



CANCER RESEARCH AND FUNDING IN WESTERN AUSTRALIA: AN OVERVIEW FROM 2008 TO 2010

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Abstract

Funding for cancer research plays a vital role in improving all aspects of cancer care and, thus, cancer-related outcomes. To identify strengths and gaps in current cancer research activities in Western Australia, an audit of all competitive funding for cancer research undertaken in Western Australia during 2008-2010 was conducted. The Commonwealth Government was identified as the most significant contributor to competitive cancer research funding, however the amount received by Western Australian researchers was much less than by other states such as New South Wales and Victoria. These states also attract larger amounts of international funding. The broad research areas that received the most funding were biology and treatment. Most cancer research projects focused on multiple tumour sites or were basic science projects. Relative to their burden of disease, some tumour types such as liver, oesophageal, ovarian and pancreatic cancer may be underfunded. To increase the success of Western Australian cancer researchers at a national and international level, support and capacity building is needed at a local level. Identified research priorities with targeted support should be integrated into cancer planning to ensure the development of research capacity in areas of most need.

Cancer research is essential to increase understanding of how to improve all aspects of cancer control and care. By supporting the discovery of mechanisms underlying cancer and the development of risk-reducing behavioural interventions, better diagnostic techniques and treatments, and improved services and support for cancer patients, funding for cancer research plays a vital role in improving care for people diagnosed with cancer and, thus, cancer-related health outcomes.

As the burden of cancer on society and healthcare budgets rise, investment in cancer research has become a priority worldwide.¹ In 2004, €2.0 billion (AUD\$3.2 billion) was spent on publicly funded cancer research in Europe – a 38% increase in spending from two years previously.² In the United States, the National Cancer Institute spent over USD \$4.7 billion (AUD \$5.2 billion) per year on cancer research during 2004-2006, representing a 14% increase from 2002.³ In Australia, cancer research funding from the National Health and Medical Research Council (NHMRC), an Australian Government body, increased by 174% from \$68 million in 2004 to \$118.6 million in 2007.⁴

In 2007, Cancer Australia conducted an audit of funded cancer research undertaken in Australia during 2003-2005.⁵ A total of \$291.5 million in cancer research funding was identified, 6% of which was awarded to researchers in Western Australia (WA). It was found that 66% of identified funding was provided by the Commonwealth Government, largely through the NHMRC and the Australian Research Council. State and territory governments supplied approximately 2% of funding, and state and territory Cancer Councils contributed 9%. As

this was the first national audit of its type, it could not be determined how the amount or distribution of cancer research funding changed from previous years. However, an audit conducted for New South Wales (NSW) indicated that from 2001-2003 to 2004-2006, Commonwealth Government funding for cancer research in NSW increased by 169% (\$40 million to \$67.7 million).¹ Across the same period, State Government funding increased by 1289% from \$1.8 million to \$25 million. This considerable increase in State Government funding was related to the establishment of the NSW Cancer Research Institute, a statewide, government-funded cancer control agency. Charitable and non-profit organisations funding remained relatively stable and industry and foreign government funding decreased during this time.

Recent audits in Australia have classified cancer research according to broad research areas (using the Common Scientific Outline classification system; see www.cancerportfolio.org/cso.jsp) and tumour sites being investigated.^{1,5,6} In the absence of any state or national level coordination of cancer research, such information is useful in guiding the funding policies and priorities of organisations that award funding for cancer research. As detailed information on the types of cancer research currently funded in WA specifically is not available, the WA Cancer and Palliative Care Network and Cancer Council WA commissioned an audit of cancer research funding in WA for 2008-2010.

The importance of cancer research and the potential value of a cancer research audit was recognised during a recent forum conducted by the WA Cancer and Palliative Care

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Network to develop a WA State Cancer Control Plan.⁷ Research was identified as a priority area for inclusion in the plan. To build capacity in this area it was suggested that the benefits of research be promoted to funders and health professionals, that collaboration between researchers and clinicians should be encouraged and supported, and that the number of clinical academic positions should be increased. A cancer research audit was proposed as a way to identify current strengths and gaps in cancer research in WA and, therefore, those areas of cancer research that should be considered as priorities during the development of the WA State Cancer Control Plan.

