



Australian Government
National Health and Medical Research Council

Submission to the Senate Select Committee into Funding for Research into Cancers with Low Survival Rates

1. Introduction

The National Health and Medical Research Council (NHMRC) welcomes the opportunity to provide a submission to the Senate Select Committee into Funding for Research into Cancers with Low Survival Rates (the Committee).

In response to the Select Committee's Terms of Reference, this submission outlines NHMRC's:

- role and strategy for health and medical research
- approach to funding
- support for cancer research, and
- role in supporting clinical trials.

2. NHMRC's role and strategy for health and medical research

Overview

NHMRC is Australia's leading body for supporting health and medical research, developing evidence-based health advice, and setting standards in ethics in health care and research, within a single national organisation. To support the agency's mission of 'working to build a healthy Australia', NHMRC:

- funds high quality health and medical research and builds research capability
- supports the translation of health and medical research into better health outcomes, and
- promotes the highest ethical standards in health and medical research.

NHMRC is an independent statutory agency within the Health Portfolio and operates under the *National Health and Medical Research Council Act 1992* (the NHMRC Act). It comprises the CEO¹, Professor Anne Kelso AO, the Council of NHMRC, Principal Committees and its staff.

The CEO of NHMRC is advised and supported by the Council of NHMRC, and assisted by a number of Principal Committees. The Council represents a wide range of expertise. Currently chaired by Professor Bruce Robinson AM, it includes the Australian Government Chief Medical Officer and state and territory chief health and medical officers. It also includes members with specific expertise in health and medical research, the health needs of Aboriginal and Torres Strait Islander peoples, consumer issues and business.

Principal Committees assist Council in carrying out its functions, helping to provide an effective governance and advisory structure for NHMRC. The establishment of the Research Committee (RC) is required by the NHMRC Act and its functions are determined by legislation. The role of RC includes advising Council on the application and monitoring of the Medical Research Endowment Account (MREA) and on matters relating to medical research and public health research, including the quality and scope of such research in Australia.²

¹ The CEO is accountable to the Minister for Health.

² The role of RC is set out in Section 35(2) of the NHMRC Act.

