AUSTRALIAN INSTITUTE
OF HEALTH INNOVATION
Faculty of Medicine and Health Sciences

MACQUARIE University

Australian Institute of Health Innovation

Annual Report

2014

As Australia's leading health systems research centre, the Australian Institute of Health Innovation aims to reinvent healthcare to enable better, safer and more cost-effective healthcare.

"Understanding modern healthcare systems is as challenging as splicing genes or curing cancer; and securing quality, affordable healthcare into the future is just as important."

AIHI Foundation Director
Professor Jeffrey Braithwaite

Securing a healthy future

By generating new evidence-based models and approaches to clinical practice, rigorous research can deliver meaningful improvements in patient outcomes, safer healthcare systems and reduced healthcare costs, nationally and worldwide.

Our increasingly complex modern healthcare systems demand an innovative, multidisciplinary approach. Working across disciplines, and in close partnership with clinicians, policymakers and healthcare providers, AIHI researchers are seeking to understand how healthcare delivery really works, and to translate that new knowledge into real gains.

That means understanding how rapid advances in medical science and biomedical and information technology are revolutionising healthcare delivery today. By identifying and solving complex and constantly evolving challenges – and by recognising and harnessing the considerable potential of new technologies and big data banks to drive positive change – AIHI is helping to improve many critical aspects of healthcare.

Securing the future of modern healthcare systems is vital as populations age and costs rise. Today, close to 10 per cent of GDP in industrialised nations is spent on healthcare. Yet 20-30 per cent of that care delivers no benefits and some 10 per cent of hospital admissions continue to be marred by errors.

AIHI's mission is to make a major contribution, nationally and internationally, to achieving high-quality, affordable healthcare by:

1. Using systems sciences and translational approaches to provide innovative, evidence-based solutions to specified healthcare delivery problems.
2. Enhancing local, institutional and international health system decision-making through evidence.

With more than 100 researchers, AIHI is Australia's largest health systems research group. AIHI aims to consolidate its role as a national hub for research, education and advocacy for better, safer, more cost-effective healthcare. The Institute operates as three research centres with specialised expertise ranging from patient safety, to health informatics and the resilience of healthcare systems, with a particular focus on:

- Understanding clinician behaviour as a basis for practice improvement.
- Decision support systems and evidence-based healthcare.
- Translational bioinformatics.
- Communication support systems.
- Designing models of care which provide improved patient safety and quality.
- Enhancing teamwork and inter-professional practice within services, and integration across services.
- Engendering change through new models of care and strategies for delivery.
- Designing intelligent services using information and communication technologies.

Director's review

This is the Institute's first annual report at Macquarie University. The Institute moved from the University of New South Wales to Macquarie University on 3rd November 2014. We're delighted to be part of the Macquarie community and to be a core component of a university which believes in being decidedly different.

Macquarie's ambition is to become the leader of integrated clinical care, medical and health research and education in Australia. The Institute is a strategic addition to the University's research efforts and, importantly, will continue to provide an in-depth understanding of healthcare. This is the basis for leading major improvements to healthcare and health for all Australians.

In the year under review, the Institute has contributed to the advancement of science, and published widely in the international literature. Staff have made contributions at national and international conferences, workshops, and seminars, providing keynote addresses and the distribution of research vital to the improvement of healthcare.

A hallmark of our research is that it is translational. Much medical and health research is done in the laboratory, the test tube, or in an electron microscope, or through animal models. The Institute's research is decidedly different. We study the health system, and traverse across the system, from the bedside where clinicians interface with patients, to the community where care is delivered, across general practices, private facilities, aged care residences, and baby health clinics, through to examining the policy process. We use big data that we either purposefully gather as we execute our studies, or that we analyse from the masses of information that healthcare produces. We are especially interested in the safety of care delivered to patients, and health informatics. We then take our findings and feed them back into the system with the aim of enhancing high-quality, affordable care.

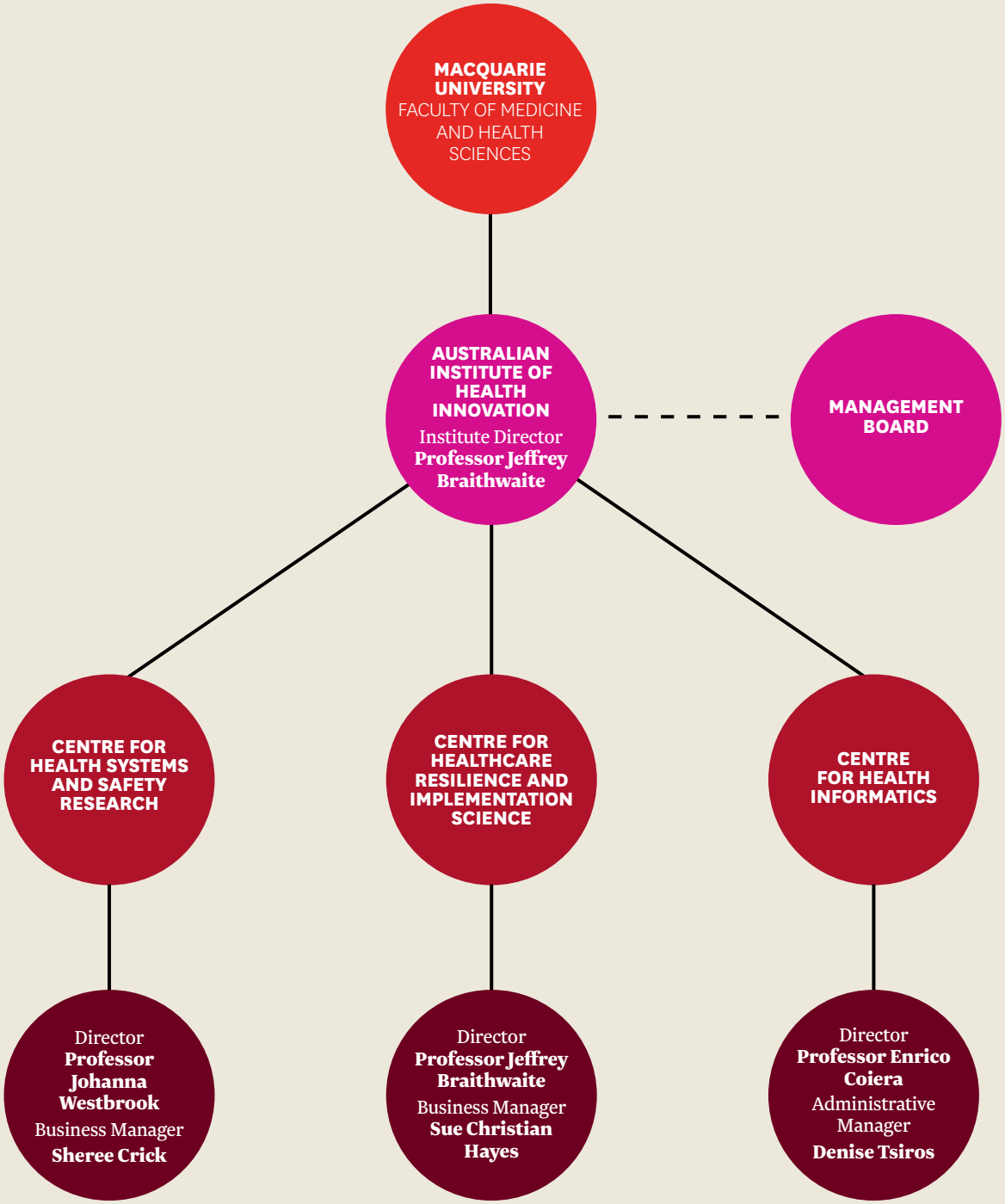
For an Institute of our size, there were many achievements in 2014. We welcomed new staff, created new collaborations to match the over 50 existing national and international collaborations that we have, and published books, book chapters and articles. In the pages that follow, we articulate these, and showcase some of our key studies.

