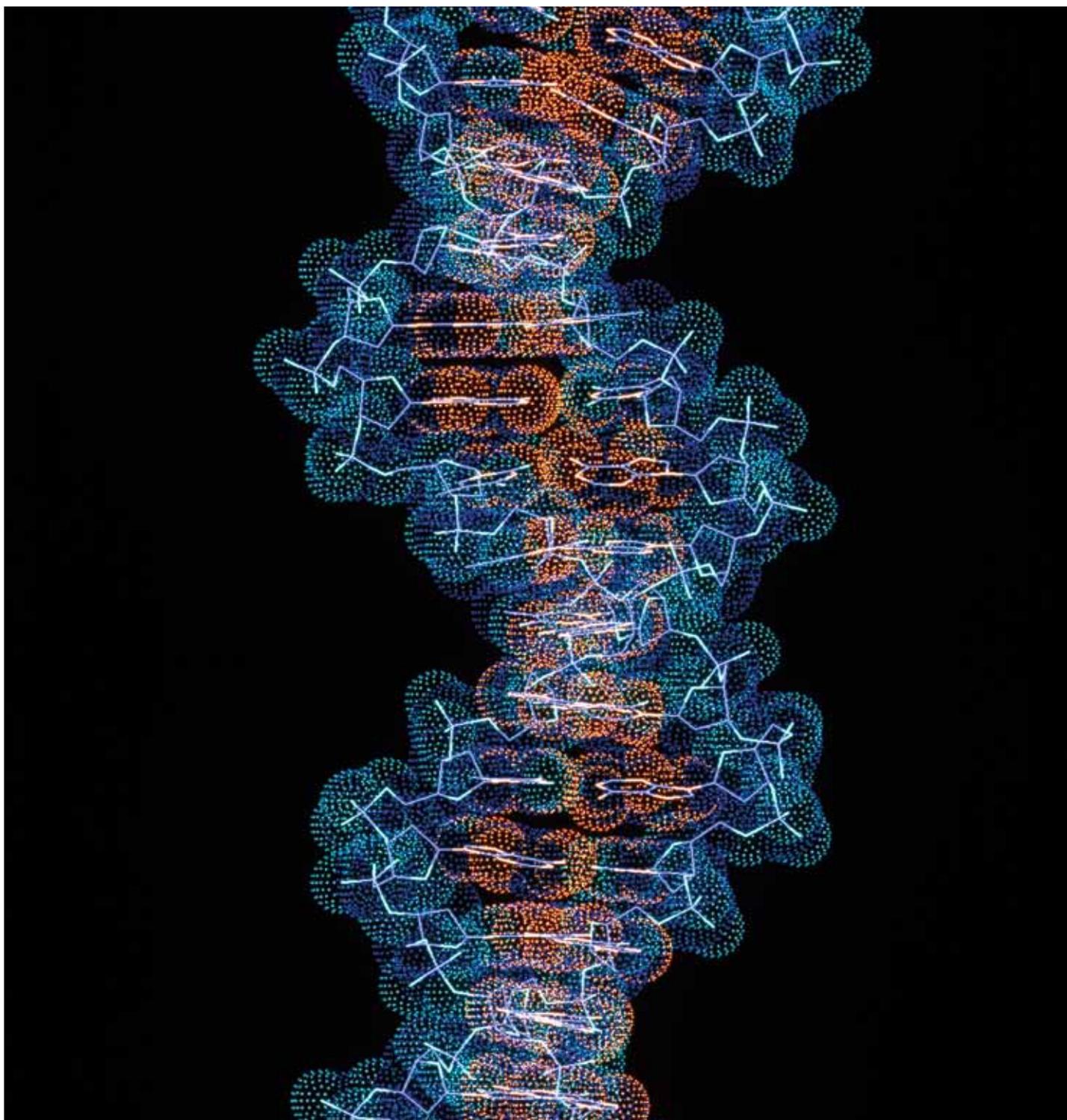


PREVENTION HAS TO START SOMEWHERE: OUR 30-YEAR CHALLENGE

National Action Plan for
Breast Cancer Research
September 2010



THE WORLD CANCER DECLARATION – A CALL TO ACTION FROM THE GLOBAL CANCER COMMUNITY

We, the global cancer community, call on the world to take immediate steps to reduce the global cancer burden by committing to the 11 Declaration targets and provide the resources and political backing needed to achieve them.

A call to action from the global cancer community to international governmental organisations, the international donor community, development agencies, professional organisations, the private sector and all civil society to take immediate steps to slow and ultimately reverse the growth in deaths from cancer, by committing to the targets set out below and providing resources and political backing for the priority actions needed to achieve them.

TARGETS: BY 2020

- Sustainable delivery systems will be in place to ensure that effective cancer control programs are available in all countries
- The measurement of the global cancer burden and the impact of cancer control interventions will have improved significantly
- Global tobacco consumption, obesity and alcohol intake levels will have fallen significantly
- Populations in the areas affected by human papillomavirus (HPV) and hepatitis B virus (HBV) will be covered by universal vaccination programs
- Public attitudes towards cancer will improve and damaging myths and misconceptions about the disease will be dispelled
- Many more cancers will be diagnosed when still localised through the provision of screening and early detection programs and high levels of public and professional awareness about important cancer warning signs

- Access to accurate cancer diagnosis, appropriate cancer treatments, supportive care, rehabilitation services and palliative care will have improved for all patients worldwide
- Effective pain control measures will be available universally to all cancer patients in pain
- The number of training opportunities available for health professionals in different aspects of cancer control will have improved significantly
- Emigration of health workers with specialist training in cancer control will have reduced dramatically
- There will be major improvements in cancer survival rates in all countries

PROGRESSING TOWARDS THE 2020 TARGETS

- Through its member organisations (now more than 300 in over 100 countries) the International Union Against Cancer (UICC) will promote partnerships and international collaboration aimed at accelerating progress towards achieving the 2020 targets
- Given the huge variability in cancer burden and service provision throughout the world, the UICC will encourage members to use the World Cancer Declaration as a template to develop regional or national cancer declarations that can better reflect local needs and priorities and allow for more accurate quantification of targets where data exists
- The UICC will take responsibility for preparing a report every two years on the progress made towards achieving the 2020 targets. These reports will be presented at the biennial World Cancer Congress

Prevention has to start somewhere: our 30 year challenge. National Action Plan for Breast Cancer Research.
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FOREWORD

A MESSAGE FROM THE PAST PRESIDENT, INTERNATIONAL UNION AGAINST CANCER

Professor David Hill

Director Cancer Council Victoria
Immediate Past President of UICC

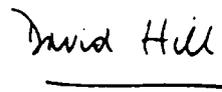
This report is a call to action for the prevention of breast cancer. We all have a deep belief that commitment, knowledge, skill and persistence will make the vision a reality. We believe that it is possible to wholly triumph over the obstacles to cancer control, despite the scale of the problem.

Upwards of 11 million people are diagnosed with cancer each year and over 7 million die from the disease. To our great shame, millions die in pain unalleviated by analgesics. These frightening numbers are set to increase rapidly, particularly in low and middle income countries. It's much more than a health problem, since the impact of cancer is also economic (and therefore political). Cancer, together with the other so-called non-communicable diseases is an escalating development issue, threatening to undermine economic gains that would otherwise bring a better life to hundreds of millions of people. For its Global Risk Report 2010, the World Economic Forum rated 35 economic, geopolitical, environmental, societal and technological risks according to severity and likelihood of occurrence. Chronic disease (NCDs) was one the top three 'global risks', along with fiscal crises and asset price collapse.

There is no place for complacency even in countries like Australia where outcomes for cancers, including breast cancer, are among the best. The gap between what is known and what is applied, equitably, in the community is often great. The problem is often not lack of knowledge, but rather barriers created by human and organisational failings. The identification in this report of the pressing need to develop 'implementation science' to fully exploit the benefits of past research in cancer prevention and treatment is salutary. This will not only improve outcomes here in Australia, but will contribute to international efforts to improve outcomes for women and their families worldwide. This is a global problem that requires collective action at a global level.

As Aristotle famously wrote, 'The whole is greater than the sum of its parts'. True, but understanding of the parts is also very important. In reading this report, I am struck by the quality of the detailed analysis of every major part the problem of breast cancer in our community. The report lays out a comprehensive and challenging framework for concerted action on what is increasingly recognised as a global issue. It sets out an agenda to which all members of the breast cancer community can respond. There is a role for everyone concerned, either because it is their job to be or because they are affected by the threat or reality of this cancer.

I see this initiative of the National Breast Cancer Foundation in the context of the advocacy agenda of the World Cancer Declaration (www.uicc.org/wcd) which calls for leadership and commitment in order to reach its ambitious targets by 2020. I would urge all members of the breast cancer community to become familiar with the Declaration and this unique document, and work together to achieve a world without breast cancer.



David Hill AO

The International Union Against Cancer (UICC) is the leading non-governmental organisation dedicated exclusively to global cancer control.

The UICC encourages partnership within the framework of the World Cancer Declaration: by working together, we can more easily implement the priority actions and achieve the 2020 targets.

The World Cancer Declaration is a tool to help cancer advocates bring the growing cancer crisis to the attention of health policymakers at national, regional and global levels. It represents a consensus between foundations, national and international non-governmental and governmental organisations, professional bodies, the private sector, academia and civil society from all continents that are committed to the vision of eliminating cancer as a major threat for future generations.

A MESSAGE FROM THE CHAIR, EXPERT ADVISORY COMMITTEE

Professor Don Iverson

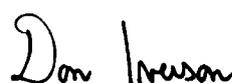
"Good plans shape good decisions. That's why good planning helps to make elusive dreams come true." – Lester R. Bittel, The Nine Master Keys of Management

In this report we envision the future for breast cancer – a future in which our understanding of breast cancer has resulted in major advances leading to personalised approaches for prevention, screening and treatment. Taken together, these advances are envisioned to result in significant reductions in the incidence of breast cancer, morbidity associated with breast cancer treatment and mortality from breast cancer. To achieve our vision, a plan is required – and this document reflects that plan.

In 2004, the National Breast Cancer Foundation (NBCF) published the *National Action Plan for Breast Cancer Research and Funding*. It noted the major challenges facing Australian breast cancer researchers, and proposed a series of changes in funding mechanisms that would have the effect of facilitating the conduct of research and lead to major advances. Since the report was issued, NBCF has been extremely successful in raising funds and using those funds to support high-quality breast cancer research. In addition, the funds have been used to develop and enhance the research infrastructure important to breast cancer researchers.

NBCF's 'dream' envisions a future in which research has led to important, major advances in breast cancer prevention, early detection, treatment and survivorship. As noted in the quote above, "good planning helps to make elusive dreams come true". This new plan identifies the outcomes that are envisioned in a range of research areas and the advances that are necessary for the outcomes to be realised. Once the full array of outcomes has been achieved, our dream will be realised. We are cognisant, however, that the route to these outcomes is likely to be altered with research advances – it is for precisely that reason that this plan will be regularly reviewed and updated. In essence, the plan is a dynamic document that should facilitate discussion and decision-making.

It is our hope that this plan proves to be useful to organisations interested in funding breast cancer research. It has been written in a manner that facilitates a funding organisation focusing on one or more of the identified outcomes, supporting research that contributes to the identified advances required in those areas. We anticipate future updates of the plan will note the many advances we envision occurring in the upcoming years – the ultimate beneficiaries of these research advances will be women at risk of developing breast cancer, those requiring treatment and those surviving breast cancer.



Don Iverson

A MESSAGE FROM THE CHAIR, NBCF BOARD OF TRUSTEES

Hon Ros Kelly AO

Considering the current challenges in breast cancer research, where will we be in 30 years time? I hope the incidence of this insidious disease will have markedly fallen as a result of a combination of factors: improved lifestyles, better diets, higher exercise levels, success in the battle against obesity, and the use of safe prevention strategies for women who are at increased risk of contracting breast cancer. I envisage breast cancer screening will be tailored to an individual woman's breast cancer risk. Smarter technologies will mean that women across the globe will have access to inexpensive, comfortable, transportable and effective early detection; perhaps even a blood test!

I trust that breast cancer mortality and morbidity rates will have been significantly cut as a result of tailoring each woman's treatment to the characteristics of her tumour, risk of relapse, likely response and preferences. This means women will be able to avoid treatments – and any related toxicity – that are unlikely to deliver benefits. A wider range of targeted therapies across the treatment spectrum, including surgical, radiotherapy and chemotherapy, will improve treatment response.

I know that Australia undertakes world-class research courtesy of the quality of our laboratory, applied and clinician scientists. However, in future it will be increasingly important to attain a more desirable balance between implementing current knowledge and encouraging new breakthroughs. Part of this process will include an increased focus on research involving humans rather than animal models and cell lines. At the same time, we must continue to ensure our talented researchers have an opportunity to demonstrate excellence through fundamental exploratory research to generate new hypotheses.

What will really improve and raise the profile of Australian breast cancer research over the next 30 years is focusing on building and sustaining the infrastructure to facilitate research in this country. I believe our funding agencies must work collaboratively to ensure we significantly increase the money available for breast cancer research in line with other developed nations. Importantly, a paradigm shift is required to embrace research as an essential component of clinical practice – both for the clinical service providers as well as patients using health services. This means clinical staff involvement in research (such as trial recruitment or developing research protocols) should become part of everyday practice. For patients, an important component of the ongoing effort to control cancer will involve an understanding that participating in research is essential to achieve improved outcomes. Similarly, they should know they will be offered appropriate research protocols throughout their cancer journey and welcome the ethical use of their clinical data, with or without biospecimens.

I invite you to join me to challenge the status quo; to consider how best you can help take action nationally and collaboratively in our goal to end breast cancer.



Hon Ros Kelly AO

EXPERT ADVISORY COMMITTEE

<p>Professor Don Iverson, Chair Pro Vice-Chancellor (Health) and Executive Director of the Illawarra Health & Medical Research Institute University of Wollongong</p>	<p>Ms Roslyn Lawson Consumer Advisory Group National Breast Cancer Foundation</p>
<p>Professor Alan Bensoussan Executive Director, National Institute of Complementary Medicine University of Western Sydney</p>	<p>Ms Michelle Marven Policy Manager Breast Cancer Network Australia</p>
<p>Ms Sue Carrick Head, National Research Strategy National Breast Cancer Foundation</p>	<p>Dr Gillian Mitchell Director, Familial Cancer Centre Peter MacCallum Cancer Centre</p>
<p>Associate Professor Boon Chua Deputy Chair of Breast Cancer Service Peter MacCallum Cancer Centre</p>	<p>Ms Sue Murray Chief Executive Officer National Breast Cancer Foundation</p>
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<p>Professor Stephen Fox Director, Pathology Department Peter MacCallum Cancer Centre</p>	<p>Professor David Roder Group Executive, Research and Information Science Cancer Council South Australia</p>
<p>Professor Afaf Girgis Director, Centre for Health Research & Psycho-oncology (CHeRP) Cancer Council NSW & University of Newcastle & Hunter Medical Research Institute</p>	<p>Professor Joe Sambrook Scientific Director Australian Stem Cell Centre</p>
<p>Associate Professor Christine Giles Deputy Chief Executive Officer National Breast and Ovarian Cancer Centre</p>	<p>Professor Christobel Saunders Deputy Head, School of Surgery University of Western Australia</p>
<p>Professor John Hopper, AM Director, Centre for Molecular, Environmental, Genetic and Analytic Epidemiology The University of Melbourne</p>	<p>Dr Clare Scott Clinician Scientist Walter and Eliza Hall Institute of Medical Research</p>

PREVENTION HAS TO START SOMEWHERE: OUR 30 YEAR CHALLENGE

MY JOURNEY – 29 SEPTEMBER, 2040

I've kept a diary for years. I'm not sure why, since at the end of each December I just throw it into a box and never look at it again. But now that my sister has developed breast cancer, I thought I would look back at my old diaries and piece together my own story of the disease.

About 30 years ago, when I was in my early 30s, I volunteered to take part in a research project aimed at preventing breast cancer. As part of this project, doctors took a sample of my DNA and mapped it. At that time, they already knew that many different genes contribute to breast cancer. So from my genetic profile they were able to analyse these genes and give me precise estimates of my risk of developing the disease. They could also predict with fair accuracy which of the many types of breast cancer I might get.