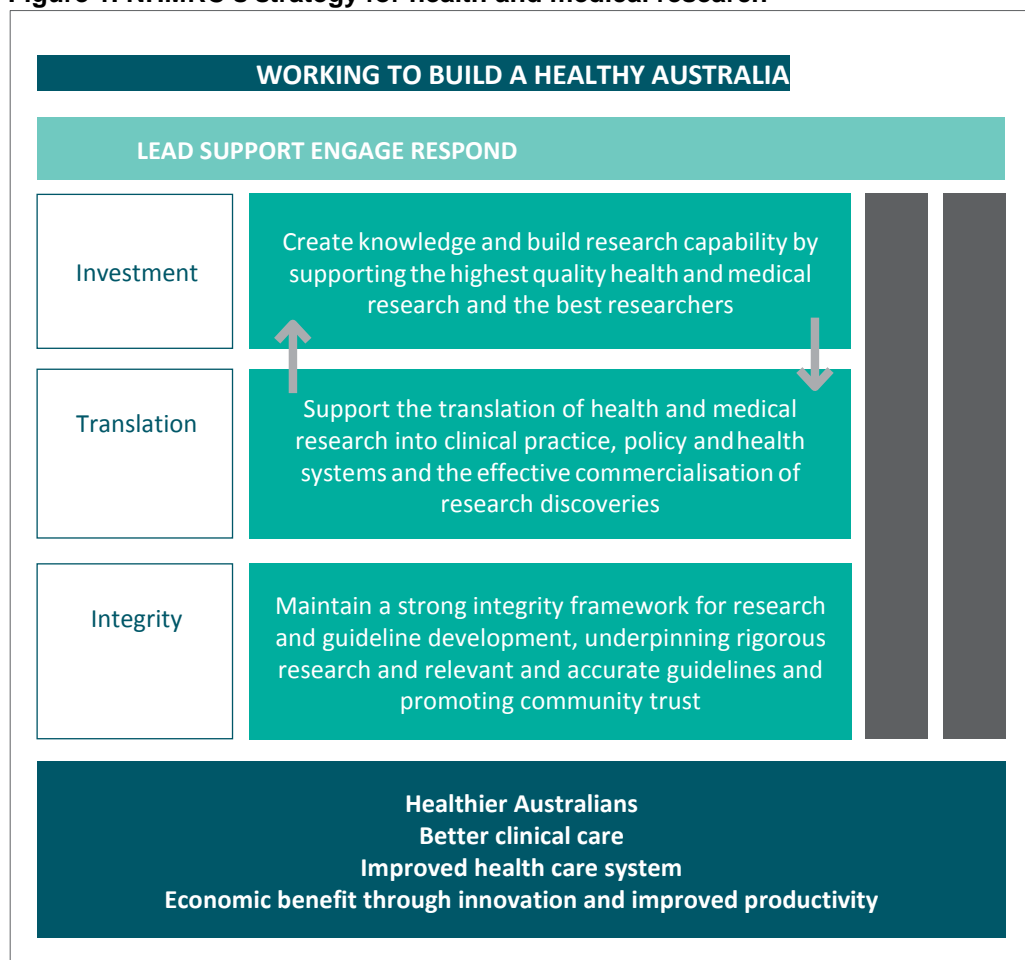
NHMRC Corporate Plan 2016-2017

The themes of investment, translation and integrity represent NHMRC's strategy for health and medical research, as outlined in the NHMRC Corporate Plan (Figure 1). NHMRC's strategy takes into account the need to respond to national priorities in health and science, to consumer needs and community perspectives and to the broad policy environment.

NHMRC aligns its strategic priorities with those identified by the Australia Government, such as the Australian Government's Science and Research Priorities. Currently, NHMRC is establishing baseline data for each of the Practical Research Challenges identified, and is developing metrics in consultation with key agencies and seeking advice from NHMRC's Council on strategic funding priorities.

NHMRC's strategic priorities, as set out in the Corporate Plan, are based on health system needs, evidence gaps, advice from the Council of NHMRC and government policies, including the National Health Priority Areas (NPHAs) and the Australian Government's Science and Research Priorities.

Figure 1. NHMRC's strategy for health and medical research



3. NHMRC's Approach to Funding

Overview

As the largest single funder of health and medical research in Australia, NHMRC provides leadership and direction for the national health and medical research agenda.

As a national body, NHMRC has a responsibility to cover the breadth of health and medical research needs. NHMRC distributes grants through a range of schemes with specific aims, e.g., to create knowledge, to build capability, to accelerate translation of research findings into policy and practice, to

foster collaboration, to strengthen international research links and to build partnerships with industry, policy makers and other research users.

Consistent with the NHMRC Act, NHMRC focuses on the relevance of research proposals for health, rather than defining 'health and medical research' as a set of research disciplines. NHMRC will fund research in any or all areas relevant to health. It will also accept grant applications in any research discipline and applicants are provided with an opportunity within their application to explain how their research will lead to improved outcomes in health.

Most NHMRC funding is awarded in response to investigator-initiated applications in which the research is conceived and developed by the researchers. A smaller proportion of funding is directed to specific areas of unmet need, e.g., through Targeted Calls for Research, special Centres of Research Excellence, Partnership Centres and some Partnership Projects.

The primary criterion for all funding decisions is excellence. NHMRC relies on review by independent experts to identify the best applications, based on the significance of the research, the quality and feasibility of the research proposal, and the track record of the investigators. Rigorous processes of expert review ensure transparency, probity and fairness.³

When applications for funding are received, the office of NHMRC manages the expert assessment of applications by independent experts. The outcomes of expert review are used to determine which applications will be recommended for funding. NHMRC's RC recommends those applications to be funded through NHMRC Council to the CEO who submits them for approval to the Minister with portfolio responsibility for NHMRC.