A word in concluding. The health system has many challenges. We know from our own work that 57 per cent of care is in line with level 1 evidence or consensus-based guidelines. Some 10 per cent of patient admissions or treatments attract some sort of error, or even serious harm. Up to 30 per cent of what is done is deemed to be waste. Yet many patients receive excellent, evidence-based care, and no harm befalls them. One of our enduring questions is not only to ask how do things go wrong and what can we do to resolve that, but also to ask how do things go right in such a complex system, and what we can do to learn from that?

And then, of course, we translate our findings into improvement for the benefit of policymakers, providers, managers, clinicians and patients. In the pages that follow, you'll find work addressing many aspects of this enterprise.

Professor Jeffrey Braithwaite
BA [UNE], DipLR, MIR [Syd], MBA [Macq], PhD [UNSW], FAIM, FACHSM, FFPHRCP,FAcSS
Founding Director
Australian Institute of Health Innovation

Organisational structure



Senior Executives


1


2


3

Management Board

Professor Patrick McNeil
Professor Lesley Hughes
1 Professor Jeffrey Braithwaite
2 Professor Enrico Coiera
3 Professor Johanna Westbrook
Professor Clifford Hughes AO
Professor Les White AM
Professor Sally Redman AO

AIHI at a glance

*$4.85m administered by other Institutions

Centre for Healthcare Resilience and Implementation Science (CHRIS)

WHAT WE DO

The Centre for Healthcare Resilience and Implementation Science (CHRIS) **is reconceptualising healthcare systems research** to build more **resilient healthcare systems.** The Centre aims to help stressed modern healthcare systems cope with concurrent challenges posed by the growing and increasingly complex care demands of ageing populations, rapid technological and organisational change and stretched healthcare budgets.

The Centre pursues highly collaborative, multidisciplinary research into how our complex healthcare systems really work, and is pioneering new approaches to ensure research findings are translated into better and more cost-effective care. By scrutinising the myriad, dynamic interactions between interconnected webs of clinical professionals, their patients and new healthcare technologies, communication systems and equipment, the Centre is committed to enhancing understanding of the big picture of healthcare delivery.

In particular, the Centre is leading new organisational research into the multitude of factors that combine to produce system-wide resilience. Such resilience can be harnessed to ensure healthcare organisations are more resistant to costly contemporary challenges, such as medical errors and other iatrogenic harm, and are able to reduce waste, improve patient outcomes and save money into the future. The Centre is also scrutinising the processes of change to help ensure that many more research findings are translated into real world gains for patients, policymakers, healthcare providers and funding agencies.

Key research streams

APPROPRIATENESS (OF HEALTHCARE DELIVERY)

Professor Jeffrey Braithwaite
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Mr Peter Hibbert
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Delivering evidence-based care at the right time is critical to ensuring the best possible outcomes for patients. Yet, as the AIHI's landmark CareTrack Australia study revealed in 2012, Australians receive 'appropriate' healthcare in only 57 per cent of consultations. Led by Peter Hibbert, from the University of South Australia, this research stream is building on Caretrack Australia's findings to pilot new approaches to clinical standards and to explore digital platforms for their delivery. A follow-up study, CareTrack Kids, led by Professor jeffrey Braithwaite, is investigating levels of appropriate care in the treatment of children across 16 common conditions. This stream aims to provide a new evidence base to reduce healthcare costs and improve care by helping clinicians to deliver the right care at the right time to the right patients, and by keeping patients informed about what to expect.

IMPLEMENTATION SCIENCE

Professor Jeffrey Braithwaite
jeffrey.braithwaite@mq.edu.au

Many research teams work to identify and understand specific problems, then envisage a solution. However, understanding how and why large organisations embrace or resist change – and so solve or fail to solve problems or improve or fail to improve their performance – is just as important. This research stream is led by Professor Jeffrey Braithwaite. It aims to achieve real-world improvements in healthcare delivery by studying the factors that ensure new ideas and approaches, or new evidence, are put into practice, rather than left gathering digital dust in a research journal. The science of improving implementation within organisations, in particular healthcare providers and the work of their clinical teams, involves a range of disciplines from management to organisational behaviour.

RESILIENCE

Dr Robyn Clay-Williams
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While the rate of medical errors and other *iatrogenic* harm remains stubbornly high at around 10 per cent in modern hospital systems, there are considerable untapped opportunities to improve care by turning our attention to what healthcare systems do well. Instead of only scrutinising why systems sometimes fail, and identifying and reverse engineering what has gone wrong, resilience science seeks to understand how highly complex organisations and systems, like healthcare, usually get things right. Led by Dr Robyn Clay-Williams, this stream is pioneering a new approach to understanding the many factors that underpin the delivery of high-quality care despite the challenges of large, complex interacting networks of various health professionals, stretched budgets and rapid technological change.

IMPROVEMENT STUDIES

Associate Professor David Greenfield
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Every organisation wants to improve the way they work and the services and outcomes they deliver, but we have little robust evidence to tell us what works and why. Associate Professor David Greenfield is leading wide-ranging research to help executives, managers and frontline professionals better coordinate and integrate the many parts of our complex health systems to deliver services more efficiently and to improve collaboration across clinical professions and teams. In particular, Associate Professor Greenfield and colleagues have conducted foundational research to develop the knowledge base for health service accreditation programs. They are recognised by the International Society for Quality in Healthcare (ISQua) as leaders in this field.

