Australian Government
Cancer Australia

Cancer Australia

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

March 2017

About Cancer Australia

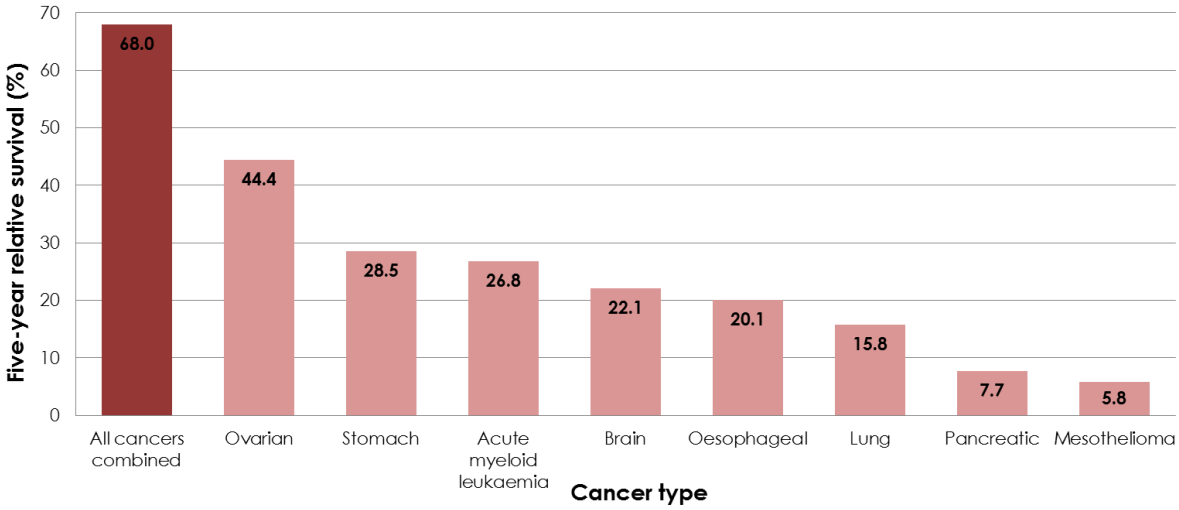
Cancer Australia was established by the Australian Government in 2006 to benefit all Australians affected by cancer, and their families and carers. Cancer Australia aims to minimise the impact of cancer, address disparities, and improve the health outcomes of people affected by cancer in Australia by providing national leadership in cancer control.[1]

Cancer Australia welcomes the opportunity to provide a submission to the Senate Select Committee into funding for research into cancers with low survival rates.

Scope of submission

The Terms of Reference for the Committee refer to 'low survival rate cancers', but do not define this group of cancers. As there is no standard definition of low survival rate cancers, Cancer Australia has focussed on eight cancer types shown in **Graph 1**, which all have a < 50% five-year relative survival rate.[2]

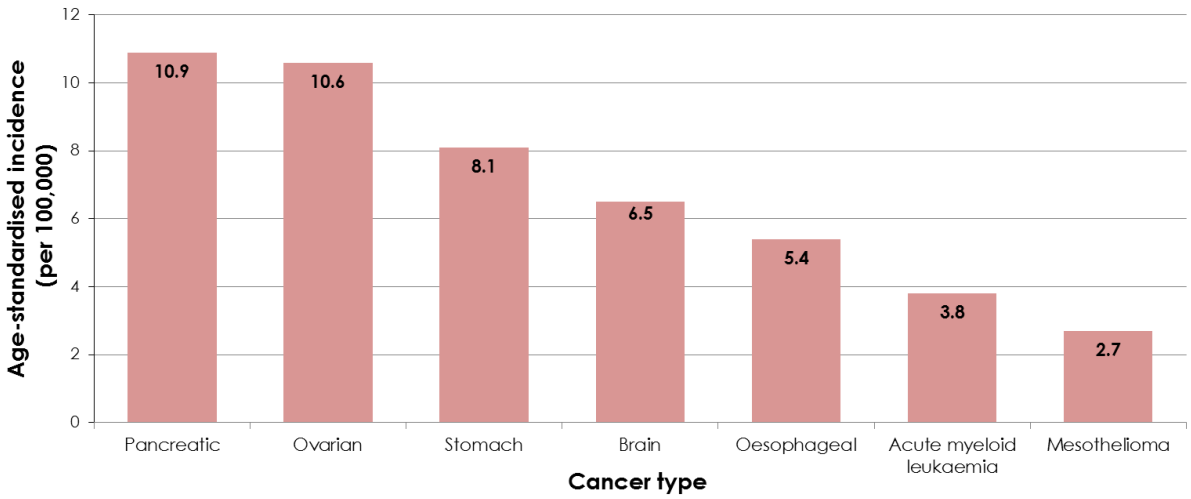
Graph 1: Cancer types with low five-year relative survival rates in Australia (2009-2013)[2]