Support for Priority-Driven Research

A major component of NHMRC's work is to administer the MREA to fund researcher-initiated research and priority-driven, strategic research.

NHMRC's range of funding schemes also provides the flexibility necessary for targeting research and capacity building in key areas of need in the health system. Each year NHMRC sets aside a component of the MREA to address identified priorities. Priorities are often implemented through additional funding provided for existing NHMRC schemes, such as the Centres of Research Excellence scheme.

Each year, a small proportion of the total annual expenditure budget is set aside to fund priority research areas through its Targeted Calls for Research (TCR) funding program. A TCR is a specific funding mechanism that invites grant applications to address a specific health issue. NHMRC may initiate a TCR to address additional major issues that arise or in cases where substantial gaps in evidence are identified. The aim of a TCR is to stimulate or greatly advance research in a particular area of health and medical science that will benefit the health of Australians. Through the TCR program, NHMRC has an opportunity to identify and subsequently fund emerging health problems in Australia.

NHMRC recently released its revised framework for TCRs and Online TCR Submission Pathway. The new TCR framework provides NHMRC with a mechanism to respond to emerging research needs and prioritise potential calls according to relative need and impact. The online pathway enables community and professional groups to submit requests for research calls.⁴

Proposals received through the online pathway are reviewed bi-annually by a Prioritisation Committee. This Committee comprises a Chair and seven members selected from a wide range of backgrounds, including NHMRC Principal Committees and Federal and State Health Departments. This level of representation seeks to ensure the necessary expertise to review and prioritise all potential TCRs identified through this pathway.

NHMRC's RC may or may not recommend a TCR Proposal based on the Prioritisation Committee's assessment. RC's considerations will take into account broader strategic funding activities and its advice is based on the key principle of continuing to fund 'excellence'.

³ The peer review of all NHMRC funding schemes is underpinned by NHMRC's Principles of Peer Review, which are available at: <https://www.nhmrc.gov.au/grants-funding/peer-review/nhmrc-principles-peer-review>

⁴ More information about TCRs and the online pathway is available at: <https://www.nhmrc.gov.au/grants-funding/apply-funding/targeted-and-urgent-calls-research>

4. NHMRC Support for Cancer Research

Cancer Funding Overview

NHMRC is the biggest funder of cancer research in Australia, accounting for 56% of all funding nationwide.⁵ Grants addressing cancer and other neoplasms represent 22% of NHMRC research funding since 2000. In the period 2000 to 2016, NHMRC provided \$2.2 billion to support cancer research, the highest level of support for any of the NHPAs. In 2016, NHMRC invested over \$170 million across 800 ongoing and new grants in cancer research.

With the exception of brain cancers, the Terms of Reference for the Select Committee do not identify specific cancers with low survival rates that are in scope of the inquiry. For the purposes of this submission, NHMRC has presented its overall cancer research funding dataset from 2012-2016 at **Attachment A**. A comparison of NHMRC cancer expenditure with Australian Institute of Health and Welfare data on incidence, mortality and survival rates is also provided.

Allocation of NHMRC funding to cancer types is based on the review of each grant against a range of investigator-provided data classifications including Burden of Disease allocations, fields of research, keywords, grant titles and media summaries. Many grants address more than one cancer type and in these cases the full value of each is attributed to each relevant cancer type.

Should other cancer types be of interest to the Select Committee, NHMRC will provide additional funding data on request to support the Select Committee's inquiry, where these are available.

International Cancer Genome Consortium

NHMRC committed \$27.5 million from the MREA to support the International Cancer Genome Consortium (ICGC) between 2009 and 2014.

