

30 YEARS OF FUNDING BREAST CANCER RESEARCH

Towards Zero Deaths from breast cancer

CEO FOREWORD

The National Breast Cancer Foundation's story is one that has been 30 years in the making. A story of extraordinary people, discoveries, and steps towards achieving our ambitious and important vision of Zero Deaths from breast cancer.

For 30 years now, we've been inspired by the belief that, together, we can do extraordinary things. It's this belief that's driven support for breast cancer research which has created lasting, positive change.

Since its inception in 1994, the National Breast Cancer Foundation (NBCF) has invested \$232 million into 642 world-class research projects. Over one million donors have contributed to this investment, and in 30 years this funding has helped support over 1,800 researchers in over 90 institutions across Australia to ignite lasting change. In this time, the death rate from breast cancer in Australia has reduced by over 40%.

Research has been critical to reducing deaths from breast cancer and the research we've funded has also influenced policy and practice both locally and internationally leading to a range of positive service delivery, health, and economic impacts.

While the reduction in the death rate from breast cancer is progress to be celebrated, the diagnoses of breast cancer continue to increase at a rate greater than population growth and numbers of deaths from breast cancer continue to rise. Nine people a day still die from breast cancer in Australia and our vision of realising Zero Deaths from breast cancer is as important as ever.

Over the next five years, we are building on the strong research foundations we have helped create. We are investing up to \$125 million to accelerate research through the Pink Horizon Research Strategy, to help reduce the 16,000 deaths from breast cancer that are expected in this time. Every life lost is one life too many.

As we mark our 30th anniversary we want to recognise and thank our extraordinary community of donors and researchers for their ongoing support, dedication and passion that will help us realise our shared vision of Zero Deaths from breast cancer.



Associate Professor Cleola Anderiesz
CEO, National Breast Cancer Foundation



“For 30 years, NBCF’s commitment to funding world-class breast cancer research has led to extraordinary discoveries. We want to ensure that a diagnosis of breast cancer doesn’t lead to a death and research is key to achieving this.”

– Associate Professor Cleola Anderiesz, NBCF CEO

NBCF'S IMPACT AT A GLANCE

OVER THE LAST 30 YEARS

NBCF's impact on research investment

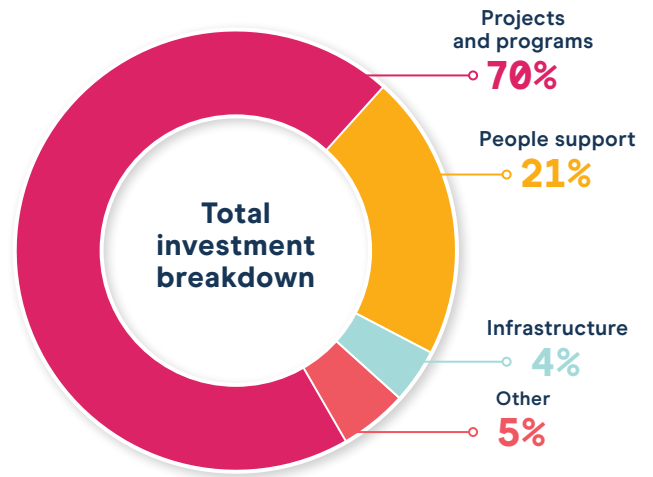
NBCF is the largest not-for-profit funder of breast cancer research in Australia, supporting researchers, research projects and infrastructure.



Largest not-for-profit funder of breast cancer research in Australia



NBCF has invested **\$232 Million** into **642 projects**



CO-FUNDING AND PARTNERSHIPS

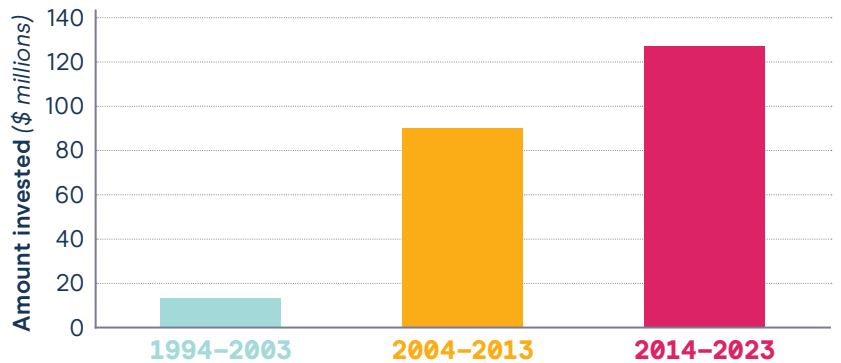
NBCF and co-funding partners together



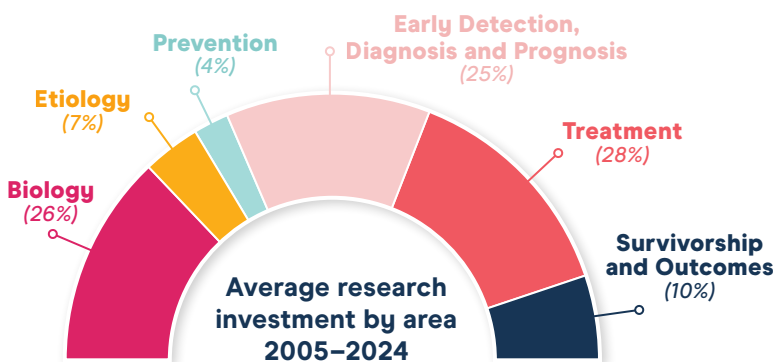
provided nearly **\$50 million** in breast cancer research funding