The Terms of Reference for the Committee refer to 'cancers with relatively lower rates of incidence', but do not define this group of cancers. The Australian Institute of Health and Welfare (AIHW) considers cancers with < 12 age-standardised cases per 100,000 population as low incidence cancers (defined, more specifically, as 'less common' or 'rare'). For the

purposes of this submission, Cancer Australia has focussed on the seven cancer types shown in **Graph 2**, which all have an age-standardised incidence of < 12 per 100,000.

Graph 2: Cancer types with low rates of incidence in Australia (2013)[2].



With the exception of lung cancer (with an age-standardised incidence of 42 per 100,000), all the low survival cancers highlighted in Graph 2 can also be defined as cancers with relatively low rates of incidence.

Response to Terms of Reference

Cancer Australia's response to the Committee addresses the Terms of Reference with specific focus on: the impact of the Priority-driven Collaborative Cancer Research Scheme on the availability of funding for research into cancers with low survival rates; the obstacles to running clinical trials for brain cancers and other cancers with relatively lower rates of incidence, with reference to the *Support for Clinical Trials Program*; and the reasons for and strategies to address the low survival rate for brain cancers. Each of these is considered in detail below.

*The impact of **health research funding models** on the availability of funding for research into cancers with low survival rates:*

a) The need to ensure the funding model enables the provision of funding research into brain cancers and other low survival rate cancers.

Under the Cancer Australia Act 2006, one of Cancer Australia's functions is to oversee a dedicated budget for research. This budget is currently administered through the Priority-driven Collaborative Cancer Research Scheme (PdCCRS).

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The PdCCRS was established in 2007 to partner with organisations that fund cancer research in order to:

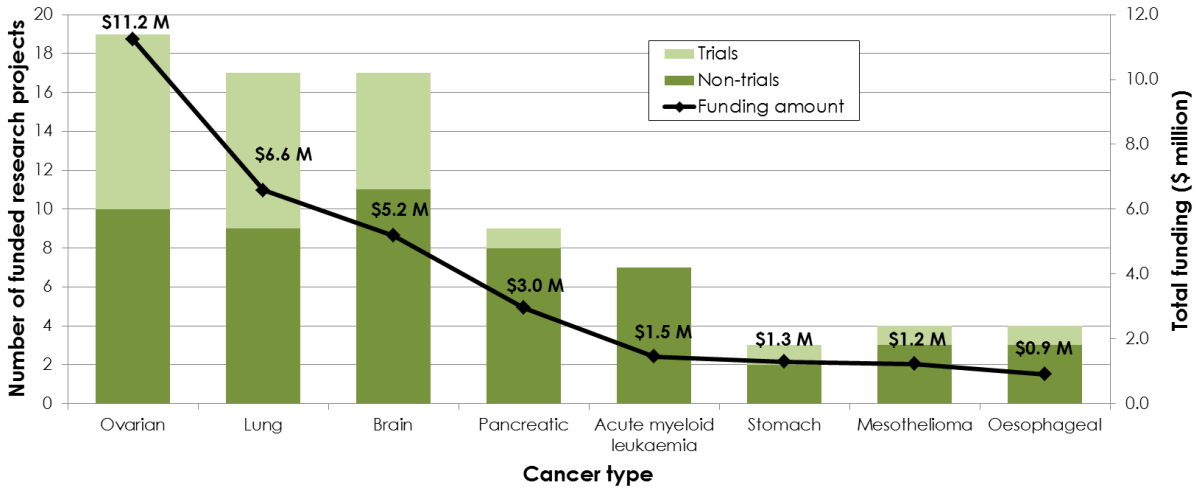
- better coordinate funding of priority-driven cancer research;
- foster collaborative cancer research and build Australia's cancer research capacity, and
- foster consumer participation in cancer research, from design to implementation.

