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Director’s message

I am proud to share with you the achievements of the Centre for Big Data Research Health in 2016, our second full year of operation. I hope that those of you who saw our 2015 Annual Report will note our rapid growth, in terms of people, projects, funding, productivity, and recognition of research excellence.

Particularly noteworthy are the 2016 successes of our early career researchers, which were recognised by prestigious national awards, including the MJA MDA National Prize for Excellence in Medical Research (Andrea Schaffer) and the Health Services Research Association of Australia and New Zealand Awards for Best PhD Student (Michael Falster) and Best Paper by an Early Career Researcher (Emily Karanges). These early career researchers are our future, and the future looks bright!

Also critical for our future is the diversification of our funding base. In 2016, we were successful in several bids for large-scale commissioned and industry-focused research. Furthermore, we commenced the development of Australia’s first Masters program in Health Data Science, which will welcome its first students in 2018. The MSc in Health Data Science will address an area of acute workforce shortage, and provide a pipeline into work in big data analytics for talented students from diverse backgrounds.

The Centre for Big Data Research in Health is on track for a big year in 2017. Two particular areas of focus for our third year of operation will be capturing the early translational impacts of our work, and building our international collaborations. I look forward to reporting on these in next year’s report.
Highlights 2016

Centre for Big Data Research in Health research among top 10 medical breakthroughs of 2015

Centre for Big Data Research in Health research to address the gap in Indigenous healthcare was included in the prestigious annual list of Australia’s top 10 medical research projects of 2015 released by the National Health and Medical Research Council (NHMRC), Australia’s peak funding body for health-related research.

“These are projects that have achieved results of particular significance for the improvement of human health – whether through advancement of knowledge or the prevention, detection or treatment of disease,” said Professor Anne Kelso, CEO of the NHMRC.

Professor Louisa Jorm, Director of the Centre for Big Data Research in Health at UNSW Sydney, was the leader of the five-year, $485,000 project that investigated the disparity in health outcomes between Indigenous and non-Indigenous Australians. Despite efforts to bridge the health gap, Indigenous Australians have a life expectancy 11.5 years lower for males and 9.7 years lower for females than non-Indigenous Australians.

Professor Louisa Jorm has made significant breakthroughs in understanding the Indigenous healthcare gap. Professor Jorm and her team, which also included researchers from the University of Western Sydney and University of Glasgow, scrutinised data held by modern healthcare systems to understand the factors influencing this persistent disadvantage.

“Our research found that crucial issues driving poor outcomes for Aboriginal people included high rates of comorbidities, low levels of private health insurance, use of smaller hospitals with fewer specialist services, and limited access to publically funded services,” Professor Jorm said.

The project found that Aboriginal people were 2.1 times more likely to be hospitalised for heart attacks than non-Indigenous people; they were 30% less likely to have cataract surgery despite higher rates of the condition; Aboriginal children were 30% less likely to have treatment for serious ear infections, which can lead to hearing loss; and Aboriginal peoples were 1.2 times more likely to have a serious traffic injury.

The research has already helped plan improved cardiac, ear and eye health services for Aboriginal peoples in New South Wales, and has informed a number of state and federal policy documents. The team is now investigating ways to promote successful early childhood development in Aboriginal children.

Study of media’s impact on statin use wins national award

A study that found Australians cut back or stopped taking statin medications after an ABC TV Catalyst program questioned their effectiveness won the MJA MDA National Prize for Excellence in Medical Research. The prize is awarded to the best original clinical research article published in the Medical Journal of Australia in the previous calendar year (2015).

The analysis of the Pharmaceutical Benefits Scheme medication records of 191,000 Australians revealed an immediate impact after Catalyst was aired in October 2013, with 14,000 fewer people dispensed statins per week than expected. Statins are widely used drugs recommended nationally and internationally to prevent and manage the risk of cardiovascular events such as heart attacks and strokes, in people at risk of cardiovascular disease.
Lead author Ms Andrea Schaffer, a biostatistician and PhD candidate with UNSW’s Centre for Big Data Research in Health, said the impact of the program was not only immediate, but long-lasting.

“Statin dispensing was significantly lower than expected for the entire 8-month post-broadcast period we examined. We even found a reduction in statin use in those who were known to be at high risk of cardiovascular disease,” said Schaffer, who completed the study while at the University of Sydney.

Study senior author UNSW Professor Sallie-Anne Pearson, also from the Centre for Big Data Research in Health and previously with the University of Sydney, said the decrease in statin use occurred despite warnings accompanying the Catalyst program that it should not be taken as medical advice.

“This points to the substantial impact that the media can have on the public’s behavior,” Professor Pearson said.

“This award is a timely reminder that health professionals and the media must work together to support consumers to make informed decisions about their health, based on the best possible evidence.”

The study was also co-authored by Associate Professor Timothy Dobbins from UNSW’s National Drug and Alcohol Research Centre, Professor Emily Banks from the ANU and Professor Nicholas Buckley from the University of Sydney.

The study authors were presented with a $10,000 prize and the award at the AMA’s National Conference in Canberra.

**Study finds Aboriginal children experience high burden of unintentional injury**

Centre for Big Data Research in Health research published in the prestigious *American Journal of Public Health* showed that Aboriginal and Torres Strait Islander children are more than one and a half times more likely to be hospitalised for unintentional injuries than non-Indigenous children, prompting calls for more targeted child injury prevention programs.

The study was the first to investigate differences in hospitalisation rates for unintentional injury between Aboriginal and non-Aboriginal children in Australia, using linked data for more than 1.12 million children from birth to age 13 years. The results suggest Aboriginal children suffer a disproportionately high burden of unintentional injury, and the gap between the two groups is wider than previously thought.

The study was the first to consider factors such as rural or remote locations and socio-economic status in assessing unintentional injuries in Aboriginal children. Surprisingly, it found that inequalities in hospitalisations for some causes, such as transport injuries and poisoning, were largest in major cities and inner regional areas.

The research also highlighted a lack of injury prevention programs specifically targeted at Aboriginal communities. “With the exception of road transportation, there are few current prevention activities that specifically target Aboriginal children,” study lead author and PhD student at the Centre for Big Data Research, Mr Holger Möller, said.”We would like to see a greater investment in targeted injury prevention programs to help parents provide a safe environment for their children to grow up in.”

The study was funded by the National Health and Medical Research Council and conducted in partnership with the Australian National University, the George Institute for Global Health and the University of Wollongong.
The chances of having a baby following IVF treatment are steadily improving

The report Assisted Reproductive Technology in Australia and New Zealand 2014, authored by Associate Professor Georgina Chambers and her team, showed that the live birth rate per initiated IVF cycle increased from 18.1% in 2011 to 19.8% for 2014, the most the most recent year from which data are available.

This improvement in success rates has occurred despite the proportion of IVF cycles with only a single embryo transferred increasing from 70% in 2010 to 83% in 2014. This has meant that the proportion of twins and triplets born following IVF treatment is now 4.9%, one of the lowest rates in the world. There has been an increase in the birth rate for frozen embryo transfers in the last five years, rising from 20% in 2010 to 24.9% in 2014. In contrast the live delivery rate per fresh embryo transfer remained stable at around 23%.

The report showed a small increase in the number of IVF treatment cycles performed in 2014 with 73,598 cycles reported from Australian and New Zealand clinics (67,707 and 5,891 respectively), representing a 2.4% increase in Australia and 9.6% increase in New Zealand, from 2013. A total of 12,875 babies were born following IVF treatment in Australian clinics and 1,363 in New Zealand clinics in 2014.