NBCF RESEARCH INVESTMENT OVER TIME

NBCF's research funding has increased 10-fold over the last three decades



INVESTMENT AREAS



NBCF has supported research across the continuum from **basic research** to its translation to the **clinic**



In the last 10 years, nearly **30%** of NBCF investment has been in the area of **treatment**




Investment in **prevention** research has almost **doubled** in the last decade



OVER THE LAST 30 YEARS

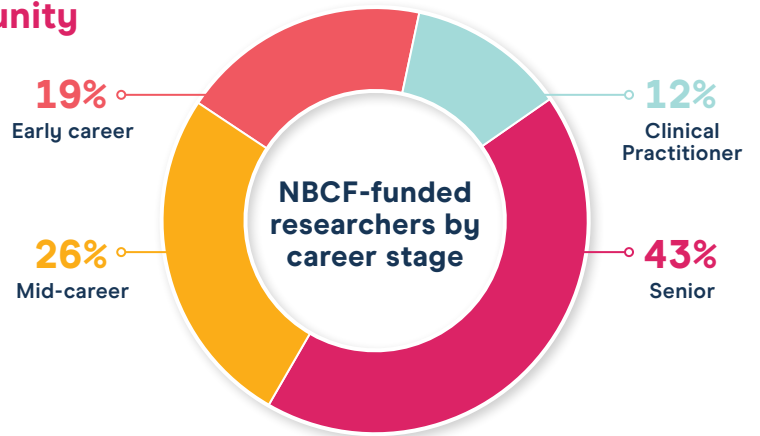
NBCF's impact on the research community

NBCF has helped build careers and support the brightest research minds in Australia


 Funded **over 1,800** Australian researchers from **over 90 institutes**

NBCF-funded lead researchers:

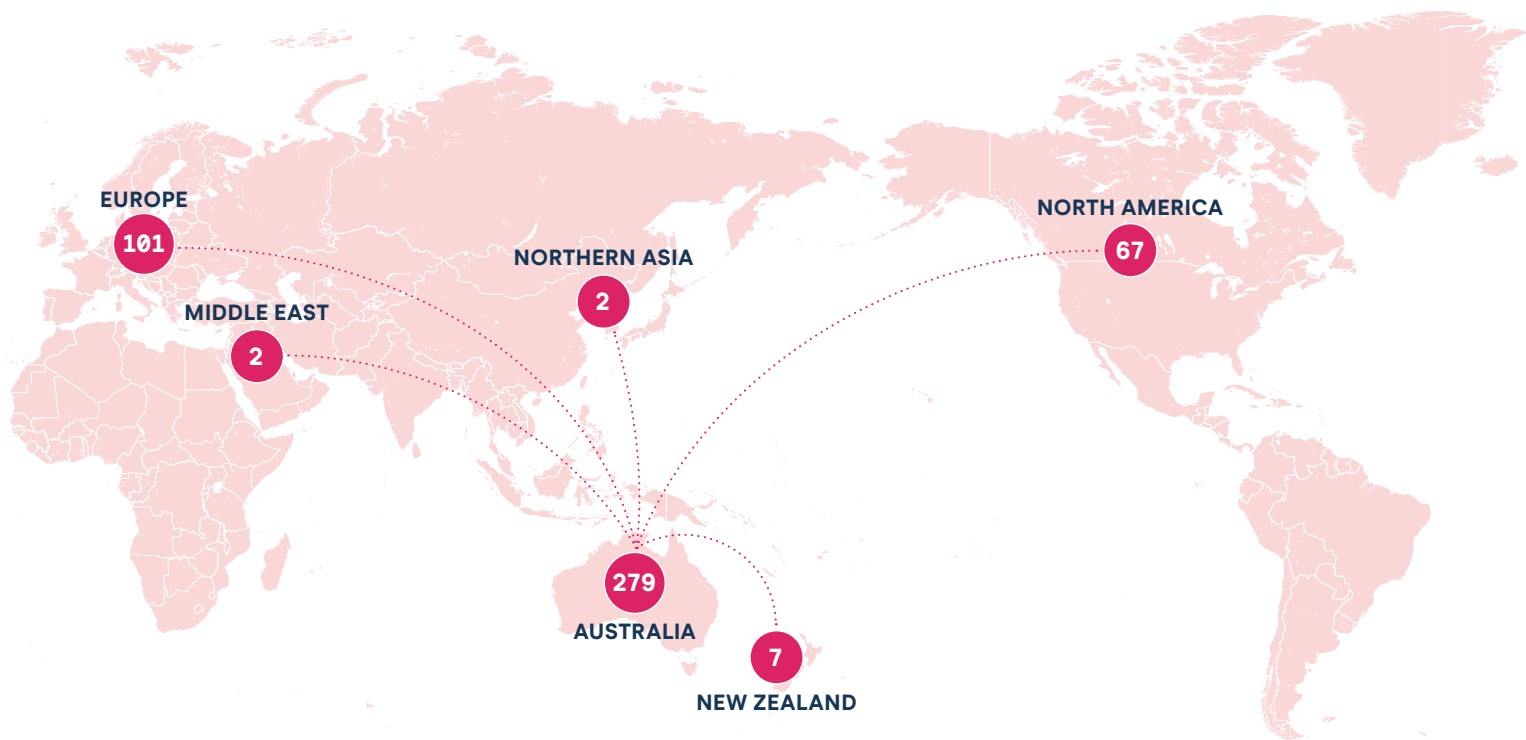
53% female  **47%** male 



NBCF funds and supports researchers at all stages of their careers

NATIONAL AND INTERNATIONAL COLLABORATIONS

NBCF-funded researchers collaborate nationally and internationally




 NBCF-funded researchers collaborate and partner with **more than 458** individuals across the globe



OVER THE LAST 10 YEARS

NBCF's impact on breast cancer

KNOWLEDGE ADVANCES



Over **2,300 publications** were reported by NBCF-funded researchers



22 intellectual property (IP) licenses have been reported

INVESTMENT IMPACT



Around half of NBCF-funded projects were able to secure **over \$200 million** in additional funding from other sources



This means NBCF funding returned **175% in additional research grant funding** for these projects

HEALTH, ECONOMIC AND SOCIAL IMPACT



NBCF-funded projects have led to **50 influences** on policy and practice

Changes in efficiency and effectiveness of public service delivery

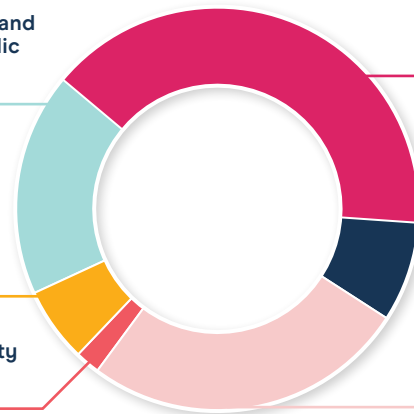
16%

Economic impacts

6%

Improved accessibility of public services

2%



Health and wellbeing

42%

Improved regulatory environment

8%

Improved capacity (educational and skill level of workforce)

26%

BREAST CANCER IN AUSTRALIA TODAY



1 in 7 women and about **1 in 500 men** in Australia will be diagnosed with breast cancer in their lifetime.



In 2023, breast cancer was the **most commonly diagnosed cancer in women** and overall, the **second most commonly diagnosed cancer in Australia**. The number of new diagnoses of breast cancer in Australia have **increased by 21%** in the last 10 years.



The number of diagnoses continues to rise and this year, **over 20,000 people** are expected to be diagnosed with breast cancer in Australia. That's equivalent to approximately **57 people** diagnosed with breast cancer per day.



Each day in Australia, **nine people die** from breast cancer and based on current trends over the next five years around **16,000 people** will die from this disease. Research is key to ending deaths from breast cancer.

