

**RESEARCH PROJECTS REGISTER (Summary as at September 2021)**

Project Short Name	Project Description	Organisations	Key Contacts	Year Commenced
Developing a next- generation of breast cancer screening: a multi-analyte blood test enhanced by artificial intelligence	<p>Developing a multi-omics multi-analyte breast cancer screening test that performs better than current mammographic screening standards (tested retrospectively and then prospectively with our health service partners).</p> <p><i>Note: this project has received in principle approval from BSV's Research Assessment Committee and currently undergoing NBCF grant application process.</i></p>	<p>UNSW SYDNEY St Vincent's BreastScreen Monash University University of Sydney Northwestern University, USA BreastScreen NSW Peter MacCallum Cancer Centre</p>	<p>Dr Fatemeh Vafaei Dr Helen Frazer</p>	2021
Cancer Pathways Project	<p>The Cancer Pathways Project (AIHW EthOS approval: EO2015-4-219) identifies and seeks to incentivise value-based clinical pathways for Victorian patients identified with colorectal or breast cancer (2008-2018). Standardisation and adherence to clinical pathways for cancer treatment is likely to result in better across-the-board outcomes for patients.</p> <p>The study uses seven years of linked DH and DHHS datasets to analyse treatment for a maximum diagnosis cohort of three years of patients (plus one year of pre-diagnosis surveillance and a three-year follow-up period). These patients can be followed for the year prior to diagnosis and three-year follow-up. Five-year follow-up is the standard metric for cancer survival, and we seek additional data to facilitate the analysis of five-year survival.</p> <p>The linkage is performed by AIHW and analyses are conducted in the DH Enterprise Data Warehouse (EDW).</p>	<p>University of Melbourne</p>	<p>Professor Robert Thomas</p>	2021
Evidence on the clinical effectiveness and cost-effectiveness of digital breast tomosynthesis in identifying breast cancer compared to standard imaging in populations at risk of breast cancer	<p>A multi-study research program on DIGITAL BREAST TOMOSYNTHESIS (DBT, also known as 3D-mammography) will be undertaken in collaboration with public and private health services, with international researchers, and with input from consumers, to generate evidence on the clinical effectiveness and cost-effectiveness of DBT in identifying breast cancer, compared to other breast imaging in three population groups at risk of breast cancer in whom there is currently limited evidence on DBT: patients with breast symptoms, patients with previous breast cancer, and patients with a family history of breast cancer.</p>	<p>University of Sydney/Cancer Council NSW</p>	<p>Dr. Carolyn Nickson Professor Nehmat Houssami Dr Darren Lockie</p>	2020
COVID-19 impact on BreastScreen Victoria screening participation and outcomes	<p>The COVID pandemic led to a 6-week pause in BreastScreen Victoria (BSV) services. The impact of these delays on cancer outcomes is not yet known, and these outcomes may vary according to screening round, age, family history and mammographic breast density. This project aims to assess the impact of reduced and delayed screening according to screening round, age, family history and mammographic breast density.</p>	<p>University of Melbourne/Cancer Council NSW</p>	<p>Dr. Carolyn Nickson</p>	2020
kConfab	<p>This project contributes to the creation of a large genetic, biological, epidemiological and clinical resource that will enable researchers to investigate familial aspects of breast cancer. The project requires the retrieval of screening mammograms for individuals who are part of the kConFab cohort.</p>	<p>Peter Mac</p>	<p>Prof Stephen Fox</p>	2020
Breast Arterial Calcification and Heart Disease	<p>Heart disease remains the number one cause of death in women and current methods of screening women for heart disease are inaccurate. Calcification in the breast arteries can be identified on routine mammograms and is associated with cardiovascular disease. This holds tremendous appeal as a means to guide decision-making but it is not known whether treatment in patients with breast artery calcification results in better prognosis.</p> <p>This is a retrospective study that will analyse mammograms performed in 2015-2016 for the presence of arterial calcification. The study will then link these patients to government health databases identifying those on treatment for typical cardiovascular risk factors e.g. high blood pressure, cholesterol and diabetes; and then identify any patients who had a heart event in the years following the mammogram. If the study can demonstrate those on treatment who had calcification had a less chance of a heart event compared to those without treatment, it may support the idea that this calcification should be routinely reported and is a useful trigger to recommend specialist review.</p>	<p>Baker Heart and Diabetes Institute</p>	<p>Dr Nitesh Nerlekar</p>	2020