The report found that the chance of IVF success differs depending on a woman’s age. For women aged 30 to 34 using their own eggs, the birth rate per cycle was 26% for fresh cycles and 28.6% for frozen/thaw cycles. For women aged over 44, it was less than 1% and 6.6% respectively.

The report, which was funded by the Fertility Society of Australia (FSA), contains data about IVF cycles undertaken in 2014 and the resulting babies born in 2014 and 2015. The data are maintained by the National Perinatal Epidemiology and Statistics Unit (NPESU), a joint unit of the Centre for Big Data Research in Health and the School of Women's and Children’s Health on behalf of the FSA.

Early career researcher successes

Two Centre for Big Data Research in Health early career researchers won prestigious annual Health Services Research Association of Australia and New Zealand Awards in 2016.

Michael Falster was presented with the best PhD student award for his work “Sociodemographic and health characteristics, rather than primary care supply, are major drivers of geographic variation in preventable hospitalizations in Australia”.


This award recognises up and coming health services researchers and is judged on the author's ability to write clearly and concisely, present ideas and arguments logically, use appropriate, sound methods; and show how their results are relevant to policy and/or practice.

Emily Karanges and her collaborators won the best paper by an Early Career Researcher award for their paper “Twenty-five years of prescription opioid use in Australia: a whole-of-population analysis using pharmaceutical claims”.

Centre Overview

“Big data” refers to datasets whose size or complexity is beyond the ability of traditional methods and tools to capture, store, manage, and analyse. Big data in health and medicine are generated through operating the health system (e.g. medical service claims), clinical care (e.g. hospital records, primary care records), laboratories (e.g. imaging data, pathology records, genetic testing) and research studies (e.g. clinical trials, observational studies), to support disease prevention, control (e.g. disease notifications) and survivorship, and by individuals themselves (e.g. “life logging”). This type of ‘real-world’ data is growing rapidly and will continue to expand exponentially for the foreseeable future.

There is enormous potential to inform improvements in the effectiveness, safety and efficiency of health care by bringing these data together, and using them for research to understand the determinants of disease risk, target therapies to those who will benefit most, compare the effectiveness of alternative preventative and therapeutic interventions, and model the health and economic impacts of interventions and policies. Recognising this potential, research that will lead to “better models of care and services that improve outcomes, reduce disparities, increase efficiency and provide greater value” is listed first among the new national research priorities for health1. Moreover, it is estimated that effective use of big data could also deliver reductions to national health care expenditure of around 8 percent2 which would translate to more than $11 billion annually in Australia.

The Centre for Big Data Research in Health (CBDRH) is a world-first research centre that is focused on delivering this value. The Centre supports UNSW Medicine’s Thematic Research model in which key research themes (Neuroscience, mental health and addiction; Infectious disease, immunity and inflammation; Cancer; Non-communicable diseases) are supported by cross-cutting enabling capabilities including ‘Big data in health’.

Vision

The power of “big data” is harnessed to transform the prevention and management of disease, and the delivery of health services.

Mission

To maximise the productive use of all possible sources of health big data in order to enhance the health and well being of Australians and the global community.

Values

**Excellence:** Our research is scientifically rigorous and of high quality

**Innovation:** We use creative and novel approaches in study design, analysis techniques and reporting

**Impact:** Our high impact research benefits population health and the health care system

**Leadership:** We are influential in the health data science field and aim to be regarded as a world leader

**Collaboration:** We develop and maintain open and respectful relationships with research partners, the community, and each other

Functions

Foster and develop innovation in health data science

Undertake high impact, high-quality and multi-disciplinary health and medical research using big data

Facilitate the rapid translation of research findings into health improvements and better value in health care

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Build multi-disciplinary capacity in health research using big data

Promote public, clinical and policy awareness of the health and societal benefits of research using big data

Research Units

While the Centre has broad expertise that spans multiple health domains and the capability to address any health issue that can be informed through research using large-scale electronic data, it has a longstanding reputation as world leaders in thematic areas that correspond to its four internal research units:

**Health Services and Outcomes Unit (HSO):** undertakes research to identify variations and disparities in the use, outcomes and costs of health services, investigates the factors that drive these, and evaluates the outcomes of health policies and programs.

**National Perinatal Epidemiology and Statistics Unit (NPESU):** conducts national epidemiological, health services, policy and health economic research in reproductive, perinatal and maternal health.

**Cancer Epidemiology Research Unit (CERU):** performs genetic epidemiology and population-based health record linkage studies aimed at understanding the causes and consequences of cancer.

**Medicines Policy Research Unit (MPRU):** conducts research regarding the judicious use, safety, costs and cost-effectiveness of prescribed medicines.
Staff list 2016

Maria Arriaga, Research Assistant
Andrew Blance, Lecturer
Georgina Chambers, Associate Professor and Director, NPESU
Sharon Chow, Coordinator
Natasha Donnelley, Project Officer
Kathleen Falster, Visiting Fellow
Michael Falster, Research Fellow
Oisin Fitzgerald, Research Officer
Louise Francis, Centre Manager
Amy Gibson, Research Fellow
Mark Hanly, Research Fellow
Katie Harris, Biostatistician
Alys Havard, Research Fellow
Lisa Hilder, Senior Project Officer
Nusrat Homaira, Senior Research Officer
Sadia Hossain, Research Assistant
Peter Hull, Senior Research Officer
Jolie Hutchinson, Biostatistician
Mikaela Jorgensen, Research Fellow
Louisa Jorm, Professor, Director CBDRH and Head, Health Services and Outcomes Unit
Emily Karanges, Research Associate
Maarit Laaksonen, Senior Research Fellow
Renate Le Marsney, Data Manager
Melisa Litchfield, Data Manager
Sanja Lujic, Lecturer in Biostatistics
Alan Macaldowie, Senior Research Officer
Kylie-ann Mallitt, Research Fellow
Donna Maxwell, Administrative Officer
Holger Moeller, Research Associate
Amy Monk, Project Manager
Michele Partridge, Administrative Officer, NPESU
Repon Paul, Research Officer
Sallie Pearson, Professor and Head, Medicines Policy Research Unit
Deborah Randall, Research Fellow
Bich Tran, Research Fellow
Danielle (Duong) Tran, Research Fellow
Claire Vajdic, Associate Professor and Head, Cancer Epidemiology Research Unit
Marina van Leeuwen, Research Fellow
Jennifer Walsh, Project Coordinator
Research Students 2016

Bilal Ahmed
Topic: Utilisation of Antihypertensive Drugs During Pregnancy and the Risk of Adverse Outcomes for Mothers and their Children
Primary Supervisor: Dr Alys Havard
Co-Supervisor(s): Professor Louisa Jorm
Funding source(s): International Postgraduate Research Scholarship (IPRS)

Maria Arriaga
Topic: Lifestyle-related risk factors for cancer in Australia
Primary supervisor: Dr Maarit Laaksonen
Joint Supervisor: A/Professor Claire Vajdic
Funding source(s): Australian Postgraduate Award, Translational Cancer Research Network (TCRN) PhD Scholarship Top-up Award

Jonathan Brett
Topic: Developing a framework to quantify low value prescribing practices in routinely collected data
Primary Supervisor: Professor Sallie Pearson
Co-Supervisor(s): Professor Adam Elshaug, Professor Nicholas Buckley
Funding source(s): NHMRC Postgraduate Scholarship, NHMRC Centre for Research Excellence Medicines and Ageing Top-up Scholarship