They designed a prevention strategy tailored to my calculated risk, which involved sensible and specific changes in lifestyle – more exercise, less alcohol, for example. I also signed up for a clinical trial to test some of the recently invented drugs designed to prevent or delay the onset of cancer. I also had a small device implanted that could monitor molecular changes in blood and lymph that are forerunners of breast cancer. Even at that time, the data indicated that the device was far more sensitive and accurate than old-fashioned mammography and was able to detect cancer changes before the disease had spread from the breast. I still have an implant, although they have changed the device from time to time as the technology has improved. So far, the monitoring has not found anything unusual.

My older sister, Liz, is less lucky. Because of our family history, both of us are at risk of breast cancer. But, unlike me, Liz's DNA had not been scanned and she was not part of the drug trial. So when she developed breast cancer a few years ago – fortunately, as it turned out, at a reasonably early stage – doctors did not know whether or not her genetic profile for breast cancer was exactly the same as mine. Sequencing people genomes was still

not in routine clinical use then. But my entire DNA sequence was already in one of their computers and so they were quickly able to compare her DNA with mine and to use the information to tailor a cocktail of drugs that would be most likely to benefit her with the fewest side-effects.

Before beginning her treatment, they used new molecular scanning techniques to check whether her tumour had already spread beyond her breast (fortunately not) and they implanted a device that could collect and analyse samples of her tumour and monitor her response to the drugs in real time. By looking at the changing patterns of gene activity in the tumour cells during her treatment, they were able to suggest improvements to her drug cocktail.

She responded well to the drugs and did not need surgery – not even the computer-assisted surgery that had just become available. These days, because of the development of highly targeted, powerful drugs, most women who develop breast cancer don't need radiotherapy either. But both Liz and I know that breast cancer is a tricky disease that can find ways to resist even the best-tailored cocktails of drugs. And because breast cancer is in our genes, there is a good chance that our daughters will have inherited an in-built risk. But the risk can be measured and the consequences managed. No wonder then that the number of new breast cancers is decreasing so quickly and women with the disease live longer and more complete lives.

INTRODUCTION

OUTLINE OF THIS DOCUMENT

This document includes several chapters that provide:

- A background of the current breast cancer situation.
- A summary of the impact of breast cancer today and the patterns of breast cancer research funding.
- An outline of the actions taken by the NBCF in response to the first national plan, *A National Action Plan for Breast Cancer Research and Funding*, published in 2004, and a series of recommendations that builds on these efforts.
- A brief discussion of issues and desired outcomes in breast cancer research, and a strategy for solving these problems and reaching these goals.
- A call to action for all interested parties to join with NBCF at a national summit to examine how breast cancer research is funded and conducted across the research spectrum.
- A commitment to implementing a nationally coordinated approach to funding breast cancer research.

BACKGROUND

Taking a Leadership Role

NBCF committed to a national leadership role on breast cancer with the publication of two important documents. The first, *Breast Cancer Research in Australia: Meeting the Challenges*, reported the findings of a national consultation between NBCF and a diverse range of stakeholders about the position of breast cancer research in Australia. The second was the inaugural *National Action Plan for Breast Cancer Research and Funding*. As the first of its kind for breast cancer in Australia, the plan outlined several actions that researchers believed would, if fully funded, accelerate efforts to answer some of the key questions about breast cancer. NBCF has acted on the majority of these recommendations (Table 1). This is reflected in our diverse research portfolio, the establishment of key external funding partnerships and a commitment to advocating a nationally coordinated approach to breast cancer control. This revision of the plan, including a commitment to work towards its implementation, is the next step (Figure 1).

NBCF ACHIEVEMENTS SINCE THE RELEASE OF THE NATIONAL ACTION PLAN

- Committed to the creation of new knowledge through the development and subsequent support for the implementation of the *National Action Plan for Breast Cancer Research and Funding*.
- Strengthened the national breast cancer voice to ensure evidence-based care across the breast cancer spectrum through a joint partnership with the Breast Cancer Network Australia and the National Breast Cancer and Ovarian Centre (NBOCC).
- Fostered new research collaborations, those with Cancer Australia and Cancer Council NSW for example, to promote outstanding priority-driven research focused on promising areas of scientific enquiry.
- Supported capacity building through the funding of a Breast Cancer Tissue Bank; kConFab; CellBank Australia; a wide variety of People awards to attract our bright young talent to breast cancer research; and to build research leadership and a resilient research workforce through new mid and senior career fellowships.
- Increased opportunities for a wide range of research disciplines to collaborate through the introduction of the unique Collaborative Breast Cancer Research Program.
- Stimulated the riskier side of research through the establishment of Novel Concept awards designed to challenge the status quo.
- Supported the translation of evidence into quality breast cancer care through a five-year translational research partnership with the National Breast and Ovarian Cancer Centre.

- Increased consumer involvement in all aspects of a national research strategy with the establishment of a Consumer Advisory Committee representing key breast cancer organisations and individuals with an interest in reducing the impact of breast cancer on the community.
- Committed to global citizenship by joining the UICC and working towards the establishment of partnerships in Asia and the Pacific. NBCF has also taken action to meet with significant and similar organisations to understand the global

funding environment and identify opportunities to grow strategic partnerships. These agencies include the New Zealand Breast Cancer Foundation, Breakthrough Breast Cancer UK, Susan G. Komen for the Cure Foundation and the Breast Health Global Initiative.

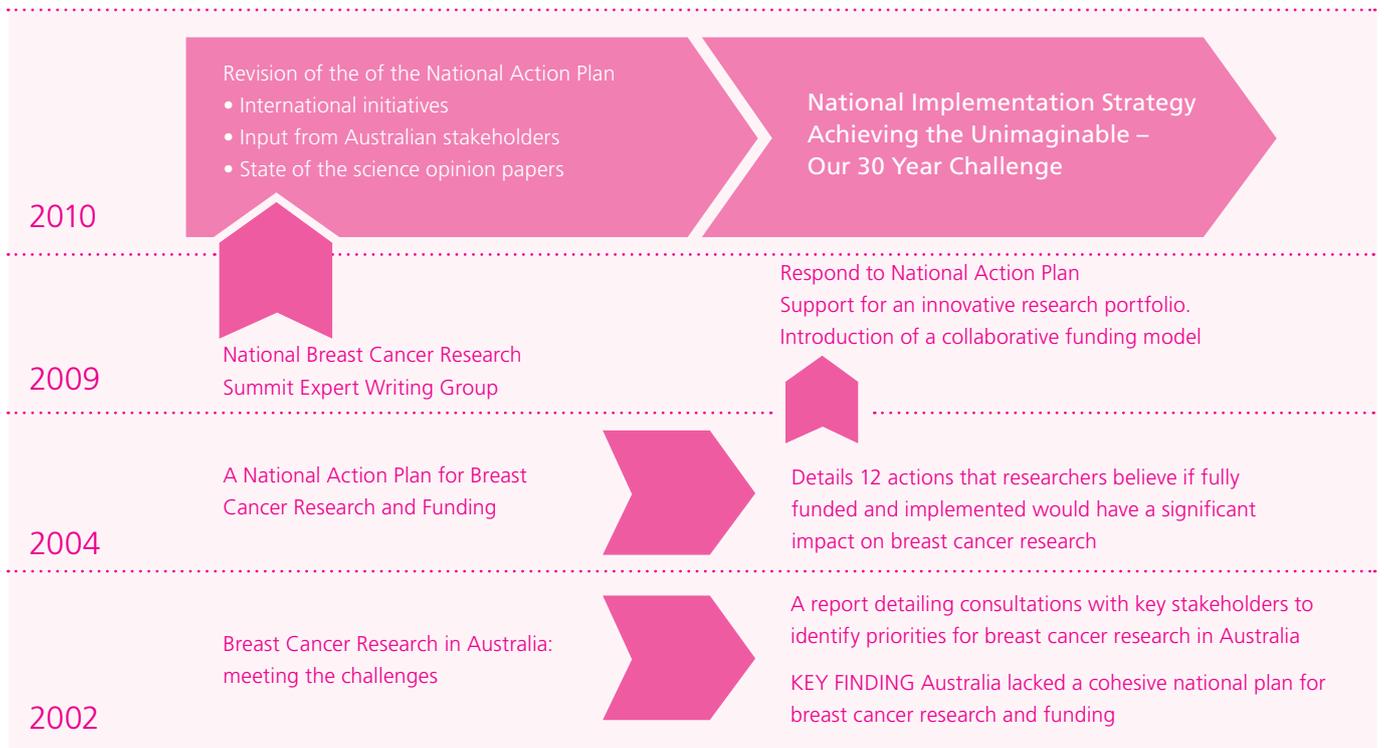


Figure 1: The process led by NBCF to develop a nationally coordinated approach to accelerate breast cancer research in Australia – A National Action Plan for Breast Cancer.

Table 1 12 ACTIONS LISTED IN THE NATIONAL ACTION PLAN FOR BREAST CANCER RESEARCH AND FUNDING, NBCF'S RESPONSE, AND THE FUNDS ALLOCATED TOWARDS RECOMMENDATIONS

No.	ACTION	NBCF RESPONSE	COMMENCED	SPEND	RECOMMENDATIONS
1	Establish an alliance of breast cancer benefactors	<ul style="list-style-type: none"> Established increased funding partnerships with government, NGOs and corporate sectors Founding member of the Cancer Research Leadership Forum* 	2007 2010	\$4,500,000	Strengthen partnerships nationally, through the Cancer Research Leadership Forum, to work with the state and federal governments and other key benefactors, including internationally, to collectively facilitate a national approach to coordinating the funding, monitoring and reporting of research and its impact. See Action 10.
2	Sustain and create long-term, large-scale projects	Introduced: <ul style="list-style-type: none"> Biennial research think-tanks Biennial national collaborative research programs 	2006 2007	\$121,385 \$20,000,000	Increase national and international partnerships to sustain truly collaborative models of research.
3	Establish and maintain a national bank of comprehensively annotated breast cancer tumours	Tri-organisation partnership funding to establish CellBank Australia; Support for a Breast Cancer Tissue Bank and kConFab through the establishment of a Facilitation Grant Scheme.	2005	\$2,828,090	Develop a national resilience plan, including data linkage, to ensure the continuation of critical research resources in Australia and to identify existing and excellent resources outside Australian borders that could be used to address unmet infrastructure needs e.g. genomics in Singapore.
4	Create a database of breast cancer research and funding	Developed a web-based national research register. See Actions 11-12. The ANZ Clinical Trials Register was established by the NHMRC Clinical Trials Centre in 2005 through an NHMRC Enabling Grant.	2010	\$5,000,000	
5	Distribute a biennial report on the status of breast cancer research in Australia	Cancer Research in Australia: An Overview of Cancer Research Projects and Research Programs in Australia 2003 to 2005, published by Cancer Australia in 2007.	2007	N/A	Develop an updatable web-based breast cancer research map to support accurate monitoring of research expenditure and its impact on the management and health of the community. Routinely include theoretically robust and appropriate economic analyses.

*The Cancer Research Leadership Forum was established in 2010 to facilitate discussion among the key national not-for-profit cancer funding agencies and to identify opportunities to collaborate and provide a collective voice for the sector at a national strategic level. Membership comprises the NBCF, Cure Cancer Foundation Australia, Cancer Council Australia, Prostate Cancer Foundation, the Leukaemia Foundation, Bowel Cancer Australia and the Melanoma Institute.

No.	ACTION	NBCF RESPONSE	COMMENCED	SPEND	RECOMMENDATIONS
6	Implement a program to fund research projects addressing truly novel ideas	Implemented annual Novel Concept Awards and Pilot Grants	2006	\$4,331,472	Continue to support research with a focus on truly novel ideas. This is a unique area not addressed by the NHMRC.
7	Facilitate national and international research and technology transfer collaborations				Grow the Collaborative Breast Cancer Research Scheme through targeted funding partnerships, including international, to facilitate more national and international research and technology transfer collaborations.
8	Develop a more coherent community of breast cancer researchers	<p>Annual funding support provided to key breast cancer research meetings including:</p> <ul style="list-style-type: none"> Victorian Breast Cancer Research Consortium biennial conferences PacRim Breast and Prostate Cancer biennial conferences kConFab conferences 	<p>2006</p> <p>2007</p> <p>2006</p>	<p>\$30K</p> <p>\$100K</p> <p>\$30K</p>	<ul style="list-style-type: none"> Establish a formal national breast cancer meeting that will stimulate cross-discipline discussion. Sharing of information and the establishment of new research initiatives. Establish a web-based NBCF Breast Cancer Research Society and use social media strategies to provide an open-access forum for researchers and the community to discuss research.
9	Expand the number of fellowships to attract and train the next generation of breast cancer researchers and to alleviate the shortage of researchers in key areas	<ul style="list-style-type: none"> Doctoral scholarship Post-doctoral training fellowships Mid-career fellowships Senior career fellowships 	<p>2000</p> <p>2004</p> <p>2009</p> <p>2007</p>	\$11,262,210	<ul style="list-style-type: none"> A national audit to characterise existing breast cancer research to determine the current skills shortage. Develop strategies to address the most critical skills shortage areas in breast cancer. Develop a national research career pathway that will address the unmet research workforce needs across all disciplines; especially in the most critical skills shortage areas, including clinical research and health economics. The pathway should include strategies inclusive of the views of research training funders and providers, consider talent management and mentoring programs and expand opportunities to enhance support for talented international students. Identify areas of opportunity for Australia.
10	Establish two grant review cycles per year to increase the responsiveness of the granting process	NHMRC has not adopted a two-year review cycle NBCF adjusted its grant calendar to avoid the peak NHMRC grant period			Through the partnership approach detailed in Action 1, facilitate a collective approach to monitor and respond to changing needs in the national granting process.

No.	ACTION	NBCF RESPONSE	COMMENCED	SPEND	RECOMMENDATIONS
11	Facilitate translation of research into practical outcomes	<ul style="list-style-type: none"> Developed the Translational Research Program with the National Breast and Ovarian Cancer Centre. Started development of a web-based national research register of individuals, with and without breast cancer, with an interest in increasing knowledge by participating in breast cancer research; includes providing epidemiological data, participating in observational studies, clinical trials and potentially providing biospecimens. <p>The register will, over time, also become an open-access repository for information about breast cancer research and funding.</p>	2005 2010	2,500,000 2,500,000	<p>Increase opportunities to translate existing knowledge through an increased focus on research on humans rather than animal models and cell lines. There are three key pathways:</p> <ul style="list-style-type: none"> <i>Finding the underlying causes of breast cancer</i> – prevention is our greatest hope to reduce the impact. Integral to this is increasing our understanding of the normal breast. <i>Clinical solutions</i>: What are the best treatment options? How can we improve outcomes for women in underserved groups with no or few treatment options? Genomic and genetic research can identify subgroups that may not need treatment or will not respond to treatment. Extend the idea of personalising medicine using multi-gene signature approaches so treatment can be tailored and change current practice to improve outcomes. Translate current knowledge: increase understanding of the interaction between individual, environmental and behavioural and lifestyle factors and develop targeted health promotion strategies to modulate in order to impact on susceptibility. <p>Support comparative effectiveness research to ensure quality care is evidence based.</p> <p>Implement strategies to increase community understanding of and participation in research.</p>
12	Enable access to biospecimens and clinical information and other relevant collected information	See Action 11.	2010		<p>Promote research that addresses the ethical and legal aspects of providing immediate and future consent by individuals for the collection and use of personal health and biospecimen data.</p> <p>Develop a consumer-led communications campaign to increase the community's understanding of research and how they can comfortably and secularly contribute to all aspects of research, including ethical discussions and policy-making.</p>

Revising the National Plan

The breadth and depth of current knowledge, infrastructure and resources has created the need for an integrated, consultative methodology for guiding breast cancer research. The approach outlined in this plan combines existing data with new data, analysis and expert opinion that includes 'imagining the future'.

NBCF started the review process with the hosting of a national summit in March 2009¹. This meeting examined current international research priorities and strategic plans for breast cancer research and discussed the critical infrastructure and resources required to facilitate the pursuit of world-class breast cancer research in Australia.