BEHAVIOUR CHANGE

Dr Natalie Taylor
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To drive innovation and improvements in healthcare delivery and outcomes CHRIS researchers, led by Dr Natalie Taylor, are investigating the many psycho-social and human factors that frustrate new approaches. By identifying what influences people to behave in certain ways, interventions can be designed more effectively. For example, by first auditing organisations to identify barriers to change, researchers can look for straightforward ways to introduce new practices to improve patient safety. One recent intervention involved redesigned packaging for gastric tubes to add clear, easy-to-follow instructions. These practical innovations, in concert with awareness days and special screen savers, improved the way these tubes were used in clinical practice. The result was fewer errors and, consequently, less adverse patient safety incidents and reduced costs.

SAFETY AND INJURY

Professor Jeffrey Braithwaite
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Keeping people safe and thereby preventing injuries is one important way to reduce human suffering and to alleviate pressure on healthcare systems, simultaneously reducing healthcare costs. This stream extends the Centre's well-established expertise in patient safety to look at safety more broadly. To prevent people coming into hospitals as a result of accidents, an understanding of common injuries and their causes can be used to help design and implement prevention strategies to reduce the prevalence of accidents. Likewise, by understanding how and why healthcare systems sometimes fail, leading to medical errors or sub-optimal treatment, evidence-based interventions can be designed to improve care, reduce hospital stays, improve patient outcomes and reduce costs.

Centre profile

STAFFING
17 Research staff and centre management
11 Higher Degree Research students

GRANTS OVERVIEW
GRANTS HELD IN 2014

15 Grants
Total funds **$9.58m**

COLLABORATION

OUR VALUED PARTNERS FOR 2014 INCLUDED:

National

ACT Government Health Directorate
Aged Care Standards and Accreditation Agency Ltd
Australian College of Health Service Management (ACHSM)
Australian Commission on Safety and Quality in Health Care (ACSQHC)
Australian Council on Healthcare Standards (ACHS)
Australian General Practice Accreditation Ltd (AGPAL)
Australian Health Insurance Association (AHIA)
Australian Healthcare and Hospitals Association (AHHA)
Australian Patient Safety Foundation (APSF)
Australian Research Council (ARC)
BUPA Health Foundation
Cancer Institute NSW (CINSW)
Children's Health Queensland
Department of Health and Ageing
Department of Health Victoria
Liverpool Hospital, NSW
Motor Neurone Disease Research Institute of Australia
National Health and Medical Research Council (NHMRC)
National Health Performance Authority (NHPA)
Northern Sydney Medicare Locals
NSW Kids and Families, NSW Ministry of Health
Population Health and Health Services Research, NSW Ministry of Health
Prince of Wales Hospital
Royal College of Pathologists of Australia Quality Assurance Programs
Queensland Health
School of Public Health and Community Medicine, UNSW Australia
South Australian Health
St Vincent's Hospital, Sydney
Sydney Children's Hospital Network
The Australian Health Care Reform Alliance
The Clinical Excellence Commission
The Sax Institute, NSW
Townsville Hospital and Health Service
University of Melbourne
University of Queensland
University of Sydney
University of Technology, Sydney
Westmead Hospital

International

Aalborg University, Denmark
Canon Institute for Global Studies, Japan
Harvard Medical School, USA
Health Services Management Centre, University of Birmingham, United Kingdom
Imperial College, London
International Society for Quality in Health Care, ISQua, Ireland
Kings College, London
Medical Management Centre, Karolinska Institutet, Sweden
National Health Service, United Kingdom (various NHS agencies)
Shanghai Municipal Health Bureau, People's Republic of China
Society for the Study of Organising in Health Care, United Kingdom
The London School of Hygiene and Tropical Medicine, UK
Universitat Autonoma de Barcelona, Spain
University College London
University of Edinburgh, United Kingdom
University of Leeds, United Kingdom
University of Manchester, United Kingdom
University of Southampton, United Kingdom
University of Southern Denmark, Institute of Regional Health Research
University of Florida, Health Science Center, Jacksonville
World Health Organization, Kobe Centre, Japan

1

A NEW NAME

The Centre for Healthcare Resilience and Implementation Science, known more colloquially at AIHI as CHRIS, was formerly the Centre for Clinical Governance Research in Health. The change of name in 2014 reflects the importance of better understanding the many interrelated and often complex factors that make healthcare systems work well. Our rigorous research helps to unlock the secrets of resilience and works to replicate success across healthcare systems. Implementing positive changes means driving research findings beyond publication, translating good ideas into real improvements in the way healthcare organisations work and the services they deliver.