Benjamin Daniels
Topic: Big Data to Real World Evidence Around HER2-Targeted Cancer Therapies
Primary Supervisor: Professor Sallie Pearson
Co-Supervisor(s): Professor Nicholas Buckley
Funding source(s): Sydney Catalyst Scholarship, NHMRC Postgraduate Scholarship, NHMRC Centre for Research Excellence Medicines and Ageing Top-up Scholarship

Natasha Donnolley
Topic: Classifying maternity models of care
Primary Supervisors: Professor Michael Chapman, A/Professor Georgina Chambers
Co-supervisor(s): Professor Elizabeth Sullivan, Dr Kerryn Butler-Henderson

Michael Falster
Topic: Understanding the roles of individuals, context and service availability in preventable hospitalisations in NSW, Australia
Primary Supervisor: Professor Louisa Jorm
Co-Supervisor(s): Professor Alastair Leyland

Shamshad Jahan
Primary Supervisor: A/Professor Georgina Chambers
Co-Supervisor(s): Professor Louisa Jorm
Funding source(s): Jagdish & Lalitha Gupta Scholarship in Neonatal & Paediatric Research

Ritu Kunwa
Topic: Effect of parental migration on healthcare seeking behaviour for common childhood illnesses and nutritional status of left behind children under 5 years of age in Nepal
Primary supervisor: Dr David Muscatello
Co-Supervisor: A/Professor Claire Vajdic
Funding source(s): Australian Government Research Training Program Scholarship
Lise Lafferty  
Topic: Social Capital of Indigenous and non-indigenous offenders  
Primary Supervisors: A/Professor Georgina Chambers, Professor Tony Butler  
Co-Supervisor(s): Dr Jill Guthrie (ANU)  
Funding source(s): NHMRC Aboriginal and/or Torres Strait Islander Health Research Postgraduate Scholarship

Evelyn Lee  
Topic: Embryo screening techniques  
Primary Supervisor: A/Professor Georgina Chambers  
Co-Supervisor(s): Dr Michael Costello

Mei Lin Lee  
Topic: The utilisation of Smoking Cessation Pharmacotherapies in pregnant smokers  
Primary Supervisor: Dr Alyx Havard  
Co-Supervisor(s): Dr Duong Tran, Professor Alec Welsh  
Funding source(s): University International Postgraduate Award (UIPA)

Sanja Lujic  
Topic: Comorbidity and Multiborbidity in New South Wales: Prevalence, Trajectories and Implications for Healthcare Utilization and Costs  
Primary Supervisor: Professor Louisa Jorm  
Co-Supervisor(s): Professor Judy Simpson

Holger Möller (thesis submitted 2016)  
Topic: Inequalities in unintentional injuries between Aboriginal and non-Aboriginal children in New South Wales  
Primary Supervisor: Professor Louisa Jorm  
Co-Supervisor(s): Professor Rebecca Ivers, Dr Kathleen Falster  
Funding source(s): NHMRC Building Capacity Grant Postgraduate Scholarship

Stella Settumba Nalukwago  
Topic: Economic Evaluation of Offender Health Programs  
Primary Supervisor: Tony Butler  
Co-Supervisor(s): A/Professor Georgina Chambers, Marian Shanahan  
Funding source(s): NHMRC Centre for Research Excellence in Offender Health Postgraduate Scholarship

Smriti Raichand  
Topic: Antidepressants use during pregnancy and their effects on mother and child  
Primary Supervisor: Dr Alyx Havard  
Co-Supervisor(s): Professor Sallie Pearson, Professor Nick Buckley  
Funding source(s): Australian Postgraduate Award (APA), NHMRC Centre for Research Excellence Medicines and Ageing Top-up Scholarship

Andrea Schaffer  
Topic: Quality use of medicines in Australia: Using administrative databases to explore utilisation and best practice research methods  
Primary Supervisor: Professor Sallie Pearson  
Co-Supervisor(s): Professor Nicholas Buckley  
Funding source(s): NHMRC Postgraduate Scholarship, NHMRC Centre for Research Excellence Medicines and Ageing Top-up Scholarship
Staff profiles

Health Services and Outcomes Unit

Louisa Jorm

Professor Louisa Jorm is the Foundation Director of the Centre for Big Data Research in Health at UNSW Australia, and heads the Centre’s Health Services and Outcomes Unit. From 2007 until November 2014, she was Foundation Professor of Population Health and Director of the Centre for Health Research at the University of Western Sydney, and Principal Scientist at the Sax Institute. Prior to this, she spent more than 15 years in service and government roles, including 10 years as Director of the Centre for Epidemiology and Research in the NSW Department of Health.

Louisa is an Australian leader in public health and health services research using routinely collected data and linked data, including hospital inpatient, mortality, perinatal and Medicare (MBS, PBS) data. Her research has addressed topics including measuring health system performance, evaluating health policies and services using “natural experiments”, evaluating the impact of policies and services on early childhood development, and targeting interventions to improve Indigenous health outcomes. She has played a leading role in the establishment of major infrastructure and capacity for “big data” health research in Australia, including the NSW/ACT Centre for Health Record Linkage, the Population Health Research Network, the 45 and Up Study and the NSW Biostatistical Officer Training Program. She led the development of the Secure Unified Research Environment (SURE), a facility that benefits researchers nationally by providing secure remote access to linked health data. Her work has had numerous policy impacts, e.g.: driving changes to reporting of national public health performance indicators; informing national guidelines for management of acute coronary syndrome in Indigenous people; and shaping national policy regarding access to linked Commonwealth data and publicly funded health data for research.

Since her appointment to an academic position in 2007, Louisa has published 79 scientific papers and been awarded $17.6 million in national competitive grant income as a chief investigator (career totals: 129 scientific papers and $19.4 million in national competitive grant income). Her scientific papers have been cited >1,700 times (Scopus), >1,400 of these citations since 2007. She has given invited plenary presentations at 7 international and 20 national conferences since 2007. Her Indigenous Health Outcomes Patient Evaluation (IHOPE) study was honoured as one of NHMRC’s ‘10 of the best’ projects for 2015.

Louisa is a member of the Editorial Board of the International Journal of Epidemiology (IF 8.8). In 2016 she was appointed as a PLuS Alliance Fellow, researchers chosen for their transformative leadership capability from the three PLuS Alliance partners: King’s College London, Arizona State University and UNSW. She represented the NHMRC on the Wellcome Trust’s Public Health Research Data Forum from 2012 until 2015, was an invited participant in the inaugural meeting of the Australia-US Science and Technology Joint Commission Steering Committee in Washington DC in 2011, and was part of the official Australian delegation to the landmark OECD meeting ‘Measuring up: Improving Health Systems Performance in OECD Countries’ in Ottawa in 2001. She is a member, nominated by the Minister for Health, of the Australian Health Ethics Committee and was previously a Ministerial appointee to two further NHMRC Principal Committees: Research Committee (2009-2015) and Prevention and Community Health Committee (2012-2015). She was a Member of the Medical and Health Sciences Research Evaluation Committee in the 2015 Excellence in Research Australia (ERA) evaluations.

Louisa is a high-profile advocate for more and better use of routinely collected health data. She appeared as a witness in relation to better use of health data before the Senate Select Committee on Health in 2015 and was invited to consult with the Productivity Commission in its inquiry into ‘Data availability and use’. Her submission is cited 7 times in the draft report from the inquiry.
She presented in the 2015 Zunz Lecture ‘The promise of big data’ broadcast by Radio National as part of its ‘Big Ideas’ series, published a commentary ‘Health boost from big data’ in The Australian in 2014, and participated as a discussant at a 2013 Consumer Health Forum workshop about using health data to enhance consumer outcomes while still protecting privacy. She actively disseminates her research, for example giving numerous radio interviews, including ABC Radio’s ‘The World Today’, for a 2016 paper on Aboriginal child injury published in the American Journal of Public Health, which was mentioned by 11 news outlets and achieved an ‘Altmetrics’ rating of 95 (top 5% of all outputs).