International Initiatives

A review of several recent international analytical and priority-setting initiatives on breast cancer and cancer research set the context for this revision of the National Plan. These initiatives were:

- Breast Cancer Campaign's breast cancer gap analysis and the identification of translational research priority areas (United Kingdom)²
- international web-based consultation on priorities for translational breast cancer research (known as the 'Top Ten Project' or the St Gallen Research Priorities)³
- a National Framework for Breast Cancer Research: A Roadmap for Research (Canadian Breast Cancer Research Alliance)⁴
- A World Without Cancer: the LIVESTRONG Global Cancer Summit, August 24-26, 2009⁵
- Breakaway: The Global Burden of Cancer – Challenges and Opportunities; a report from the Economist Intelligence Unit⁶.

These findings were discussed at the national summit and it was agreed the revision of the National Plan must build on the strengths of previous work. The summit acknowledged that it was impossible to define precisely where breast cancer research would be in 30 years. The summit therefore focused on identifying the aims of breast cancer research in Australia and the importance of articulating the actions needed to achieve these outcomes.

An Expert Advisory Committee representing interests across the breast cancer research spectrum was nominated by those attending the summit. Nominees prepared opinion papers about the current status of breast cancer research and what objectives might be achieved in the foreseeable future⁷.

¹The report of these discussions is available at www.nbcf.org.au

²Thompson et al. Evaluation of the Current Knowledge Limitations in Breast Cancer Research: a Gap Analysis. *Breast Cancer Research* 2008, 10:R26 <http://breast-cancer-research.com/content/10/2/R26>

³International web-based consultation on priorities for translational breast cancer research. *Breast Cancer Research* 2007, 9:R81 doi:10.1186/bcr1798. <http://breast-cancer-research.com/content/9/6/R81>

⁴A National Framework for Breast Cancer Research: A Roadmap for Research (Canadian Breast Cancer Research Alliance). December 2009. <http://www.nationalframework.ca>

⁵A World Without Cancer: the LIVESTRONG Global Cancer Summit, August 24-26, 2009. <http://www.livestrong.org/pdfs/LSSummitReport>

⁶Breakaway: The Global Burden of Cancer – Challenges and Opportunities; a report from the Economist Intelligence Unit. <http://livestrongblog.org/GlobalEconomicImpact.pdf>

⁷Available at <http://www.nbcf.org.au>

UNDERSTANDING THE IMPORTANCE OF PARTNERSHIPS

The success of a national strategy for reducing the impact of breast cancer on Australian families is dependent on three factors: fostering collaboration, enhancing capacity and increasing knowledge.

FOSTERING COLLABORATION

Working together to promote and support research into the prevention and cure of breast cancer

ENHANCING CAPACITY

Supporting new approaches, retaining the best talent in Australia and building strong leadership for the future

INCREASING KNOWLEDGE

Fostering a passion for innovation, understanding and communication about all aspects of breast cancer research

Partnerships at all levels are crucial to supporting a national and international approach to reducing the impact of breast cancer on Australian families and, indeed, families around the globe. Reduction, and possibly elimination, of the breast cancer burden is possible if partnerships are formed that take a coordinated and collaborative approach to planning, funding, implementing and monitoring breast cancer research (Figure 2).

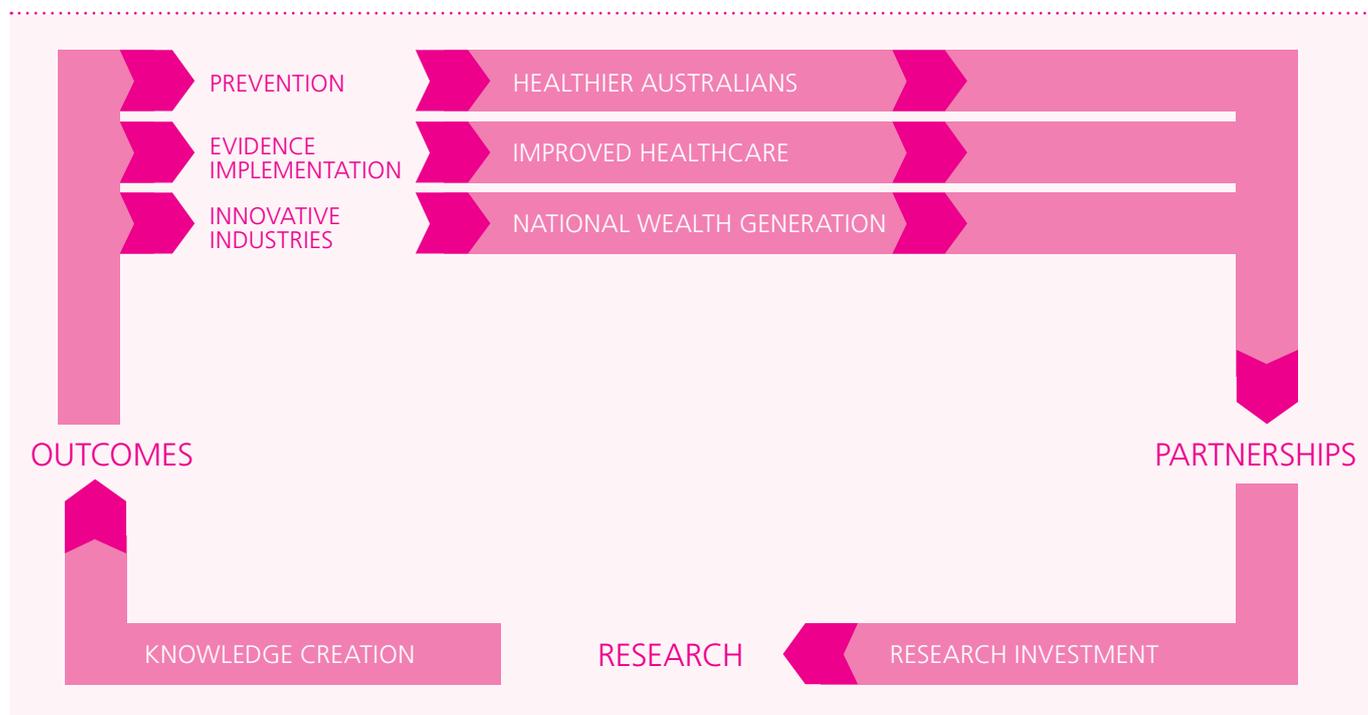


Figure 2: The virtuous cycle⁸ – Investment in research leads to knowledge creation, which in turn enhances healthcare and partnerships between researchers, government and the private sector.

⁸National Health and Medical Research Council, 2010-12 Strategic Plan, Australian Government, 2010.

THE GLOBAL PICTURE

Among women, breast cancer is the most common cause of cancer-related death worldwide. More than 411,000 deaths result from breast cancer annually, accounting for more than 1.6% of female deaths. In 2010, the global number of new breast cancer diagnoses will be about 1.5 million. About 4.4 million women diagnosed with breast cancer in the past five years are alive today, making it the single most prevalent cancer in the world.

The highest national survival rate for breast cancer five years after diagnosis is 80%. However, this occurs only in wealthier areas, including Australia, North America, Sweden, Japan and Finland. Less than 60% of women diagnosed with breast cancer in poorer countries such as Brazil and Slovakia survive longer than five years. The statistics are even worse for women in very poor countries such as Algeria, where five-year survival remains below 40%. The disparity between countries based on their income is illustrated in Figure 3.

Globally, the breast cancer burden is expected to increase. This is due to increased life expectancy and changing reproductive and behavioural patterns associated with the risk of acquiring the disease. Demographic change alone could promote up to a 50% increase in the global incidence and mortality of breast cancer between 2002 and 2020. It is likely that the majority of future breast cancer deaths will occur in low and middle-income countries rather than the developed world⁹. In the countries of the developing world, the consequence of the growing burden of new cancer cases and deaths is expected to continue to worsen¹⁰.

By 2030, the developing world is expected to bear 70% of the global cancer burden, including breast cancer¹¹.

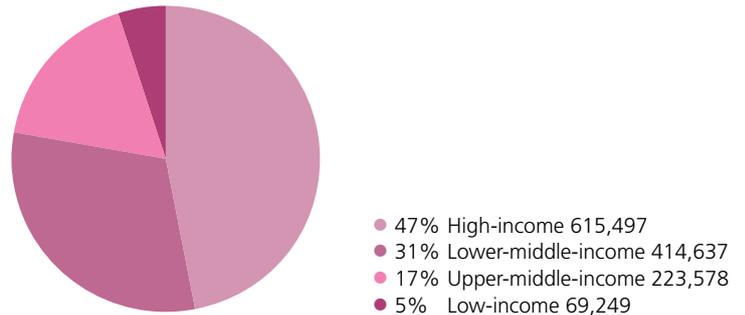


Figure 3: Number of new breast cancer cases by country income group in 2009.

⁹Anderson BO et al. Guideline Implementation for Breast Healthcare on Low-Income and Middle-Income Countries; Overview of the Breast Health Global Initiative Global Summit 2007. Supplement to Cancer. Published by the American Cancer Society. Online 24 September, 2008, Wiley InterScience www.interscience.wiley.com

¹⁰Breakaway: The Global Burden of Cancer – Challenges and Opportunities©, Economist Intelligence Unit Limited 2009.

BREAST CANCER IN AUSTRALIA

In Australia, the incidence of breast cancer is increasing (it rose 18% from 1995-2005). This growth is projected to increase with an ageing population. An Australian woman's risk of developing breast cancer is now one in nine by the age of 85. In Australia in 2006, the total number of breast cancer cases in males and females was 12,716. Of this group, 12,614 women were diagnosed, accounting for 28% of all new cancer cases (Table 2). The number of women expected to be diagnosed with breast cancer in 2010 is estimated at 14,000, with 2,930 projected deaths from breast cancer¹. By 2015, the number of new cases is estimated to rise to about 15,500.

Despite the increase in the incidence of breast cancer, there has been an improvement in mortality from the disease. The five-year survival of women diagnosed with breast cancer has improved from 72% in the period from 1982-86 to 88% over the course of 1998-2004. This is explained by increased understanding of the mechanisms driving the disease, the development and availability of early detection through mammographic screening and advances in available treatments. All these improvements arose from high-quality research.

Most Australian women benefit from these improvements in detection and treatment. Alarming, Indigenous Australian women experience a much lower survival rate from breast cancer than non-Indigenous women. They are more likely to present with advanced disease and are less likely to accept or complete chemotherapy, radiotherapy and hormonal treatments¹¹.

CAUSE OF DEATH

In Australia in 2005, there were 67,241 male deaths and 63,473 female deaths. Coronary heart disease was the leading cause of death in both sexes, accounting for 18.5% of deaths in men and 17.5% of deaths in women. Breast cancer was the fifth-leading cause of death in women, accounting for 4.3% of all deaths. This is similar to the number of Australian males dying from prostate cancer.

Cancer is the leading cause of death for women aged 25 to 44 and the main cause of death in both sexes between the ages of 45 to 64. Cancer remains the leading cause of death for men aged 65 to 84, and drops to second ranking in the 85-plus age group. In women, cancer drops to the second-leading cause of death at age 65 and over.¹²

Table 2: Summary Statistics for Breast Cancer in Females, Australia¹²

Number of New Cases	12,614 in 2006
Incidence Rates	112 per 100,000
Per Cent of All Cancers in Females	28
Incidence Rank in Females	1*
Number of Deaths	2618
Mortality Rate	22.1 per 100,000

*Excluding non-melanoma skin cancer

BURDEN OF DISEASE

Allocation of health resources is governed by which conditions have the biggest impact on Australians and where the most gains in quality of life can be made. To achieve this, a measure of disability-adjusted life years (DALY) is used to compare the impact of different diseases and injuries.

Cancer accounted for almost 20% of the total burden of disease in Australia during 2003. More than 82% of this burden was due to premature death and the remainder was non-fatal years of life due to disability (YLD). Cardiovascular disease ranked second for a total burden of 18%, with 78% of this burden due to premature death. Mental disorders ranked third for overall burden at 13%, but only 7% of this burden was caused by premature death.

In 2003, breast cancer accounted for the highest fatal burden of disease in women, with 40,080 years of life lost (YLL) as well as the highest non-fatal burden, with 20,440 YLD giving a total DALY of 60,520 years.

HEALTH RISK AND PROTECTIVE FACTORS

There are many factors that are known to either raise or lower the risk of poor health for individuals. Health risk and protective factors vary among working-age adults (25 to 64 years). This group constituted just over half (54%) the population in 2006. In 2005, 64% of males and 42% of females in this group were overweight, one quarter were current smokers and 17% of males and 13% of females reported consuming alcohol at levels considered to pose a risk to their health.

¹¹Joan Cunningham ScD, Alice R Rumbold PhD, Xiaohua Zhang PhD, John R Condon PhD. Incidence, Aetiology, and Outcomes of Cancer in Indigenous Peoples in Australia. The Lancet Oncology, Vol. 9 No. 6 pp 585-595

¹²Australian Institute of Health and Welfare 2008. Australia's Health 2008. Cat. no. AUS 99. Canberra: AIHW.

Breast cancer is among the top-five leading causes of death in every age group of working adults in Australia. Breast cancer ranked fourth in the 25-to-34 age group, but was the leading cause of death in every other age group from 35 to 64. While the causes of breast cancer remain unknown, controlling lifestyle risk factors such as weight gain, physical inactivity, smoking and alcohol consumption reduces the lifetime risk of developing the disease.

PATTERNS OF BREAST CANCER RESEARCH AND FUNDING

Research is undertaken across Australia by a variety of individuals and groups of differing size, and in a range of settings such as institutions, hospitals and universities. The National Health and Medical Research Council (NH&MRC) is considered to be Australia's major national research funding agency, although the council estimates it provides only 9% of the national research spend across all funding sources¹³. Other significant public and community-based funders of breast cancer research include the Australian Research Council, state and territory Cancer Councils, NBCF, most state and territory governments, and university affiliated research institutes. Additional sources of research funds are derived through trusts, philanthropic initiatives and the private sector, including the pharmaceutical industry.

There is no significant national coordination for the provision of breast cancer research funding or, indeed, for any other cancer, and there is no single source of information about national investment in breast cancer research. Many funding agencies are cautious or unwilling to publicly report funding data. This impedes the process of monitoring the impact of the national investment in breast cancer research.

In 2007, Cancer Australia reported, for the first time in Australia, the results of a National Audit of Cancer Research Projects and Research¹⁴. Although limited by the lack of data from all funders across all sectors, it did give a descriptive analysis of the data collected. This provided a national overview of the direct funding to cancer research projects and research programs from 2003-05. As a foundation report, it described the patterns of funding by research categories and disease site classification systems, a snapshot of the geographical distribution of research funding across Australia, detailed patterns of research collaboration, and a comparison of the patterns of research funding in Australia with trends in the United States, Europe and the United Kingdom. Data from this report has been used to guide assumptions about breast cancer research in this document.

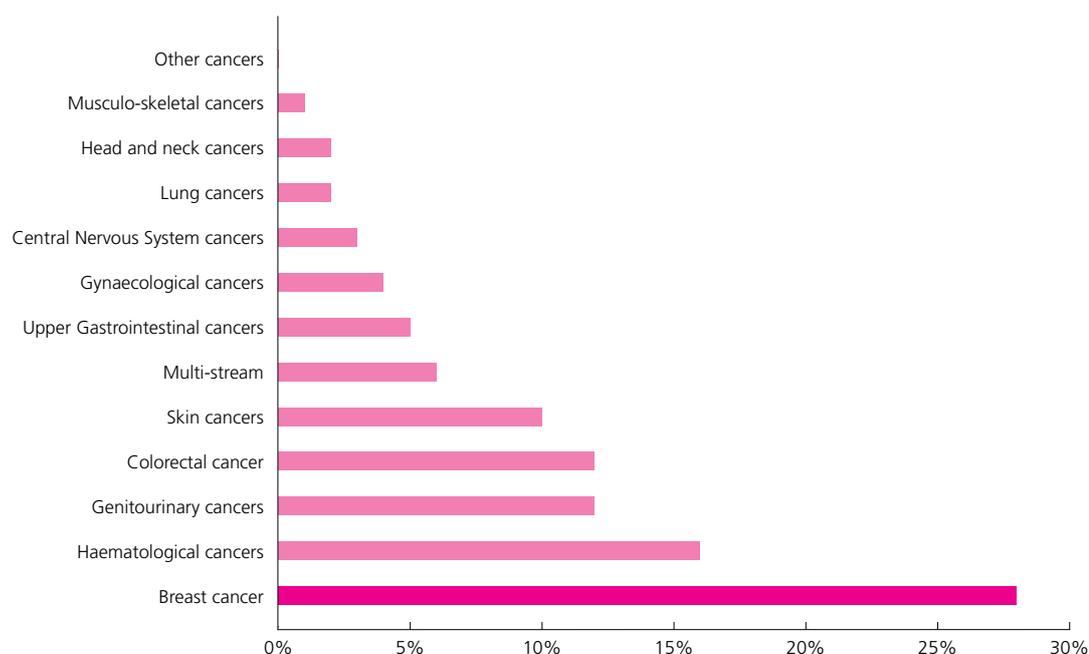


Figure 4: Funding of cancer research in Australia 2003-05, classified by tumour stream (Cancer Research in Australia, Cancer Australia).