30 YEARS OF NBCF RESEARCH INVESTMENT AND IMPACT

NBCF'S INVESTMENT INTO BREAST CANCER RESEARCH

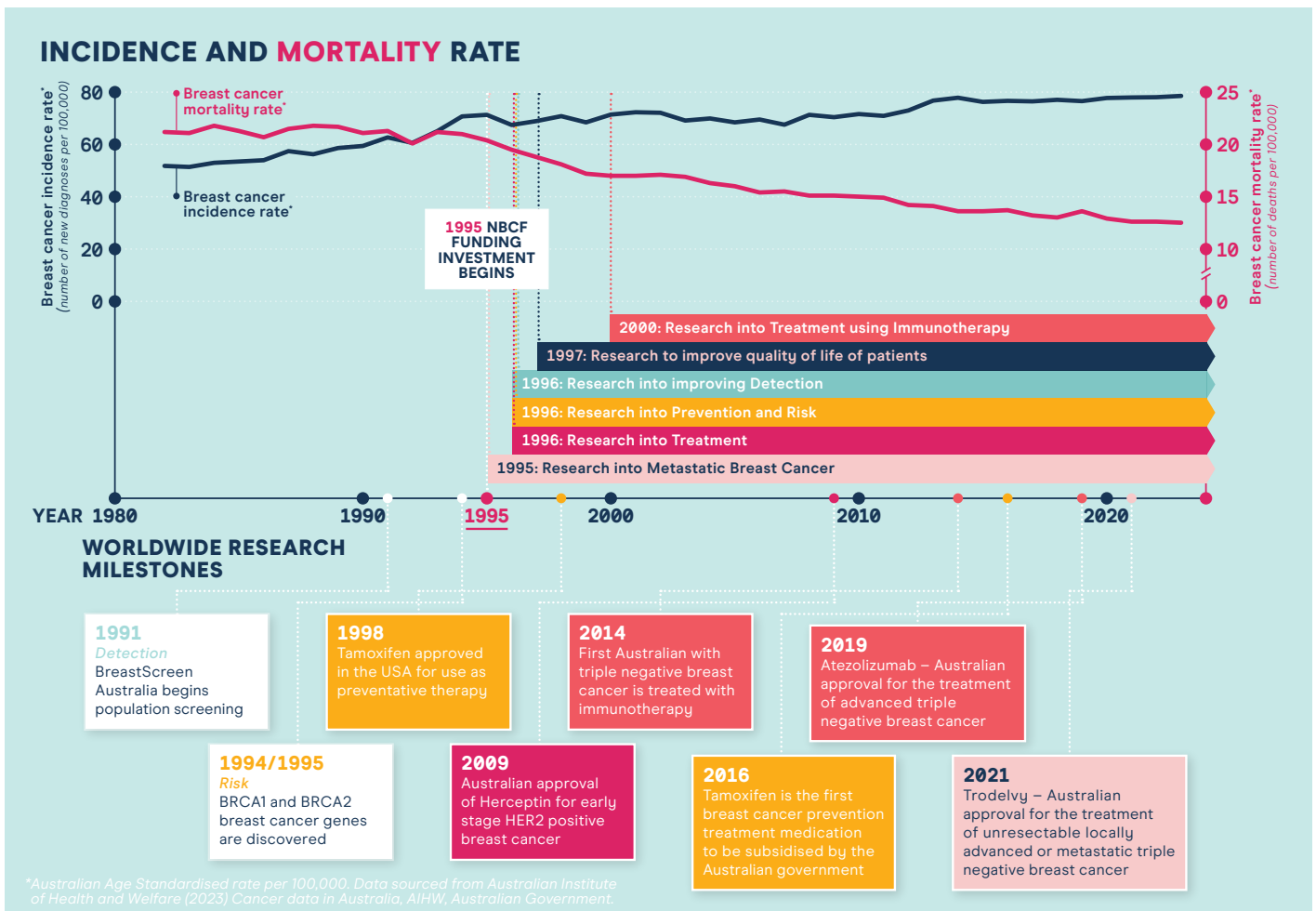
Since NBCF's inception in 1994, a total of \$232 million has been invested in 642 breast cancer research projects.

In this time, the death rate from breast cancer has reduced by over 40% and the five-year relative survival rate has increased from 76% to 92%.

This would not have happened without research, and as the largest not-for-profit funder of breast cancer research in Australia, NBCF is proud to have played a role in improving these outcomes. NBCF's research funding has increased 10-fold over the last three decades, and NBCF along with co-funding partners provided nearly \$50 million in breast cancer research funding. NBCF investment is making an even greater impact towards our vision of Zero Deaths from breast cancer.

NBCF has invested across the continuum of research from fundamental biology research to treatment and survivorship research and in the last 10 years, nearly 30% of NBCF investment has been in treatment research. With approximately nine people who die from breast cancer in Australia each day, effective treatments are an important part of helping to reach Zero Deaths from breast cancer.

NBCF has also continued to invest strongly in understanding the biology of breast cancer, and in early detection research. Our investment in prevention research has doubled in the last decade and continues to be a key focus of NBCF's research strategy moving forward.



NBCF'S IMPACT ON THE RESEARCH COMMUNITY

BUILDING CAPACITY

From its inception, NBCF has funded the best and brightest researchers in Australia, helping to grow and retain exceptional talent in Australia and enabling breast cancer research to thrive.

NBCF has supported over 1,800 Australian researchers from over 90 institutes throughout their careers. Many of these NBCF-funded researchers are now internationally acknowledged, contributing to breakthroughs with global impact.



“I received my first grant from NBCF after starting my lab, and NBCF have been essential supporters of my research ever since. NBCF funding was central to establishing the international Breast Cancer Cell Atlas consortium and I am extremely grateful for their continued support.”

– Professor Alexander Swarbrick, NBCF-funded researcher

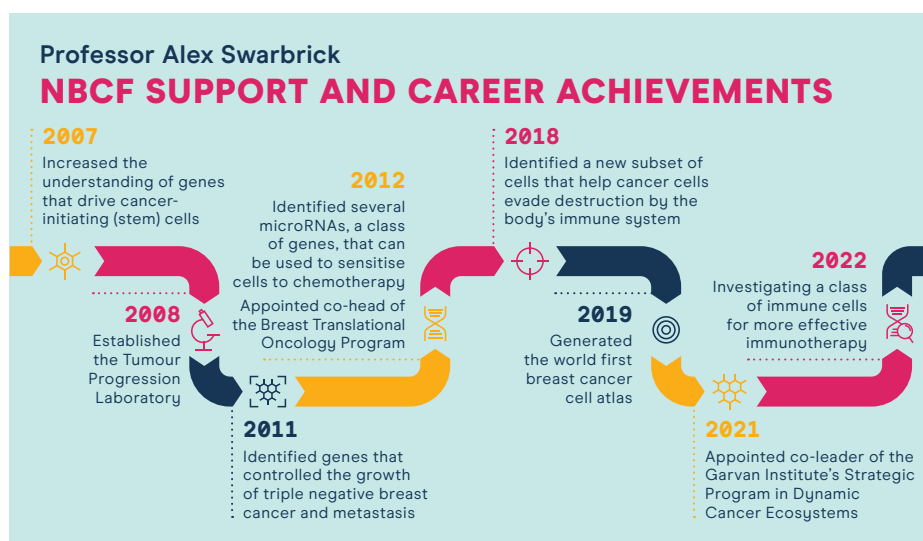
“NBCF has been the driving force funding breast cancer research and breakthroughs in Australia. They fund cutting-edge research projects including critical salary support for young investigators. If it were not for a NBCF fellowship in 2012–2015 when I was in the early stage of my career, I would have had to quit research and start from scratch to find another career.”