The aim of the audit was to obtain an overview of competitive cancer research funding in WA for the years 2008-2010. The specific objectives were to:

1. Determine the funding sources of cancer research
2. Determine how cancer research funding is used
3. Determine the broad research areas studied, using the Common Scientific Outline classification system
4. Determine the tumour sites researched.

Method

Data was collected from September to November 2010. Information was sought for cancer research projects that received competitive cancer research funding and that were conducted during 2008-2010. Ethical approval for the audit was obtained from The University of Western Australia Human Research Ethics Committee (RA/4/1/14428).

Approaches to data collection and responses

'Top-down' approach

Cancer research and competitive funding information (see table 1) was requested from organisations that provide cancer-related research funding (eg. NHMRC, Australian Research Council, Cancer Council WA and other non-profit organisations) and that administer cancer-related research funding (eg. universities and hospitals in WA).

The desired information was available online from some institutions. For other institutions, we invited research offices to provide details of cancer-related research grants administered by them during 2008-2010. Research offices that did not respond were contacted again two and four weeks after the initial request.

All five WA universities provided details of cancer research funded at their institution between 2008-2010. The three major public hospitals and two large private hospitals in WA were also contacted. Two public hospitals responded – one with the requested information and another with information from two oncology departments only. One private hospital reported it did not receive direct cancer research funding and the other provided names of researchers involved in cancer research at their institution. These researchers were then followed up directly.

For projects identified through the 'top-down' approach, information on Common Scientific Outline codes, main tumour site studied and type of grant was not provided by the institutions. Audit researchers were, however, able to determine the Common Scientific Outline code and

tumour site studied from the project title, and the grant type from the project title and type of institution that provided the funding. For projects where the amount of funding received was unclear or not provided, the chief investigator was contacted for clarification.

'Bottom-up' approach

Two hundred and eighty five individuals thought to be working in cancer-related research in WA were identified from annual reports or lists of successfully funded projects published on funding organisations' websites, and from the programs of cancer conferences held in Perth during the past four years. Prominent researchers in WA were also asked to provide names of individuals they knew were likely to be involved in cancer research. In addition, the Australian New Zealand Clinical Trials Registry was asked for names of chief investigators of all WA cancer-related trials registered during 2008-2010. Researchers were asked directly for information for each of their cancer research projects conducted during 2008-2010.⁸

Individuals were contacted via phone and/or email, and asked to provide the data by either completing a provided information template (which listed the variables and response options in table 1), or by providing their CV or another document containing a list of their funded research grants. Non-responders were contacted again after four weeks. Before finalising data collection, the research team reviewed the list of remaining non-responders and followed up with those thought to be involved in cancer research. In total, ninety-two individuals (32%) responded to the request for data. Fourteen respondents reported they were not involved in funded cancer research during 2008-2010 and two declined to participate.

Variables and coding

Table 1 shows the information sought for each cancer research project funded from January 2008 to December 2010 and how the variables were coded.

Data exclusions

Clinical trials funding was excluded from this analysis due to a poor response in this area. Researchers who conducted clinical trials expressed concerns regarding confidentiality and difficulties in estimating the amount of funding their involvement in a particular trial attracted.

Results

Overview of competitive cancer research funding in WA for 2008-2010

Data was collected for 218 distinct cancer research projects. Four projects received two grants and one attracted three grants, resulting in a total of 224 competitive grants identified for the audit period. The amount awarded per grant for the three year audit period ranged from \$1058 to \$900,000. Table 2 shows the total competitive funding awarded in each calendar year.

Sources of funding

The distribution of competitive cancer research funding across different sources is shown in figure 1. The Commonwealth Government made the largest contribution

Table 1: Information sought for each cancer research project conducted in WA during 2008-2010.