2

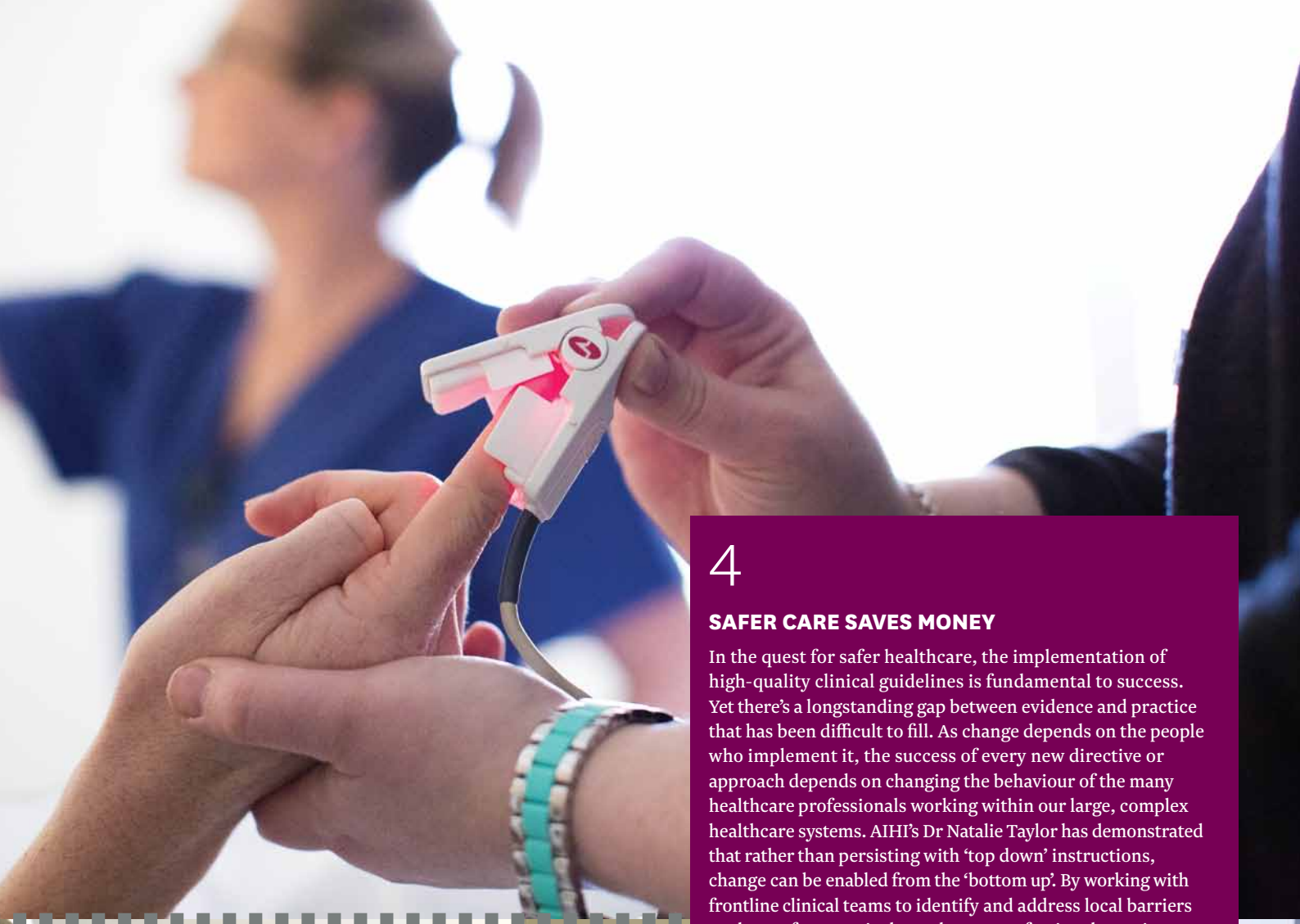
SAFETY I TO SAFETY II

A conventional approach to safety is what we call a Safety I approach. Over decades we have tried to reduce harm by exhaustively studying what has gone wrong, often long after an error or accident has occurred. The theory behind this 'find and fix' approach is that by unpicking a problem we can prevent it happening again. However, in real life few errors – especially medical errors that are the result of a long chain of events involving numerous people, different technologies and their many interactions – ever occur again in exactly the same way. Although understanding how harm occurs remains important, a Safety II approach offers an additional, potentially powerful way to improve safety. By recognising that healthcare delivery is almost always safe, despite the many variables in play, we can begin to study what goes right and why. For safety studies, the solution to persistent harm may be the very circumstances we have long overlooked: all those instances when nothing went wrong.

3

THE GLOBAL 'STATE OF THE ART' OF HEALTHCARE REFORM

Healthcare Reform, Quality and Safety was co-edited in 2014 by Professor Jeffrey Braithwaite for the international academic publisher Ashgate. The book offers a global perspective on healthcare reform and investigates the impact of national reform initiatives on the quality and safety of care. The 30 nations scrutinised have implemented wide-ranging reform agendas in different social and cultural contexts. Yet the 'lessons learned' section suggests all systems have something in common. As the first book of its type, *Healthcare Reform, Quality and Safety* cross-fertilises ideas for the mutual benefit of the countries involved and will inform governments, policymakers, managers and leaders, clinicians, teaching academics, researchers and students.



4

SAFER CARE SAVES MONEY

In the quest for safer healthcare, the implementation of high-quality clinical guidelines is fundamental to success. Yet there's a longstanding gap between evidence and practice that has been difficult to fill. As change depends on the people who implement it, the success of every new directive or approach depends on changing the behaviour of the many healthcare professionals working within our large, complex healthcare systems. AIHI's Dr Natalie Taylor has demonstrated that rather than persisting with 'top down' instructions, change can be enabled from the 'bottom up'. By working with frontline clinical teams to identify and address local barriers to change for a particular task, new professional practices can be effectively implemented. In 2013, Dr Taylor worked with several UK hospitals to reduce the risk of misplaced nasogastric tubes. The results, published internationally in 2014, were safer practices and reduced costs. Estimated savings for hospitals across one UK region were £2.56m as more clinicians shifted away from expensive X-rays (misinterpretation of which is the main cause of patient harm) to determine if the tube was correctly placed in the stomach, by using a simple first line pH test.

"We have developed a behaviour change 'tool kit' that can be used by those tasked with achieving behaviour change for quality and safety improvement – it has the potential to improve healthcare delivery, reduce risks to patients and save lives and money", Dr Taylor said of her ongoing research.


OPMI VARIO

Centre for Health Systems and Safety Research (CHSSR)

WHAT WE DO

The Centre for Health Systems and Safety Research is at the forefront of research into the impact of new information and communications technology (ICT) on the safety, effectiveness and cost-efficiency of healthcare delivery. Fast, accurate information exchange is at the heart of healthcare systems that deliver optimum patient outcomes, even in the face of growing budgetary pressures and the many challenges of co-morbidities in ageing populations.

In healthcare systems, rapid advances in ICT and biomedical technology are transforming the way clinicians and support staff work, as older information management systems and procedures are replaced by newer ICT-enabled models of healthcare delivery. Telemedicine applications, for example, allow care to be delivered in the community outside large hospitals, while sophisticated information systems now support the decisions clinicians make at a patient's bedside. Information technology represents a potentially powerful tool for driving systems-wide improvements. Consequently, healthcare systems across the globe are making multi-billion dollar investments based on this promise.

Yet until recently little attention has been paid to whether new ICT-enabled processes and systems are performing as expected or if they may also pose unanticipated risks.

CHSSR's internationally-recognised research is filling this gap. Our health informatics evaluation research team – Australia's largest – designs rigorous, innovative ways to assess whether health informatics interventions are effective, efficient and, above all, safe. The Centre aims to make a significant contribution, nationally and worldwide, to health informatics, health information management, evaluation methodologies and safety and quality in healthcare. By forging innovative partnerships with our national and international peers from many disciplines – and with information industry leaders and health practitioners, administrators and policymakers – we can ensure our work can be readily translated to inform ICT systems design and decision-making for better, more cost-effective healthcare.

Key research streams

PATHOLOGY AND IMAGING INFORMATICS

Associate Professor Andrew Georgiou
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Pathology and medical imaging services perform a major role in the delivery of patient care by ensuring reliable and accurate results are delivered in a timely fashion to inform clinical management decisions. Over the last three decades there has been considerable growth in the number of requests for pathology, and medical imaging services. Our research is investigating the use and impact of e-Health systems to improve the appropriate and efficient use of pathology and imaging services in hospitals. Topics of investigation include the impact of IT systems on improved laboratory test turnaround times, and the follow-up and management of test results to inform decision-making.

HUMAN FACTORS EVALUATION AND DESIGN

Dr Melissa Baysari
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Human factors studies the design of systems with the aim of improving interactions between people and their environments. Our research examines how well, or otherwise, ICT systems fit in with the work of doctors – specifically, computerised decision support for prescribers, including pre-populated orders, online resources, and electronic alerts. Observing systems in operation, we found nearly half the prescriptions triggered an alert, but most of these were dismissed – a reaction which undermines the system's effectiveness. Current work, which incorporates organisational analysis, focuses on designing effective decision support. This research stream, led by Dr Melissa Baysari, is working towards designing resilient systems that can adapt and function effectively in the event of a disturbance.