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Bilateral tomo (DetectED)	DetectED-X is a new commercial entity spinning off from the University of Sydney's BREAST program. Its aim is to provide educational solutions based on high quality image test sets to improve radiologists' performance regardless of their location, experience or stage of training. DetectED is being set up by two individuals well known within the breast imaging community in Australia. This proposal focusses on Digital Breast Tomosynthesis (DBT) images.	University of Sydney	Professors Mary Rickard and Patrick C Brennan	2020
The CREATE Project	<p>Medically assisted reproduction (MAR) has been linked with increased risk of cancer in women, particularly endometrial and ovarian cancer. Children born after MAR may also be at higher risk of some cancer types, including leukemia. Despite the strong biologic plausibility of carcinogenic risks from MAR, conclusive evidence is lacking due to methodological limitations and small sample sizes.</p> <p>This project will address these questions via linkage of Australian Commonwealth and jurisdictional data (Phase 1; this application). Cancer incidence in women after MAR will be compared with women not exposed to MAR, while adjusting for major confounders. Cancer incidence will also be compared between children conceived after MAR and spontaneously from fertile women. Data from this project will then be combined with those from the UK and Nordic countries (Phase 2; future HREC application). This project will provide conclusive evidence regarding the association of cancer with MAR, and the clinical and policy impacts.</p>	University NSW Sydney	Professor Claire Vajdic	2020
BRAIx	The aim of the "Transforming screening with Artificial Intelligence (AI)" project is: To better use mammography to prevent women dying from breast cancer in a way that improves detection, lowers harms, reduces costs, causes less stress and can be quickly put into practice. The project will specifically address breast cancer but will establish an exemplary project for broad deployment of patient-focused AI in healthcare and give rise to large scale cross discipline engagement with AI opportunities due to the cross disciplinary reach and scale of BreastScreen.	St Vincent's Hospital St Vincent's Institute of Medical Research The University of Melbourne The University of Adelaide	Dr Helen Frazer Coleen Elso Dr David Robson Simon Brennan	2020
Molecular characterisation of B3 lesions	This study is to propose a new test for patients with pre-cancerous breast lesions (B3) often diagnosed with routine mammographic screening. It is challenging to accurately know the risk of breast cancer with this diagnosis. This test will help the clinicians and patients decide what they should do. For example, if the test says the breast cancer risk is low, they will know not to remove the whole breast unnecessarily. This low risk project involves utilising archived tissues from patients starting from 2000. Therefore, the participants have already been treated with standard therapy and there will be no risk for the patients. There will be no germline testing, therefore, there will be no impact on patients' families.	Peter Mac	Dr Tanjina Kader	2020
Trial of AI (Transpara to Reduce Recall)	<p>Where a BSV Screening Centre has an established elevated First Round recall rate, an opportunity exists to improve Cancer detection specificity by firstly trialling a proven AI product Transpara and these outcomes could (secondly) further be compared with use of established analysis algorithms (e.g. for predictably benign masses etc) currently used by other BSV services – with compliant recall rates.</p> <p>The largest opportunity for reducing recalls is in women younger than 60 years of age, both because of the frequency of benign mammographic masses, asymmetric densities where prior films are NOT available for comparison (first screening round). Hence a Rereading Trial of a year's worth of First Round screening mammograms is proposed.</p> <p>Use of AI Software (Transpara) could provide the most cost effective method of assistance to existing BSV readers to reduce first Round recall rates, whilst maintaining good cancer detection. Recall rate reduction could be compared with any improvement achievable by other readers using established analysis algorithms (e.g. for predictably benign masses).</p>	Monash BreastScreen Monash University	Dr John Waugh Dr Jill Evans Professor Robyn Bell	2019
Gist of cancer in mammograms	<p>This work will 1. Identify the basis of "missed" cancers so that technological and educational interventions can be transformed 2. Establish whether previous mammograms contain information that can predict future malignant events.</p> <p>The project will combine expert radiologists' assessment and innovative image analysis algorithms to exploit information contained within mammograms. The work will transform breast cancer screening by informing technological and educational interventions to diagnose "missed" cancers and identify women of higher than average risk of future malignancy.</p>	University of Sydney	Professor Patrick Brennan	2019