The ICGC is a confederation of members (mostly key funding agencies in major countries) that agreed to work in a coordinated and collaborative manner to characterise a minimum of 500 unique cases for 50 different cancer types or subtypes that are of the highest clinical and societal importance across the world. The aim was to obtain a comprehensive description of the full range of genetic events associated with these tumour types and make the data available to the entire research community as rapidly as possible, and with minimal restrictions, to accelerate research into the causes, diagnosis and control of cancer.

The \$27.5 million grant was awarded to Professor Sean Grimmond (Institute for Molecular Biosciences, University of Queensland). This funding supported two large Australian-based projects to characterise ovarian and pancreatic cancers. The ICGC has now evolved into ICGC medicine (ICGCmed) that will link genomics data to clinical information, health and response to therapies.

Genomics Revolution in Health Care

In 2015, NHMRC provided \$25 million in funding for a Targeted Call for Research (TCR) into Preparing Australia for the Genomics Revolution in Health Care (for funding commencing in 2016). The aim of this targeted call was to support research that will provide evidence and information that could be used to help prepare Australian policy and practices for implementation of genomic information into health care. NHMRC sought to fund a single, multidisciplinary, nationally focussed grant through this TCR.

The funded application supports a national alliance of clinicians, researchers, health economists and policymakers to evaluate the case for clinical genomics across inherited disease and cancer, and to determine how best to deliver this to the patient and to train a capable workforce.

⁵ Cancer Australia (2015). *Cancer Research in Australia – An overview of funding initiatives to support cancer research capacity in Australia 2006 to 2011*. Available at: https://canceraustralia.gov.au/system/tdf/publications/cancer-research-australia-overview-funding-initiatives-support-cancer-research-capacity-australia/pdf/2015_audit_report_2_1.pdf?file=1&type=node&id=4263

5. NHMRC's role in supporting clinical trials

Background

Since July 2013, NHMRC has received \$6.2 million through the *Expediting Clinical Trial Reform in Australia* and *Simplified and Consistent Health and Medical Research* Budget measures to develop a nationally consistent approach to clinical trials, improve efficiency and streamline administration and costs with the aim of positioning Australia as a world leader in clinical research. In so doing, NHMRC has worked on a variety of projects to improve the clinical trial environment, and reduce obstacles to the commencement of clinical trials.

The work of NHMRC has been carried out with oversight from the Clinical Trials Advisory Committee and, more recently, from the Clinical Trials Jurisdictional Working Group of the Hospitals Principal Committee of the Australian Health Ministers' Advisory Council. Despite the progress made, some obstacles to the conduct of trials remain. These are related to trial feasibility, cost, timeliness of commencement, and recruitment and awareness of potential participants. While not specific to cancers with low survival rates, such cancers may present additional obstacles such as securing funding, attracting sufficient interest of researchers and recruiting sufficient numbers of potential participants, either for a standalone clinical trial or even to support an Australian 'arm' of a multi-national study. These obstacles, along with potential solutions and NHMRC's role in overcoming such obstacles, are considered below.

Obstacles

i) Awareness of Available Trials

Data from a number of surveys and reviews, including one conducted on behalf of the Department of Health in 2016, demonstrate that the lack of awareness of relevant trials is a barrier, not just to increased participation, but also to increased cross-referral of patients by general practitioners or clinicians.

In order to address this, NHMRC has been working to improve recruitment into and awareness of clinical trials by:

- a) enhancing the functionality of the *AustralianClinicalTrials.gov.au* website to bring together resources for consumers, participants, researchers and proponents of clinical trials, and as a tool to encourage patient recruitment, and
- b) developing a national marketing campaign to improve awareness of the website and an understanding of the role and value of clinical trials. Funding for the campaign has been provided by the Department of Industry, Innovation and Science.

Improvements in cross-referral rates of GPs and clinicians have also been observed through the use of a Mobile Applications ('Apps') - *ClinTrials refer*⁶.

ii) Trial Feasibility and Recruitment

Through its work to identify barriers to the commencement of efficient and effective clinical trials, NHMRC has identified the need for a rigorous feasibility assessment to be conducted prior to executing an agreement to commence a trial at a site.