Through its collaborative funding mechanism, the PdCCRS brings together government and other funders of cancer research to coordinate, co-fund and maximise the number of cancer research grants funded in Australia. The aims of the PdCCRS are to:

- fund research in cancer types that place a high burden of disease on the Australian community;
- fund cancer research projects that directly relate to the identified priorities of Cancer Australia and/or its funding partners; and
- fund research that can directly improve cancer outcomes by influencing clinical practice, policy and/or care.

These aims have enabled the provision of funding for research into cancers with low survival rates. Through the 2007-2016 funding rounds of the PdCCRS, $30.8 million has been awarded to research in cancer types with low survival rates, including brain cancers (see **Graph 3**). This $30.8 million represents over one quarter of the total research investment by the PdCCRS, and provides funding for 80 projects, covering both trial-based and non-trial-based research.

Graph 3: PdCCRS funding (2007-2016) in research into cancer types with low survival rates.



The PdCCRS funding model is priority-driven which enables funding to be specifically directed into areas of identified national cancer research priority. These include the provision of funding to research focussed on populations with poorer cancer outcomes - such as those diagnosed with low survival rate cancers. Each year, Cancer Australia and its

PdCCRS funding partners identify particular areas of research focus and then call for applications from the research community to address these research priorities. Some examples of specific funding priorities of Cancer Australia and/or its funding partners that relate to research into cancers with low survival rates are shown in **Table 1.**

Table 1: Examples of PdCCRS funding priorities that enable the provision of research into brain cancers and other low survival rate cancers.

Funding partner	Funding priority
Cancer Australia	Specific areas of cancer research, tumour types and populations with **poorer outcomes**. Research addressing cancers of the **lung**, colon and rectum, **pancreas**, cancer of unknown primary, lymphoma, kidney, bladder, **stomach** or **oesophagus** is strongly encouraged. Specific priorities in **lung** cancer. Specific priorities in **gynaecological** (e.g. ovarian) cancers.
Cancer Council Australia	Cancer research focusing on populations with **poorer cancer outcomes** is encouraged including: Aboriginal and Torres Strait Islander peoples, socioeconomic status, geographic locations. Multi-state clinical or epidemiological studies of cancers of **poor prognosis**. Research areas that are currently under-represented and under-funded, e.g. cancers of the colon, **pancreas,** prostate and unknown primary site. Specific priorities in **pancreatic** cancer.
The Kids' Cancer Project	Causes of **childhood cancer**.
Beyondblue	Encourage research addressing the psychosocial impact of **brain** cancer. Other relevant studies which lead to improvement in quality of care and quality of life for people with depression and cancer, including **childhood cancers.**
Cancer Council NSW	**Brain Tumour:** the development and discovery of molecular imaging markers with predictive and prognostic capacity for glioma. Research that focuses on specific tumour types including: i)head and neck; ii)**lung**; iii)lymphoma; iv)oesophagus;