Andrew Blance
Andrew Blance is an experienced Biostatistician and Lecturer in Health Data Sciences, in the Centre for Big Data Research in Health. Andrew holds a BSc (Hon) and a MSc. Andrew Blance is currently focussed on convening a forthcoming Masters program in Health Data Science. His research interests include analysis of clustered (dependent) data and random-effects.

Kathleen Falster
Dr Kathleen Falster is an epidemiologist with interest and expertise in epidemiologic methods, cohort and cross-sectional studies, analysis of linked data, managing and manipulating large and complex datasets, and the health of disadvantaged populations.

Kathleen is currently an NHMRC Early Career Fellow with the National Centre for Epidemiology and Population Health at the Australian National University and the Sax Institute. She is also a Visiting Fellow with the Centre for Big Data Research in Health at the University of New South Wales. Her current research focuses on health and development outcomes in Aboriginal children using data from cohort studies and linked administrative datasets.

Kathleen is a Chief Investigator and the Study Director of the NHMRC-funded ‘Seeding Success’ study that aims to identify factors that promote positive early childhood health and development in Aboriginal children using linked, cross-sectoral population datasets. She has also collaborated with the Indigenous Health Outcomes Patient Evaluation (IHOPE) study since 2010.

Michael Falster
Michael Falster is a Biostatistician and Research Fellow at the Centre for Big Data Research in Health (CBDRH) at UNSW Australia. Michael has over 10 years’ experience working in public health, biostatistics and epidemiological research, and is currently project coordinator on the Assessing Preventable Hospitalisation InDicators (APHID) Study, an NHMRC funded partnership grant using linked data to explore contributors to geographic variation in ‘preventable’ hospitalisations.

Michael’s work and interests are characterized by finding innovative statistical methods for quantifying and exploring variation in health and health care, such as: multilevel models for deconstructing geographic variation in health inequalities and outcomes; data visualizations exploring temporal patterns of health events; spatial methods for identifying and analyzing hospital patient catchments; and data algorithms for characterizing longitudinal patterns of healthcare use. Having a background in health, policy and statistics, Michael is interested in translating complex statistical methods and findings towards a policy audience.

Amy Gibson
Dr Amy Gibson is an epidemiologist and Research Fellow who conducts analyses using linked health data and participates in public health policy projects. She joined the Centre for Big Data Research in Health in 2014, and is currently drafting the data governance framework for the UNSW Australia E-Research Institutional Cloud Architecture (ERICA). She is also an investigator on two linked data projects; one examining the incidence and clinical outcomes of meningococcal disease in children; and the other evaluating outcomes following calls to healthdirect Australia, a telephone-based health care triage and advice service. Amy completed her PhD on mortality associated with maintenance treatments for opioid dependence at UNSW in 2009 and her MPH (University of Sydney) in 2004.
Amy is particularly interested in the use of large administrative health data sets for research, including their analysis, and the policies and governance of their use. She has worked with a range of data sets including hospital admissions, emergency department presentations, mortality data, notifiable conditions, perinatal data, telephone triage data and registrations for maintenance pharmacotherapies for the treatment of opioid dependence. She has experience in a range of public health fields including drug and alcohol dependence, paediatric communicable disease and telemedicine.

Mark Hanly
Dr Mark Hanly is a Research Fellow in the Health Services and Outcomes Unit, Centre for Big Data Research in Health. In his role as statistician on the Seeding Success project, Mark is responsible for managing, preparing, and analysing the linked administrative datasets used in the study. Mark joined the CBDRH from the University of Bristol, where he completed his PhD in Advanced Quantitative Methods for the Health and Social Sciences. His doctoral research focused on novel approaches to correct for nonresponse bias in large household surveys. He also holds a MSc in Applied Social Research from Trinity College Dublin.

As a social statistician, Mark’s broader research interests lie on the intersection between the collection and analysis of data pertaining to people’s everyday lives, across a range of domains, including health, gerontology, education, and early childhood development. Methodologies of interest include: sampling and household surveys; data linkage; sequence and event history analysis, with applications to longitudinal data; multilevel modelling, used to study hierarchical effects arising in the context of clustered data; best practice approaches for addressing missing data; techniques for program evaluation in the context of non-random rollout and uptake of services; and modern approaches to version control, which promote collaborative and reproducible research.

Alys Havard
Dr Alys Havard is a Senior Research Fellow in the Centre for Big Data Research in Health at the University of New South Wales (UNSW). She was awarded her PhD in 2011, and since then she has been supported by an NHMRC Early Career Fellowship followed by a National Heart Foundation Future Leader Fellowship.

Alys’ primary research interest is in using linked administrative datasets for tobacco control research and for examining the utilisation and safety of prescription medications. She has a growing national profile as an expert in research using large-scale routinely collected health data, and in particular, these data linked together to create longitudinal person-based records. She leads the first project to obtain Commonwealth Pharmaceutical Benefits Scheme (PBS) data linked to administrative data from other jurisdictions (NSW and WA) since arrangements for cross-jurisdictional data linkage were established in Australia. This NHMRC-funded project investigates the utilisation and safety of medications during pregnancy. It has brought together 10 different data collections, resulting in a linked dataset containing almost 35 million records belonging to over 2 million individuals. She is also currently undertaking a fellowship project of similar scale in which she is examining the safety of pharmacotherapies for smoking cessation in the general population.

Nusrat Homaira
Dr Nusrat Homaira is a medical epidemiologist at the Centre for Big Data Research in Health. She has 10 years working experience in the field of epidemiological and population health research. Much of her work has evolved around outbreak investigations, establishing surveillance for communicable diseases and estimating burden of childhood disease using low cost novel methodologies. Nusrat’s expertise includes aetiological epidemiology of childhood infectious respiratory diseases. She is interested in understanding the complex interrelationship between communicable and non-communicable respiratory diseases and how it is modified by environmental factors with a particular interest in the contribution of early childhood viral infections on chronic respiratory morbidity. Prior to coming to UNSW, she worked as Assistant Scientist, Centers for Communicable Diseases at the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b).
Mikaela Jorgensen
Dr Mikaela Jorgensen is a Research Fellow at the Centre for Big Data Research in Health at UNSW. She is project coordinator for Seeding Success, a study aiming to identify factors that contribute to positive early childhood health and development in Aboriginal children using linked population-based health, welfare and education data.

Mikaela completed her PhD in 2014 while working as a research officer with the Cancer Epidemiology and Services Research group at the University of Sydney. Her research included using linked routinely collected health datasets to examine disparities in the care and outcomes of older adults with colorectal cancer in NSW. She has a background in speech pathology and community aged care.

Sanja Lujic
Ms Sanja Lujic is a Lecturer in Biostatistics at the Centre for Big Data Research in Health at UNSW. She has BSc (Hons I), MStats and MBiostats and is currently completing her PhD.

Sanja is an experienced senior biostatistician who specialises in analysing complex linked administrative datasets. She has been involved in numerous research projects involving both small- and large-scale datasets, including randomised controlled trials. Her analysis expertise spans methods for analysing survey, cross-sectional, longitudinal, as well as clustered/hierarchical datasets. Sanja’s research interests include health services research, population ageing, multimorbidity, data linkage methods and the use of routinely linked administrative datasets in statistical modelling.