– Professor Jeff Holst, NBCF-funded researcher

Triple negative breast cancer cells use glutamine as an energy source to meet the high metabolic demands to sustain rapid tumour growth. **Dr Omid Faridani and Professor Jeff Holst have developed a platform to test whether drugs can target breast cancer cell addiction to glutamine, ultimately starving the cancer cells to death.** This will enable the ability to personalise treatments and give the right treatment, to the right person, at the right time.

To date, Professor Alexander Swarbrick has been the recipient of seven NBCF grants, that have been essential to his lab's research discoveries that will ultimately benefit people diagnosed with breast cancer. A significant outcome from Professor Swarbrick's work has been the establishment of the *Breast Cancer Cell Atlas*. The work, published in the prestigious international medical journal *Nature Genetics*, classified diverse tumour samples into nine subgroups, termed 'ecotypes'. These ecotypes have unique cellular compositions and correspond with a different clinical outcome in individuals. This new knowledge may help reveal personalised treatment strategies.



NBCF is proud of its continued support of the very best researchers who are passionate about finding answers to questions that will lead to life-saving improvements.

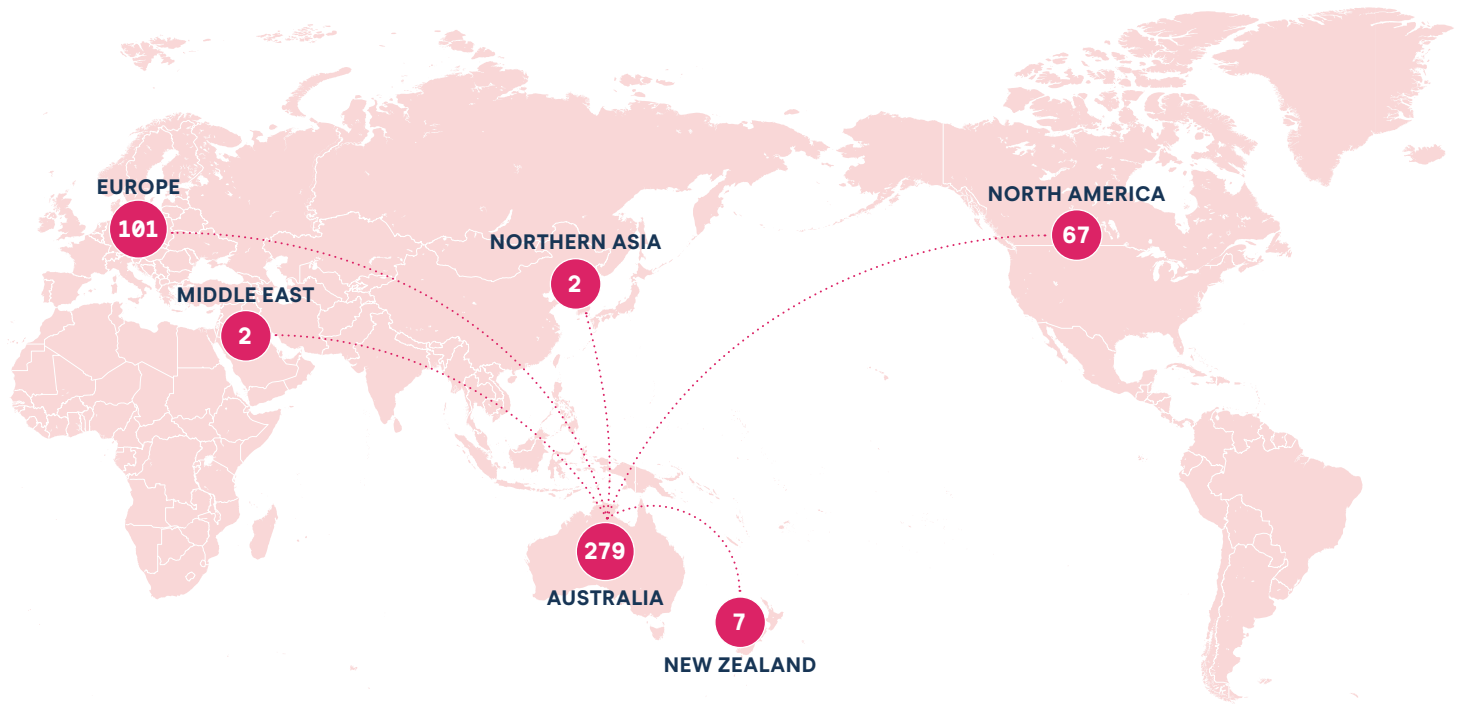
GLOBAL IMPACT

NBCF-funded researchers have been nationally and internationally recognised for their work, collaborating with researchers to create knowledge advancements that have a positive impact on all those affected by breast cancer around the world.