Feasibility assessments include an assessment of the adequacy of the resources required to commence a trial, including realistic assessments of patient numbers, and site capability and capacity. Access to suitable patient numbers is particularly important for later phase trials that require a large cohort. Similarly clinical trials to test therapies and treatments for rare diseases will only be completed if there is access to the necessary patient numbers.

Following a national forum of researchers, industry and clinical trial sites in September 2013, NHMRC produced the Good Practice Process for site assessment and authorisation of clinical trials which is in

⁶ <http://www.clintrial.org.au/> ClinTrials Refer have also developed a series of Apps that are available for iOS devices from the iTunes App Store and Android devices from the Google Play store.

various stages of implementation through Australian jurisdictions.⁷ Use of the Process has been demonstrated to lead to significant reductions in times to clinical trials commencement.⁸

iii) Inclusion and Exclusion Criteria

As stated above, feasibility is key to the timely commencement and successful completion of clinical trials. Many sites may believe that they have enough patients but, ultimately, the trial at a site may not start because patients do not meet the complex eligibility criteria.

Inclusion and exclusion (eligibility) criteria are usually determined by the clinical trial sponsor (e.g. a pharmaceutical company or clinical trial network). Paradoxically, a sponsor's legitimate aim to reduce confounding factors and thus ensure that a clinical trial produces the highest quality evidence of efficacy, may result in narrow eligibility criteria that significantly lower recruitment.

iv) Attracting Funding or Researchers to Conduct a Trial

NHMRC provides a significant amount of funding for non-commercially sponsored clinical trials. In the period 2000 to 2016, NHMRC expenditure on cancer clinical trials was \$212.1 million, approximately 10% of the total cancer research expenditure over that same period.

Funding for a trial depends on a number of factors, including a high quality application that receives a favourable review during the peer-review process, and sufficient researchers to conduct such research. As the majority of NHMRC funding is investigator-initiated, support for clinical trials relies on researchers submitting high quality applications for consideration.

Another reason for the paucity of trials on rare, low survival cancers may be the high risk and low potential return on investment in any therapies developed, as has been reported for other, so-called 'orphan', 'neglected' or rare diseases.⁹

6. Concluding remarks

NHMRC thanks the Select Committee for this opportunity to outline our important role as the Australian Government's medical research funding agency and in supporting clinical trials.

NHMRC's major role is in supporting health and medical research and training for the improvement of individual and population health. NHMRC is committed to ensuring that its funding program supports the breadth of research needed to address Australia's current and future health challenges and is proud of its work to help position Australia as a world leader in clinical research through initiatives to streamline the commencement of clinical trials and to improve patient recruitment.

As outlined in this submission, NHMRC's current research funding model is designed to make best use of investigator-initiated and priority-driven approaches. The model is not designed to favour funding for particular types of cancers.

NHMRC notes that NHMRC's current funding model is of particular interest to the Committee's inquiry. NHMRC is happy to answer further questions of the Committee on its current funding model, or on the recent Structural Review of its Grant Program, if required.

⁷ The Good Practice Process can be found at:

https://www.nhmrc.gov.au/files_nhmrc/file/research/clinical_trials/good_practice_process_for_research_governance_final.pdf.

⁸ Findings from the pilot of the Good Practice Process can be found at:

https://www.nhmrc.gov.au/files_nhmrc/file/research/clinical_trials/good_practice_process_report_final_with_attachment.pdf.

⁹ Efforts to address rare diseases in the European Union, for example, led to the development of national plans by member states, for example: The UK Strategy for Rare Diseases,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/260562/UK_Strategy_for_Rare_Diseases.pdf. See generally: https://ec.europa.eu/health/rare_diseases/policy_en.

