Research Excellence (SRE) program to provide indirect cost funding of 50 cents per dollar for competitive grants. The SRE/RIBG program allocates funding based on NHMRC, ARC and a range of other competitive grants
- When combined with current RTS and IGS funding, total funding for indirect costs for universities will rise to 60 cents per dollar of peer-reviewed funding
- The ramp-up of the SRE will create a further funding gap between universities and MRIs of approximately 30 cents per dollar of research income by 2014. This discrepancy appears to be unintentional and likely brought about by university and MRI indirect funding being overseen by different Government portfolios
- MRIs should receive equivalent funding to universities, given their productivity in the delivery and commercialisation of research outcomes. MRIs have a higher citation rate for their research articles compared to other national and international research sectors. MRIs have significantly higher licences, options and agreements (LOAs) per dollar of funding than the top universities, and are on par with universities for invention disclosures and patents
- The discrepancy between indirect funding for MRIs and other research sectors needs to be resolved, and will require increased contributions from both State and Federal Governments

Section 4: International indirect cost funding

Australia's international reputation for research and innovation is strong, but indirect cost funding is substantially below the levels in leading research countries

Australia is likely to face increased regional competition in the future from a number of developing countries in the Asia Pacific who are seeking to grow their R&D sectors



India has made significant advances in the field of medical research

Outsourcing of early stage drug development

- Indian pharma firms have developed the expertise to perform in-house R&D, leveraging their generics manufacturing experience
- As a result, the last 4-5 years have seen global pharma contract out early-stage activities to Indian R&D institutes. Over $700m has been invested in partnerships over the last two years
- Global MNCs are attracted to Indian firms for their low cost, proven technical ability and speed. Additionally, the government has enacted tougher data security laws, stronger IP protection and tax incentives to aid the development of the industry

Attractiveness for clinical trials

- India is becoming an increasingly attractive country to conduct clinical trials in, due to:
  - low cost. Total costs are 30 – 50 percent cheaper than in the US
  - speed. Trials can be conducted ~75 percent faster than in the US
  - diverse genetic pool
  - availability of medical talent
  - recent capital works upgrades
  - recent accreditation in international quality standards
- The continued strong growth of clinical trials is expected

Public investment in Medical Research Institutes

- The Indian Government has committed to the development of at least 20 new biotech parks to promote life sciences research
- The Government has also entered a 10-year pact with the Wellcome Trust, UK's largest medical research charity. The pact aims to support the retention of Indian scientists through the offer of fellowships
- Furthermore, the Government has improved tax incentives and increased legal support offered for medical R&D. As a result, India is expected to attract significant amounts of research in the future

The attractiveness of India as a location for medical research is increasing, which poses a threat to other countries, including Australia

Source: Financial Times, 17 April 2008. 'India looks beyond copycat medicines'; Economic Times, 7 December 2008. '20 more biotech parks to come up in India: Sibal'; Zinov LLC, 2008. 'Pharmaceutical Offshoring Landscape Analysis'; Fierce Biotech, 7 February 2007. 'Ranbaxy touts R&D abilities in new discovery pact'; Fierce Biotech, 8 January 2009. 'India drawing more clinical trials'; Wellcome Trust, 3 December 2008. 'Feature: Meet the new CEO of the Wellcome Trust-DBT India Alliance'; Fierce Biotech, 30 March 2009. 'Lilly inks $300M R&D pact with Cadila'

China has substantially increased its investment in R&D and health care. This investment is beginning to attract foreign clinical trials

Government investment in R&D

- China's growth in R&D investment has been led by the central Government. The Government has set a goal to spend 2.5 percent of GDP on R&D by 2020, which includes biomedical sciences
- China has also announced funding support of $US9.2bn for eleven national research priorities to 2010, including research into drug development and the treatment of major infectious diseases
- To facilitate research, the Government has strengthened IP protection and ensured the safe use of biological technologies and products

  "… Licensing deals, both domestic and foreign, are on the rise and much needed reform of its intellectual property laws has been initiated since China joined the World Trade Organization in 2001 …"

  Nevrivy & Bakin, Fierce Biotech, 2009
- Furthermore, China has committed to spend $US124bn on basic health care reform to attempt to improve public health

Clinical trials

- China offers several advantages for running clinical trials:
  - China is able to offer low cost clinical trials, access to a large pool of patients and a sizable supply of researchers
- Both global pharma and international universities have set up relationships with Chinese universities to take advantage of the benefits of conducting clinical trials and the growing development in the healthcare sector

  "… The trend [in increasing clinical trials] reflects intensifying interest by the healthcare sector in China, which is growing rapidly as a result of rising income and expanding health coverage and is already forecast to be the world's fifth-largest pharmaceuticals market by 2010 …"

  Financial Times, Aug 07

  "… In 2006, big drug companies doubled R&D investment in China and India over the previous year, to $2.2 billion. Nearly all of that went into China, thanks to generous government support and strong infrastructure …AstraZeneca, Novartis, Eli Lilly and GlaxoSmithKline are among the leaders in the pharma world who are blueprinting some ambitious expansion plans within China"

  Time Magazine, Nov 2007

Source: BBC News, 24 July 2007. 'China's drive to promote invention'; Financial Times, 28 August 2007. 'China overtakes India in drug testing'; Nevrivy and Bakin, Fiercebiotech, 2 September 2009. 'China gets serious about biotech'; Time Magazine, 14 November, 2007. 'China's Drug Addiction'; Ministry of Commerce, People's Republic of China, 14 May 2009. 'China to invest billions on key technology development, bio industry'

Singapore has the express aim of being the medical hub of Asia Pacific

Public policy and investment

Singapore intends to increase R&D spending to 3 percent as a proportion of GDP by 2010

– biomedical sciences is touted as one of Singapore's research focal points

Under the auspices of the National Medical Research Council, the Singapore Government has committed $S1.55bn from 2006-10. It aims to be a centre for translational and clinical research