¹³Personal communication. Professor Warwick Anderson, CEO NHMRC, 2010

¹⁴Cancer Australia. Cancer Research in Australia: An Overview of Cancer Research Projects and Research Programs in Australia 2003 to 2005. Canberra 2007

Overall Expenditure on Breast Cancer Research

During the period 2003-05, a total of \$291.7 million was invested in cancer research in Australia. Of this funding, \$119 million was allocated to tumour site specific research. Total funding for breast cancer research projects was \$33.4 million, or 28.3% of the funding pool (Figure 4). This does not include funds directed to infrastructure, individual awards or health services research.

The cancer research funding profile of Australia is similar to other comparable leading research countries such as the United Kingdom, Canada and the United States. During the period 2002-06, 18% (equivalent to AUD\$3.1 billion) of the total amount spent on cancer research in the United Kingdom was dedicated to breast cancer. Similarly, in Canada 15% of total cancer research funds were spent on breast cancer during 2006. In the same year in the US, 23.8% (equivalent to AUD \$663 million) of total funds were allocated to support breast cancer research.

Breast cancer research attracted the largest contribution in all countries in comparison to other types of cancer. These data reflect the wide recognition of the importance of breast cancer research, due in part to robust campaigning by breast cancer advocates over the past 15 years.

Expenditure by Area of Research

A closer examination of how the \$33.4 million was spent on breast cancer research in Australia provides an interesting insight. Using the Common Scientific Outline (CSO)¹⁵ as a reference, biology research accounts for the largest share of the portfolio, at 51%, with expenditure on aetiology next at 18%. Less than 10% of program funds focused on prevention; early detection, diagnosis and prognosis; treatment; cancer control, survival and outcome research; and scientific model systems (Figure 5). This portfolio followed similar patterns to research programs into other types of cancer such as prostate cancer and leukaemia. This is also a similar profile to funding systems in the UK and Canada³.

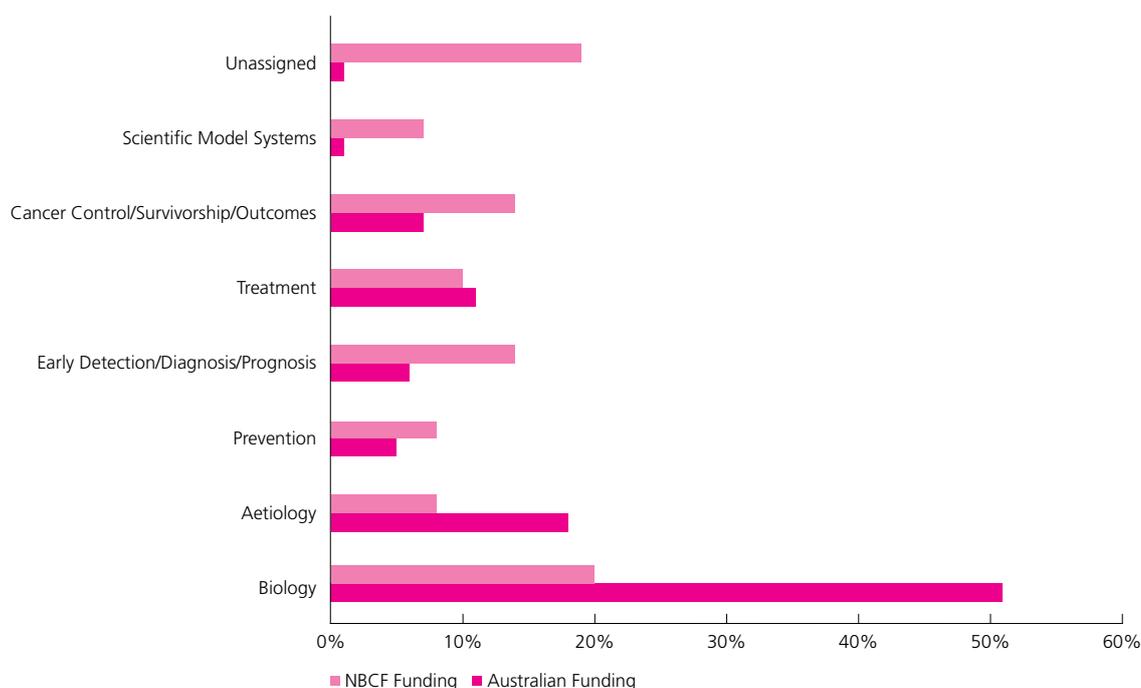


Figure 5: Distribution of funding by CSO category in Australia and the NBCF from 2003-05.

¹⁵The Common Scientific Outline (CSO) is a classification system developed to identify areas of cancer research focused by research project. Seven broad areas of cancer research include biology; aetiology; prevention; early detection, diagnosis and prognosis; treatment; cancer control, survival and outcome research; and scientific model systems.

Worthy of note is the apparent lack of investment nationally in prevention research. Clearly, this is a critical area of research encompassing a wide variety of scientific disciplines from novel treatments and epidemiology to behaviour and clinical practice. Across all cancer research, Australia invested 5% of total funds into prevention research during the reported period of 2003-05. During this time, NBCF contributed 8% of total research funds towards prevention research (Figure 5). Similarly, the National Cancer Research Institute in the UK highlighted a lack of investment (less than 2%) in prevention in 2002 and has since doubled its funding in this area. The National Cancer Institute (NCI) of the US reported a similar trend, spending just 2% of its total budget on prevention and early detection. US-based breast cancer group Susan G. Komen for the Cure spends about 7% of its total budget on prevention¹⁶. Only by combining prevention research with other research areas can we develop a strategy to effectively eradicate breast cancer. It is for this reason that NBCF believes the issue warrants further discussion and investment.

NBCF Expenditure Directed to Breast Cancer Research

NBCF has a strong commitment to supporting research to deliver improved outcomes across the breast cancer continuum. To date, NBCF has distributed \$67,420,173 to Australian breast cancer research. During the period of the Cancer Australia Audit from 2003-05, NBCF distributed in excess of \$9 million including ongoing and new funds to breast cancer research¹⁷. Research into the area of biology received most funding. This figure may be an underestimate as 19% of funds were not classified according to the CSO during this period (Figure 5). Nonetheless, this portfolio highlights the comparative expenditure in the areas of prevention and treatment research.

Compared to total Australian funding, the NBCF had a more balanced funding profile (Figure 5). Less was spent on the biology of breast cancer and a greater emphasis given to scientific model systems. In comparison with the Cancer

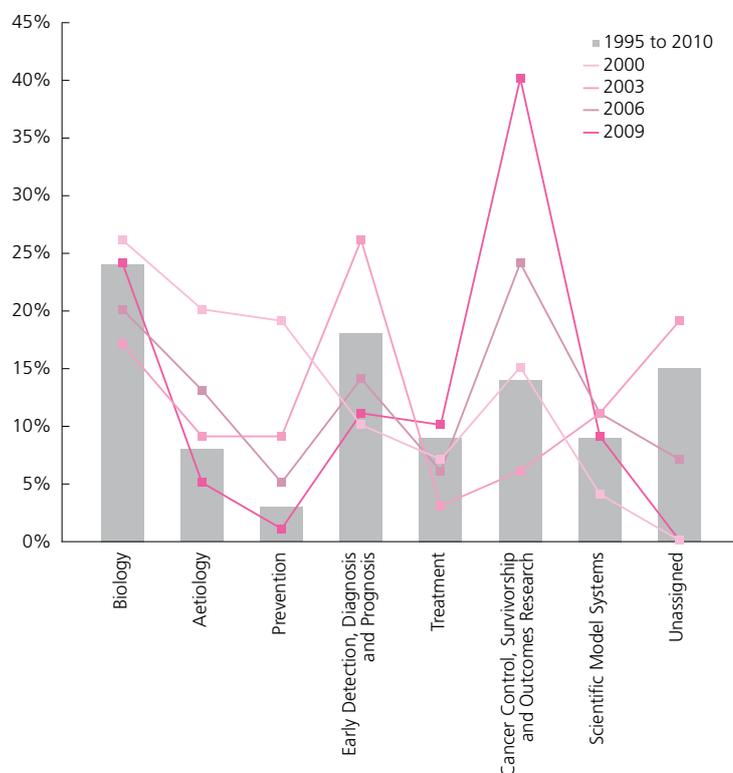


Figure 6: Trends in NBCF funding allocated according to the CSO for the period 1995-2010.

¹⁶Susan G. Komen for the Cure®, the largest not-for-profit breast cancer organisation in the US, has invested nearly \$1.5 billion since inception in 1982. It considers itself a global leader and the world's largest grassroots network of breast cancer survivors and activists, working together to save lives, empower people, ensure quality care for all and energise science to find the cure.

¹⁷NBCF internal Annual Grant Expenditure Analysis.

Australia findings, the NBCF funding profile does include infrastructure and individual awards.

There is some variation in the funding trend according to the CSO over time, particularly following the 2004 publication of the *National Action Plan for Breast Cancer Research and Funding*. This follows a significant increase in funds raised for research annually until 2009. Figure 6 reflects this pattern and highlights the impact of NBCF's implementation of the National Plan with the introduction of new research grant schemes intended to address gaps in the Australian breast cancer research environment. This included the introduction of the Novel Concept Awards, Pilot Grants, Facilitation Grants, a Translational Research Program and an increased focus on leadership development for the future. Since 2007, this has included the large-scale National Collaborative Grant Program, now totalling \$20 million over four grants, and new middle and senior career fellowships totalling \$4.4 million. The increase in the current spend on some areas including treatment and cancer control/survivorship/outcomes reflects the research programs funded

through the new schemes. These figures need to be interpreted with some caution because scientific model systems research may also pertain to other research areas such as aetiology, biology, prevention, prognosis and treatment. This may include for example the development and characterisation of animal, cell and tissue model systems and experimental and analytical methods, including new technologies.

There has been a decrease in funds allocated towards cancer control, survivorship and outcomes research. This is due in part to funding the NBCF collaborative programs, none of which focus on this area. The Translational Program totaling \$2.5 million over five years was established to specifically allow the National Breast Cancer and Ovarian Cancer Centre to support health services research with a focus on breast cancer management and outcomes¹⁸.

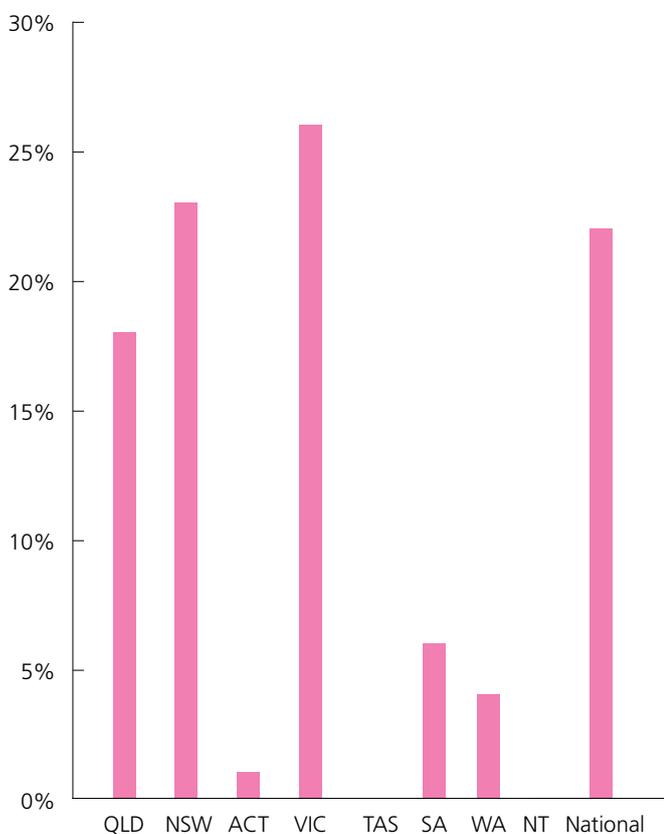


Figure 7: Total NBCF funding for the period 1995-2010 (\$67,420,173) allocated according to state.

¹⁸The National Breast and Ovarian Cancer Centre (NBOCC) is Australia's leading national authority on evidence-based information on breast and ovarian cancer. It plays a vital role in the translation of worldwide cancer research into meaningful and evidenced-based information. <http://www.nbocc.org.au/>

The national figure includes funding distributed to support infrastructure such as the Breast Tissue Bank, CellBank Australia and the Kathleen Cuninghame Consortia for Familial Breast Cancer Research (kConFab). The distribution of funds by state generally reflects the population. The lack of funding to the Northern Territory and Tasmania reflects the smaller research capacity and few applications from these states (Figure 7).

Supporting the Breast Cancer Health and Medical Research Workforce

The NHMRC estimates that about 100,000 Australians are involved in the conduct and support of health and medical research in one form or another. This workforce, comprising researchers and technicians, is concentrated in the higher education sector¹⁹. This is in contrast to other OECD countries where the business sector is the primary employer of research personnel. The research workforce is recognised not only for the creation of new knowledge but also its dissemination and translation into meaningful outcomes into the wider community²⁰. Meeting the demands of Australia's research workforce is currently the subject of Commonwealth consultation; it is clear that the challenge for breast cancer research funding bodies is how to attract and retain the most talented breast cancer researchers now and in the future.

Based on publicly available data, NBCF has funded almost half as many people awards as the NHMRC during the period 1995-2010, illustrating that NBCF is a significant funder of Australia's breast cancer research workforce (Table 3 and Table 4). This suggests that other major funding agencies are relying on NBCF to support the development of capacity and leadership in breast cancer research to enable them to support research into other cancers. This finding is not reflected in the marketing strategy of these agencies. Clearly, there needs to be some additional research and increased transparency in reporting on this matter.

Table 3 TOTAL NUMBER OF PEOPLE AWARDS FUNDED BY NBCF FROM 1995-2010

SUPPORT FOR RESEARCHERS	NUMBER OF APPS	NUMBER FUNDED	% FUNDED	COMMENCED	TOTAL BUDGET
Doctoral Scholarship*	126	31	25%	2001	\$2,210,095
Post-doctoral Fellowships	51	12	24%	2005	\$2,969,120
Early Career Fellowships**	33	8	24%	2009	\$4,087,275
Senior Fellowships**	13	2	15%	2008	\$2,000,000
TOTAL	97	53			\$11,266,490

* Includes top-up funds to selected successful NHMRC recipients

** Commenced in response to the National Plan

Table 4 TOTAL NUMBER OF ACTIVE PEOPLE AWARDS FUNDED BY NHMRC IN BREAST CANCER FROM 1995-2010

SUPPORT FOR RESEARCHERS	NUMBER FUNDED	TOTAL BUDGET
Doctoral Scholarship	36	\$2,809,544
Post-doctoral Fellowships	22 (Aust) 16 (OS)	\$10,518,631
Early Career Fellowships	4	\$1,495,500
Senior Fellowships	18	\$10,846,938
TOTAL	96	\$25,670,613

¹⁹Meeting Australia's Research Workforce Need: A Consultation Paper to Inform the Development of the Australian Government's Research Workforce Strategy. Department of Innovation, Industry, Science and Research.

²⁰Research Workforce Strategy Submission. The Australian Society for Medical Research. August 2010.