Variable	Coding details
Area of research	<p>Broad area of research for each project was classified using the following internationally recognised Common Scientific Outline codes:</p> <ul style="list-style-type: none"> • biology • etiology • prevention • early detection, diagnosis and prognosis • treatment • cancer control, survivorship and outcomes • scientific model systems <p>More information on the Common Scientific Outline can be found at: www.cancerportfolio.org/cso.jsp</p> <p>Projects were classified by either the researchers who provided information on each of their own studies, or, if this information was unavailable, by the audit investigators.</p>
Disease site	Defined by either the researchers who provided information on each of their own studies, or if this information was unavailable, by the audit investigators.
Amount of funding for 2008-2010	Where a total amount of funding was provided for a project funded over a number of years and yearly amounts were not able to be identified, the total amount was divided by three to give an estimated amount of funding per calendar year.
Source of funding	<p>Source of funding for each grant was classified as one of the following:</p> <ul style="list-style-type: none"> • NHMRC • Other Australian Government body • State/Territory Government body • Cancer Council • Other non-profit/charitable organisation • University • Public hospital • Pharmaceutical company • Overseas organisation • Other
Type of funding	<p>The funding received for each project was classified as one of the following:</p> <ul style="list-style-type: none"> • research grant • tender • non-competitive funding • infrastructure funding • equipment funding • training and people support (eg scholarships and fellowships)

Table 2: Annual funding to cancer research projects in WA 2008-2010.*

Year	Total funding
2008	\$7,579,383
2009	\$9,990,017
2010	\$10,925,259

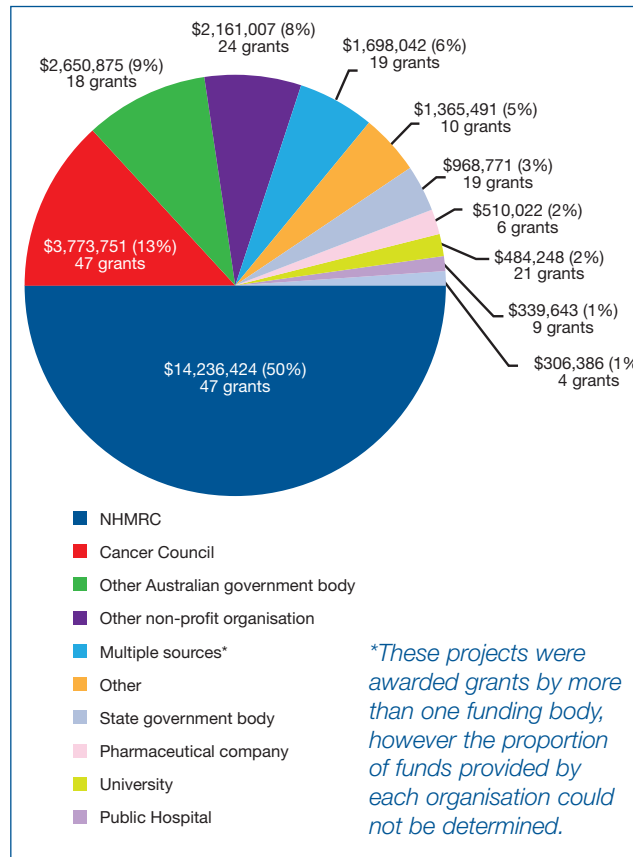
*No adjustment for inflation in these figures has been made.

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(59%) to funding, predominantly through grants from the NHMRC, Australian Research Council and Cancer Australia.

Cancer Councils (largely Cancer Council WA) and other non-profit organisations made the second largest contribution (24%). All other individual sources each contributed less than 5% of research dollars to competitive funding. The State Government contributed less than \$1 million, or 3% of identified competitive funding.

Figure 1: Sources of competitive cancer research funding for 2008-2010.