ATTACHMENT A

The following tables present NHMRC expenditure on cancer research from 2012 to 2016 across all NHMRC grant types. Allocation of NHMRC funding to cancer types is based on the review of each individual grant against a range of investigator provided data classifications including Burden of Disease allocations, fields of research, keywords, grant titles and media summaries. Many grants address more than one cancer type and in these cases the full value of each is attributed to each relevant cancer type.

Table 1. NHMRC cancer research expenditure 2012 to 2016

Cancer Type	2012	2013	2014	2015	2016	Total
Leukaemia	\$23,803,468	\$19,769,414	\$24,096,017	\$25,068,518	\$23,704,073	\$116,441,490
Breast Cancer	\$24,803,186	\$21,852,140	\$20,508,426	\$23,924,737	\$21,469,127	\$112,557,616
Colorectal Cancer	\$17,110,467	\$14,400,726	\$11,047,089	\$13,427,898	\$12,371,421	\$68,357,601
Childhood Cancer	\$13,873,871	\$12,425,114	\$11,839,850	\$12,219,439	\$10,358,657	\$60,716,931
Melanoma	\$11,083,287	\$11,012,931	\$11,943,557	\$13,145,930	\$13,403,015	\$60,588,720
Prostate Cancer	\$15,714,971	\$10,777,957	\$8,299,874	\$8,895,471	\$8,458,090	\$52,146,363
Hodgkin's Lymphoma	\$10,448,532	\$8,507,097	\$8,081,885	\$8,088,540	\$6,100,138	\$41,226,192
Ovarian Cancer	\$11,516,436	\$10,569,137	\$7,690,016	\$4,393,454	\$4,701,048	\$38,870,091
Brain Cancer	\$7,973,145	\$7,207,891	\$8,341,513	\$8,469,035	\$6,630,739	\$38,622,323
Lung Cancer	\$5,822,566	\$6,795,275	\$7,610,659	\$7,988,644	\$7,769,633	\$35,986,777
Pancreatic Cancer	\$9,812,427	\$8,923,906	\$6,841,808	\$3,653,131	\$4,117,523	\$33,348,795
Multiple Myeloma	\$7,055,307	\$6,079,353	\$5,654,967	\$5,851,116	\$4,769,828	\$29,410,571
Liver Cancer	\$3,209,094	\$3,812,146	\$5,470,925	\$5,275,872	\$4,455,742	\$22,223,779
Stomach Cancer	\$3,731,366	\$3,716,477	\$2,662,717	\$3,608,741	\$4,695,318	\$18,414,619
Mesothelioma	\$1,914,182	\$1,696,954	\$2,097,639	\$3,117,450	\$2,142,460	\$10,968,685
Bone Cancer	\$2,515,135	\$1,986,772	\$2,202,010	\$2,205,394	\$1,383,337	\$10,292,648
Oesophageal Cancer	\$3,059,316	\$2,667,775	\$1,781,589	\$1,524,016	\$1,148,474	\$10,181,170
Endometrial Cancer	\$2,362,829	\$2,039,453	\$1,587,515	\$1,474,190	\$1,420,730	\$8,884,717
Non-Hodgkin's Lymphoma	\$1,488,384	\$1,533,322	\$2,166,269	\$2,210,672	\$1,433,272	\$8,831,919
Head and Neck Cancers	\$1,917,637	\$1,929,367	\$1,691,935	\$1,195,252	\$1,003,233	\$7,737,424
Cervical Cancer	\$1,131,369	\$1,442,060	\$1,909,510	\$1,040,493	\$1,308,283	\$6,831,715
Testicular Cancer	\$1,453,958	\$1,602,101	\$1,183,460	\$1,194,662	\$895,991	\$6,330,172
Kidney Cancer	\$1,340,442	\$852,278	\$667,439	\$420,627	\$321,571	\$3,602,357
Bladder Cancer	\$464,861	\$467,727	\$537,361	\$304,437	\$198,704	\$1,973,090
Thyroid Cancer		\$97,733	\$428,827	\$551,373	\$535,646	\$1,613,579
Vulvar Cancer	\$439,249		\$397,276	\$383,721	\$373,346	\$1,593,592
Adrenal Cancer	\$295,384	\$250,452	\$119,529	\$165,361	\$477,340	\$1,308,066
Anal Cancer	\$202,025	\$132,337	\$122,911	\$60,173		\$517,446
Eye Cancer	\$188,285				\$36,134	\$224,419
Parathyroid Cancer				\$124,531		\$124,531
Pituitary Cancer		\$17,949	\$38,437	\$13,335	\$21,197	\$90,918