Overall, the basic science areas have received the higher proportion of research funded from NBCF and the NHMRC; this reflects the overall distribution of research funds by CSO across the research portfolio (Table 5 and Table 6).

Table 5 TOTAL NUMBER OF PEOPLE AWARDS FUNDED BY NBCF ACCORDING TO AREA OF RESEARCH FROM 1995-2010

SUPPORT FOR RESEARCHERS	BASIC SCIENCE	APPLIED SCIENCE	CLINICAL RESEARCH
Doctoral Scholarships	19	6	6
Post-doctoral Fellowships	8	2	2
Early Career Fellowships	7	1	0
Senior Fellowships	1	0	1
TOTAL	35	9	9

Table 6 TOTAL NUMBER OF PEOPLE AWARDS FUNDED BY THE NHMRC ACCORDING TO AREA OF RESEARCH FROM 1995-2010 FOR BREAST CANCER

SUPPORT FOR RESEARCHERS	BASIC SCIENCE	APPLIED SCIENCE	CLINICAL RESEARCH
Doctoral Scholarship	18	3	15
Post-doctoral Fellowships	21	8	9
Career Development Award	3	0	1
Career Awards	18	0	0
TOTAL	60	11	25

Research Resources in Australia

There is no single and central source of information about breast cancer research infrastructure across the research spectrum. Table 7 lists breast cancer research resources readily identifiable by the authors and the area of research they support. It is almost certain that there are more, particularly institutional biospecimen collections. These resources support basic biomedical science, translational clinical research, population research, biotechnology and training. This table also lists a number of large biospecimen resources that may be of relevance to breast cancer research. Some of these may be underutilised due to a lack of awareness across the research community. Not only is there scope to enhance collaboration and increase access to these resources but to expand the range of participants providing the data. This will greatly enhance the quality of research being conducted. There is increasing evidence that individuals, when provided with the opportunity, are willing to contribute personal data to credible resources for the benefit of research and the community²².

Expanding these databases will enhance each individual's contribution to research and minimise 'study fatigue' in some groups, as well as having both ethical and efficiency benefits.

The list reflects a growing commitment among the research community to foster broader linkage of existing resources. This is demonstrated by the establishment of a number of initiatives including the Australasian Biospecimen Network and kConFab. There clearly remains a need to encourage cooperation and collaboration between the custodians and users of these resources. Mapping and linking these significant data resources is essential for sustaining and enhancing an innovative research community and will maximise the value of investment in research.

Table 7 CURRENT RESEARCH INFRASTRUCTURE RESOURCES AND THE AREAS OF RESEARCH THEY CAN SUPPORT

RESEARCH INFRASTRUCTURE				
RESOURCE	RESEARCH WORKFORCE	BASIC RESEARCH	CLINICAL RESEARCH	POPULATION RESEARCH
ANZBCTG	X		X	
ANZ Clinical Trials Register	X		X	
Australasian Biospecimen Network	X	X		
Australian Twin Registry		X	X	X
Breast Cancer Tissue Bank		X	X	X
BioGrid	X	X	X	X
Bio21	X	X	X	X
CellBank Australia		X		
College of Surgeons Breast Cancer Audit			X	
Genetic Repositories Australia		X	X	X
kConFab	X	X	X	
Victorian Breast Cancer Research Consortium Inc	X	X	X	X
Victorian Cancer Biobank	X	X	X	
WA Genetic Epidemiology Resource	X	X	X	X
Cohort Resources				
Australian Breast Cancer Family Study	X	X	X	
Longitudinal Women's Study	X			X
The Melbourne Collaborative Cohort Study (MCCS)	X	X	X	X
45 and Up Study	X		X	X
Other Resources				
AusLeukLymphGroup	X	X		
AusOvCaStudy	X	X		
Brain Bank	X	X		
AusProstateCaConsort	X	X		

²²Unpublished data. National Breast Cancer Foundation: Community attitudes to the development of a national online register of women willing to consider participation in research. August 2010

PREVENTION HAS TO START SOMEWHERE: OUR 30 YEAR CHALLENGE

DECREASE MORBIDITY AND MORTALITY
FROM BREAST CANCER BY 30% BY 2040.



Monitor and report the impact of research.



Sustain interactive, collaborative and
critical research infrastructure resources.



Train health and medical research workforce.



Increase research funding through partnerships.



Build strong research advocacy.



Establish a nationally coordinated and collaborative
approach to breast cancer research and funding.

BREAST CANCER RESEARCH OVER THE NEXT 30 YEARS

Significant advances in our understanding, detection and management of breast cancer have occurred over the past 30 years. These advances are the result of high-quality research conducted by researchers located throughout the world, including Australia. A number of these advances, along with new research opportunities, are noted in various sections of this report.

It is, of course, almost impossible to envision what specific advances will occur as a result of breast cancer research conducted over the next 30 years. The breadth and speed of research advances over the past two decades have been breathtaking – far beyond what even the most optimistic researcher would have envisioned in 1990.

The research advances have made a difference – opportunities to prevent breast cancer have been identified; breast cancer can be detected earlier and with greater certainty; and the range and effectiveness of treatment options have increased significantly. Advances in the detection and management of breast cancer have translated into reduced morbidities among women undergoing treatment and major improvements in survival rates.

Over the next 30 years our overriding goals remain similar to those that currently exist – to understand what can be done to prevent breast cancer from occurring; to determine how to detect breast cancer at the earliest stage of development; to identify the most effective treatment approaches for individual breast cancer patients; and, most importantly, to ensure that all women with breast cancer have access to and actually receive the best available care. These goals can only be achieved through research that crosses the cancer continuum.

Achieving these goals requires the support and involvement of multiple stakeholder groups, most notably the community (especially women), health-care providers (especially those working with breast cancer patients), researchers, funding bodies (including state and federal governments and non-government organisations) and policy-making organisations.

It is important to acknowledge that progress in breast cancer has been and will continue to be affected by policy, infrastructure and administrative issues that impinge on the research process. Over the past 20 years a number of reports have examined aspects of the breast cancer research situation in Australia. These reports have provided observations, insights and recommendations related to breast cancer research while simultaneously advancing public debate on the issue. Unfortunately, many of the identified impediments and challenges to breast cancer research in Australia remain today – and they must be addressed. Leading these is the lack of commitment by funders across the sectors to engage in a national priority-setting process for breast cancer, and the territorial nature of the funding and research communities.

Other challenges include: a lack of routinely collected national health and cancer data; traditional and conservative funding models, including a lack of continuity of funding for capacity building; a skills shortage across some research areas; and a lack of current economic information to inform research planning and decision-making by policy-makers and those involved in providing care to people at high risk of developing breast cancer or who have a diagnosis of the disease.

While the contributions made by Australian researchers to breast cancer have been considerable, these contributions represent only a small percentage of the breast cancer research conducted worldwide. Resources to support breast cancer research in Australia will never be adequate given the range of opportunities. As a consequence, funding bodies will always need to establish their own research priorities. Developing strategies to leverage Australian breast cancer research resources, both nationally and internationally, is likely to be even more important in the next 30 years in order to ensure our researchers remain major players on the international stage.

Finally, the importance of public accountability will likely increase over the next three decades, and this will have an impact on funding bodies and individual researchers. While public support for research can be expected to increase over the next 30 years, resulting in a larger pool of research funds, competition for these funds will be great, with breast cancer research being only one of a number of worthy options. This environment will result in individual donors and funding bodies requiring a higher level of accountability from researchers than currently exists. How this will influence research priorities is unknown.

OUR 30 YEAR CHALLENGE

As previously noted, it is almost impossible to imagine the specific research advances that will be made over the next 30 years. We know, however, that there will be significant advances across the cancer continuum if high-quality research in breast cancer is supported in Australia and elsewhere. Government and non-government funding bodies will continue to provide support for high-quality research that is consistent with their research priorities. A challenge for these bodies is to create a process that regularly examines existing breast cancer research priorities and establishes new priorities based on worldwide advances in breast cancer research. The process of establishing new research priorities for Australia will always need to consider existing research capacity. The research priority-setting process for breast cancer should be done at a national level in order to maximise our research investments. This need was reflected in NBCF's previous call for the development of a National Breast Cancer Research Plan. The need for a national, coordinated approach to breast cancer research funding is even more important today.

For us to ‘achieve the unimaginable’ we need to be cognisant of factors that impact on our ability to conduct meaningful breast cancer research in Australia. These factors directly or indirectly impact on the ability of Australian researchers to conduct research in the most efficient and effective manner, and in some instances even their ability to conduct the research. Since these factors are national in scope it is incumbent upon all bodies that play a role in breast cancer to work in a coordinated and committed manner to minimise or remove the impediments. We should not, and morally cannot, accept ownership and territorial arguments as reasons for not addressing these impediments because not addressing them will almost certainly reduce the scope and quality of breast cancer research conducted in Australia. Success will be forthcoming only if the relevant organisations accept responsibility and devote resources towards the support of activities to remove these impediments. How these impediments to breast cancer research are addressed and by which organisations should be discussed in a National Breast Cancer Research Plan.

MAJOR CHALLENGES FOR THE CONDUCT OF BREAST CANCER RESEARCH IN AUSTRALIA

- Data
- Funding
- Skills shortage
- Risk assessment
- Economics
- Consumer involvement
- Breast cancer research across the continuum
- Underserved populations
- Disconnection between research and implementation

We have identified the following factors as being major challenges to the conduct of breast cancer research and the translation of findings into evidence-based care for all Australians affected by breast cancer.

1. Data and Bio Resources

The importance of data and biological resources such as tissue samples, cell lines and antibodies, to breast cancer research cannot be overstated. We see five dominant issues with regard to breast cancer data in Australia. First, while there are a number of breast cancer-related data sets in Australia, such as those provided by BreastScreen Australia and Medicare, timely access to these and other data sets is problematic. Second, because there are no nationally agreed approaches for collecting breast cancer data it is not possible to aggregate data at a national level. This has a significant impact on researchers’ ability to address important questions. Third, there are many missed opportunities for collecting data, especially from patients who enter the health-care system for investigation of breast cancer. This includes treatment-related data as well as data required to establish individual approaches to risk and treatment. Fourth, the lack of a national approach for linking relevant breast cancer data sets means that it is not possible to understand how breast cancer patients are managed or the impact of different management approaches. Without such data it is really not possible to determine, on an ongoing basis, whether women are receiving the best available treatment among many other important issues. Fifth, there is a need to determine if the establishment of select cohorts of women, followed over decades, would have a major positive impact on breast cancer research. Similar issues are encountered in the collection, storage and distribution of biological resources such as tissue samples, cell lines and antibodies. The major challenge for data banks and bio banks is the lack of long term funding on a national level. Investment in resources to date is at risk of being lost if continuity of funding and administration is not secured.

The routine, systematic collection of high-quality breast cancer data and biological samples needs to be seen as a national priority. Providing funds to support the infrastructure required to collect, store and manage these data sets and samples is essential and needs to be addressed immediately. In addition, it is necessary to have a national dialogue that results in a coherent and acceptable approach that ensures individual privacy issues are addressed while simultaneously facilitating research access to data sets and biological resources required to answer important breast cancer research questions. These two actions require a national coordinated approach that involves multiple stakeholders.

2. Funding

Some of the current approaches to funding are an impediment to the conduct of breast cancer research in Australia. As previously noted, Australian researchers represent only a small percentage of breast cancer researchers worldwide. Within any one state, the number of breast cancer researchers devoted to a particular

research issue is often very small. Australian researchers have tried to address this issue by establishing research partnerships with colleagues across Australia and overseas. Unfortunately, many of the funding mechanisms are not supportive, from a financial perspective, of establishing and maintaining such research partnerships.

Organisations that support breast cancer research need to revise their funding guidelines to encourage and facilitate the creation of research partnerships across Australia and internationally. Women are not concerned if the research that results in important advances in the prevention, detection and management of their breast cancer is conducted in their state, in Australia or elsewhere. What they are concerned about is that these advances are made through research and then translated into practice to have a positive impact on their breast cancer status. It is also important to acknowledge that establishing and maintaining productive research partnerships requires regular contact, some of which requires travel. Therefore, funding bodies must be willing to support, at a reasonable level, activities that create and maintain research partnerships.

3. Skills Shortage

Conducting high-quality breast cancer research is dependent upon the proper mix of research skills within a research team. Unfortunately, there is increasing evidence that there are skills shortages in some areas critical to the planning and conduct of high-quality breast cancer research. For example, the national shortage of researchers with expertise in bioinformatics limits the amount and quality of research that involves large data sets, especially data sets that involve genomic and other personal health data. Another example relates to the national shortage of academic pathologists and especially academic pathologists with a research interest in breast cancer. The national shortage of breast cancer clinician-researchers will almost certainly have a negative impact on the rate at which research advances are incorporated into clinical settings.

A national audit to characterise existing breast cancer research talent may be a necessary first step to determine the current and projected areas of breast cancer research skills shortage. With this information, funding bodies can work together to develop strategies to address the most critical skills shortage areas.

4. Risk Assessment

In the next few years, assessment of personal risk status for developing breast cancer, for creating a personalised breast cancer screening strategy and for formulating a personalised approach to managing the disease will become commonplace. The anticipated benefits of a personalised approach are considerable, including an increase in treatment effectiveness coupled with reduced treatment-related morbidities, an

improved quality of life and a corresponding positive impact on cost-effectiveness.

For risk assessment to reach its full potential, three impediments need to be addressed. First, development of risk algorithms depends on the availability of large data sets that contain relevant individual data, including physiological and genomic data. As previously noted, these data are not routinely collected, there is not a national process in place that would ensure researcher access to such data were it to be available, and there is a shortage of people with expertise in bioinformatics to examine these data sets. Second, development of strategies to calculate individual risk likely requires advances in mathematical approaches, yet there are few Australian researchers with this type of expertise who have an interest in breast cancer. And third, how an individual's breast cancer risk status is communicated has a profound impact on its acceptance and, subsequently, decisions made by the clinician and the affected women. Unfortunately, our understanding of this issue is limited.

5. Economics

There is and always will be a finite budget for health within any country. The implication of this is that governments and health funds will always need to make decisions regarding the prevention, detection and management strategies they are willing and able to support. As breast cancer screening and to a greater extent treatment approaches become more individualised, the issue of cost increases in importance. For governments, health funds and individuals to make evidence-based decisions among competing opportunities, it is necessary that they have access to rigorous economic information.

It is, therefore, important that funding bodies support, and preferably require, that economics be addressed within any research project that involves populations or individuals from the perspective of prevention, detection or management of breast cancer. Although health economics capacity has become established in Australia over the past two to three decades, integration within research and subsequent health policy-making is likely to require increased skills development.

6. Consumer Involvement

Consumers have been critical to raising national awareness and concern about breast cancer. Their involvement has had a significant impact on national breast cancer policy and most certainly on the amount of funds available to support breast cancer research. In fact, NBCF is in an enviable position to fund breast cancer research solely because of the donations it receives from individuals and corporations. The importance of involving consumers has been most visibly championed by the Breast Cancer Network of Australia and its member groups, but other organisations such as Cancer Council Australia and its state

affiliates, the National Breast and Ovarian Cancer Centre and NBCF have also demonstrated a sincere commitment to the involvement of consumers.

Identifying meaningful opportunities to involve consumers should be seen as a priority for all organisations involved in breast cancer research. It is likely that these opportunities will differ among the organisations as will their definition of the consumer (e.g. all women, women who have or have had breast cancer). Once these opportunities have been identified, the organisations have a responsibility to provide appropriate training for the consumer representatives to ensure they have the ability to maximise their input into the decision-making process. Creation of meaningful opportunities for consumer involvement will help ensure that support for breast cancer research continues into the future.

7. Breast Cancer Research Across the Continuum

As illustrated in the following sections, breast cancer research focuses on a range of issues from basic fundamental questions to survivorship questions. It is important to fund research across the breast cancer continuum because each point along that continuum relates to a different aspect of breast cancer. It is the right and responsibility of individual funding bodies to determine what their particular research priorities are along the continuum. However, as each country including Australia has a unique health-care system, it is important that research related to how breast cancer services are organised and delivered in Australia is supported – this is a primary focus of health services research. Economic issues are likely to be especially important in this type of research. To date, there has been little health services research related to breast cancer conducted in Australia.