MEDICATION SAFETY AND e-HEALTH

Professor Johanna Westbrook
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Medication error and inappropriate medication therapy are two of the oldest, most costly and least tractable safety problems that health systems face. Information technology has the potential to make medication management safer and more effective. With that expectation, health systems worldwide are making vast investments in information technology. Our research investigates the ways in which information technology can reduce medication errors and support improved medication therapy decisions and outcomes. This includes research on the design and use of electronic decision support systems.

WORK INNOVATION, COMMUNICATION AND e-HEALTH

Professor Johanna Westbrook
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Understanding the way clinical care is delivered is central to supporting effective and safe delivery models, including the design of new models. Applying novel measurement techniques, the Centre has undertaken leading research investigating the impact of interruptions on error production and patient safety. Information and communication technologies (ICT) provide an opportunity to reshape the composition of teams who deliver care, and the processes of care delivery. ICT may both enhance and disrupt patterns of work. Our research investigates patterns of clinicians' work, and how ICT influences workflow and workloads. We apply a broad range of methods, including direct observational methods, social network analysis and qualitative techniques. Projects have included investigation of the relationship between interruptions to work and error, the impact of electronic health record systems on workflow and efficiency, and clinicians' actions in response to electronic decision support alerts. This research covers broad discipline areas such as cognitive psychology, process engineering, communication processes, health informatics and operations research.

SAFETY AND INTEGRATION OF AGED AND COMMUNITY CARE

Associate Professor Andrew Georgiou
andrew.georgiou@mq.edu.au

Delivering care and services to ageing populations is a significant challenge internationally. Communities and health systems are seeking effective ways to plan and manage the health and support services required to enable citizens to actively engage in society and maintain a high quality of life. Information and communication technologies (ICT) can help meet these challenges by offering direct assistance (e.g. telehealth) that promotes individuals' engagement and social connection and, through large-scale electronic health record systems, can enhance the integration and coordination of care across healthcare sectors. Issues that our researchers are investigating include the use of community support services by older people, the quality of care provided within residential aged care facilities, and the role of ICT.

PRIMARY CARE SAFETY AND e-HEALTH

Associate Professor Meredith Makeham
meredith.makeham@mq.edu.au

The field of patient safety in primary care is an emerging research area that encompasses a broad range of settings and themes. There is limited scientific evidence of the risks to patient safety in primary care settings, although there is some understanding that the provision of primary healthcare from a safety perspective could be greatly improved. e-Health is integral to many of our daily processes in the delivery of safe primary healthcare in Australia and other countries with a similarly developed healthcare system – it is a major component in the interface of primary care with secondary and tertiary healthcare settings. Our centre is focused on research that explores these subjects. We are working to expand our understanding of them, and to close the gap between what we know and what we do. We are currently conducting projects that are defining the nature of threats to patient safety in primary care, and examining interventions that reduce these threats. We are investigating the use of e-Health in primary care settings, including electronic clinical information systems, My Health Record (the Personally Controlled Electronic Health Record (PCEHR)), secure messaging, and electronic medication management and decision support systems.

Centre profile

STAFFING
16 Research staff and centre management
11 Higher Degree Research students

GRANTS OVERVIEW
GRANTS HELD IN 2014

11 Grants
Total funds **$4.57m**

COLLABORATION

OUR VALUED PARTNERS FOR 2014 INCLUDED:

National

Austin Centre for Applied Clinical Informatics, Melbourne
Austin Hospital, Victoria
Australian Association of Clinical Biochemists
Australian Catholic University
Australian Commission on Safety and Quality in Health Care
Australian Patient Safety Foundation
Campbelltown Hospital, NSW
Cancer Institute of NSW (CINSW)
Clinical Excellence Commission
Concord Repatriation General Hospital, NSW
Deakin University, VIC
Department of Health and Ageing / Department of Health, Canberra
eHealth NSW
Flinders University
HealthConsumers NSW
Healthdirect Australia
HTR Business and Technology Services Pty Ltd
LaTrobe University, VIC
Liverpool Hospital, NSW
Mater Health Services, QLD
Mater Hospital, QLD
National e-Health Transition Authority (NeHTA)
National Health Foundation
National Prescribing Service
NSW Health Ministry
NSW Health Pathology
NSW Health Pathology North
NSW Health Pathology West
NSW Kids and Families
Prince of Wales Hospital, NSW
Royal Adelaide Hospital, SA
Royal Australian and New Zealand College of Radiologists
Royal College of Pathologists of Australasia Quality Assurance Programs
Royal North Shore Hospital, NSW
Royal Prince Alfred Hospital, NSW
South Eastern Area Laboratory Services, NSW (SEALS)
St Vincent's Hospital, NSW
Sydney Children's Hospital Network
Sydney Local Health District
Sydney South West Pathology Services
UnitingCare Ageing, NSW & ACT
University of Adelaide
University of Melbourne
University of Newcastle
University of Sydney
University of Southern Queensland
University of Tasmania
University of Technology Sydney
Western Sydney Local Health District

International

Canterbury District Health Board, New Zealand
Harvard Medical School
London School of Economics
Portsmouth University, UK
Sysmex New Zealand Ltd
University of Birmingham
University of Edinburgh
University of Leeds, UK
Veteran Affairs Hospital, Houston, Texas, USA

1

TOP ICT AWARD FOR PROFESSOR JOHANNA WESTBROOK

CHSSR's Director, Professor Johanna Westbrook, was named Australian ICT Professional of the Year for 2014 at the iAwards – the ICT industry's premier national award.

Having previously won the NSW title, Johanna was representing the state at the national awards held at the Melbourne Convention and Exhibition Centre and attended by more than 1,000 professionals representing all sectors of ICT.

The iAwards are judged by the ICT industry and honour both companies that lead in innovation, and professionals who reach the highest levels of performance in any part of the ICT industry.

Johanna said she felt "very honoured" and that the Award "recognised the importance of research which investigates and measures how ICT impacts upon the healthcare system, and the implications of this work for other industries".

"The credit lies with the tremendous team of talented researchers at the Centre for Health Systems and Safety Research, and AIHI, whose work places Australia at the forefront of research delivering evidence to harness the potential of ICT to improve healthcare services."

2

LAUREN'S WEEKEND ADVENTURES

Lauren Richardson's Honours project at AIHI – 'What do junior doctors do during weekend shifts?' – convinced her that health services research is where she'd like to end up.

Lauren had initially planned a career as a Dermal Clinician (BHSc – Clinical Dermal Therapies) before she began to think about a career in medicine.