Kylie-ann Mallitt
Dr Kylie-ann Mallitt is an NHMRC Early Career Fellow at the Centre for Big Data Research in Health. She holds a BSc and a PhD and is an experienced biostatistician. Her project during her fellowship is a study on ‘Optimising patient flow and identifying inequalities in health service delivery in NSW hospitals using linked data’.

Holger Moeller
Dr Moller is a Research Fellow at the Centre for Big Data Research in Health. Holger was recently award his PhD, having earlier completed a Master of Public Health and Master of Science. Holger has been performing health and medical research since 1999.

Deborah Randall
Deborah Randall is a Research Fellow at the Centre for Big Data Research in Health. Deborah holds a BSc (Psych), and MBiostat and has submitted her PhD. Deborah is a senior biostatistician with specialist training and expertise in survey methods, analysis of linked administrative data and multilevel modelling. Her primary research interests are in using linked administrative data to monitor health outcomes and health inequalities. She also has extensive experience as a researcher in the areas of drug and alcohol, cardiovascular disease and Aboriginal health. She has high-level data management and analytic skills, including experience analysing large population health datasets, linked data, cohort study and cross-sectional survey data.

Deborah has analysed datasets including the National Nutrition Survey, BreastScreen Register, NSW Admitted Patient Data Collection and NSW Perinatal Data Collection. She has extensive experience in report development, including setting up the programming infrastructure for the Clinical Excellence Commission report Quality of Healthcare in NSW: A Chartbook.

Bich Tran
Dr Bich Tran is a Research Fellow at the Centre for Big Data Research in Health. Her current project is to investigate indicators of potentially preventable hospitalisation and readmission. She will use data from the 45 and Up Study and linkage to other health records including the NSW Admitted Patient Data Collection to identify admissions and Medicare Australia for non-hospital medical attendances/services.
Danielle Tran
Dr Danielle Tran is a Research Fellow at the Centre for Big Data Research in Health. She has expertise in using large-scale linked datasets for research on utilisation and outcomes of health services and interventions, chronic diseases and patient safety. She uses complex statistical analyses to assess independent effects of patient and health services factors on health outcomes.

Currently, Dr Tran is undertaking projects to investigate the utilisation and safety of smoking cessation pharmacotherapies and other medications during pregnancy, evaluate patient compliance and health outcomes following 1.4 million calls to the national healthdirect telephone triage service, and assess the use of primary care and quality of care among people with diabetes.

National Perinatal Epidemiology and Statistics Unit

Georgina Chambers
Associate Professor Georgina Chambers is the Director of the National Perinatal Epidemiology and Statistics Unit (NPESU), a leading source of statistical and epidemiological research to inform policy, community discussion and decision-making on the health and wellbeing of mothers and babies in Australia. The NPESU also manages and is Data custodian of the Australian and New Zealand Assisted Reproductive Database (AZNARD) and the Australian and New Zealand Neonatal Network (ANZNN).

Georgina is a leading international expert on the epidemiology and health economics of assisted reproductive technologies (ART). Her qualifications include a PhD, an MBA, a BAppSci(MLS), and a Grad Diploma(IT). Georgina has built a significant research career in perinatal epidemiology, policy analysis and health economics. She established the first research group dedicated to policy and economic analysis of ART in 2010 and has received three Category 1 Grants (as CIA) to support this group. She has significant experience in leading data linkage projects, including on the health outcomes of ART conceived children. She has undertaken a number of policy analyses as they relate to IVF, including publications on the impact of changes to the Extended Medicare Safety Net, access to IVF by socioeconomic groups, impact of affordability on clinical practice and child outcomes.

Georgina’s work informs (inter)national policy and the public debate on funding of fertility treatments, providing information and advice to government bodies (Australia, UK, Canadian governments) on policies related to fertility treatments. She is a member of the International Committee Monitoring Assisted Reproduction (ICMART).

Georgina has been CIA on three Category 1 grants on health economics and epidemiology of fertility treatments (NHMRC Project 2016-18, NHMRC Project 2017-2019, ARC Linkage 2010-14). Since 2012, she has received $4.9 million in Category 1 funding and $1.8 million in Category 2 funding (AIHW, NSW Health, New Zealand Government, Fertility Society of Australia, Australian Fertility Medicine Foundation).

In the last 5 years Georgina has authored 30 epidemiology and health economic publications in perinatal health, including 20 peer-review articles (>1000 citations since 2012), a book chapter and 10 government reports. She is a regular invited speaker at conferences (13 invited speaking appointments since 2012) and frequently speaks with the media on subjects pertaining to her research and fertility policy.

As NPESU Director, Georgina supervises 3 academic and 8 professional staff, together with 5 5 higher degree students.

Sharon Chow
Sharon Chow is the Coordinator for the Australian and New Zealand Neonatal Network (ANZNN), a registry that monitors the care of high risk newborn infants in Australia and New Zealand. The ANZNN is based at the National Perinatal Epidemiology and Statistics Unit (NPESU), in the Centre for Big Data Research and the School of Women’s and Children’s Health, Faculty of Medicine. Sharon Chow has skills in database management, validation and analysis in SQL Server.
Natasha Donnolley

Natasha Donnolley is a Project Officer at the National Perinatal Epidemiology and Statistics Unit (NPESU), at the Centre for Big Data Research. She has been contributing to large national epidemiological studies since 2011. She completed her Bachelor of Science (HIM) in 2011, graduating with distinction and dux of her year. She is a Certified Health Information Manager with over 15 years’ experience in the Australian public and private healthcare sectors as both a consumer advocate and researcher.

Natasha led the development of the Maternity Care Classification System (MaCCS) as part of the Commonwealth-funded National Maternity Data Development Project (NMDDP) 2011-2016. The MaCCS is a world-first classification system that enables models of maternity care to be classified based on their characteristics and model category. Natasha is currently undertaking her PhD research study validating the MaCCS.

Oisin Fitzgerald

Oisin Fitzgerald is a Research Officer in the National Perinatal Epidemiology and Statistics Unit (NPESU), at the Centre for Big Data Research in Health. He is currently involved with the Australian and New Zealand Assisted Reproduction Database (ANZARD). Prior to joining NPESU Oisin completed a BSc (Hons) at Dublin City University, Ireland and undertook postgraduate study in Statistics and Operations Research at RMIT University. He is currently completing a Master of Statistics at UNSW.

Katie Harris

Dr Katie Harris is a Research Fellow in Biostatistics in the National Perinatal Epidemiology and Statistics Unit (NPESU), at the Centre for Big Data Research in Health, UNSW and course coordinator for Reproductive and Perinatal Epidemiology and Statistics, School of Women’s and Children’s Health, Faculty of Medicine, UNSW.

Katie has gained extensive experience as a biostatistician, specialising in statistical techniques such as multilevel modelling, longitudinal data analysis, functional data analysis and relative survival analysis, and is highly competent with the statistical software package R. Current research interests are in Assisted Reproductive Technology and Maternal and Perinatal outcomes at birth.

Lisa Hilder

Dr Lisa Hilder is a Senior Project Officer in the National Perinatal Epidemiology and Statistics Unit (NPESU) at the Centre for Big Data Research in Health. Following medical undergraduate training and internship she went to in India where she co-ordinated field work for a study pre-school nutritional status using anthropometric data. Lisa went on to postgraduate clinical training in obstetrics, gynaecology and sexual health. In 1987 she was a research visitor in the Demography at LHSTM before undertaking formal qualifications in epidemiology. Lisa was a lecturer in the Department of Epidemiology at the Royal London Hospital Medical School and later a Senior Research Fellow in the Department of Midwifery at City University in London, where she was awarded a University Research Prize for a national record linkage study of NHS Numbers for Babies data with birth registration data that made gestational age at birth available for the first time for statistical reporting.