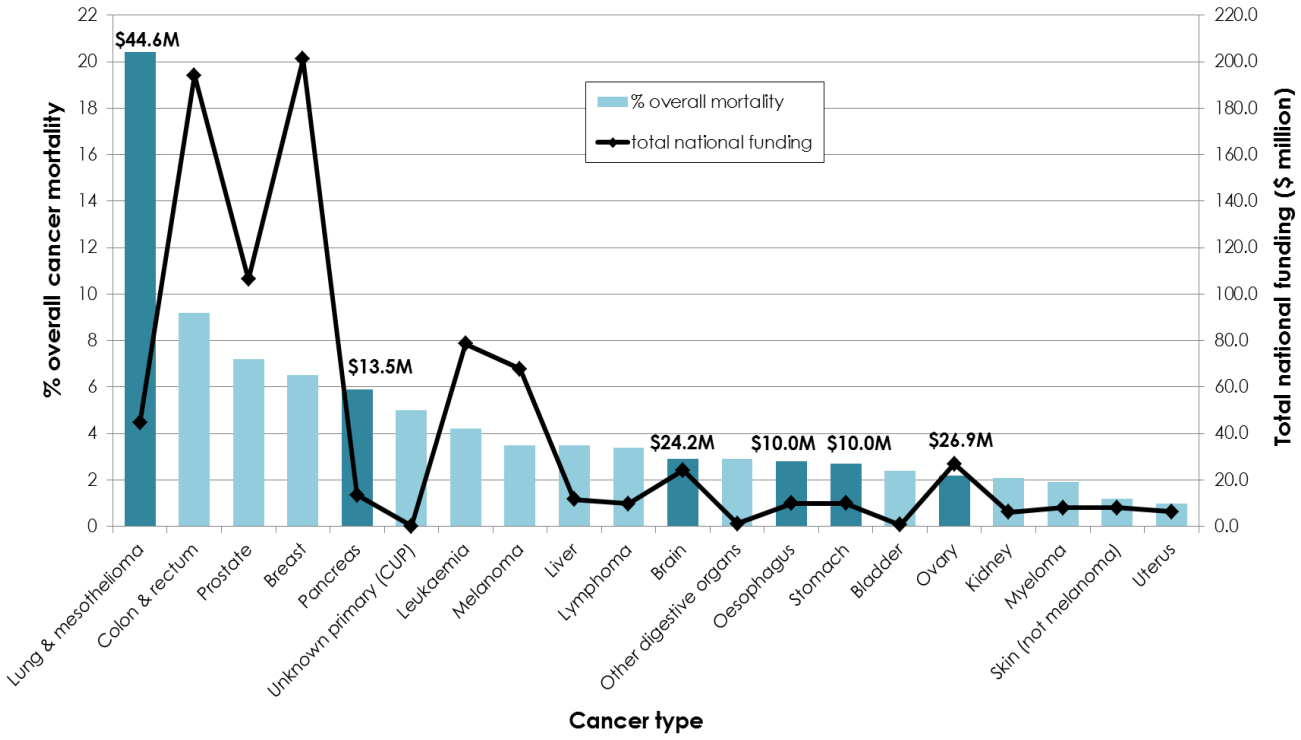
To inform the development of PdCCRS funding priorities, Cancer Australia has examined the existing pattern of cancer research funding in Australia. *Cancer Research in Australia: an overview of funding initiatives to support cancer research capacity in Australia 2006 to 2011*[3] is the first national overview of funding to cancer research in Australia. The report captures data from all the major government and non-government funders of cancer research in

Australia. It covers funding to cancer researchers, capacity and infrastructure, and is broken down by cancer types, with relevant international comparisons.

The audit findings have provided a critical evidence base for Cancer Australia and other funders of cancer research to identify gaps in funding and inform future cancer research investment and focus. For example, levels of national funding for particular cancer types can be compared to measures of disease impact and burden, such as incidence, mortality, and disability-adjusted life years.[3]

Graph 4 provides an example of how the data in the audit have been analysed to describe national funding for cancer types in Australia relative to their mortality rates.[3] When compared with mortality (as a percentage of overall cancer mortality), these data show proportionally lower levels of national funding to research into low survival rate cancer types, including lung cancer and mesothelioma, cancers of the pancreas, oesophagus and stomach.

Graph 4: National funding to cancer type-specific research in Australia (2006-2011) compared with the top 20 cancers by overall cancer mortality (2012)[3,*].



[*] Data for lung cancer and mesothelioma are combined. Data for acute myeloid leukaemia are not available.

b) *The obstacles to running **clinical trials** for brain cancers and other cancers with relatively lower rates of incidence, with regard to: i) **funding models** that could better support much-needed clinical trials.*

Clinical trials are fundamental to establishing whether new cancer treatments or new ways of using existing therapies, diagnostic tests, preventative or supportive interventions are effective, and they help generate the evidence for best-practice cancer care.