Having knowledge of the type of Australian research conducted at various points along the cancer continuum is essential to setting research priorities. In instances where little research is being conducted it is appropriate to understand why – it may be due to the lack of data or access to available data, the lack of specific research expertise or the inability to secure funding for the partnerships that are required to conduct the research. It should be seen as a priority to create a system for the collection of data to characterise the breast cancer situation in Australia and facilitate a process for sharing that data with the relevant stakeholders.

8. Underserved Populations

Advances in the prevention, detection and management of breast cancer must benefit all Australian women. Such advances, however, have not benefited Indigenous women and women from culturally and linguistically diverse (CALD) groups to the same extent as they have helped women from mainstream groups. One of the reasons for this situation is the relative lack

of involvement of women from these groups in breast cancer research projects.

It is important for funding bodies and individual researchers to further develop and implement strategies that increase the involvement of Indigenous women and women from CALD groups in breast cancer research projects, especially those projects that involve clinical and population level interventions.

9. Disconnection Between Research and Implementation

While there have been significant advances in our understanding of breast cancer over the past 20 years, the process whereby discoveries are introduced into the clinical setting remains inefficient. This situation has led to an emphasis on ‘translational research’, although there is no agreement on precisely what this term actually means. The intent of translational research, however, is generally accepted as being to improve the efficiency of the process whereby discoveries in fundamental science are ultimately applied in an appropriate form in the clinical setting. How this goal is best achieved remains unknown.

Achieving the overall goal of increasing our ability to prevent, detect and manage breast cancer requires that structures and processes be created to enable and facilitate the conduct of translational research. Establishment of such structures and processes has the potential to significantly reduce the time from discovery to clinical application, in part, by altering the manner in which breast cancer research is planned and conducted.

PREVENTION

If breast cancer was untreated only 18% of patients would survive more than 5 years after diagnosis and all patients will ultimately die of their disease²³. Current treatments have had a remarkable impact on this outcome; 90% of patients survive more than 5 years. These spectacular gains in breast cancer survival have been achieved over the last 100 years, but can similar leaps be made for the prevention of breast cancer? Will breast cancer be confined to history by 2100?

Currently, prevention of breast cancer occurs in two stages. Firstly, risk factors are identified that point to the women (and men) who are more likely to develop the disease. Secondly, suitable intervention measures are undertaken to try to reduce the risk that these people will develop breast cancer. Currently two approaches have proved successful:

1. Women carrying faults in the breast cancer susceptibility genes BRCA1 and BRCA2 are highly likely, though not certain, to develop breast cancer. A genetic test is used to

²³Journal of Surgical Oncology 2000; 73: 273–277

identify this very small proportion of women (about 1 in 200). The only proven preventative measure for these women is surgery; removal of the breasts reduces risk by 90% and removal of the ovaries also confers a substantial reduction in risk.

2. Exposure to estrogen is a risk factor for breast cancer. The current preventative strategy is to reduce exposure by prophylactic treatment. The use of anti-estrogen therapies such as Tamoxifen and Raloxifene is approved by the FDA and reduces breast cancer risk by about 50%. This treatment is associated with side effects, some of which are rare but life threatening while others can reduce quality of life.

If prevention is to work it must be targeted to those who are most likely to develop breast cancer. The problem with current preventative strategies lies in the test that is applied to indicate women at risk. Genetic testing for BRCA1 and BRCA2 faults is highly predictive of risk but only for a very small proportion of women. The criteria for increased risk of breast cancer due to estrogen exposure are broad and not very specific. A large proportion of women with a family history of breast cancer never develop breast cancer, so treating all such women with anti-estrogen therapies could produce little benefit not justified against the side effects. As demonstrated by the above examples our current understanding of breast cancer risk factors is not sufficient to make major advances in prevention.

Clearly better preventative strategies and treatments are needed. Researchers are still discovering fundamental aspects of breast biology, such as the regulatory role of RNA, but new molecular and genetic tools are opening the door to discovering new ways to prevent the disease.

To develop the sophisticated predictive tools and preventative interventions necessary to eliminate breast cancer we need a much greater understanding of what causes the disease. A research strategy that aims to build a comprehensive understanding of breast biology will be a major step in this direction.

The Role of Genetic Testing

The genetic architecture of common cancers is complex. Epidemiological, twin and family studies have demonstrated that people vary greatly in their genetic risk of acquiring cancer. There is a range of risk across and within genes. Some genes have variants that confer a substantial lifetime risk, but most cancers have a polygenic risk due to multiple variants at many loci.

Genetic testing holds promise for cancer prevention, and there are already examples of it making an impact. Due to cost to the public health system and associated consumer anxiety it could be argued that cancer genetic testing should only be offered in the

context of prevention. The challenge is to identify prevention strategies that are acceptable, proven and cost-effective before undertaking, or even taking up, genetic testing. Targeted prevention and screening programs based on genetic testing must be developed before any changes to disease prevalence can occur.

PREVENTION HAS TO START SOMEHWERE - WHAT DO WE NEED TO DO TO GET THERE?

In order to be effective, research into breast cancer prevention must be conducted across the prevention continuum (Figure 8). This involves preventing mortality to reduce deaths from breast cancer, preventing morbidity to improve the lives of those living with breast cancer and preventing the disease itself so that future generations are free from breast cancer.

In preparing this report a number of individuals, most of whom are accomplished researchers, were asked to 'envision the future' for their particular area of expertise. These documents can be found on the NBCF website. For this report we summarised their observations and visions for the future into a single chart. Thus charts exist for the following topics: risk management, screening, molecular markers, targeted treatments, radiation treatment, treatment services, psycho-social care, complementary therapies, translation of evidence into care, underserved populations, survivorship, national monitoring of breast cancer trends, access to complete data repositories, and funding of research with a consumer focus.

Each chart takes the form of a timeline. At the top of each chart is the 'outcome' that the author believes can be achieved over the next 30 years, while the bottom of each chart reflects the starting point for the particular research area or issue. The bold arrow indicates where we currently are with respect to achieving the stated outcome. Between the arrow and the outcome a number of research advances are noted that must be achieved before the outcome can be realised.

It is likely, and indeed expected, that persons and organisations with expertise in a specific area may have slightly different perceptions of the steps that need to be achieved to realise the stated outcome. We encourage debates on these charts within research groups and organisations with the expectation that such debates will result in a refinement of the charts. As the charts are refined and regularly updated, it is our hope that they will prove to be useful to funding agencies supporting breast cancer research.

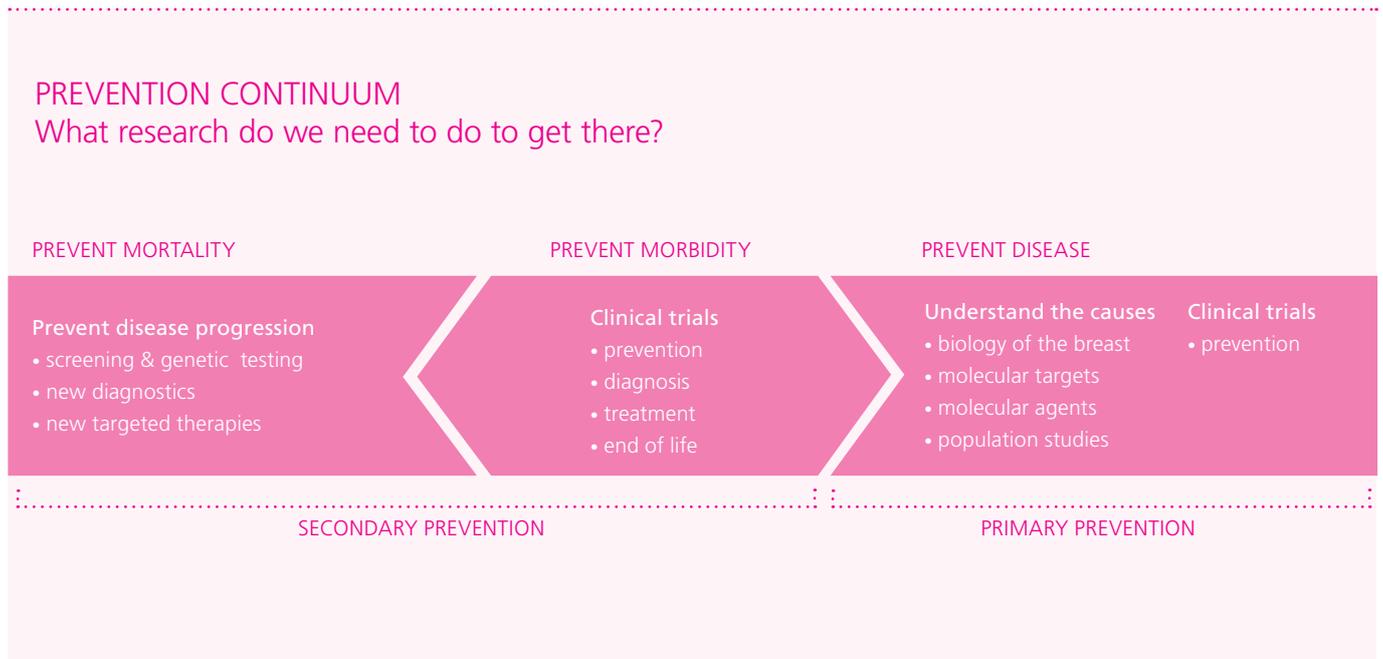
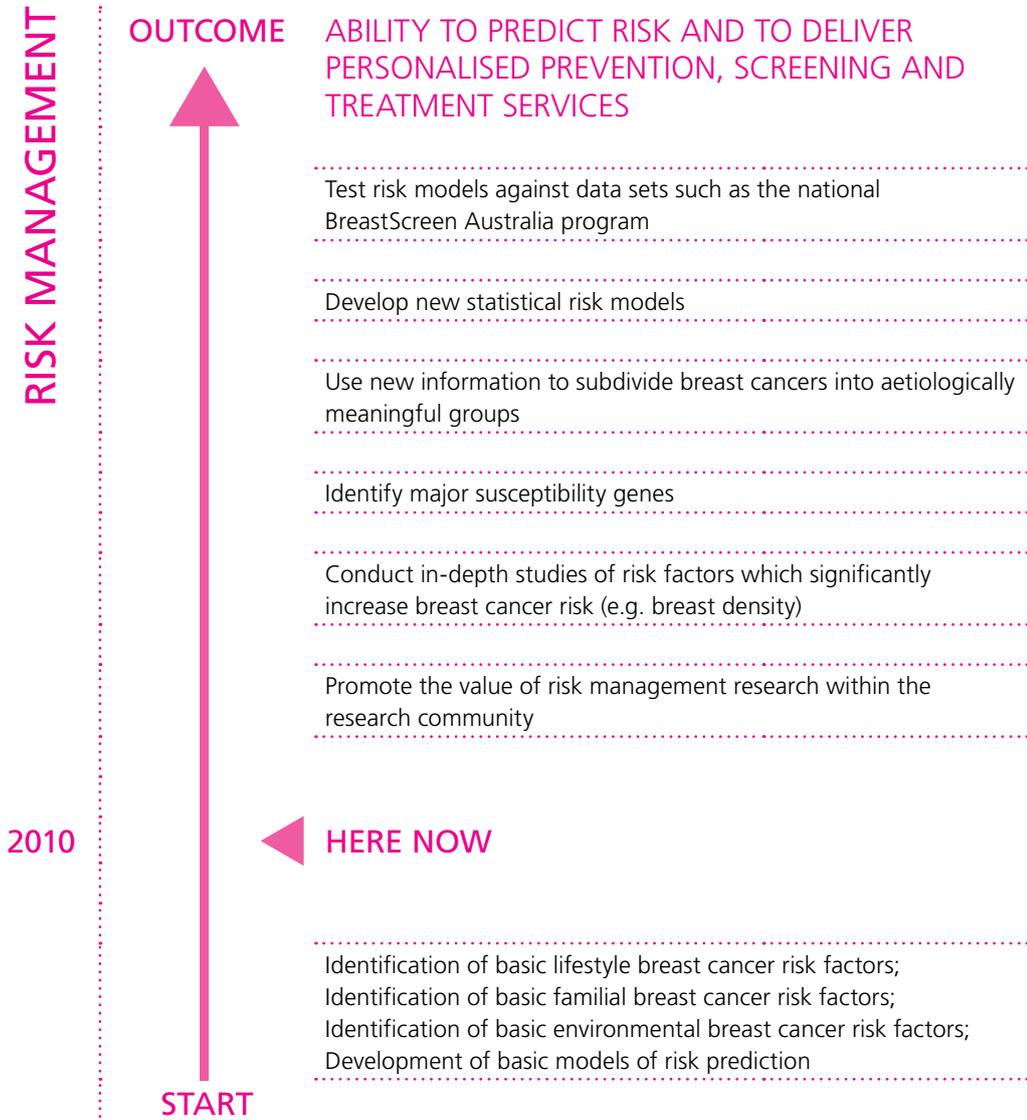
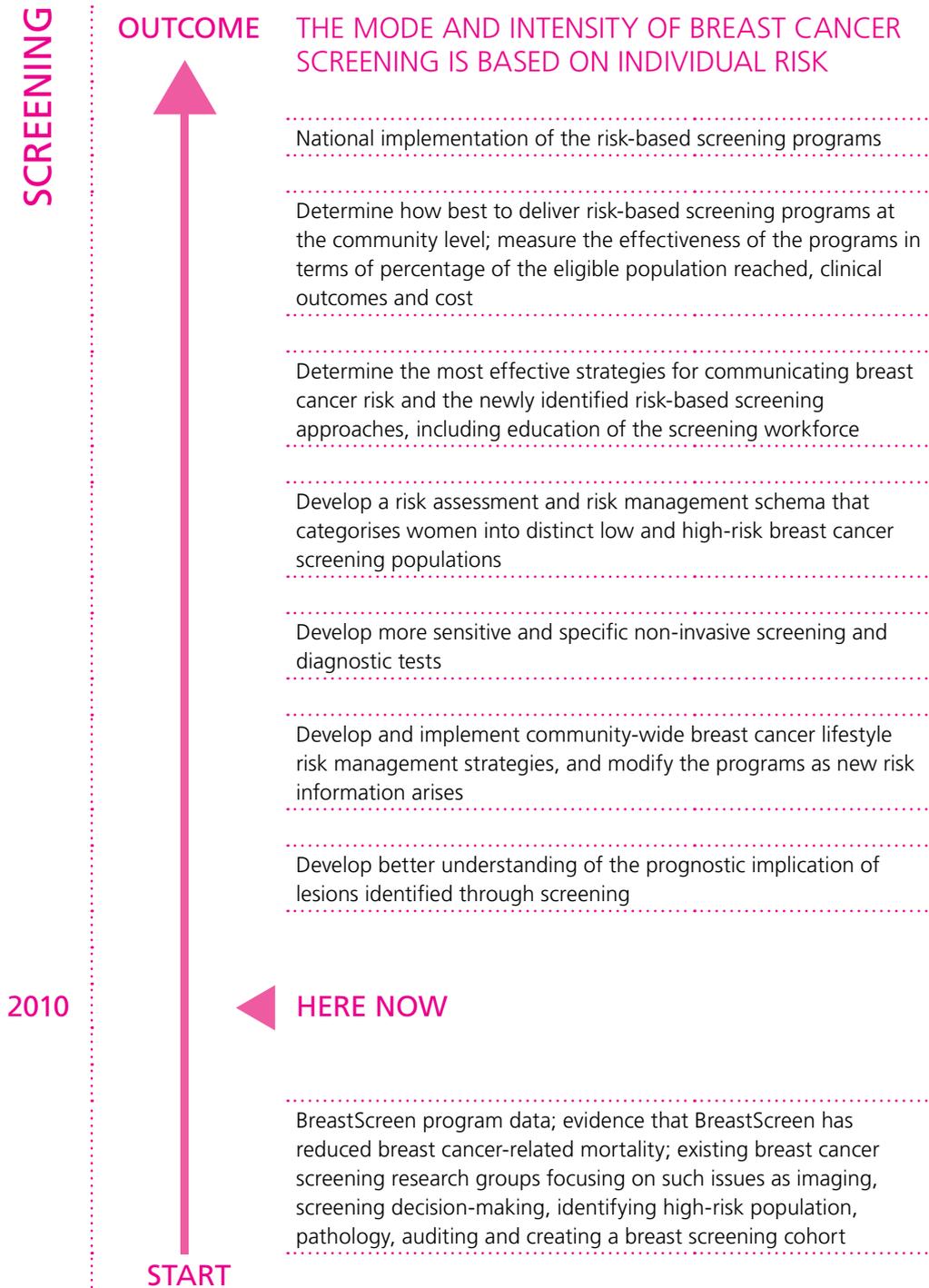


Figure 8: The prevention continuum outlining the research necessary to prevent breast cancer mortality, morbidity and to ultimately prevent the disease itself.