Collaborating with over 458 leading national and international researchers, NBCF-funded researchers have established these links to undertake collaborative research and enable vital knowledge exchange on a global level.

“I think the biggest impact is collective. By funding outstanding Australian breast cancer research, NBCF fosters a strong, interactive research community that has global impact.”

– Associate Professor Theresa Hickey, NBCF-funded researcher



NBCF fund around 45% of early to mid-career researchers. By funding researchers across all stages of their career, NBCF are helping to build careers and support the brightest research minds in Australia from the very beginning.

“In building capacity in the breast cancer research work force, NBCF has enabled the huge expansion in research into breast cancer in Australia. NBCF has fostered a large number of very talented young researchers. The smaller grants awarded to early career researchers have been instrumental in building this capacity and have often initiated their life-long research and focus into breast cancer.”

– Professor Robin Anderson, NBCF-funded researcher



Recreational physical activity shows promise in improving mortality thanks to international collaboration

An international collaborative study co-funded by NBCF support of the Kathleen Cunningham Foundation Consortium for Research into Familial Aspects of Breast Cancer (kConFab) that provided resources and researchers, investigated the relationship between recreational physical activity and breast cancer survival in a large cohort of women that included participants in the Breast Cancer Family Registry (US, Canada and Australia).

The study revealed that recreational physical activity was associated with a 12% reduction in mortality in women diagnosed with breast cancer compared to those who are inactive. The effect was stronger in those individuals who carry BRCA1 or 2 mutations where recreational physical activity reduced mortality by 47.5%.

NBCF'S IMPACT ON BREAST CANCER

KNOWLEDGE ADVANCES

In the last 10 years, NBCF-funded researchers have had more than 2,300 science discoveries published in science and medical journals contributing to an improved understanding of how to prevent, detect, treat and stop the progression and recurrence of breast cancer.



“A heartfelt thank you to all NBCF donors and supporters. Your donations make our breakthroughs possible.”

– Associate Professor Tatyana Chtanova, NBCF-funded researcher

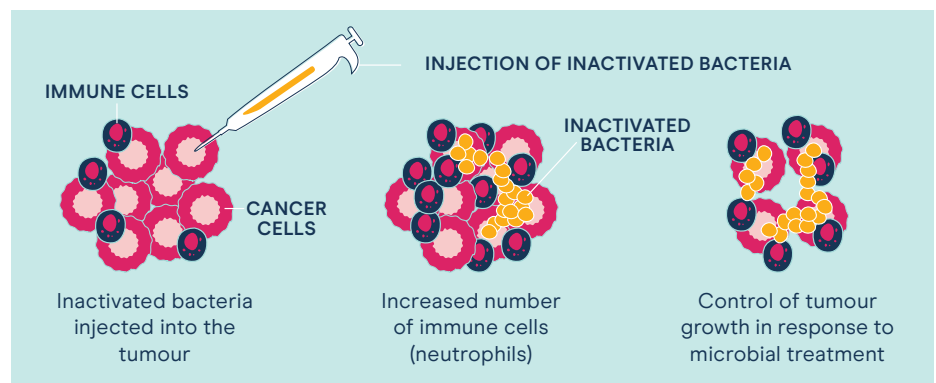


“We hope our research will lead to immunotherapies that are far more effective for breast cancer in the future.”

– Associate Professor Paul Beavis, NBCF-funded researcher

Published in the prestigious *Cancer Research* journal, NBCF-funded researcher Associate Professor Tatyana Chtanova has shown that injection of ‘inactivated’ bacteria (termed microbial therapy) directly into the tumour can increase anti-tumour responses by causing specialised immune cells called neutrophils to change from pro-cancer cells to cancer destroying cells.

These ‘activated’ neutrophils can also release signals to attract other immune cells that can kill the tumour. Associate Professor Chtanova and colleagues also showed that this microbial therapy can increase the effectiveness of approved immunotherapy drugs in pre-clinical models of triple negative breast cancer (TNBC). Encouragingly their microbial treatment was also effective in models of lung cancer, pancreatic cancer and melanoma showing the broad potential for benefit.



A total of 22 intellectual property (IP) licenses have been reported by NBCF-funded researchers in the last 10 years. In 2018, a patent was granted to Associate Professor Paul Beavis for a specific use of chimeric antigen receptor T-cells (CAR T-cells).

CAR T-cell immunotherapy is an approach that reprograms a person’s own immune cells to find and destroy cancer cells. While CAR T-cell therapy has shown great promise in the treatment of certain blood cancers, its role in treating breast cancer is still being explored.

Within solid tumours like breast cancer, CAR T-cells face an unfavourable environment and become exhausted, leading to ineffective destruction of cancer cells. NBCF-funded researcher Associate Professor Beavis has made significant headway into understanding how to overcome CAR T-cell fatigue by genetically engineering CAR T-cells with DNA sequences. This empowers them to combat this fatigue and boost anti-tumour immunity. These fundamental discoveries have been crucial to harness the potential of CAR T-cell therapy as an effective treatment for breast cancer.