Generous awards are available for researchers, including the TCR Flagship program which is is worth $125m over 5 years. Its aim is to attract a critical mass of world-class researchers in the areas of cancer, neurosciences, eye diseases, cardiovascular and infectious diseases

Capital works

Over $2bn of public and private capital works has been developed or announced since 2000

The first stage of public capital works development was the construction of Biopolis, a $S500m biomedical research park housing over 2,000 researchers. The park includes private research as well as Singapore's Government-led research organisation, A*STAR

Biopolis is part of a larger development known as one-north, which aims to be Singapore's main science research hub

An additional $S140m has been committed to research capital works at the National University of Singapore and the Singapore General Hospital

Attractiveness of Singapore for research

Singapore is an attractive destination for Australian researchers:

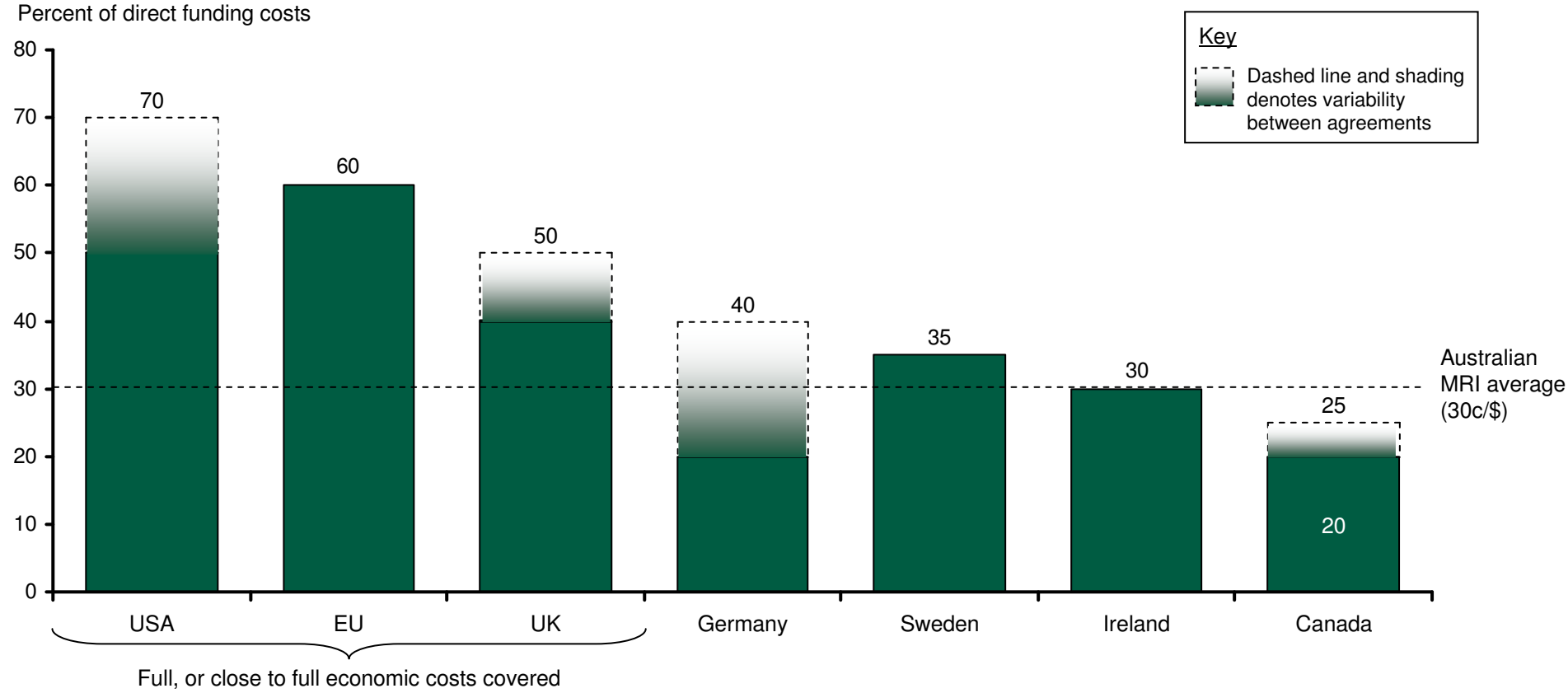
- access to world-class infrastructure
- proximity to Australia
- access to global pharma
- strong IP protection
- pro-business culture which facilitates quick approval turnaround for operations, including clinical trials
- low taxation (18 percent)
- westernised society
- English is an official language

Singapore is an attractive destination for researchers and poses a threat to the Australia Medical Research Industry

Source: National Research Foundation, Prime Minister's Office, Republic of Singapore, 4 December 2007. 'About Us'; Agency for Science, Technology and Research, Singapore, 2007. 'A*STAR – Extramural Grants'; Medical News Today, 22 October 2007. 'Singapore's Biomedical Sciences Initiative For Clinical Research'

Australia's spend on indirect research costs lags other countries, where 'best practice' reimbursement of indirect costs is up to 50-70 cents per dollar of direct grant funding

Estimated total indirect funding as a proportion of peer-reviewed research funding



Source: The Allen Consulting Group, 2008. 'Recognising the full costs of university research'; Research Councils UK; Investment Review of Health and Medical Research; European Commission- Directorate-General for Research, 2009. Diversified funding streams for university based research: Impact of external project-based research funding on financial management in Universities; L.E.K. analysis;

The US and UK have implemented full economic costing. The benefits to research institutions are high, although the investment in compliance is significant

UK

- The UK pioneered full economic costing in 2005 under the program known as TRaC – transparent approach to costing. The program was created to allow a transparent view of the full costs of research
- The program enabled the full support for the indirect costs incurred from government and research council grants
- Institutions seeking to be part of the program must comply with program rules. Compliance typically requires substantial administrative resources on the part of the institute
  - the TRaC manual suggests compliance costs in the order of £100,000 - £300,000 per annum, though many universities claim this is higher
  - many institutions require additional staffing, including a dedicated TRaC officer
- However, university administrators are in agreement over the positive net benefits of the system,