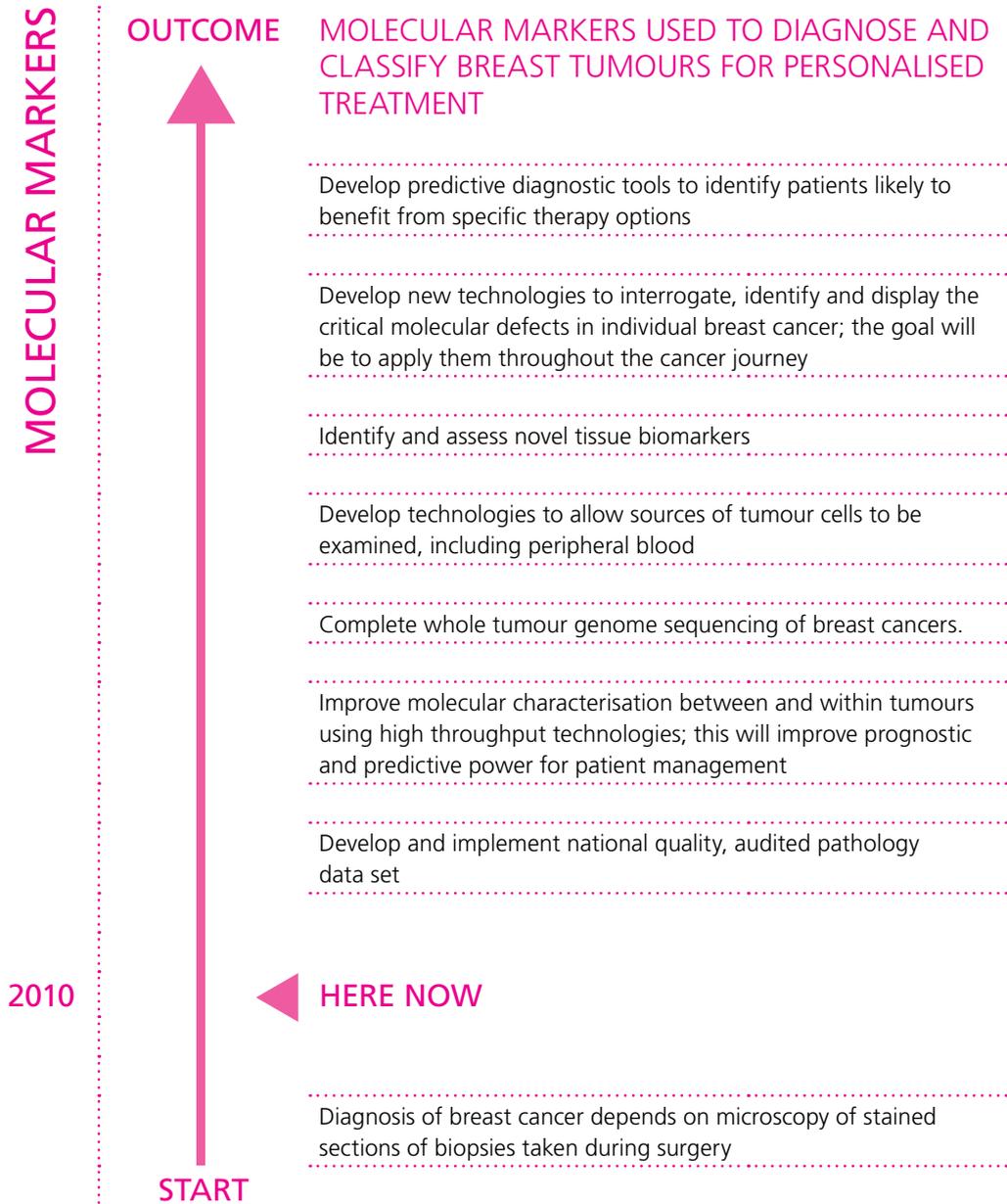
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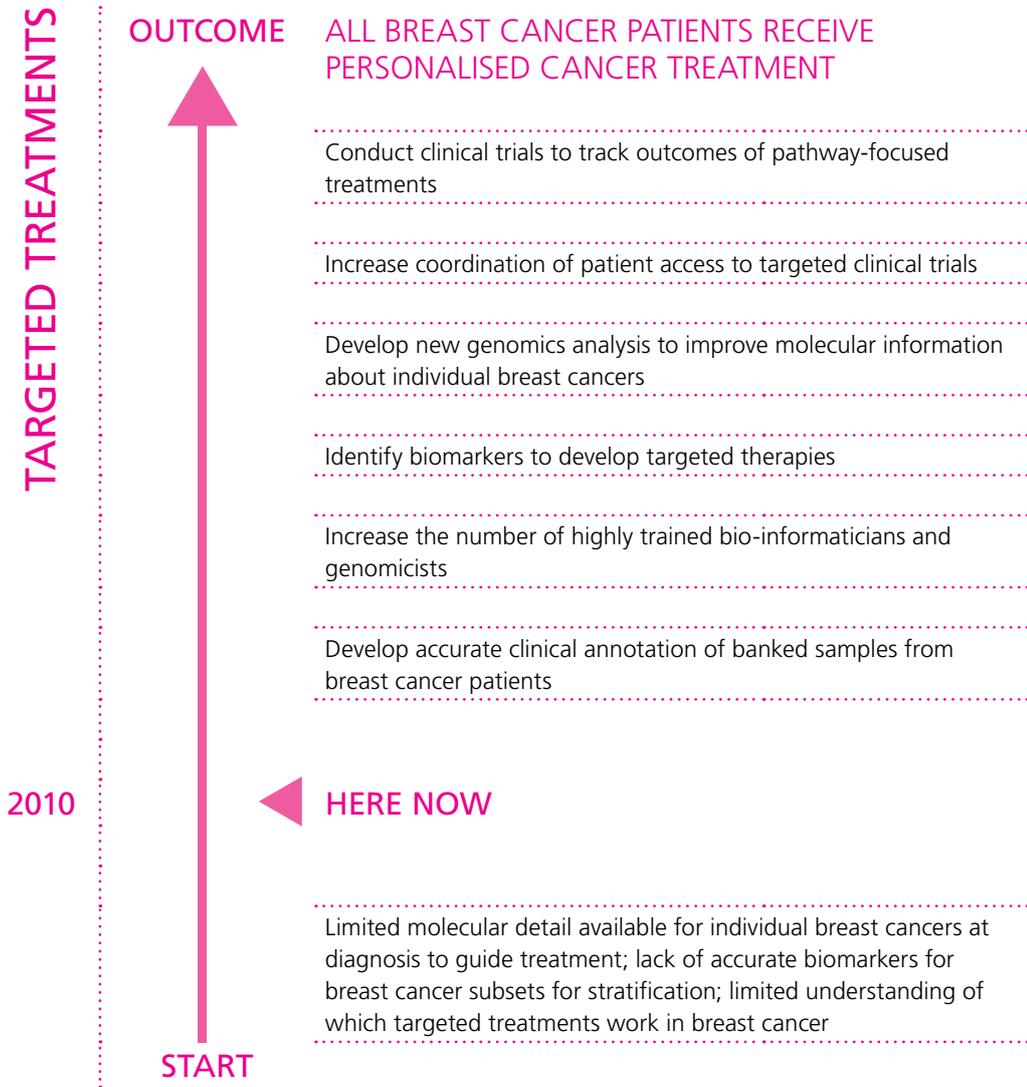
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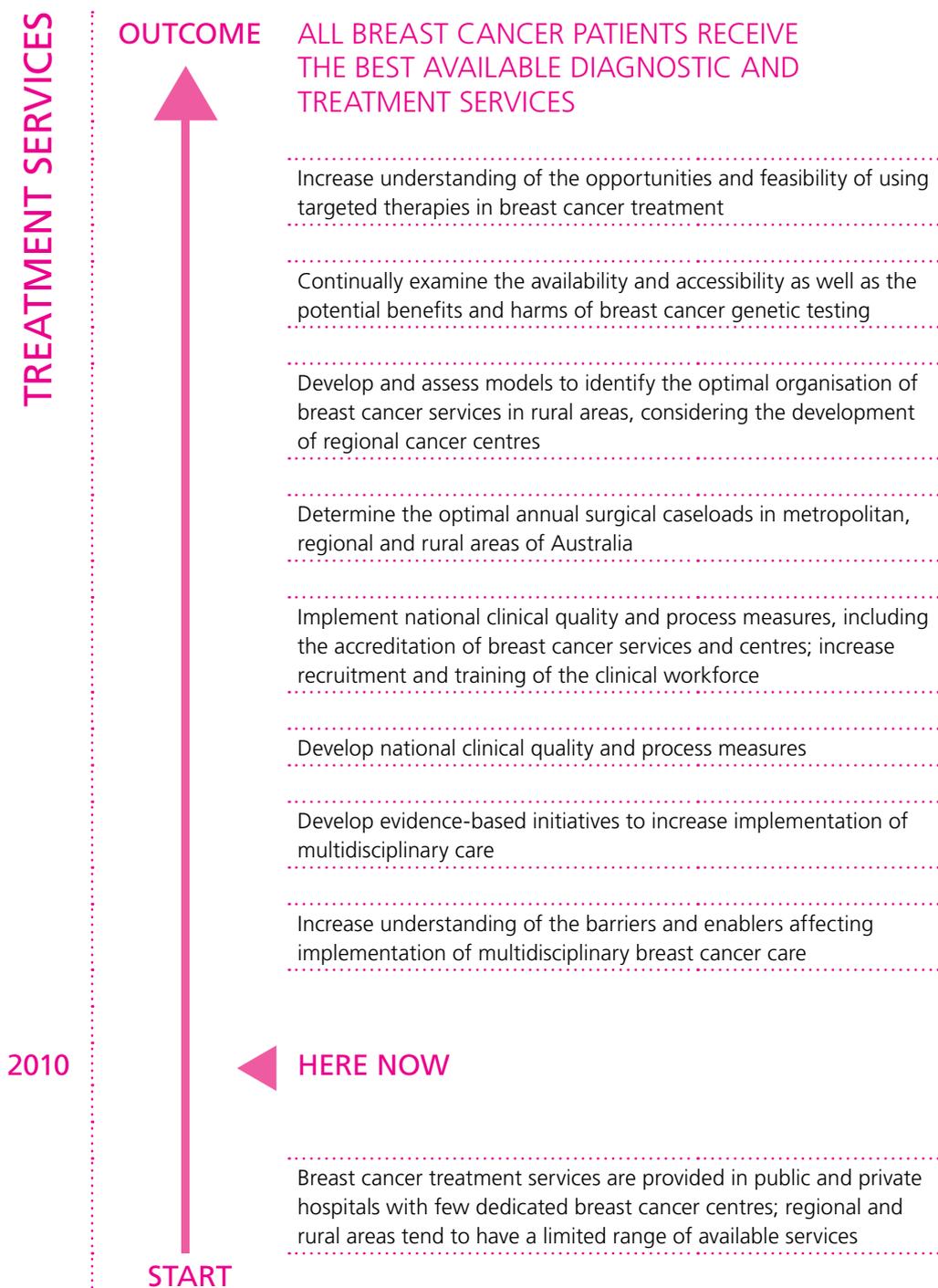
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PSYCHOSOCIAL CARE

OUTCOME

ALL BREAST CANCER PATIENTS ARE ASSESSED AND TREATED FOR PSYCHOSOCIAL ISSUES USING EVIDENCE-BASED STRATEGIES

Develop cost-effective strategies to encourage uptake of effective psychosocial interventions

Develop and test strategies to integrate clinical and psychosocial research

Develop and assess effective models of care across the survivorship continuum

Create a national database of psychosocial and survival-related projects; create a national register of psychosocial research expertise

Develop and assess psychosocial performance indicators

Identify the unique psychosocial needs and characteristics of unique or disadvantaged breast cancer patient populations

Develop and assess strategies to support decision-making among breast cancer patients

Increase understanding of the interaction between health systems factors and psychosocial outcomes and increase understanding of psychosocial outcomes amongst the health sector workforce

Examine the long-term effects of cancer diagnosis and treatment on breast cancer patients, their families and caregivers

Assess various strategies for the effective communication of breast cancer information to breast cancer patients

2010

HERE NOW

A significant percentage of breast cancer patients have psychosocial needs that remain unidentified and untreated; there is very little funding for psychosocial research or psychosocial fellowships

START

PREVENTION HAS TO START SOMEWHERE – WHAT DO WE NEED TO DO TO GET THERE?

COMPLEMENTARY THERAPIES

OUTCOME

INTEGRATION OF EVIDENCE-BASED COMPLEMENTARY MEDICINE INTO CANCER CARE SERVICES

- Integrate effective CM into the delivery of cancer services
- Develop standardised evidence-based CM protocols
- Develop practice standards for CM practitioners working in usual cancer services settings
- Fast-track research on promising CM interventions
- Establish national and international links with research teams and organisations with a focus on CM research
- Establish and support CM collaborative research teams
- Develop a CM strategic research plan that includes a focus on prevention and treatment, and which includes a process for setting and regularly examining research priorities
- Increase opportunities for breast cancer clinicians to learn about effective CM therapies
- Provide information to consumers about safe and effective CM treatments based on national and international evidence

2010

◀ HERE NOW

Vast majority of breast cancer patients use CM, with many using more than four therapies. Little research on CM therapies is occurring in Australia and there is no strategic CM research plan

START

PREVENTION HAS TO START SOMEWHERE – WHAT DO WE NEED TO DO TO GET THERE?

TRANSLATION OF RESEARCH

OUTCOME

SCIENTIFIC ADVANCES ARE RAPIDLY TRANSLATED INTO IMPROVED CLINICAL CARE

Develop a clinical trials program to fast-track advances

Provide long-term funding for defined cooperative groups established to translate laboratory discoveries to validation in patient care

Develop a defined, sequential biomarker program

2010

HERE NOW

The time from discovery to application in breast cancer care is lengthy

START

PREVENTION HAS TO START SOMEWHERE – WHAT DO WE NEED TO DO TO GET THERE?