INVESTMENT IMPACT – LEVERAGED FUNDING

In the last ten years, 46% of the projects funded by NBCF were able to secure an additional \$200 million in funding from other sources. This has allowed researchers to continue their work and ultimately lead to even greater research impact.

Australian probe removes all traces of breast cancer

An Australian imaging device invented to better detect remaining cancer cells during the surgical removal of a tumour was classified as a 'breakthrough device' in 2021 and fast tracked towards commercialisation by the United States Food and Drug Administration (FDA).

Developed by NBCF-funded researcher Dr Brendan Kennedy, the breast probe uses 'quantitative micro-elastography (QME) imaging', a technique to identify microscopic cancerous tissue that can prevent the need for repeated breast cancer surgery. The FDA deemed the probe capable of providing more effective treatment for breast cancer than available techniques, with studies that show a 96% accuracy in detecting the tissue.

Thanks to NBCF-funding, Dr Kennedy was able to leverage over \$2 million in co-funding to commercialise the product.



“It’s thanks to NBCF funding that I was able to leverage further funding to commercialise this breakthrough device which is potentially capable of providing a more effective treatment of breast cancer.”

– Dr Brendan Kennedy, NBCF-funded researcher

IMPACT ON POLICY AND PRACTICE

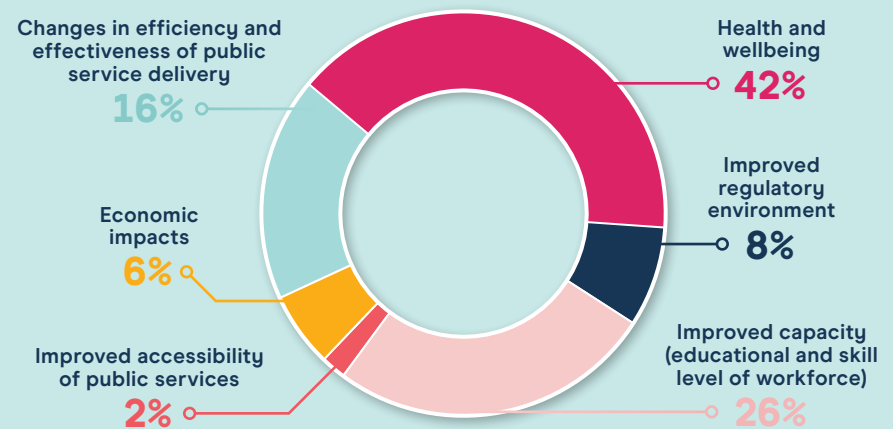
How research findings are used is key to changing the future of breast cancer. In the last 10 years, NBCF-funded research has influenced policy and practice on 50 occasions.



“Our research has been key to improving the efficiency and effectiveness of service delivery by providing an online cancer genetics resource for health professionals testing for additional mutation carriers.”

– Professor Melissa Southey, NBCF-funded researcher

These policy impacts have included:



NBCF-funded researchers Professor Melissa Southey and Associate Professor Tu Nguyen-Dumont have significantly advanced our understanding of genes associated with breast cancer risk which has led to more informative genetic testing offered in clinical genetics practice. Together they conducted a large nation-wide genetic study of women at high-risk of breast cancer that had tested negative for the well-known breast cancer genes, BRCA1 and BRCA2. The study revealed genetic aberrations in three other genes, ATM, CHEK2 and PALB2.



Associate Professor Tu Nguyen-Dumont, NBCF-funded researcher

The results of their work have influenced genetic testing protocols. eviQ, an online cancer genetics resource for health professionals, now recommends the inclusion of genetic testing and cancer risk management for ATM, CHEK2 and PALB2 mutation carriers, in addition to standard BRCA1 and BRCA2.

IMPACT ON POLICY AND PRACTICE

In 2014 Professor Sherene Loi participated in an international clinical trial that treated the first Australian with triple negative breast cancer (TNBC) with the immunotherapy drug pembrolizumab.

The positive outcomes of this trial and her continued contribution to clinical trials investigating the safety and efficacy of pembrolizumab in TNBC, led to pembrolizumab being listed on the Pharmaceutical Benefits Scheme in 2023 for the treatment of early and late-stage TNBC.



“Due to its makeup, TNBC that has recurred is a much harder type of breast cancer to successfully treat, so it’s great seeing such positive improvements in survival from our trials. I know this will ultimately have a positive impact on outcomes for patients with advanced TNBC in Australia over the coming years.”

– Professor Sherene Loi, NBCF-funded researcher

Professor Nehmat Houssami previously contributed to the development of the international consensus guidelines on surgical margins, which informed surgical oncologists about appropriate surgical margins helping to avoid unnecessary repeat breast operations for women with early-stage breast cancer.

As NBCF’s 10-year Chair in Prevention, Professor Houssami is implementing a long-term research program, addressing breast cancer screening and prevention with the ultimate aim of reducing deaths.



“My research aims to reduce the burden of breast cancer by addressing all levels of prevention. Primary prevention (reducing the risk of breast cancer by managing risk factors), secondary prevention (early detection and diagnosis through enhanced screening), and tertiary prevention (reducing the impact of breast cancer through better surveillance and patient care).”