She selected her Honours project because she felt it would give her a unique insight into what being a doctor is like. After shadowing junior doctors on weekend duties for more than 130 hours, Lauren had not only learnt a great deal about what junior doctors do on weekend shifts, but had identified a whole range of ways that weekend work could be improved. She didn't take up medicine. Instead, realising that health services research can be a powerful tool for change, Lauren is now determined to make a difference to the way care is delivered to patients.

3

LIFE-SAVING HOSPITAL TRACKING SYSTEM

CHSSR generated a good news story across Australia that offered a solution to the potential serious problem of overlooked test results.

CHSSR's paper, published in the *Journal of the American Medical Informatics Association*, described how an electronic safety net was introduced in a South Brisbane hospital – and changed the way clinicians acknowledged test results. The story was picked up by the national news agency, Australian Associated Press in April 2014, and was then featured in newspapers and in radio reports across the country, as well as in the medical press.

The study observed clinicians' practices over 13 months in the Mater Mothers' Hospital in Brisbane following the implementation of the electronic safety net. It found all test results – 27,354 for 6,855 patients – were acknowledged. Three out of five laboratory results were acknowledged within 24 hours.

In previous CHSSR studies, which involved expensive and time-consuming audits of paper records, problems were usually discovered after the fact, often when it was too late to act.

The importance of the new system at the Mater is that it provides a safety net to ensure all results are monitored, any that are missing are identified, and action is taken quickly – when it can do some good.

Centre for Health Informatics (CHI)

WHAT WE DO

The potential for information and communication technology (ICT) to change the ways healthcare systems work is enormous. In some settings its effects will be incremental; in others, radical. Some of the changes are easy to predict; others are clouded in uncertainty. At Macquarie University, the Centre for Health Informatics (CHI) within the Australian Institute for Health Innovation, focuses on studying the many facets of this process in all its complexity.

CHI is the largest academic group in Australia researching the emerging discipline of health informatics, and is building an international reputation as a research leader in the application of information technology to healthcare. Its principal aim is to map the complex organisational systems that shape today's health systems and to design and evaluate rigorous, system-wide interventions that provide a sustainable platform for future healthcare systems in areas including intelligent search systems, safety models and standards, communication systems, and the application of data mining to healthcare.

Our work at CHI is of direct relevance to clinicians, administrators and policy makers at all levels of government. Consequently, CHI is a highly collaborative research centre working in partnership with major healthcare providers, research institutions and governments, including the NSW Department of Health, the National Institute of Clinical Studies and the Commonwealth Department of Health.

Key research streams

PATIENT SAFETY INFORMATICS

Associate Professor Farah Magrabi
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e-Health uses information and communications technology (ICT) to improve the quality and safety of healthcare, and to let patients participate actively in their own diagnosis and treatment. But ICT can also introduce new types of medical error. And because ICT systems are usually implemented at scale, such errors can affect many patients simultaneously, multiplying the risks. A cross-disciplinary approach to research into e-Health safety, led by Associate Professor Farah Magrabi, allows CHI to contribute widely to theory, methodology and policy in this important field. We monitor the safety of e-Health using reports of critical incidents and automated surveillance of ICT systems, and also investigate safety governance models.

HEALTH ANALYTICS

Dr Blanca Gallego-Luxan
blanca.gallegoluxan@mq.edu.au

Large and constantly growing sets of digital biomedical data – and the availability of technology to collect, store and analyse it – is transforming healthcare into a learning system. This new information and communication technology means analytics can be performed sustainably and in real time at the point of care. The health analytics team at CHI, led by Dr Blanca Gallego-Luxan, is developing and testing models of such learning systems for future electronic health record systems. By combining the theory and methods of computing and deep analytics with an understanding of clinical decision-support systems, we can advance theoretical knowledge of health analytics while also translating our research into practice.

COMPUTABLE EVIDENCE LAB

Dr Guy Tsafnat
guy.tsafnat@mq.edu.au

The members of CHI's Computable Evidence Lab (CEL), led by Dr Guy Tsafnat, research how automation can help gather, synthesise and disseminate evidence so clinical decisions can be made quickly and safely based on evidence. Our research follows three main themes:

- For *machine learning* we devise algorithms that find patterns in data for applications such as prediction, classification and artificial intelligence.
- *Natural language processing algorithms* find, appraise and extract information from text.
- *Heuristic systems* are rule-based systems that encapsulate and use domain expertise to solve a particular problem.

CONSUMER INFORMATICS

Dr Annie Lau
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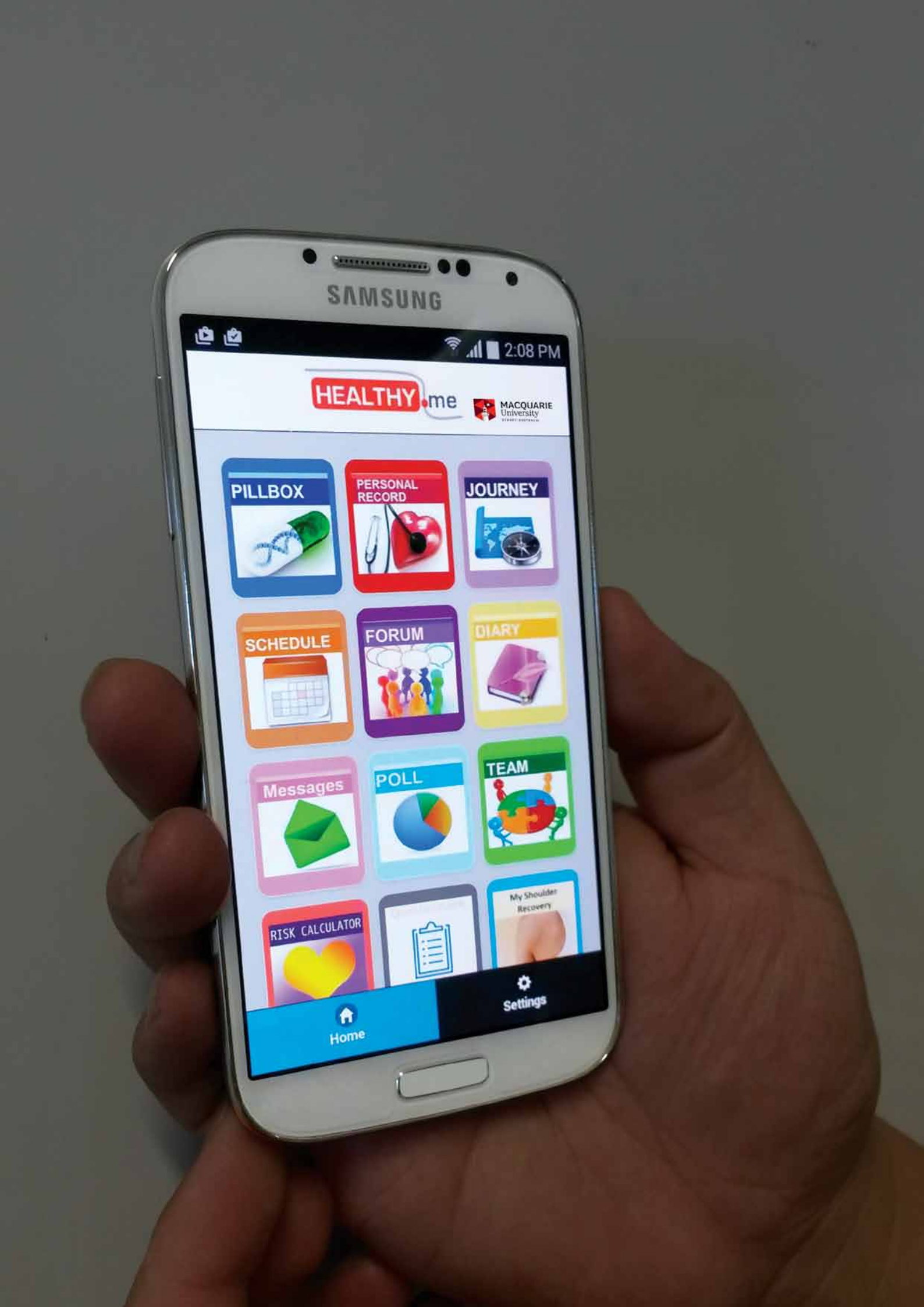
CHI's consumer informatics research program investigates how the theory and design of ICT systems affect those with the highest stake in our healthcare system – consumers, patients and carers. Led by Dr Annie Lau, our research addresses three fundamental questions:

- How does ICT affect our health decisions, behaviours, and outcomes?
- How can we design ICT that improves our engagement with health services?
- What theoretical understanding underpins the way we use and design ICT for consumers, patients and carers?

EVIDENCE SURVEILLANCE

Dr Adam Dunn
adam.dunn@mq.edu.au

CHI's evidence surveillance research observes and measures medical research itself. Using data mining, network science, and machine learning, the team, led by Dr Adam Dunn, undertakes projects examining networks of interacting researchers, clinical trials, clinicians, and the communities they serve. Our broad focus covers the entire pipeline of evidence translation – from the design and undertaking of clinical trials, through the reporting and synthesis of evidence in published research and the media, to the use of clinical evidence in policy, practice, and the decision-making of clinicians and their patients.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Centre profile

STAFFING

17 Research and centre management staff
8 Higher Degree Research students

GRANTS OVERVIEW

GRANTS HELD IN 2014

9 Grants
Total funds **$5.77m**

COLLABORATION

OUR VALUED PARTNERS FOR 2014 INCLUDED:

National

Austin Hospital, Melbourne
Australian Commission on Safety and Quality in Health Care
Australian Patient Safety Foundation, South Australia
Blackdog Institute, UNSW
Centre for Healthcare Resilience and Implementation Science, MQ
Centre for Health Systems and Safety Research, MQ
Centre for Infectious Diseases and Microbiology, Westmead Hospital, NSW
Centre for Research on Evidence Based Evidence, Bond University, Queensland
Clinical Excellence Commission, NSW
Clinical Trials Centre, Sydney University
Department of Computing, MQ
Flinders University, South Australia
The George Institute, Sydney
The Kirby Institute, UNSW
Macquarie University Hospital, MQ
Prince of Wales Hospital, Sydney
Royal Hospital for Women, Sydney
St Vincent's Hospital, Sydney
School of Computer Science and Engineering, UNSW
School of Public Health and Community Medicine, UNSW
Simpson Centre for the Health Services Research, UNSW
South Australia Health
South Western Sydney Local Health Network, Cancer Services
Spokade Pty. Ltd. Sydney
Sydney South West Area Health Service General Practice Unit
University of Adelaide, SA
University of Melbourne, VIC
University of Sydney, NSW
University of Technology, Sydney (UTS), NSW
University of Western Sydney, NSW
UNSW Counselling and Psychological Services, UNSW
UNSW Health Service Clinical Research Unit for Anxiety and Depression (CRUfAD), UNSW
Westmead Hospital, Sydney

International

Aalborg University, Denmark
Biomedical Research Centre, Stanford Medicine
Danish Centre for Health Informatics, Department of Development and Planning, Aalborg University, Denmark
Harvard Medical School, USA
Indraprastha Institute of Information Technology (IIIT), Delhi, India
Johns Hopkins University, USA
Schizophrenia Cochrane Review Group, Nottingham Univerisyt, UK
Medical Informatics Research Centre, Ben Gurion University of the Negev, Israel
Université de Lille Nord de France, France
University of Applied Sciences Weihenstephan-Triesdorf, Bavaria
University of Texas – Memorial Hermann Center for Healthcare Quality & Safety, Houston, Texas, USA
University of Tromso, Norway

1

HOW TWEETING CAN AFFECT OUR HEALTH

From bushfires to weeds and invasive animals, and from medical evidence to misinformation on Twitter. There is a common thread to Dr Adam Dunn's research, though at first glance it may be hard to see. Adam leads two streams of research at AIHI's Centre for Health Informatics (CHI). The key to his work is spread.

"My doctoral thesis was on a new kind of modelling formalism that would help us predict the spread of bushfires", Adam says. Later, as a post-doctoral fellow in landscape ecology, he modelled the spread of invasive weeds and animals, and later still, workflow processes in hospitals, alongside CHI's Farah Magrabi.

At CHI he currently heads teams working in two related but distinct fields: "We are looking at biases in the production of evidence and the synthesis of evidence. And we've been working on computational epidemiology – specifically, how people decide not to vaccinate their children."

"We used Twitter to look at all the people who tweeted about the HPV vaccine. It turns out if you are exposed to negative information you're much more likely to retweet an anti-vaccine opinion."

2

FILE NOT FOUND: THE TROUBLE WITH e-RECORDS

Putting a beautifully simple theory into practice can be a lot harder than it looks. Computerised medical records are a perfect example. And Tom Bowden, at CHI, is the perfect researcher to find out why.

Before embarking on a research career Tom had plenty of hands-on, real-world experience with digitised clinical information. In 1993 he set up HealthLink, a private company which exchanges patients' records and clinical information between general practices and other parts of New Zealand's health sector. HealthLink has since expanded to Australia and Canada.

In theory, electronic health records are a great idea: in whichever part of the health system you find yourself, all your records are available for clinicians who may never have seen you before. But making the ideal a reality has generated a lot of error messages.

"It has been disappointing in most of the big implementations", Tom says. "In the UK they allocated £12bn and they actually had to close the system down. In Australia the Government has spent $1bn on the Personally Controlled Electronic Health Record and it's not widely used. It is the same in the US."