  "… One estimate puts additional funding at £1bn per annum …"
  Research Councils UK, 2009

  "… the fact that the sector has implemented TRAC has been important in building Government confidence that HEIs can manage additional funding if it is provided…"
  UK Joint Costing and Pricing Steering Group, 2009

USA

- US universities negotiate a fixed cents per dollar indirect funding rate with the Office of Naval Research and the Dept. of Health and Human Services. This is applied to all grants for a four-year cycle
  - this rate is intended to be representative of all costs incurred by the institution
- The university is responsible for documenting and justifying the indirect costs incurred. Preparation costs for the negotiation are significant:
  - consultant fees are in the order of several hundred thousand dollars
  - the process can take up to six months
- The negotiation process allows increased transparency and efficiency in the allocation of funding

  "… The [funding] system has benefitted from [the process], in terms of efficiency and value for money, and in fostering a common understanding of aims and purposes …"
  May and Sarson, Nature, 1999

Source: The Allen Consulting Group, 2008. 'Recognising the full costs of university research'

Section Four Summary – International indirect cost funding

- Australia is a global leader in research excellence
- However, Australian private sector investment in medical research is likely to face increased regional competition in the future. A number of Asia Pacific countries are committed to growing their R&D sectors
- Emerging markets such as India and China have increased their attractiveness for undertaking medical research, particularly contract research. The development of medical talent, reformed IP laws and existing low cost labour has attracted significant global investment
- Singapore has also invested heavily in medical research. Singapore is an attractive destination for expatriates, and poses a particular threat to the Australian medical research industry
- Mature markets widely considered 'best practice', for example, the USA and the UK, currently reimburse indirect costs up to a level of 50-70 cents per dollar of peer-reviewed funding, approximately double the level funded by the Australian State and Federal Governments
- It is imperative that the funding of Australian accredited MRIs be maintained at globally-competitive levels to enable Australia to continue to attract and retain investment and world's best researchers

Section 5: Benefits of increasing MRI indirect cost funding

The benefits of increasing funding for indirect costs to Australian accredited MRIs, and the risks of falling further behind, are real

An increase in indirect funding to Australia's MRIs will generate significant social, health and economic benefits

Uplift in medical research activity

- Additional indirect cost funding would allow philanthropic and other sources of income currently used to fill the gap by MRIs to be directed towards **improved medical research**, for example
  - investment in better platform technologies and core technologies
  - additional research programs that may involve a lower proportion of indirect costs, e.g. health services research

Improved translational health benefits

- **A healthier community and workforce** through both translational research and workforce culture
- Improved **delivery of health outputs** in relation to expenditure
  - health workforce performance
  - treatment / technology gains
  - preventative / public medicine

Economic benefits

- Increased **economic investment** in medical research in Australia
  - additional international research investment, NHMRC & other peer-reviewed research grants
  - increased philanthropic support
- Increased **utilisation of government capital works investment**
  - ensures government capital works are maintained and provides a return on government investment
- Increased **employment opportunities** for Australians

Planned medical research capital works will put further pressure on funding for direct costs, and therefore funding for indirect costs

Major medical research capital works projects under construction*

States	Number of projects	Value of projects	Estimated new employment
VIC	7 projects	$947m	Approximately 600 to 1,000 new researchers*
NSW	8 projects	$822m	At least 600 new researchers*
WA	4 projects	$305m	770 new researchers
QLD	2 projects	$520m	At least 340 new researchers*
SA	1 project	$200m	340 new researchers
TAS & NT	2 projects (one in each state)	$134m	60 new researchers 210 new employees
Total	**24 projects**	**$2,928m**	**2,925 – 3,325 new employees***

Over the next four years, medical research capital works requiring at least 2,900 new employees will be built in Australia

Note: * May be incomplete. In some cases, the number of researchers was not specified, therefore the total figure could be much higher

Source: Victorian Minister for Innovation, 2008. 'Victorian medical research gets $25.7 million'; NSW Minister for Science and Medical Research, 2009. '$30 million in additional funding for the Westmead Millennium Institute'; FNI News, Issue 1, 2008; Victorian Government Department of Innovation, Industry and Regional Development, 2008. ' Innovation: Victoria's future'; University of Melbourne, 2000. 'University has leading role in Bio21 initiative'; ANU News, 2009. 'Speech by Prime Minister Kevin Rudd at the opening of JCSMR building'; WEHI Annual Report, 2007-08; QIMR press release, 2009, 'Queensland Institute of Medical Research receives record $27.5m gift; AAMRI member correspondence; L.E.K. Analysis

There are important social consequences if Australia continues to under-fund the indirect costs of medical research for MRIs

Australia will fall behind other countries in terms of research indirect cost funding

This will limit the previously successful growth trajectory of Australian accredited MRIs. They will have difficulty attracting and retaining renowned and talented researchers due to strong competition from other countries

Significant investment of over $2.9 billion in new capital works will be under-utilised
(The capital investment is much higher than the annual outlay required to support research on an ongoing basis and ensure utilisation of these capital works)

The employment, economic and translational health benefits associated with a vibrant medical research community in Australia will be eroded