There are a number of recognised obstacles to developing and running clinical trials for brain and other low incidence cancers,[5-7] including:

- **Patient recruitment.** Conventional, randomised clinical trials require large numbers of patients to detect statistically significant effects on health outcomes. For trials in low incidence cancers, there are fewer affected patients available to participate, making it difficult to meet this criterion.
- **Cost.** Clinical trials in low incidence cancers have higher unit costs per patient than cancers with larger populations, due to the longer time to recruit patients and to achieve statistically significant outcomes.
- **Industry engagement.** Industry-led clinical trials prioritise cancers with larger populations as they apply to larger patient populations and produce a higher cost-benefit ratio than those in low incidence cancers.

Cancer Australia *Support for Cancer Clinical Trials* Program

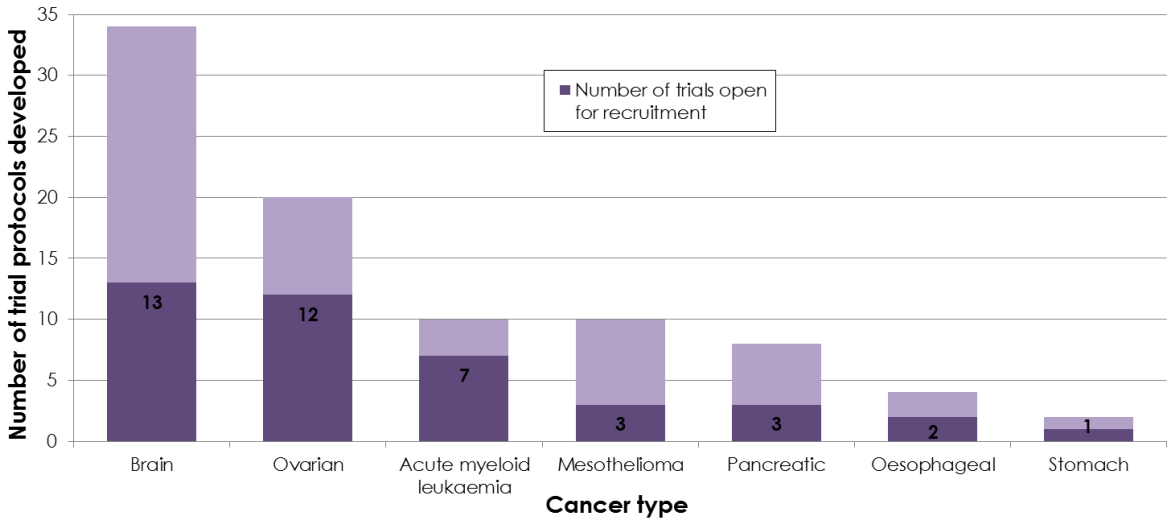
Cancer Australia supports Australia's capacity to develop industry-independent cancer clinical trials through the *Support for Cancer Clinical Trials* program. Since 2007, over $48.6 million has been provided to National Cancer Cooperative Trials Groups (CTGs) to support the development of industry-independent cancer clinical trial protocols, and in doing so increase the:

- participation in clinical trials by people affected by cancer;
- number of cancer clinical trials conducted in Australia;
- number of clinical sites actively participating in clinical trials; and
- involvement of clinicians and researchers in clinical trials within Australia.

Since 2007, CTGs have developed more than 80 clinical trial protocols in low incidence cancers, with the highest number of protocols being developed in brain cancer (see **Graph 5**). Over 40 of these protocols have gone on to become active clinical trials open for patient recruitment in Australia. Furthermore, nearly two thirds of these new clinical trials are recruiting patients both nationally and internationally – including six clinical trials in brain cancer, two of which are for paediatric brain cancer. Establishing and maintaining international collaborations plays an important role in improving the clinical trial participation

of patients with low incidence cancers, where obtaining sufficient numbers of patients within a reasonable timescale can often be unfeasible within a single country.

Graph 5: Development of clinical trial protocols in low incidence cancer types supported through the Cancer Australia *Support for Cancer Clinical Trials* program (2007 – 2016).