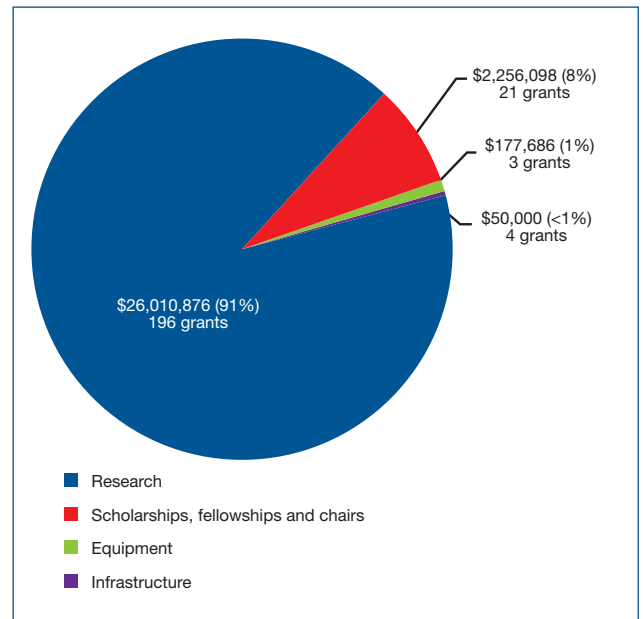


Use of funding

Cancer research grants were categorised according to how the funds were used. Figure 2 shows the proportion of total funds which were allocated to general research, infrastructure, equipment and scholarships, fellowships or chairs. The majority of funding was specifically for research projects, followed by people support (eg. scholarships and fellowships).

Little information was received regarding Medical and Health Research Infrastructure Fund grants, which are awarded by the WA Government to applicants who meet a prescribed minimum threshold of research funding (ie. >\$400,000) from international and/or national peer-reviewed sources for the past three years. Given the unique circumstances under which Medical and Health Research Infrastructure Fund grants are awarded, and the lack of reliable data received, Medical and Health Research Infrastructure Fund grants were excluded from data analysis. The Department of Health WA Research Development Unit reported that the amount of Medical

Figure 2: Use of competitive cancer research funding

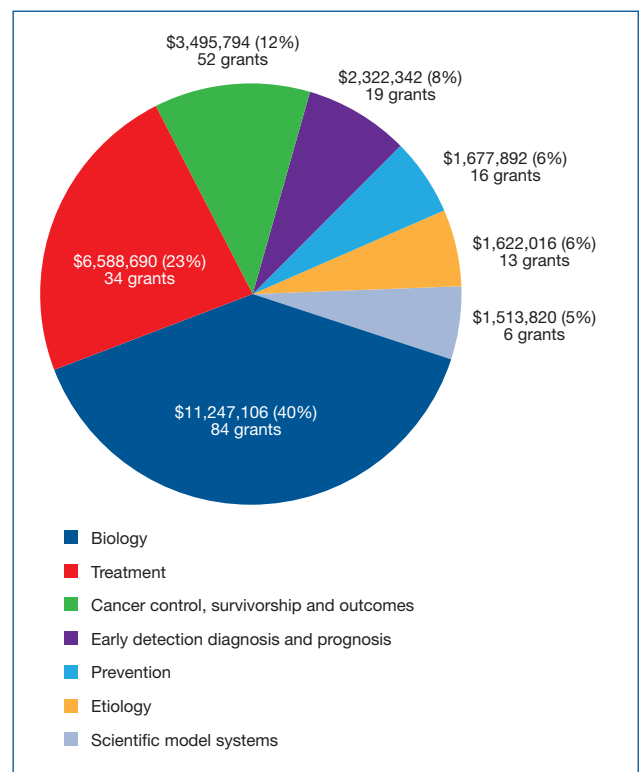


and Health Research Infrastructure Fund funding awarded during 2008-2010 was \$306,000, which represents approximately 2.7% of identified funding.