Section 5 Summary – Benefits of increasing MRI indirect cost funding

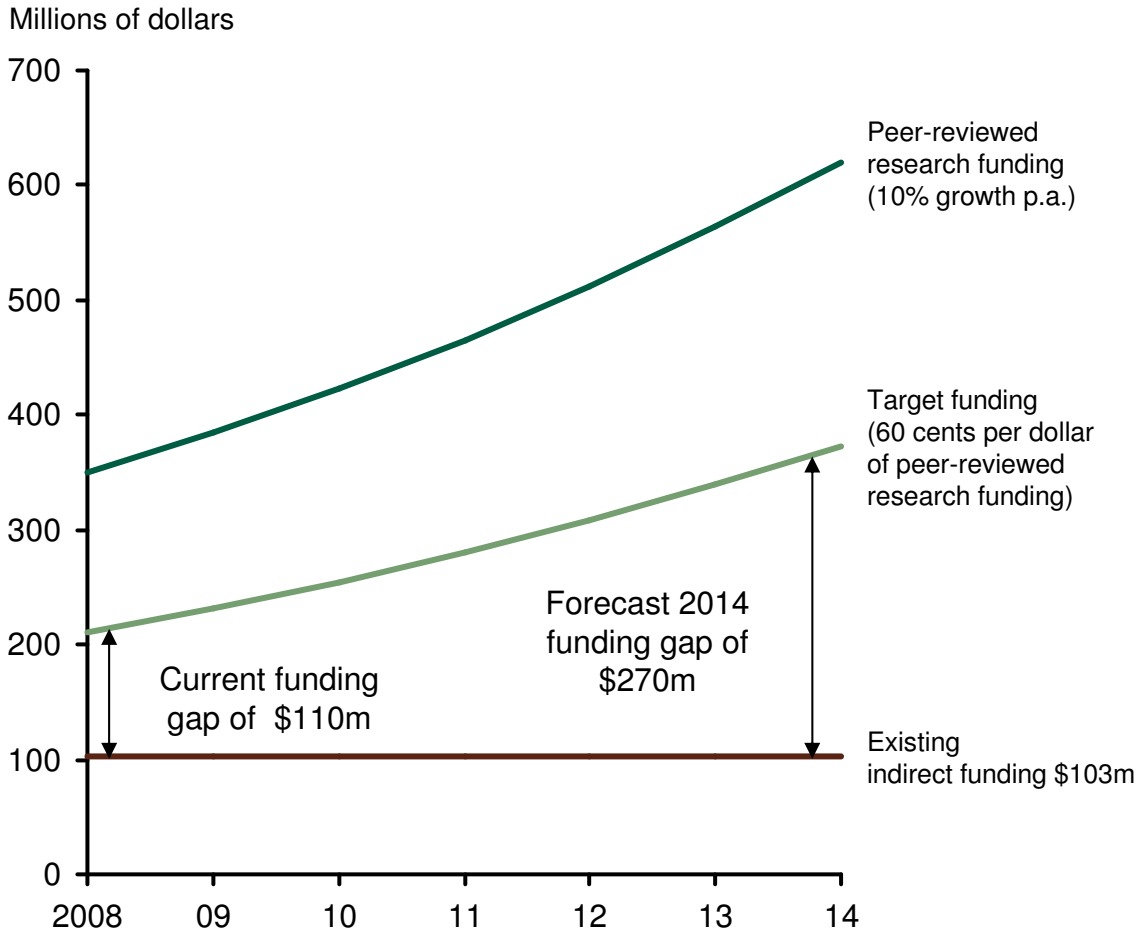
- The social and economic benefits of equitable funding of Australia's MRIs are significant
  - improved health outcomes and increased investment in the medical research sector provide a range of social and economic benefits
- In Australia, over $2.9b of investment in medical research capital works is planned over the coming years which is expected to employ approximately 2,900 – 3,300 additional staff
- The operating costs required to maintain these investments will put further pressure on funding for indirect costs
- There are significant economic and health risks to under funding the direct costs of medical research for Australian accredited MRIs
  - Australia will fall behind other countries' indirect cost funding
  - the $2.9 billion of new capital works investment will be under-utilised
  - the employment, economic and translational health benefits associated with a vibrant medical research community will be eroded
- The funding of Australian accredited MRIs must be maintained so that the social and economic benefits can be reaped by all Australians

Section 6: The proposed role of the Federal and State Governments in funding indirect costs

Proposed funding model. Federal and all State Governments have an important role to play in raising indirect cost funding for accredited MRIs to competitive levels

Future indirect funding should take into account growth in underlying peer-reviewed research funding, which is estimated at approximately 10 percent per annum

Forecast funding gap for MRIs (CY2008-14)



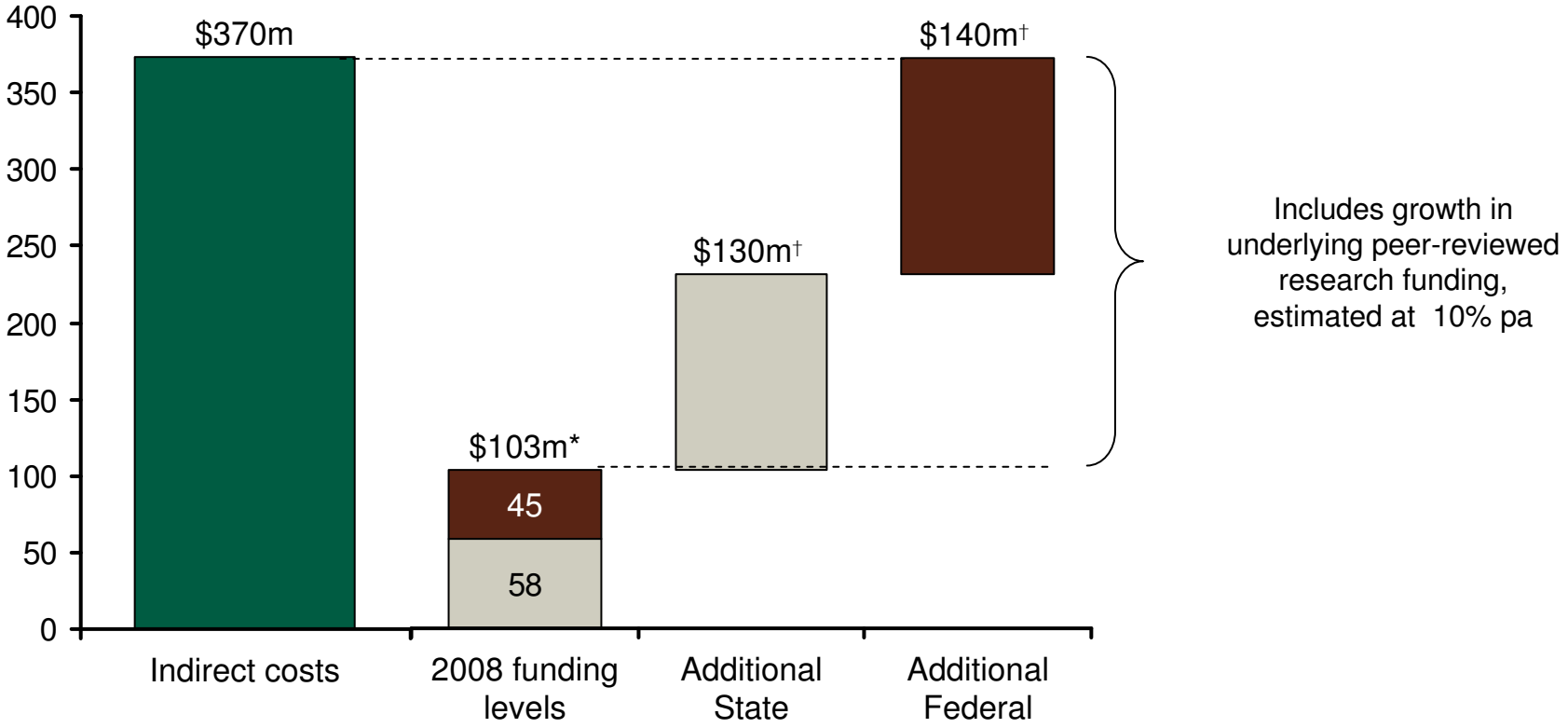
- NHMRC funding for Australian accredited MRIs has been forecast to grow by 10 percent per annum over the next six years (see appendix for supporting information)
- Total peer-reviewed research funding has been assumed to increase in line with NHMRC funding
- It is estimated that accredited MRIs will be awarded a total of $620m from all peer-reviewed grants (NHMRC, ARC, plus others) in 2014. These grants will require an estimated total of $370m* in indirect costs