Lisa’s research focus has remained centred on the effective use of routinely collected data and record linkage. Since returning to Australia in 2008 she has worked as a Perinatal Epidemiologist on national perinatal reporting and record linkage studies.

Sadia Hossain

Sadia Hossain is a Research Assistant for the Australian and New Zealand Neonatal Network (ANZNN). The ANZNN is based at the National Perinatal Epidemiology and Statistics Unit (NPESU), at the Centre for Big Data Research and the School of Women’s and Children’s Health, Faculty of Medicine. Sadia assists in regular data management, preparation of data for research requests and publication of reports.
Jolie Hutchinson
Jolie Hutchinson is a Biostatistician in the National Perinatal Epidemiology and Statistics Unit (NPESU) at the Centre for Big Data Research in Health. Prior to this she worked with linked administrative data exploring the impact of perinatal mental health policies for an NHMRC Partnership grant with the Department of Psychiatry, School of Medicine (UNSW) and NPESU in collaboration with colleagues at the University of Western Australia and Deakin University. She has also worked in perinatal health at University of Sydney (Centre for Perinatal Health Services Research). Jolie has a first class honours in statistics from Adelaide University and is currently enrolled in Masters of Biostatistics at Sydney University.

Renate Le Marsney
Renate Le Marsney is a Data Manager for the Australian and New Zealand Neonatal Network (ANZNN) with a focus on the follow up outcomes for infants born extremely preterm. The ANZNN is based at the National Perinatal Epidemiology and Statistics Unit (NPESU), at the Centre for Big Data Research and the School of Women’s and Children’s Health, Faculty of Medicine. Renate has skills in managing data for a large population registry using SQL Server.

Amy Monk
Dr. Amy Monk is a Project Officer Officer in the National Perinatal Epidemiology and Statistics Unit (NPESU) at the Centre for Big Data Research in Health. She is a Registered Midwife and Registered Nurse with extensive research and clinical experience in midwifery, perinatal health and maternity services. Amy is the project manager for the NPESU components of the National Maternity Data Development Project.

Amy was recently awarded a PhD from the University of Sydney. Her thesis was entitled “Evaluating Midwifery Units (EMU): a prospective cohort study of freestanding midwifery units in New South Wales, Australia” and was funded by the National Health and Medical Research Council. Her other qualifications include a Bachelor of Nursing (Hons) from the University of Sydney, for which she was awarded the University Medal in 2003, and a Graduate Diploma (Midwifery) from the University of Technology in 2006.

Alan Macaldowie
Alan Macaldowie is a Senior Research Officer in the National Perinatal Epidemiology and Statistics Unit (NPESU) at the Centre for Big Data Research in Health. He is currently the data manager of Australia and New Zealand Assisted Reproduction Database (ANZARD). Alan has completed a Bachelor of Science in Science with Management Studies from Napier University. His current research interests and areas of expertise include perinatal/reproductive medicine and assisted reproductive technology.

Repon Paul
Repon is a Research Officer in the National Perinatal Epidemiology and Statistics Unit (NPESU) at the Centre for Big Data Research in Health. He holds a BSc (Hons) in Statistics and MS in Population Sciences, and currently is in a PhD program under School of Public Health and Community Medicine. He has over ten years of professional experience in a wide range of fields including infectious diseases epidemiology, social and behavioural sciences, reproductive health, and health economics.
Cancer Epidemiology Research Unit

Claire Vajdic

A/Professor Claire Vajdic is a population health researcher specialising in cancer epidemiology. She was awarded her PhD in 2002 and appointed Head of the Cancer Epidemiology Research Unit at the Centre for Big Data in Health Research. She leads a program of research on the causes and consequences of cancer with a focus on outcomes that inform the direction of basic science research and impact public health policy and clinical practice.

Claire is an internationally recognised expert on the environmental and genetic risk factors for lymphoma, cancer risk in immune dysregulation, and malignancies associated with sun exposure. She has a track record of successful high-level collaboration with specialists from a range of clinical, biological, population health and computational disciplines. These studies have enhanced strategies for cancer prevention and early detection in high-risk groups. For example, her data on cancer risk in people with HIV infection and kidney transplants directly informed the draft 2016 Australian Clinical Management Guidelines for the Prevention for Cervical Cancer. She is PI of the NSW non-Hodgkin lymphoma study and member of the GWAS working group of the international lymphoma Consortium (InterLymph). Multidisciplinary work within the InterLymph Consortium has resulted in the discovery of new gene variants for non-Hodgkin lymphoma risk, recognised by 3 Nature Genetics and 2 Nature Communications papers. These seminal discoveries have generated multiple ongoing secondary analyses of which Claire is an active collaborator. Within the Consortium she is currently leading one, and collaborating in three, international pooled analyses of gene-environment interactions in collaboration with the National Cancer Institute, City of Hope & University of Southern California. She is also a member of the InterLymph Genetics of NHL and Skin Cancer Working Group. She is a member of AIHW’s Cancer Monitoring Advisory Group and she was a member of the Organising Committee for the 2016 Sydney Cancer Conference.

Claire has been awarded a total of $10.7m in competitive grants, $4.7m as CIA, and $3.2m in the last 5 years. Most of these grants (70%) are tier-one. The projects are large-scale, with a trajectory of increasing research innovation, cross-disciplinary collaboration, and international reach. She held NHMRC CDFs Level 1 and 2, 2008-2011 and 2012-2015.

Claire has a career total of 6 book chapters and 129 publications including two chapters in the authoritative textbook Cancer Epidemiology and Prevention (4th Edition, Oxford University Press). Her work has been cited more than 5400 times.

Claire has supervised 2 PhD and 5 Honours students to completion, and is currently supervising 1 PhD student, 1 Masters by Research student and 2 NHMRC Postdoctoral Fellows. All PhD students obtained competitive top-up awards. She was Prince of Wales Clinical School Postgraduate Coordinator (2009-2012). Claire taught Cancer Epidemiology within the UNSW Masters of Public Health program (2008-2015).

Maria Arriaga

Maria Arriaga is a PhD candidate and a Research Officer in the Cancer Epidemiology Research Unit at the Centre for Big Data Research in Health. In her PhD she studies the relative importance of lifestyle-related risk factors for rarer cancers in Australia. This involves application of disease burden measures to pooled data from seven Australian cohort studies, linked to the National Death Index and Australian Cancer Database, and Australian National Health Surveys.

Maria is experienced in literature searches and reviews, data management and harmonisation, and is currently gaining experience in statistical analysis of linked longitudinal data. Prior to starting her PhD, Maria completed a Bachelor of Science at the School of Pharmacy and Biochemistry, University of Buenos Aires, Argentina and a Masters in Science of Medicine (HIV/STD) at the School of Medicine, University of Sydney. She also has 8 years of experience as a Clinical Project Coordinator at the Kirby Institute, UNSW.
Peter Hull
Peter Hull is a Senior Research Officer in the Cancer Epidemiology Research Unit with the Centre for Big Data Research in Health and the Centre for Social Research in Health. Peter has a BSc (Psych) and a BPsysch (Hons) both from Macquarie University. He has experience in computerised and online data collection and data management.