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DEFINE	<p>Personalised, individualised or risk stratified breast cancer screening appears to be the next logical progression for population screening. The project aims to develop and evaluate a decision aid to help women decide if personalised (risk stratified) breast screening is right for them over the current population screening model.</p> <p>The project has been divided into 2 stages – an initial qualitative stage to assess what women’s values are when considering about risk stratified screening has been completed and an online decision aid developed to explain what breast cancer risk is as well as what risk stratified screening may look like.</p> <p>The second stage of the project is evaluation of this online decision aid for informed decision making, impact on knowledge, risk perception and acceptability of personalised breast screening.</p>	UOM	Dr Jocelyn Lippey	2019
DetectED (Annual Activity)	To build a web-based system that allows radiologists to diagnose sets of mammographic images on-line in a geographically limitless way with each image interaction being instantly and centrally recorded. High quality 2D and 3D mammographic image (digitally acquired with DR rather than CR) + radiology and pathology report for each case.	University of Sydney	Professors Mary Rickard and Patrick C Brennan	2018
Health4Her (alcohol, Turning Point)	<p>Trial an intervention about alcohol consumption with clients at Maroondah BreastScreen (clients to be informed before the appointment and approached after the mammogram).</p> <p>The project aims to develop and test a brief alcohol and lifestyle health promotion activity, offered to women attending Maroondah BreastScreen for routine screening, to support a greater proportion of women drinking within current national recommendations. It is hypothesised that the brief alcohol and lifestyle health promotion activity will lead to a greater proportion of women drinking within current national recommendations compared to controls. Additional anticipated outcomes are improved health literacy and general health.</p>	Turning Point Maroondah BS Eastern Health Clinical School Monash University	Professor Dan Lubman Dr Darren Lockie	2018
Young Women's Study	Review breast screening efficacy in women aged 40-44 years.	St Vincent's BreastScreen	Dr Helen Frazer	2018
LCIS and ALH Audit	To determine the upgrade rate to ductal carcinoma in situ (DCIS) or invasive carcinoma at excision at the same site after percutaneous breast biopsy findings of atypical lobular hyperplasia (ALH) or lobular carcinoma in situ (LCIS) using current imaging and strict pathologic criteria. And to obtain more information and data in regards to Lobular neoplasia, in order to make more evidence based decision.	St Vincent's BreastScreen and Monash BreastScreen	Dr Parisa Aminzadeh	2017
Taking BC Risk prediction to next level	To use digital mammography, and family history data collected by BreastScreen Victoria, to create an improved and automated breast cancer risk prediction tool (BRISK) that will inform women and clinicians in real time, enabling better tailored breast cancer screening.	University of Melbourne	Prof John L. Hopper	2017

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Measures to predict masking and risk (Volpara)	Develop new and better automatic measures that can be used to inform womn at screening about the risk of [1] having a breast tumour missed and [2] having breast cancer in the future. Data collected automatically by the VOLPARA system. Aims to use two new automated measures, CIRRUsmasking ad CIRRUrisk.	University of Melbourne	Prof John L. Hopper	2017
LifePool (Ongoing Annual Activity)	To investigate the relationship between mammographic density in combination with geonimic profile, environmental exposures and breast cancer risk.	BSV, Peter Mac, UOM, RMH	Prof Ian Campbell	2008

**Definitions**

<b>BSV</b>	BreastScreen Victoria
<b>DAD</b>	Data Access Deed
<b>IS</b>	Information Services Team
<b>IT</b>	Information Technology Team
<b>MIA</b>	Multi Institution Agreement