Note: *Totals may not add up due to rounding
Source: AAMRI member data; L.E.K. analysis

AAMRI is requesting the Federal Government lift funding from $45m in 2008 to $185m in 2014 to ensure parity with universities and leading international research centres

Estimated total MRI indirect funding gap (2014)

Millions of dollars



Note: * Other funding has been included within federal funding. †Rounded to the nearest $5m
Source: AAMRI member data; L.E.K. analysis

The additional indirect funding can be introduced over a time period, consistent with the introduction of SRE for universities. This will lessen the immediate burden on Government and will maintain parity with the universities

Proposed Federal Government Funding for indirect costs of research for MRIs*

Millions of dollars	CY2008	CY2011	2012	2013	2014
Total indirect cost funding (current and requested)	45	81	116	151	187
Year-on-year funding increase due to increase in funding rate	-	27	27	27	27
Year-on-year funding increase due to growth in underlying competitive grants won	-	9	9	9	9

Proposed State Government Funding for indirect costs of research for MRIs**

Millions of dollars	CY2008	CY2011	2012	2013	2014
Total indirect cost funding (current and requested)	58	90	122	154	187
Year-on-year funding increase due to increase in funding rate	-	21	21	21	21
Year-on-year funding increase due to growth in underlying competitive grants won	-	11	11	11	11

Note: * Includes IRIISS and RIBG for MRIs
**Totals may not add up due to rounding
Source: AAMRI member data, L.E.K. analysis

The proposed Federal Government initiative will ensure equity in health and medical research funding and will maintain the support for excellence in research

Quantum of funding

1. **Establish a new health and medical research indirect costs funding scheme** to recompense all competitive peer-reviewed grants. The new scheme should fund indirect costs at the rate of **60 cents per dollar** of competitive grants awarded. This would assist in ensuring equity in funding arrangements between publicly-funded research sectors and would reward excellence
2. **Responsibility** for funding the new scheme should be shared between the Federal and State Governments, under a clearly defined agreement. For instance, the Federal Government should aim to fund indirect costs of 30 cents per dollar of grant funding by 2014; each state government can also aim to provide a base of 30 cents per dollar
3. The Federal Government should **ensure parity** is maintained by taking a 'whole of Government' approach, rather than the current departmental view
4. **Establish regular reviews** every 3 years to ensure funding for indirect costs keeps pace with growth in competitive grants and the costs of research. As a result, the federal and state budgets need to accommodate growth in funding for indirect costs

→ Maintained at international competitive levels over time

Mechanism of allocation

5. **Allocate funding on the basis of transparent and consistent criteria** to enable a level playing field and certainty for MRIs in their funding stream.
6. The large majority of indirect cost funding should remain **directly linked to competitive peer-reviewed grants**
7. In the long term, all grants should carry full funding for all research costs

→ Transparent allocation criteria, directly linked to grants

Section Six Summary – The proposed role of the Federal and State Governments in funding indirect costs

- The indirect cost funding gap is significant, at 30 cents per dollar of peer-reviewed funding
- It is imperative that Australia maintains its leadership position for health and medical research. In order to achieve this, the level of State and Federal funding for indirect costs needs to double on a cents per dollar basis (from 30 cents to 60 cents per dollar of peer-reviewed research grants)
  - this will achieve parity with universities and meet international best practice for funding indirect costs
- This implies an increase in Federal Government funding of approximately $140m per annum to $185m by 2014 will be required to support Australian accredited MRI research excellence
  - this increase incorporates an expansion of Federal Government funding to include all competitive peer-reviewed grants, not just NHMRC grants
- State Governments should make a commitment increase in indirect cost funding of approximately $130m per annum
- The requested increase in Federal Government funding represents only 5 percent of the $2.9 billion in new capital works investment in medical research in Australia over the next few years
- An increase in indirect cost funding will enable Australian MRIs to maintain competitiveness, and divert income currently used to fill the 'gap' into incremental research programs and technologies. This in turn will deliver significant translational health and economic benefits to Australians

L.E.K.