Maarit Laaksonen
Dr Maarit Laaksonen is a Senior Research Fellow in the Cancer Epidemiology Research Unit at the Centre for Big Data Research in Health. She is a biostatistician with 12 years’ national and international experience in the field of epidemiology and public health. Her main research focus is on the development of novel, more accurate disease burden measures and their application to big data in health to inform priorities for reducing the burden of cancer and related multi-morbidity. She holds NHMRC and Cancer Institute NSW Early Career Fellowships, and leads an NHMRC project evaluating the population-level relevance of the risk factors for cancer in Australia.

Maarit has expertise in analyses and meta-analyses of cohort, case-control and nested case-control studies, survival models and competing risks. She is experienced in carrying out research on several diseases, including cancer, type 2 diabetes, cardiovascular diseases, and mental health disorders, and wide range of both traditional and novel risk factors related to lifestyle, environment, and genes. At UNSW, she has developed expertise in the analysis of large linked primary and secondary health datasets, aimed to inform prevention, treatment and costs of cancer.

Marina van Leeuwen
Dr Marina van Leeuwen is a cancer epidemiologist whose research interests include the epidemiology of lymphomas, germ cell tumours, and other young adult cancers; cancer in immune-deficient populations; late adverse treatment effects; and cancer survivorship. She is experienced in the analysis of large-scale, population-based linked health data sets.

Jennifer Walsh
Jennifer Walsh is the Study Coordinator for the AGOG (Australian Genomics and Clinical Outcomes of Glioma) Epidemiology Study. With BSc and MPH qualifications, Jennifer has extensive experience as a Project Manager working on surgical outcome intervention studies as well as large scale epidemiological cancer studies at the University of Sydney and Cancer Council Victoria. In her current position as Study Coordinator, Jennifer is responsible for developing study protocols and policies, coordinating participant recruitment as well as data collection and management.

Medicines Policy Research Unit
Sallie Pearson
Professor Sallie Pearson is a leading authority in the conduct of population-based research using routinely collected health data, particularly studies examining the use and impact of prescribed medicines in routine clinical care. She heads the Medicines Policy Research Unit, Centre for Big Data Research in Health, UNSW Australia. She is also the Scientific Director the NHMRC Centre of Research Excellence in Medicines and Ageing. Sallie completed her doctoral training at the University of Newcastle, Australia, in 1998 and was the inaugural Postdoctoral Fellow in Pharmaceutical Policy at Harvard Medical School from 2000-2001. She returned to Australia in 2002 where she worked as a private consultant to the WHO Collaborating Centre in Pharmaceutical Policy, Boston, and the Australian Health Insurance Commission (now the Department of Human Services). She returned to full-time academic research in 2006 to establish her independent research group; since that time her team has received continual competitive grant and fellowship funding. Sallie was recognised for her research leadership in the post-market surveillance of cancer medicines in 2015 with the award NSW Premier’s Outstanding Cancer Research Fellow.
Sallie’s research to date has been dominated by high-quality studies on the post-market surveillance of prescribed medicines. Her program has contributed to the field by: 1) providing much needed evidence about the use and impact of prescribed medicines outside clinical trial conditions; 2) understanding the intended and unintended consequences of pharmaceutical policy decisions on the way in which individuals and the broader population access medicines; 3) demonstrating the utility of large-scale linked routine data collections to conduct health service research and contribute to clinical and policy practice; 4) advancing the methodology relating to the use of routine data collections for pharmacoepidemiological research.

Sallie’s research has been published in leading general medical and specialist journals including *Lancet Oncology, Journal of Clinical Oncology, Annals of Oncology, Medical Journal of Australia, Pharmacoepidemiology and Drug Safety*. It has also been the subject of numerous editorials and disseminated in the popular press. Her research was cited by Professor Ian Olver, Chief Executive Officer of Cancer Council of Australia at the time of publication in the *MJA* as ‘demonstrating the potential benefits of post-marketing research for the Australian health care system’. Sallie also generates research with clinical and policy impact. For example, her pivotal research evaluating the use of targeted cancer agents in routine clinical practice has been used by the PBAC with respect to the listing of other targeted agents for public subsidy. In addition, the outcomes of Sallie’s research (published in *Archives of Internal Medicine*) addressing the discriminatory effects, by race, of a physician surveillance program formed part of the testimony on the importance of universal drug coverage in the Massachusetts Health Reform. The testimony was successful in overturning government plans to omit drug coverage for lower income enrollees in ‘minimal plans’. This work also forms part of the core curriculum in the Harvard Medical School PhD in Health Policy.

Sallie receives regular requests to consult with government organisations on matters pertaining to pharmacoepidemiology and data linkage for population health research including her role as a research advisor to NPS MedicineWise and recent invitation to present at the Senate Select Committee on Health public hearing on big data and data linkage. She is actively engaged in a range of quality use of medicines and health data linkage committees and advisory groups including: Chair, NSW Population Health Services Research Ethics Committee; Chair: NSW Ministry of Health, Ethics and Data Linkage Working Group; Member, Research Advisory Group, Department of Health and Human Services (custodian of Pharmaceutical Benefits and Medicare benefits data); Member, Drug Utilisation Subcommittee of the Pharmaceutical Benefits Advisory Committee; and Member, Sydney Catalyst Translational Cancer Research Consortium: T2 Working Group.

Sallie is CI on $12 million in competitive grants and fellowships from NHMRC, Cancer Australia, Cancer Institute NSW since 2011: $18 million career total. Sallie has presented on 50 occasions at international meetings and workshops. Since 2006 Sallie has supervised, or is currently supervising, ten Postdoctoral Fellows, seven PhD students, and more than ten honours students. All PhD students have gained NHMRC or APA postgraduate scholarships and many of her students and fellows have won research awards at national and international meetings.

**Emily Karanges**
Dr Emily Karanges is a Research Fellow in the Medicines Policy Research Unit at the Centre for Big Data Research in Health. Her research focus concerns the pharmacoepidemiology of psychotropic medicine use. While her research extends to all age groups, Emily has a particular interest in the use of psychotropics in children, adolescents and young adults. She is also interested in the pharmacoepidemiology of opioid analgesics. Emily also has expertise in the field of psychopharmacology. In 2015 she received her PhD in behavioural neuroscience, psychopharmacology and psycho-pharmacoepidemiology at the University of Sydney. Her thesis was primarily concerned with the behavioural and neurobiological effects of antidepressant treatment during adolescence.

**Melisa Litchfield**
Melisa Litchfield is a Data Manager in the Medicines Policy Research Unit at the Centre for Big Data Research in Health. She has over 15 years experience working in public health research, epidemiology and program delivery. As a Data Manager, she is responsible for the overall management of the large, linked datasets administered by the unit. Her responsibilities include research governance and ethics, data storage and security, data manipulation and analysis using SAS software.
Key Projects 2016

Health Services and Outcomes Unit

Seeding success: identifying factors that contribute to positive early childhood health and development in Aboriginal children

Promoting positive early childhood development is fundamental to improving life opportunities and outcomes for Aboriginal Australians. However, national data show that a significant proportion of Aboriginal children have markers of developmental vulnerability at school entry and this tracks through to poor literacy and numeracy outcomes across all schooling years. We currently lack information about the key drivers of positive early childhood development in Aboriginal children, and the features of local communities and early childhood service provision that make a tangible difference.

Seeding Success aims to address this information gap using linked routinely collected health, welfare and education data, from birth to school age, for all children who started school in NSW in 2009 and 2012. It will determine which social, perinatal and early childhood health factors predict positive early childhood development from birth to school age in Aboriginal children, and test the impact of two early childhood services (Aboriginal Maternal and Infant Health Services and the Brighter Futures program) in promoting positive early childhood development in Aboriginal children.