– Professor Nehmat Houssami, NBCF-funded researcher

NBCF'S FOCUS FOR THE NEXT FIVE YEARS

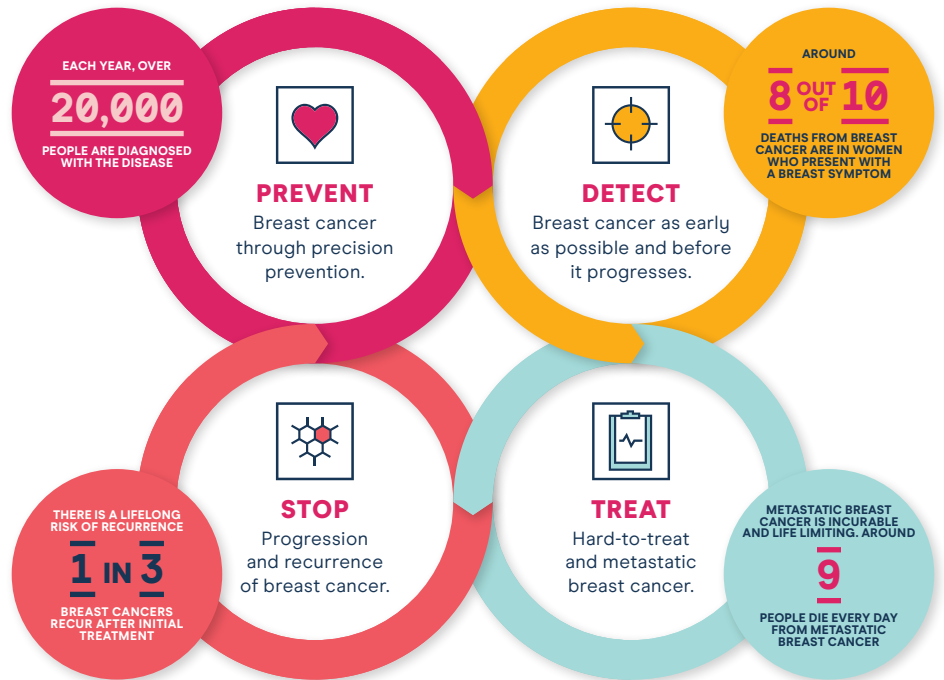
While celebrating the impact of the last 30 years, NBCF looks to the future with optimism, equipped with a five-year *Pink Horizon Research Strategy* to help accelerate research towards achieving our ambitious vision of Zero Deaths from breast cancer.

In the past three years, the world's leading researchers showed us just how quickly outcomes could be achieved through the COVID-19 vaccine development. NBCF looks to bring this collective focus to breast cancer, to target and support areas of research which will solve our most difficult problems in breast cancer and will save lives.

The *Pink Horizon Research Strategy* spans four key objectives – prevent, detect, stop and treat breast cancer. The strategy will fund three national grants programs that will pioneer, support, and drive progress towards Zero Deaths from breast cancer.

The *Pink Horizon Research Strategy* is centred on collaboration, and will help bring together world-class breast cancer researchers across the country and form different disciplines to collaboratively address the most difficult of questions at a pace and scale that will lead to measurable impact.

Our research has **four core objectives** focused on ending deaths from breast cancer.



Our objectives are underpinned by the need to minimise harm and maximise impact.

COLLABORATIVE RESEARCH ACCELERATOR GRANTS

Significant, recurrent funding

Fosters an ecosystem of multiple diverse research teams, at all career stages, to address critical questions through a connected suite of research activity at the pace and scale that reflects the urgency of achieving our vision of Zero Deaths from breast cancer.

\$25M over 5 years per accelerator

RESEARCH PROJECT GRANTS

Annual funding

Support for investigator-initiated research projects to build Australia's breast cancer research pipeline that addresses research questions with a clear line of sight to Zero Deaths from breast cancer.

Up to \$1.5M per grant

PINK SKY GRANTS

Intermittent merit-based funding

Support high-risk, high-reward research projects with significant paradigm shifting potential to revolutionise approaches to combating breast cancer.

Varied

CONCLUSION

For 30 years, NBCF's commitment to funding world-class breast cancer research has led to extraordinary donors helping us fund extraordinary researchers to make extraordinary discoveries. Discoveries which have fundamentally transformed our understanding of breast cancer and changed how we treat and care for people with this disease. Discoveries which have helped reduce the death rate from breast cancer in Australia by 40% and will continue to benefit people who are living with breast cancer now and those who will be diagnosed in the future.

We would like to thank our supporter community and dedicated researchers.

THANK YOU



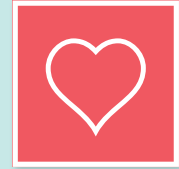
For the **research** you've invested in.



For the **lives** you've saved.



For the **futures** you've changed.



For the **impact** you've helped to shape with us.

With your ongoing support, NBCF is poised to deliver on its vision of Zero Deaths from breast cancer. We know research is the solution, and we will not stop until we reach our vision and end deaths from breast cancer.