Broad research areas for funded projects

Funded projects were classified into Common Scientific Outline categories, reflecting the primary focus of the research. The distribution of funding across the seven major Common Scientific Outline categories is illustrated in figure 3. The largest proportion of competitive funding

Figure 3: Broad research areas (Common Scientific Outline codes) of competitively funded cancer research projects.



was allocated to biology research, followed by treatment and research related to cancer control, survivorship and outcomes. Scientific model systems received the least amount of funding during 2008-2010.

Disease sites studied

One hundred grants (40%) were awarded to projects that were not site-specific, or of a basic science nature. For projects that focused on one or more disease sites, the majority of funding went to mesothelioma (20%), leukaemia (19%), prostate (15%), breast (14%) and brain (12%) cancers (see figure 4). Research related to cancers of the testes, cervix, bladder, endometrium and oral cavity and lip received minimal funding.

To examine whether the pattern of site-specific cancer research funding across different tumour sites is consistent with burden of disease, potential years of life lost was compared against the amount of funding for the 17 most

burdensome cancers in Australia (see figure 5).⁹ While prostate cancer is the most commonly diagnosed cancer in Australia,¹⁰ the amount of funding awarded to prostate cancer research in WA was relatively disproportionate to the potential years of life lost due to this disease. Mesothelioma and leukaemia also received a relatively large proportion of research funding compared to their burden of disease. Melanoma, myeloma and cancers of the lung, colorectum, pancreas, liver, oesophagus, stomach, ovary, kidney and bladder are among the top contributors of potential years of life lost due to cancer, but received relatively low or no identified cancer research funding during the audit time frame.

Discussion

The main aim of the audit was to obtain an overview of cancer research funding in WA for the period 2008-2010.

The total number of organisations that provide cancer research funding is not known, so it is difficult to quantify what percentage of total cancer research funding was captured in this audit. Funding information most likely to be missing is that from smaller organisations whose research funding details are not publicly available. As a result, funding from major organisations with easily accessible funding information and the types of research they fund may be over-represented. However, given the method in which individuals were identified and followed up, it is likely that those who did not reply were not actively involved in cancer research during 2008-2010 and that most individuals involved in cancer research provided input to the audit.

Figure 4: Disease sites studied by competitively funded cancer research projects.

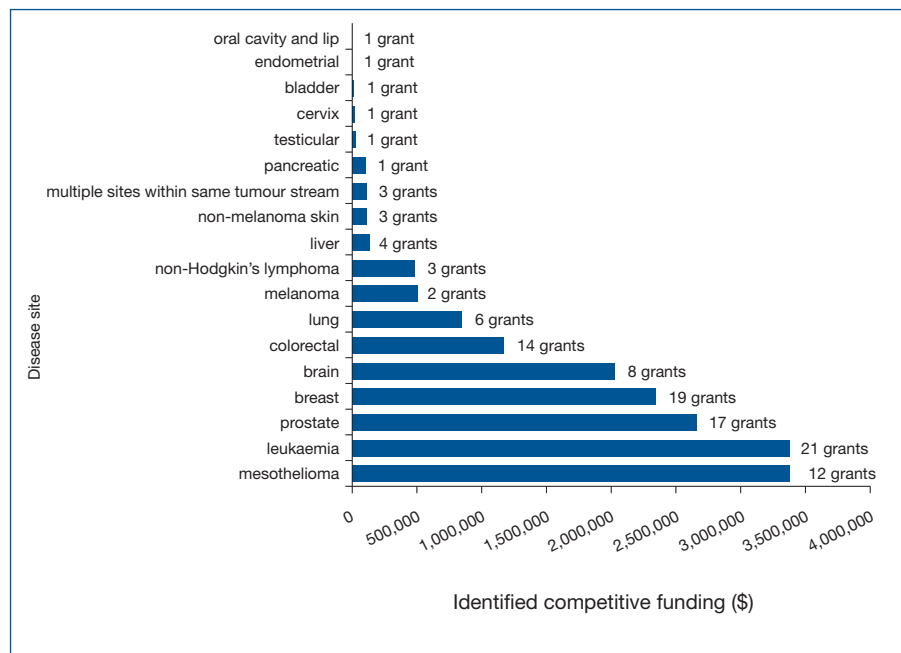
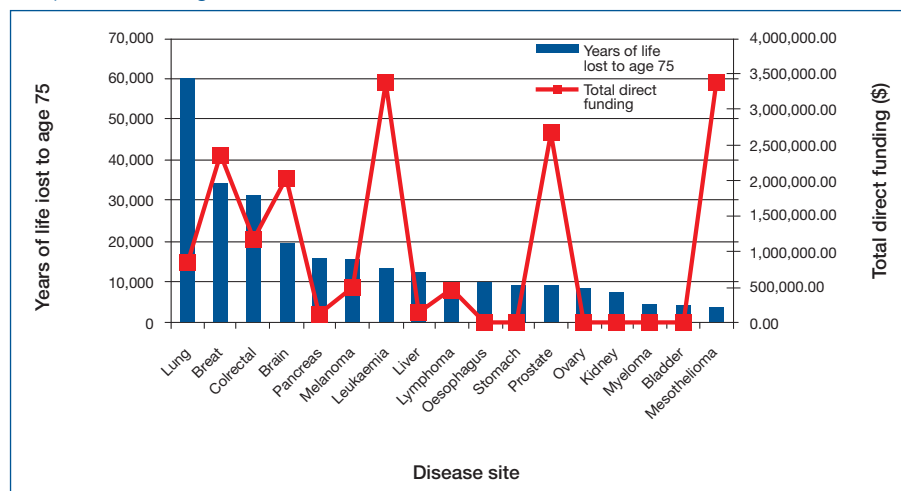