The Smoking MUMS (Maternal Use of Medications and Safety) Study

Little is known about the utilisation, effectiveness and safety of pharmacotherapies for smoking cessation during pregnancy. The Smoking MUMS (Maternal Use of Medications and Safety) Study will explore these issues using routinely collected perinatal data from NSW and WA linked to pharmaceutical data and records of other health service use. In addition to investigating the maternal and neonatal safety of nicotine replacement therapy, bupropion and varenicline use during pregnancy, the Smoking MUMS Study is exploring inequalities in the use of these medications in disadvantaged populations, including Aboriginal women, and whether their use has changed in response to pharmaceutical policy reforms and changes in clinical guidelines.

National Perinatal Epidemiology and Statistics Unit (NPESU)

Population trends and live birth rates associated with common assisted reproductive technology (ART) treatment strategies


This large population study of ART treatments performed in Australia over a 12 year period, reported substantial improvements in treatment success using frozen/thaw embryos, extended embryo culture, and single embryo transfer. However, there was no evidence of benefit for the widespread use if intracytoplasmic sperm injection for non-male factor infertility.

This study received a worldwide twitter and email alert for Editors of Human Reproduction, the second highest ranked journal in Obstetrics and Gynecology
Cancer Epidemiology Research Unit

Cancer incidence and risk factors after organ transplantation in Australia: liver and cardiothoracic transplantation

The Cancer After Transplantation project concluded in 2016. This NHMRC-funded study quantified the risk of cancer after liver, heart and lung transplantation in Australia. It was a multi-disciplinary collaboration with the Australia and New Zealand Liver Transplant Registry and the Australia and New Zealand Cardiothoracic Organ Transplant Registry, and included linked administrative and medical records for 4232 patients.

Solid organ transplantation is a life-saving medical procedure, but the subsequent lifelong immunosuppressive medication increases the risk of cancer. We found that the excess risk of cancer after liver, heart and lung transplantation was 2.6-times higher than the matched general population. Recipients had an excess risk of 16 cancer types, predominantly cancers with a viral cause, and the risk of cancer was higher in heart and lung compared to liver transplant recipients.

We also found a 2.8-fold excess risk of death from cancer for transplant recipients compared to the matched general population. Non-Hodgkin lymphoma was the most common cancer-related death, and the highest relative risk was observed for keratinocyte skin cancer (i.e. squamous cell carcinoma or basal cell carcinoma), a malignancy that is uncommonly fatal outside the setting of solid organ transplantation. This program of work was the first to identify significant differences in the type and dose of immunosuppressive therapy by organ type. Overall, liver recipients received consistently lower doses of immunosuppression compared to heart and lung recipients. For all recipients the dose of most drugs was reduced with increasing time since transplantation, and the type of drug was changed in 30% of recipients.

Finally, we found that higher doses of the immunosuppressive drug azathioprine increase the risk of both lip cancer and non-Hodgkin lymphoma in transplant recipients, and that differences in the type and extent of immunosuppression explains the excess risk in heart and lung compared to liver transplant recipients. Our findings help inform personalised cancer prevention and early detection strategies for transplant recipients. They also have implications for managing cancer risk in other immunosuppressed populations, and they aid our understanding of carcinogenic processes.

Medicines Policy Research Unit

Centre of Research Excellence (CRE) in Medicines and Ageing

The Centre of Research Excellence (CRE) in Medicines and Ageing is a multi-disciplinary collaboration between highly dedicated and internationally recognised researchers from the University of Sydney, Australian National University, the Sax Institute, University of Western Australia, University of NSW, University of Technology Sydney, and the Institute for Clinical and Evaluative Sciences in Canada. The CRE will generate vital information about the role that medicines play over Australians’ lifetimes. Using large linked databases of routinely collected medicines and other health information, the CRE will produce much-needed, quantitative evidence on the real-world use, harms, costs and cost-effectiveness of specific medicines. Little of this much-needed research has been conducted to date. Yet the evidence is critical to understanding the balance of benefits and harms of medicines used across the adult lifespan.

The CRE investigators work closely with agencies to influence national pharmaceutical policy decisions and health professionals making important treatment decisions with their patients. The benefits will be far ranging, on a national scale. The CRE is building a national workforce in pharmacoepidemiology by training new researchers in the use and evaluation of medicines data and by developing robust research methods and protocols. This is key to the continuity and success of the work. The CRE will be a successful model of research collaboration in healthcare, and one that will directly benefit the Australian population.
Research funding 2016

New Grants awarded – 2016


Ongoing Grants - 2016


5. McNamara B, Eades S, Jorm L, Preen D, Jones J, Joshy G, Gubhaju L, Shepherd C, McCaully D. Defying the odds: Exploring the impact of perinatal outcomes, maternal social and health outcomes and level of culturally appropriate service availability on the health of Western Australian Aboriginal infants and children. NHMRC Project Grant 2014 ($634,886).


32. Daniels B. Big data to real-world evidence: Informing pharmaceutical policy decisions around targeted cancer medicines. NHMRC Postgraduate Scholarship 2015.


34. Vajdic C, Pearson S, Dobbins T. Health service utilization and risk factors for cancer of unknown primary. Cancer Institute NSW Cancer Epidemiology Linkage Program Grant 2011 ($300,000).


39. Pearson S, Charles C. Do changes in chemotherapy dose and increased toxicity explain poorer survival outcomes in advanced cancer patients with systemic inflammation? Sydney Catalyst Seed Funding Grant 2015 ($50,000).

Publications 2016

Papers published in peer-reviewed journals


50. Du W, Pearson S, Buckley N, Day C, Banks E. Diagnosis- and external cause-based criteria to identify adverse drug reactions in hospital ICD-coded data: application to an Australia population-based study Public Health Pract (Accepted for publication, Sep 1, 2016).


Published Abstracts


**Letters**


**Government and Industry Reports 2016**


Conference presentations 2016


2. Jorm LR. How to make sure that your research findings do not get lost in translation. 3rd Annual Global Alliance on Chronic Disease (GACD) Implementation Science Workshop, Sydney, 2016 (Invited speaker).


4. Jorm LR. Big data in Asia Pacific health care. International Society for Pharmacoeconomics and Outcome Research (ISPOR), Singapore, 2016 (Invited plenary speaker).


7. Jorm LR. Big data, small populations: unpacking health inequalities using linked data. Leaders in Science Seminar, Garvan Institute, 2016 (Invited keynote speaker).

8. Jorm LR. Using linked data to evaluate policies and programs. Data Linkage Symposium, Menzies Institute, Hobart, 2016 (Invited keynote speaker).


15. Byrne M, Gibson A, Jorm L. Using data linkage to map and assess the outcome of calls to the after-hours GP helpline, GP16- The RACGP Conference for General Practice, Perth, Australia, 2016.

16. Byrne M, Gibson A, Jorm L. Using data linkage to map and assess the outcome of calls to telephone triage and advice services, Health Informatics Conference (HIC16), Nursing Informatics stream, Melbourne, Australia, 2016.


20. Chambers GM. What has been the impact of the National Perinatal Depression Initiative (NPDI) on Medicare and hospital service use? 2016 International Marcé Society for Perinatal Mental Health Society Conference, Melbourne 2016.


27. Laaksonen MA, Webster AC, Gruilich AE, Meagher NS, McCaughan GW, Keogh AM, Na R, Vajdic CM. Longitudinal immunosuppression data reduces exposure misclassification and improves outcome prediction among solid organ transplant recipients. 26th International Congress of the Transplantation Society, Hong Kong, 2016 (oral).