Appendix

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AAMRI members participating in this report (Participant Australian accredited MRIs)

State	MRI
NSW	Children's Medical Research Institute
NSW	Centenary Institute of Cancer Medicine
NSW	Garvan Institute of Medical Research
NSW	Victor Chang Cardiac Research Institute
NSW	Westmead Millennium Institute
NSW	Children's Cancer Institute Australia
NSW	Heart Research Institute
NSW	Kolling Institute of Medical Research
NSW	Institute for Eye Research
NSW	Prince of Wales Medical Research Institute
NSW	Woolcock Institute of Medical Research
NSW	The George Institute for International Health
QLD	Queensland Institute of Medical Research
QLD	The Wesley Research Institute
NT	Menzies School of Health Research
SA	Women's and Children's Health Research Institute

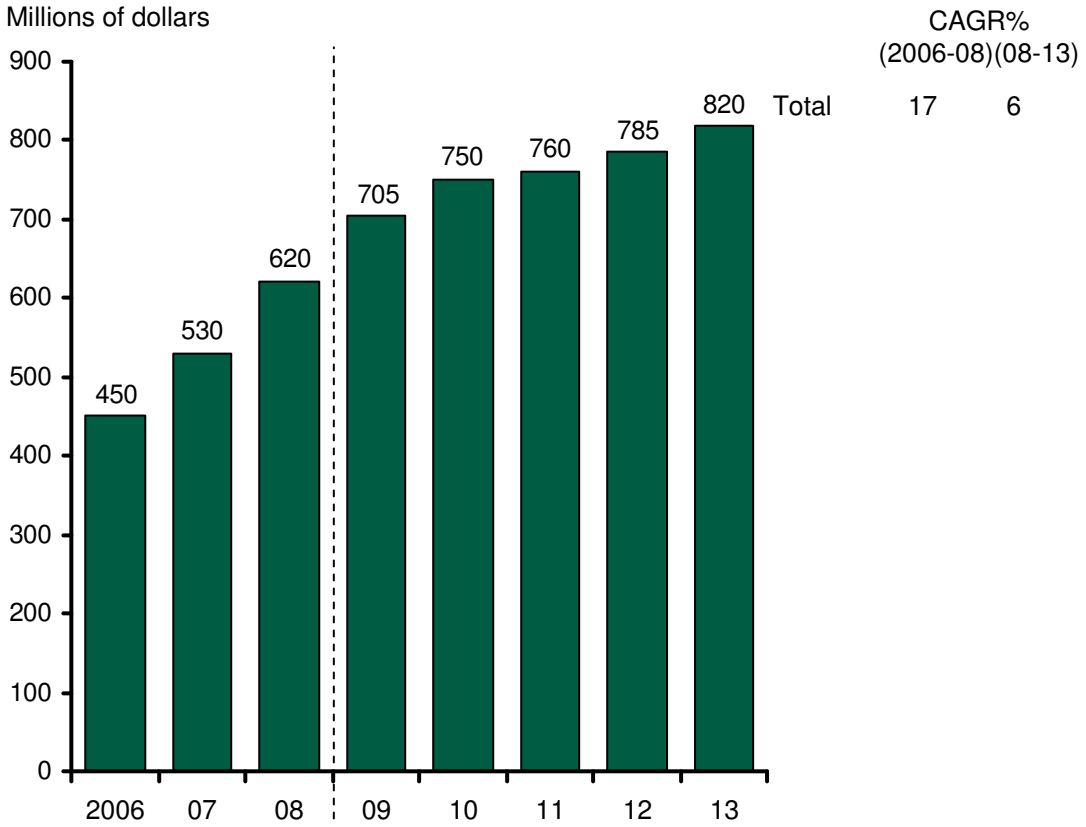
State	MRI
VIC	Baker IDI
VIC	Burnet Institute
VIC	Centre for Eye Research Australia
VIC	Florey Neuroscience Institute
VIC	Walter and Eliza Hall Institute of Medical Research
VIC	Murdoch Children's Research Institute
VIC	Prince Henry's Institute of Medical Research
VIC	St Vincent's Institute of Medical Research
VIC	Peter MacCallum Cancer Institute
VIC	Bernard O'Brien Institute of Microsurgery
VIC	Bionic Ear Institute
VIC	Ludwig Institute for Cancer Research
VIC	Mental Health Research Institute of Victoria
TAS	Menzies Research Institute
WA	Western Australian Institute for Medical Research
WA	Telethon Institute for Child Health Research

Glossary

Term	Definition
CAGR (Compound annual growth rate)	The annualised average growth rate over a specified period of time
CY (Calendar year)	Year ending 31st December
Capital works	Physical facilities or infrastructure (also known as investment in property plant and equipment)
FY (Financial year)	Year ending 30th June
HEP	Higher Education Provider
Indirect costs	All other costs excluding direct research costs (e.g. electricity, use of common facilities, administrative costs and salaries, building/facilities rent, cleaning, and maintenance, legal, insurance, information technology and computing services and any other costs involved operation of the MRI).
Indirect costs funding	Funding aimed at financing the indirect costs associated with research (e.g. funding aimed at supporting training, paying for administrative costs, etc).
Discount Rate	A certain interest rate that is used to bring a series of future cash flows to their present value in order to state them in current dollars
IGS (Institutional Grants Scheme)	A federally funded scheme to provide capital works funding for universities
IRR (Internal Rate of Return)	The discount rate at which the present value of the future cash flows of an investment equals the cost of the investment
Peer-reviewed research funding	Funding directly attributable to research projects (e.g. researcher salaries, project related consumables, conference-related travel, costs directly attributable to a project). Funding is obtained through the competitive peer review process
ROI (Return on Investment)	The profit, or return, from an investment, divided by the cost of the investment
RIBG (Research Infrastructure Block Grant)	A federally funded block funding available for universities to support indirect funding for research activities
SRE (Sustainable Research Excellence)	A federally funded scheme to augment the RIBG scheme to cover the indirect costs of research