UNDERSERVED POPULATIONS

OUTCOME



BREAST CANCER MORTALITY AMONG INDIGENOUS WOMEN IS AT LEAST EQUAL TO THAT OF NON-INDIGENOUS AUSTRALIAN WOMEN

Ensure Indigenous women have access to the same range of breast cancer treatment services and options as non-Indigenous women

Apply evidence from research in health care for Indigenous women

Develop and trial novel models of breast cancer care for Indigenous women, including the increased involvement of Indigenous women in the delivery of services

Eliminate the disparities in rates of breast cancer screening participation among Indigenous women

Identify unknown factors that contribute to the breast cancer mortality difference between Indigenous and non-Indigenous Australians

Collect more comprehensive breast cancer-related information from Indigenous women

Increase the involvement of indigenous Australians in the research workforce

Increase the percentage of Indigenous women who participate in breast cancer research activities

Increase the levels of awareness among Indigenous women regarding the importance of participation in breast cancer screening programs

2010

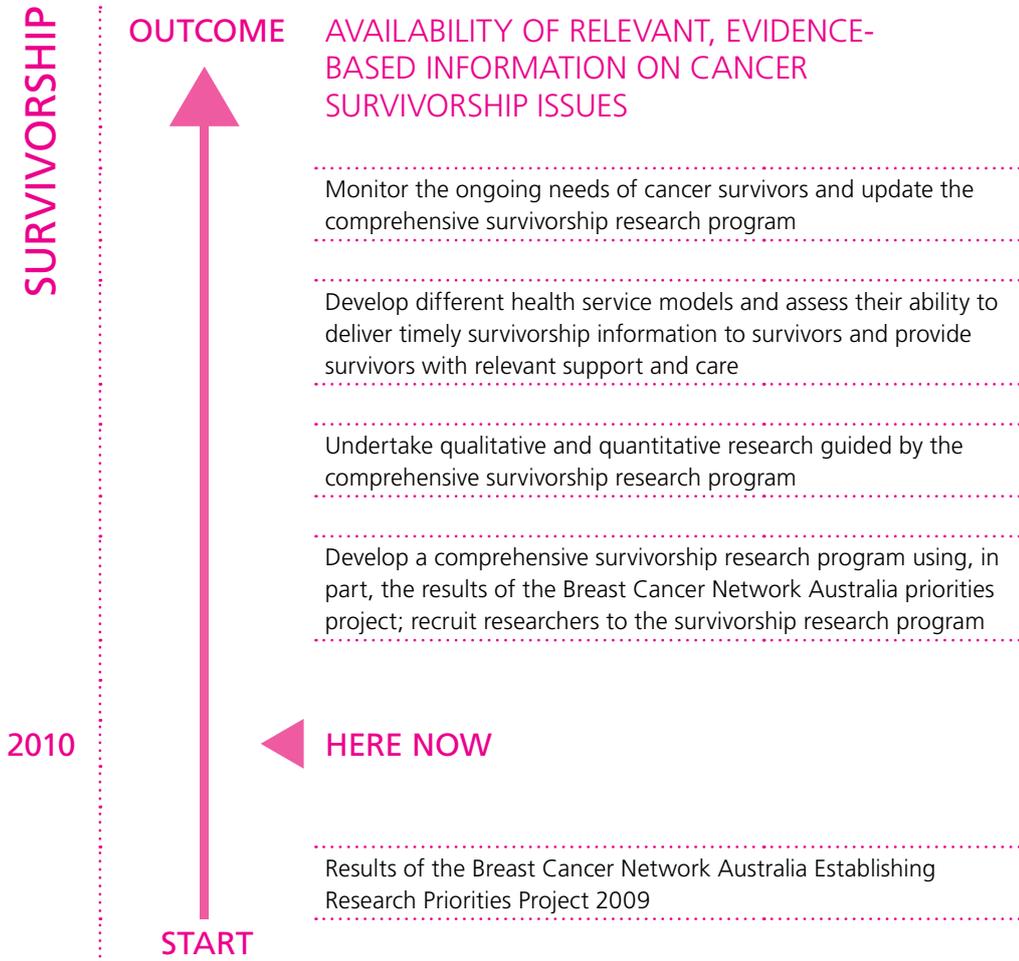


HERE NOW

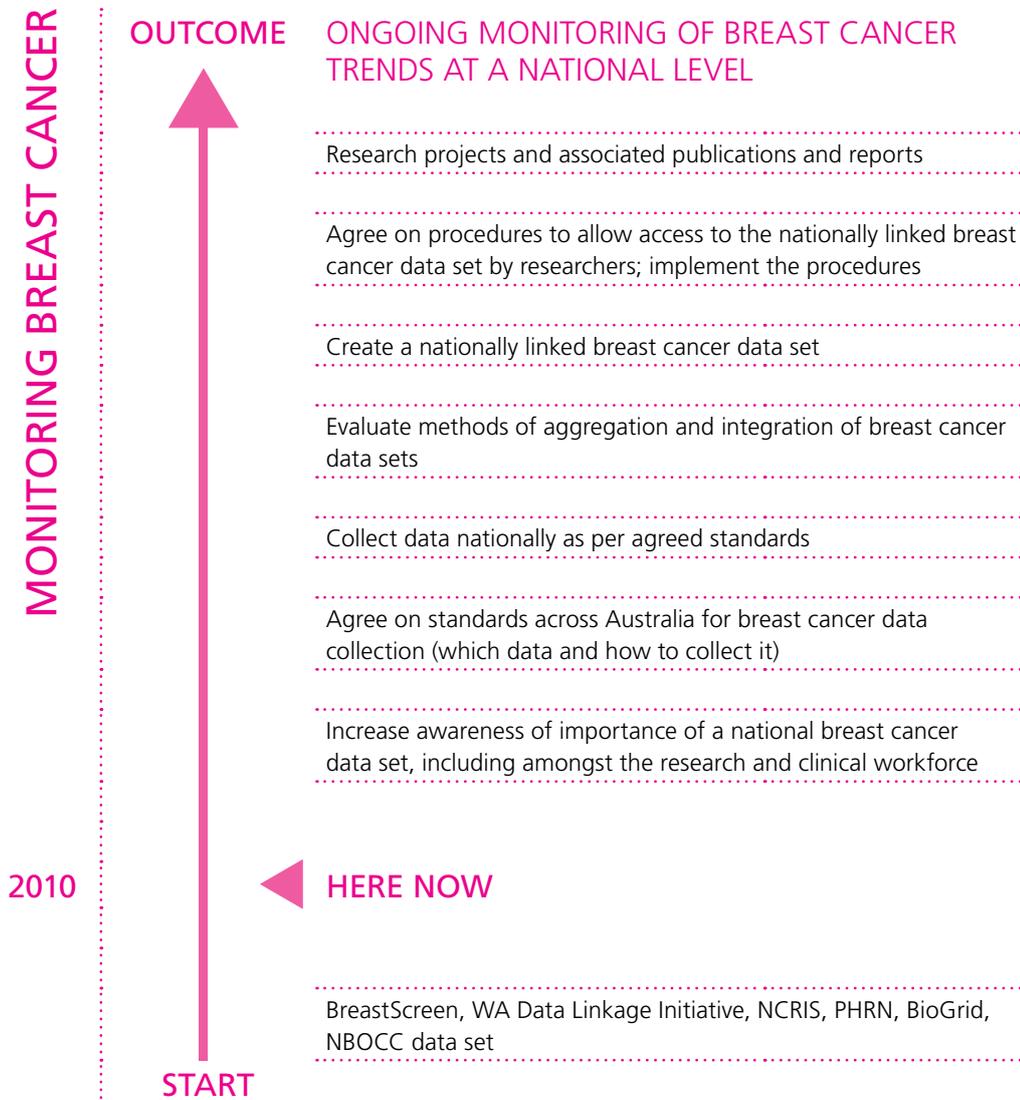
Published reports on the incidence, aetiology and outcomes of breast cancer (and other cancers) in Indigenous women in Australia; negative history of research activities involving Indigenous Australians

START

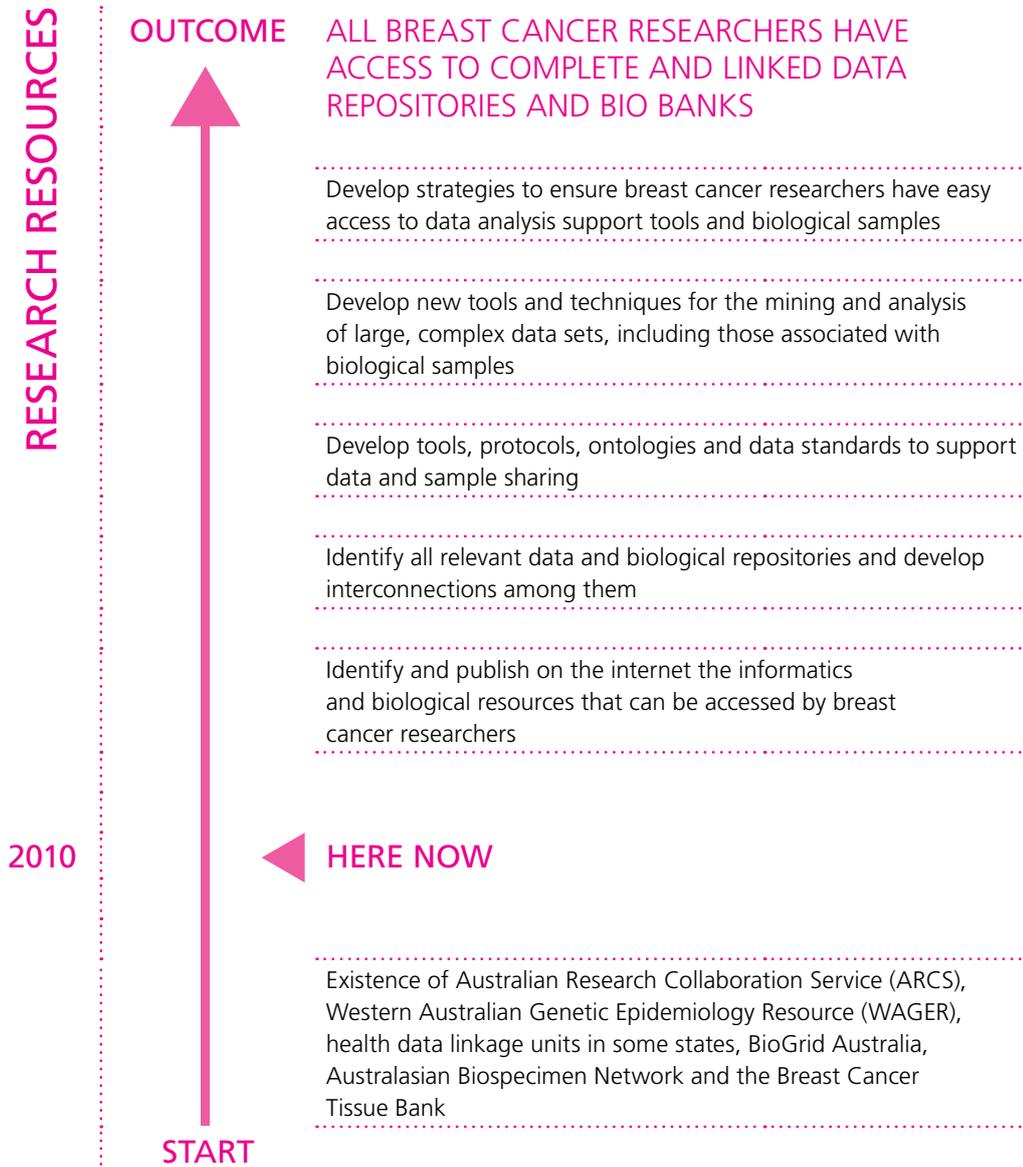
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A CALL TO ACTION

People and organisations across the globe are increasingly highlighting the importance of global leadership, unity and collaboration as critical elements in advancing the global effort to reduce the impact of cancer throughout all countries²⁴. Four priority actions have been agreed as a roadmap to making cancer, including breast cancer, a global priority:

- national cancer plan development
- investment and funding for cancer research, prevention and treatment
- investments in public health infrastructure and education
- reducing stigma for cancer patients and survivors

NBCF is committed to ensuring this plan is cognisant of the need to integrate the identified components to ensure its effective implementation. Importantly, research in breast cancer is increasingly relevant to other cancers; hence the lessons learned about developing and implementing a national breast cancer action plan should form the basis for increased advocacy for the development of a national cancer action plan.



Figure 9: Components necessary to ensure the effective implementation of the National Action Plan for Breast Cancer Research.

²⁴A World Without Cancer: the LIVESTRONG Global Cancer Summit, August 24-26, 2009, <http://www.livestrong.org/pdfs/LSSummitReport>. Accessed 14th August 2010

IMPLEMENTING THE NATIONAL ACTION PLAN

NBCF will proactively champion the adoption of the recommendations outlined in the National Action Plan through existing and new partnerships in research and funding, including the recently established Cancer Leadership Forum. It will actively encourage those interested to become part of a national and international network that will share learning experiences in pursuit of more effective research strategies and funding solutions (Figure 9).

NBCF has continued to take a leadership role in championing a nationally coordinated approach to funding and implementing breast cancer research since it first published the National Breast Cancer Priorities Report in 2003 detailing the views of Australia's research and broader community. This document represents the possibility of a paradigm shift in the way breast cancer research is funded and conducted. It is not intended to provide prescriptive priorities; it is envisioned as a dynamic plan that responds to new information and data about research activity throughout the globe. Therefore:

- NBCF will establish a National Implementation Committee that will take charge of the plan and be responsible for dissemination, implementation, evaluation and its ongoing review.
- NBCF will facilitate a national breast cancer summit to explore what Australia can best contribute to the global research effort and how we should go about it.
- All members of the breast cancer research community are invited to become familiar with the plan and to consider how best to collaborate to achieve improved outcomes in the shorter and longer terms and, ultimately, a world without breast cancer.
- Breast cancer research funders across Australia are urged to adopt a collaborative approach to mobilise support for breast cancer research through implementation of the plan across the breast cancer continuum from prevention to the impact of increasing survivorship and end of life.
- Private sector industries, including pharmaceutical and biotechnology companies, informatics and software developers and equipment manufacturers, are encouraged to participate in new collaborative opportunities.
- NBCF will advocate for the application of existing research findings to policy and practice areas as they relate to breast cancer and chronic disease, and to engage with researchers, policy-makers, academics and funders to shape future research aligned with policy development.

MONITORING PROGRESS AND UPDATING THE NATIONAL PLAN

To maintain its relevance and effectiveness, the National Plan will, with the support of the national and international research communities, be kept current. Emerging discoveries, new knowledge and activities in the cancer and health research environments will be tracked, while trends in breast cancer research funding, annually and longer term will be reported regularly. In this way, the National Action Plan promises to have a profound impact on current and future efforts to prevent breast cancer and its impact on society.

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THE WORLD CANCER DECLARATION – A CALL TO ACTION FROM THE GLOBAL CANCER COMMUNITY

PRIORITY ACTIONS

These targets are ambitious. During the past few years, however, there is growing evidence that concerted action can make a difference in a short time. We believe, therefore, that the targets can be achieved provided a number of priority actions are implemented.

Health Policy

- Place cancer on the development agenda. Increase the political priority given to cancer by demonstrating that a country's investment in dealing with its growing cancer problem is an investment in the economic and social well-being of the country. Organisations concerned with cancer control should work with the global donor community, development agencies, the private sector and all civil society to invest in cancer control.
- Mobilise stakeholders to ensure that strategies to control cancer globally are targeted at those who are most in need. Involve all major stakeholder groups in the development, or updating, of national cancer control policies.
- Implement strategies that have been proven to bridge existing cancer surveillance gaps.
- Increase efforts to involve cancer patients in cancer control planning at a local and national level.

Cancer Prevention and Early Detection

- Increase efforts to reduce tobacco consumption by encouraging governments to fully implement and enforce the FCTC.
- Raise awareness about the need for culturally sensitive cancer risk reduction campaigns, along with public and professional education about cancer warning signs. Push governments to implement policies that will support risk-reducing strategies at a community level and enable individuals to make more informed consumption choices and adopt healthier behaviour.
- Encourage governments to implement measures to reduce people's exposure to environmental and occupational carcinogens.
- Undertake actions to ensure that vaccines and other strategies that are shown to prevent cancer-causing infections are made more widely available.
- Advocate for the provision of affordable screening programs for which there is evidence of efficacy in the population in question. Undertake pilot projects that are designed to evaluate the feasibility and efficacy in populations in which the screening technology has not yet been tested.

Cancer Treatment

- Promote the development and use of cancer treatment guidelines that are relevant to local needs and resources. Ensure that sufficient treatment, rehabilitation and palliative care facilities and well-trained staff are available to meet the physical, social and emotional needs of patients with cancer.
- Take steps to tackle the many barriers to optimal pain control. Work with governments to address the over-regulation of pain medicines. Cooperate with international organisations, including the International Narcotics Control Board and the World Health Organisation, to ensure that global implementation of the United Nations international drug control conventions do not unduly interfere with legitimate efforts to advance access to pain medicines for cancer patients in pain.
- Work with the pharmaceutical industry to increase access to cancer medicines that are affordable and of assured quality.
- Increase the number of health professionals with expertise in all aspects of cancer control by providing specialist training opportunities and fellowships to enable professionals to study in specialist settings.
- Raise awareness about the impact of health worker emigration on the ability of countries to provide adequate levels of cancer care and work collectively to address global and national health workforce shortages and the resultant deepening of inequity.
- Increase investment in independent basic and applied cancer research and accelerate the translation of research findings into clinical and public health practice.
- Encourage cancer research organisations in different countries to collaborate, share data and define complementary research objectives to optimise the use of the limited funds available for cancer research and reduce duplication of effort.



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