Figure 5: Potential years of life lost for cancer specific sites compared to the amount of competitive funding received.



Other types of data that may be under-represented in the audit are those related to funding for equipment, infrastructure or scholarships, fellowships or chairs. For these grant types, a discrepancy was noticed between data collected through the top-down and bottom-up approaches, whereby individuals were less likely to report such funding. Any future audits should make clear to participants which forms of cancer-related funding are relevant to the audit.

Cancer research in WA was funded by a variety of sources, with the Commonwealth Government (ie. NHMRC, Australian Research Council

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and Cancer Australia) making the largest contribution. WA Government funding for competitive cancer research was relatively low (3%). In contrast, the NSW Government contributed 19% of total cancer research funding in NSW for 2004-2006. This relatively high level of state funding in NSW may be related to the fact that NSW (along with many other jurisdictions across Australia and the rest of the world) has identified research as a priority to improve cancer outcomes, and has mandated action to support and coordinate research endeavours in its Cancer Action Plan. The proportion of WA funding from international sources was also relatively low (5%) when compared to Victoria (25%)⁶ and to Australia as a whole (13%).⁵ Victoria and NSW also attract much larger amounts of Commonwealth funding in the form of NHMRC grants than WA.^{1,6} These variations may be due, in part, to differences in audit methodology. However, the higher rate of international funding may also relate to the relative strength of those states' cancer research.

The broad areas of research and tumour sites studied in WA generally follow a similar pattern to that in other states and at a national level.^{1,5,6} As is the case in Victoria and NSW, biology attracted a greater proportion of cancer research funding than any other broad research area, and most cancer research addressed multiple tumour sites or were basic science projects.^{1,6} The audit also identified some cancer types which, relative to their burden of disease, may be underfunded. Given the potential for one or two very large grants in a specific area to skew the results, it is important that regular audits are conducted to obtain an accurate, up-to-date overview of cancer research funding.

Research is a key enabler of evidence-based medicine and optimal care for people with cancer. As such, research is increasingly identified around the world as an

important component of cancer management planning and an aspect of care warranting support by providers of health services. To increase the success of WA cancer researchers at a national and international level, support and capacity-building is needed at a local level. Inclusion of identified research priorities with targeted support in a state cancer control plan will ensure the development of research capacity in areas that will benefit this state. This audit has provided an overview of the broad research areas and tumour sites currently studied in WA and may, therefore, be useful in identifying priority areas for the plan.

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