Peer reviewed funding, including NHMRC funded grants, has increased significantly over the last three years. Funding is expected to continue to grow, albeit at a lower rate

Total NHMRC grants administered, by institution type (CY2006-13F)



- Total NHMRC funding has increased by 17 percent per annum over the last three years
  - over the same time period, MRIs have increased their share of total NHMRC funding by 1 percent per annum
- NHMRC funding is expected to grow for the next five years, albeit at the lower rate of 6 percent per annum
- Assuming MRIs continue to increase their share at the same rate to 2013, the implied 2008-13 growth rate of MRI NHMRC funding is 10 percent per annum
- Total peer-reviewed research funding has been assumed to increase in line with NHMRC funding

Note: See slide 23 for detailed calculation methodology
Source: AAMRI member data; NHMRC Annual Report, 2008-09; L.E.K analysis

Products developed in medical research institutes often provide stand alone commercial benefits, and in the case of Genera, underpin corporate spin-offs

Commercial value of products

WEHI - DNA anchoring technology and the creation of Genera Biosystems Limited

Researchers from the WEHI invented a new method for anchoring DNA fragments onto small particles of silica.

The technology formed a platform for a wide range of potential applications in research, environmental and diagnostic markets

In 2002, Genera Biosystems Pty Ltd was created as the commercialisation vehicle for the technology. The technology was incubated at the new WEHI Biotechnology Centre at Bundoora

In June 2008, Genera Biosystems listed on the ASX. Total capital raised to date is in excess of $12 million and current market capitalisation is approx. $37 million

The benefits to Victoria have been employment and activities funded by the capital raised, exploiting a world-class strength in women's health and expanding a translational capability in molecular diagnostics

Ludwig – Use of VEGF-D factor to prevent blocking of blood vessels after surgery

The VEGF-D factor was discovered at the Ludwig Institute (1998) and it is now been applied to late stage clinical trials in a product called Trinam ®. Trinam ® consists of a local delivery device and gene-based medicine (the VEGF-D gene) and is being developed to prevent the blocking of veins and arteries that frequently occurs after vascular surgery

This treatment has been shown to prevent blocking of dialysis lines in renal dialysis patients and has achieved orphan drug status in Europe and the US in 2004

Ark Therapeutics, the developer of the drug, has received approval from the US Recombinant DNA Advisory Committee to conduct a Phase II/III trial in haemodialysis access surgery for which recruitment is starting in 2009

Source: WEHI, Bionic Ear Institute

Technologies provide health and economic benefits through commercialisation, as in the case of Replikun, ADRO and CASALA

Commercialisation of technology

QIMR – Replikun Pty Ltd

Replikun Biotech Pty Ltd is a spin-off company, formed by QIMR to further develop and commercialise the KUNrep technology.

The KUNrep technology is based on the Kunjin virus, which is related to the West Nile virus. The Kunjin virus is being investigated for use in vaccine delivery and gene therapy treatments. The technology also has significant prospects as a new method for the production of therapeutic proteins, which may be used by many of the world's pharmaceutical companies

Replikun Biotech has obtained $2m of funding from Start-up Australia's Innovation Investment fund to further the research. Since then, the company has also entered an out-licensing agreement with UniQuest Pty Ltd to commercialise a new West Nile virus vaccine technology

Bionic Ear Institute – the development of ADRO ® and CASALA ™ software

The Bionic Ear Institute was the Managing Agent for CRC Hear. The Institute's participation in the CRC Hear involved contributions to the development of ADRO and CASALA

ADRO is an innovative concept in digital signal processing for cochlear implant and hearing aid users. Following the development, a spin-off company, Dynamic Hearing, was established leading to subsequent clinical trials, commercial licenses and export earnings. The patented technology is currently marketed by Dynamic Hearing Pty Ltd under the ADRO® brand. ADRO® is a registered trade mark of Dynamic Hearing Pty Ltd

CASALA is a stand-alone computer software program designed to help speech pathologists and other people interested in spoken language to transcribe and analyse speech samples. CASALA has been commercialised by the Hearing CRC and is used in clinical practice as well as research studies

Source: Queensland Institute for Medical Research, Ludwig Institute for Cancer Research

New projects in the medical research field will employ more than 600 new staff in the coming years in Victoria

Project	State	Funding ($m)	Total employment	New employment	Completion
Bio21	VIC	400	500 researchers	Not specified	Completed
Peter MacCallum Cancer Centre – Genomics Platform Technology	VIC	0.8	5 researchers	5 researchers	2010
Victorian Life Sciences Computation Initiative	VIC	50	30 employees	30 new employees	2011
Melbourne Neuroscience Project	VIC	225	500 researchers	Not specified	2011
Walter and Eliza Hall Institute (new wing and redevelopment)	VIC	150	400 researchers	400 new researchers	2012
Children's Bioresource Centre	VIC	4.9	100 researchers	100 researchers	2012
Monash Health Research Precinct Translation Research Facility	VIC	116	400 researchers	100 researchers	2013

Source: Victorian Minister for Innovation, 2008. 'Victorian medical research gets $25.7 million'; Victorian Government Department of Innovation, Industry and Regional Development, 2008. ' Innovation: Victoria's future'; University of Melbourne, 2000. 'University has leading role in Bio21 initiative'; WEHI Annual Report, 2007-08; AAMRI member correspondence; L.E.K. analysis

New projects in the medical research field in NSW will employ over 600 new staff in the coming years

Project	State	Funding ($m)	Total employment	New employment	Completion
Moss Vale Mouse Breeding Facility	NSW	20	30 employees	30 new employees	2009
Lowy Cancer Research Centre (Children's Cancer Institute Australia)	NSW	35	250 researchers	170 researchers	Late 2009
Neuroscience Research Precinct / Prince of Wales Medical Research Institute	NSW	42	250 employees	No new researchers required	2010
Westmead Millennium Institute	NSW	90 current (seeking further 40)	600 employees	200 new employees	2012
National Institute for Virology	NSW	120	300 employees	Not specified	2012
Garvan St Vincent's Campus Cancer Centre	NSW	100	Not specified	200 new researchers (~50 from overseas), 50 new support staff	2012
Centre for Obesity, Diabetes and Cardiovascular Disease	NSW	400	1,000 researchers	Not specified	2013
Centre for Basic and Translational Cancer Research	NSW	15	380 researchers	Not specified	2014