Table 2. NHMRC cancer research expenditure comparison with incidence, mortality and survival rates^[1]

Cancer Type	NHMRC Expenditure 2012 to 2016	2013 Age-standardised incidence rate^[2]	2014 Age-standardised 5 yr mortality rate^[2]	Five-year relative survival from selected cancers, 2009–2013 (%)^[2]
Leukaemia ^[3]	\$116,441,490	13.3	6.2	-
Breast Cancer	\$112,557,616	63.6	10.5	90.2
Colorectal Cancer	\$68,357,601	57.7	14.9	68.7
Melanoma	\$60,588,720	50.3	5.5	90.4
Prostate Cancer	\$52,146,363	151.3	25.8	94.5
Hodgkins Lymphoma	\$41,226,192	2.6	0.4	87.5
Ovarian Cancer	\$38,870,091	10.6	6.8	44.4
Brain Cancer	\$38,622,323	6.5	5.3	22.1
Lung Cancer	\$35,986,777	42.6	30.5	15.8
Pancreatic Cancer	\$33,348,795	10.9	9.3	7.7
Multiple Myeloma	\$29,410,571	6.3	3.3	48.5
Liver Cancer	\$22,223,779	6.9	6.4	17.3
Stomach Cancer	\$18,414,619	8.1	4.2	28.5
Uterine Cancer	\$12,351,703	18.6	3.4	83.2
Mesothelioma	\$10,968,685	2.7	2.6	5.8
Bone Cancer	\$10,292,648	0.8	0.4	69.7
Oesophageal Cancer	\$10,181,170	5.4	4.4	20.1
Non-Hodgkins Lymphoma	\$8,831,919	19.4	5.5	74.3
Head and Neck Cancers	\$7,737,424	17.2	3.8	-
Cervical Cancer	\$6,831,715	6.8	1.7	72.1
Testicular Cancer	\$6,330,172	6.4	0.2	97.9
Kidney Cancer	\$3,602,357	11.9	3.4	74.9
Bladder Cancer	\$1,973,090	9.7	3.7	53.3
Thyroid Cancer	\$1,613,579	10.6	0.5	96.1
Anal Cancer	\$517,446	1.5	0.4	67.1

[1] - All figures provided are for 'all persons' with the exception of Cervical, Ovarian, Uterine, Prostate and Testicular cancers which are gender specific.

[2] - Figures for Cancer Incidence, Mortality and Survival Rates were extracted from the Australian Institute of Health and Welfare (AIHW) report 'Cancer in Australia 2017, Appendix B' and reflect the definitions used by AIHW in this report – <http://www.aihw.gov.au/publication-detail/?id=60129558547> – as summarised below:

Age-standardisation: A method of removing the influence of age when comparing populations with different age structures. This is necessary because the rates of many diseases, including some cancers vary strongly (usually increasing) with age.

Incidence: The number of new cases of cancer in a given period.

Mortality: The number of deaths in a given period for which the underlying cause of death was recorded as cancer.

Relative survival: The probability of being alive for a given amount of time after a diagnosis of cancer, when compared to the general population over the same period (in this case, five years).

[3] - Figures for Leukaemia were extracted from AIHW - <http://www.aihw.gov.au/cancer/leukaemia/#source2>