Recent advances in genomics have increased our understanding of cancer at the molecular level, leading to new approaches to diagnosis and treatment.[8] Genetic sequencing technology has enabled cancers to be re-classified based on a specific tumour mutation (or mutations) rather than the site of origin of the cancer. This has led to the development of genomics-based clinical trials that test a therapy or combination of therapies targeted to the mutation across multiple cancer types, and can provide important insight into the effectiveness of targeted treatment interventions.[9] Genomics-based clinical trials present opportunities for patients with low incidence cancer types to join a larger clinical trials based on the genomic profile of their cancer, rather than its site of origin.[10]

In 2013, Cancer Australia established and funded the *Genomic Cancer Clinical Trial Initiative* to provide CTGs with expert advice and technical services relating to the collaborative development of genomics-based clinical trials protocols. From 2013 to the present, this initiative has led to the development of 17 new concepts for genomics-based clinical trial protocols across multiple cancer types, including a multicentre, randomised study specifically focussed on new treatment approaches in rare cancers.

Australian Cancer Trials website.

Cancer Australia has developed the Australian Cancer Trials website (http://www.australiancancertrials.gov.au) in partnership with the Australian New Zealand Clinical Trials Registry, the University of Sydney and Cancer Voices. The website is designed to raise awareness about current cancer clinical trials in Australia by providing consumer-friendly information, as a basis for discussion with a cancer specialist.

Better enabling patients and clinicians to identify relevant cancer clinical trials has particular potential to increase trial participation rates for people with low incidence cancers, which are typically difficult to recruit for due to fewer affected patients available to participate.

c) *The low survival rate for **brain cancers**, lack of significant improvement in survival rates, and strategies that could be implemented to improve survival rates.*

Over recent decades, the five-year relative survival for all cancers combined has increased by 27% (from 41% in 1982-6 to 68% in 2009-13), while survival for brain cancers has remained relatively unchanged (21% in 1982-6 to 22% in 2009-13)[2,4].

The reasons for the poor prognosis for brain cancer are complex.[11] A lack of clear understanding of what causes the majority of brain cancers makes the development of new therapies challenging – particularly those targeted to specific genetic mutations. Brain cancers are also relatively uncommon, with distinct genetic subtypes of brain cancer reducing the number of cases even further, so it is difficult to collect information from a large enough group of patients to help clinicians to make informed decisions about effective treatment.

In addition to the recent genomic-based approaches to clinical trials outlined above, a continued focus on brain cancer research, particularly through mechanisms like the PdCCRS that facilitate priority-driven, collaborative, and cross-disciplinary research, presents an opportunity to provide a critical evidence base to drive improvements in outcomes for patients with brain cancer. Given the increasing research focus on genetic and epigenetic factors which are common across cancer types, collaborative funding models also present an opportunity to foster funding which supports research activity across different cancer streams.

Targeted research into the aetiology and biology of brain cancers, including the genetic basis of different subtypes, has particular potential to yield important information of diagnostic and therapeutic benefit.[12] Given the small numbers of patients, research in these areas is often critically dependent upon building and supporting effective national and international partnerships, particularly those centred on databank and tissue bank sharing to provide enough data to produce clinically meaningful results. Such research could be fostered and supported through funding models which enable national and international collaborations across areas of common research endeavour and need.

Summary

Low survival cancers represent a significant burden of disease in Australia – the low survival rate cancers highlighted in this submission are estimated to cause 18,703 deaths in 2017, nearly 40% of total cancer deaths estimated for that year,[2] with brain cancer remaining the leading cause of cancer death in children and young adults. Furthermore, while the majority of low survival cancers are relatively low incidence (with the notable exception of lung cancer), collectively they account for a disproportionally high level of cancer mortality. For example, the low incidence cancers highlighted in this submission together account for just over 10% of estimated new cases in 2017, but over 20% of estimated cancer deaths.[2]

Challenges to effectively treating low survival rate cancers undoubtedly exist. However, the past two decades of global research effort have seen major advances in our understanding of cancer at the molecular level, leading to the development of new generations of 'targeted' cancer therapies, many of which are showing considerable efficacy in the clinic.[13,14] These research advances are transforming clinical trial design,[9,10] and have potential for the improved treatment of low survival cancers.

Funding models that enable collaborative, multi-disciplinary and priority-driven cancer research, such as the PdCCRS, and facilitate industry-independent clinical trial development, such as the *Support for Cancer Clinical Trials* program, are vital to realising this opportunity, and improving health outcomes for all those affected by low survival rate cancers.

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