Source: NSW Minister for Science and Medical Research, 2009, '$30 million in additional funding for the Westmead Millennium Institute'; AAMRI member correspondence; L.E.K. analysis

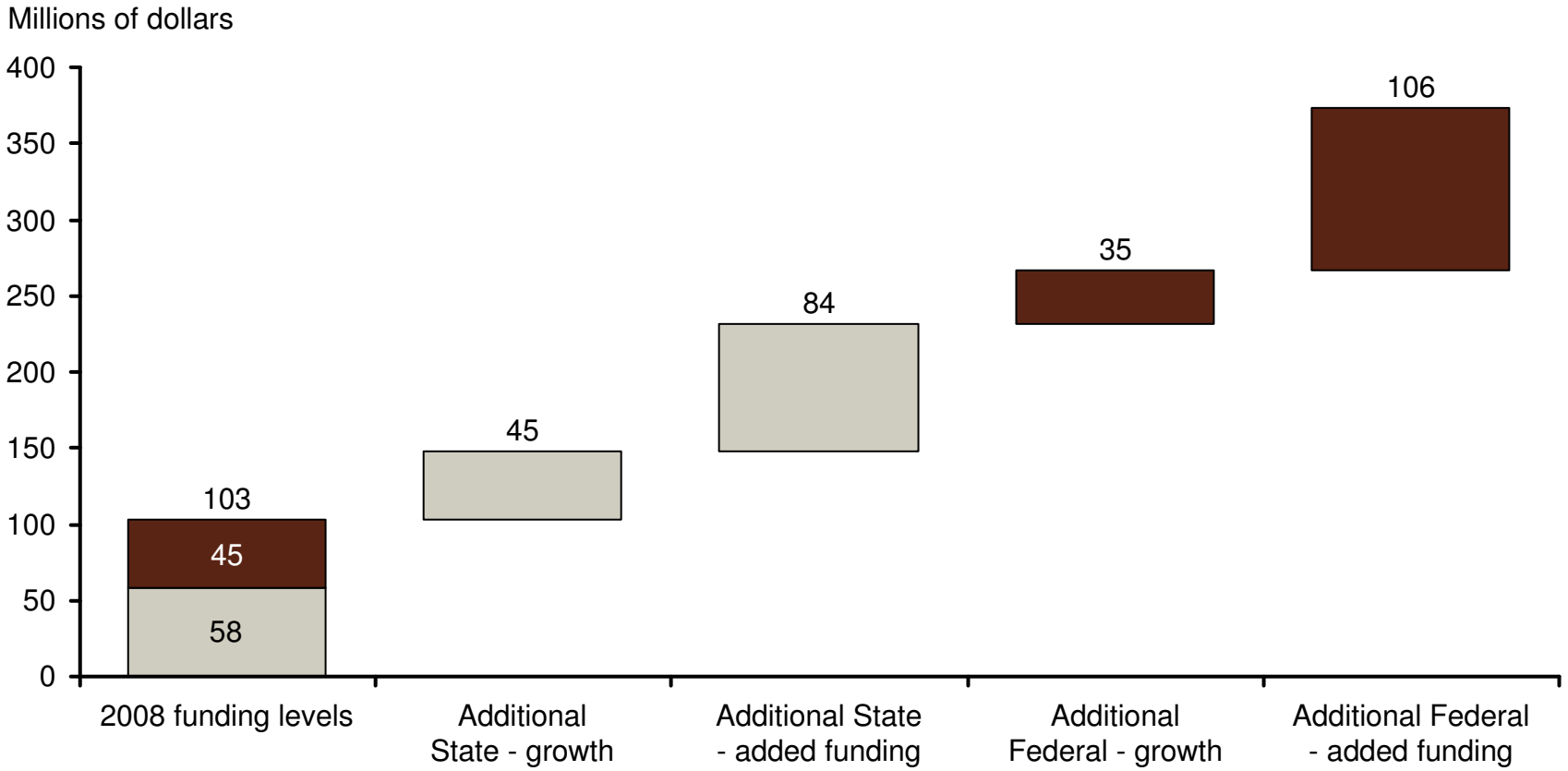
New projects in the medical research field will employ approx. 2,000 new staff in the coming years in WA, QLD, SA, TAS and NT

Project	State	Funding ($m)	Total employment	New employment	Completion
Clinical Trials at WAIMR	WA	9.5	20 researchers	20 researchers	1st qtr 2010
Western Australian Institute for Medical Research North	WA	100	800 researchers	300 new researchers	Dec 2012
Western Australian Institute for Medical Research South	WA	67	500 researchers	150 new researchers	Dec 2013
Telethon Institute for Child Health Research	WA	130	600 researchers	300 new researchers	2014
QIMR Smart State Medical Research Building	QLD	180	400 employees	340 new employees	2011
Translational Research Institute	QLD	342	500 employees	Not specified	2012
Health and Medical Research Institute	SA	200	675 researchers	675 – estimated that 50% will be new to the state from either overseas or interstate	2012
Menzies Centre	TAS	90	160 researchers	60 researchers	2012
Menzies School of Health Research	NT	44	500 employees	210 new employees	2010

Source: Kate Ellis MP, Media release ,2009,'SA's new $200m health and medical research institute'; QIMR press release, 2009, 'Queensland Institute of Medical Research receives record $27.5m gift'; AAMRI member correspondence; L.E.K. Analysis

By 2014, without a funding increase the gap will grow to $270m. AAMRI is requesting the Federal Government lift funding by $140m in 2014

Estimated total indirect funding gap as a proportion of peer-reviewed research funding (2014)



Source: AAMRI member data; L.E.K. analysis