For his PhD, Tom is researching the use of primary care and pharmacy records during unscheduled care. "I want to deepen my understanding of shared record systems. I want to understand the right way to implement them."

3

FROM CLIMATE HEALTH TO PUBLIC HEALTH

Researchers at AIHI come from distant places – both geographically and intellectually. Dr Blanca Gallego-Luxan, a member of the Centre for Health Informatics team, began her academic career in the United States building predictive models of climate systems.

When she moved to Sydney she shifted academic direction, heading, first, into environmental economics and then into health. Although modelling the dynamics of climate and those of a health system are related, she likes the contrasts.

"Climate dynamics is very theoretical", Blanca says. "You are solving differential equations. You are looking at climate models, which are huge things. In health it is extremely empirical."

Blanca's a work has focused on predictive models for patients, in particular using real-time studies. During a six-month sabbatical at Stanford University in 2014, she worked on the so-called green button project. The idea is to give clinicians real-time data about other patients with similar conditions to those they are treating, how they were treated and how they fared.

Blanca is also studying patients' trajectory in hospitals. When a patient is admitted, what is the probability they will be alive – or dead, or discharged – in a week's time? And how does that probability change as their stay progresses? "We are focusing on the temporality of events – what day in the week things happen, whether more people die on the weekends."

4

THE YEAR GUY TESTED THE WATERS

Dr Guy Tsafnat and his team at CHI had been working for eight years on strengthening existing measures to protect against what the World Health Organisation calls the world's highest priority health problem – lethal antibiotic resistant superbugs.

In a process known as cycling, a hospital will stop using a particular antibiotic temporarily to allow antibiotic resistance to subside. Hospitals or wards may monitor microbial ecosystems, but until now no mechanism has been available to give instant feedback, so that cycling regimens can be adjusted for maximum effectiveness.

To translate this research into working technology, Guy has created a startup company called Spokade. Guy says the process combined academia and the commercial world "using each system for what it is good at".

"Academia is good for research and showing something works. The university will help you a certain way but they will not go beyond that. They will help you bundle it up and say, 'Off you go.'

"To take it to the world, that is where the commercial world comes in."

Large scale research initiatives

WOMBAT DIGS DEEP INTO THE WORLD OF HEALTH SYSTEMS

When new technology arrives in a hospital or clinic, it will change the way doctors and nurses work. But how? And how can those changes be measured accurately so administrators can determine how that expensive new technology is making a difference? Those questions lie at the heart of the work of CHSSR. And to help answer them, AIHI researchers have devised some new, world-leading technology of their own – the Work Observation Method by Activity Timing system, also known as WOMBAT.

Using WOMBAT on a convenient seven-inch tablet computer, an observer can log accurately, and in all their complexity, the work and communication patterns of health professionals as they go about clinical tasks. The data collected can then be uploaded to an external server where it can be compared with that from other observers, analysed and made available to participating researchers.

CHSSR researchers, led by Professor Johanna Westbrook, developed WOMBAT because they found existing systems were not sensitive enough to reflect the nuances of clinical work – including important but extraneous details like interruptions and multitasking. The software, which uses the Android operating system, initially measured four work dimensions – what task is under way, who is performing it, where, and what information resource is being used. Different versions were developed to fit the work of nurses, doctors and pharmacists.

The latest version of the technology (WOMBAT 2.0) allows researchers anywhere to modify it to suit local research needs, or to answer a specific question. WOMBAT has now been used under licence by research teams in Australia and overseas, and its value has been confirmed in a Canadian study.

ENSURING e-HEALTH LIVES UP TO ITS PROMISE

e-Health is revolutionising healthcare – and throwing up new problems and new areas for our researchers to investigate as it does so.

Our research has established the advantages of e-Health in, for example, reducing turnaround times, duplication and error rates in medical imaging and pathology testing. It can also improve performance in areas where paper-based systems cannot. An AIHI study showed how a system of following up test results, introduced into a Brisbane hospital, led to the acknowledgement of all results, with more than 60 per cent acknowledged within 24 hours.

The biggest promise held out by e-Health is that it will turn health systems into learning systems. We can learn from the experience of every patient admitted and every system installed, and feed that information back to those involved to create cycles of continuous improvement. With computers tracking each medical test from the initial order to the receipt of results, errors and delays in clinical processes can be quickly identified. AIHI has been researching how to automate the process because unless holdups are found quickly the potential for improvement will be lost. Real-time monitoring can detect disruptions to processes including ICT incidents. Based upon syndromic surveillance, which is well established for disease outbreaks, we have shown ICT systems can be monitored in real time to detect early any incidents that might lead to an adverse event.

The e-Health revolution – the use of information and communication technology in the health system – is incomplete. New information technology systems have been developed separately and in isolation. AIHI research has shown

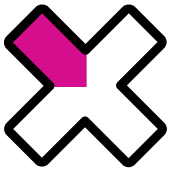
An AIHI study showed how a system of following-up test results, introduced into a Brisbane hospital, led to the acknowledgement of all results, with

more than 60%

acknowledged within 24 hours.

57%

of Australian consultations receive 'appropriate' healthcare.



20-30%

of today's care delivers no benefits.

10%

of medical error rates in hospitals remain high.

e-Health, for all its many advantages, can introduce unforeseen errors that may lead to patient harm. The challenge today is to integrate the systems and monitor them better so problems can be detected before harm is done.

GETTING HEALTHCARE ONTO THE RIGHT TRACK

Getting the right healthcare to the right people at the right time is critical to ensuring the best possible outcomes for patients. Building on its landmark Caretrack Australia study, AIHI is leading internationally-significant research to enable the delivery of 'appropriate care'; that is, care in line with best practice based on the latest medical evidence.

In the first national snapshot of the quality of clinical care in Australia, and only the second such study worldwide, Caretrack Australia revealed in 2012 that Australians receive 'appropriate' healthcare in only 57 per cent of consultations. The study covered 22 common conditions responsible for over 40 per cent of the total national disease burden. For some conditions, such as coronary artery disease, patients received very high levels of appropriate care (90 per cent) but there was very poor compliance with appropriate care standards in other areas, such as alcohol dependency (13 per cent), administering prophylactic antibiotics at the correct time before surgery, as well as big discrepancies between healthcare providers.

By establishing for the first time crucial baseline data, the study has laid the foundation for innovative solutions as well as prompting AIHI's major follow-on study of the appropriateness of the care provided to our children, CareTrack Kids.

CareTrack Australia found today's complicated and voluminous clinical guidelines are one major barrier to appropriate care. Clinical guidelines that are difficult to synthesise and burdened by duplication and out-of-date information discourage routine use. New brief, plain English, wiki-style guidelines for use on smart phones and other devices – and suitable for both clinicians and patients – are being developed and piloted by AIHI researchers as a potential breakthrough solution.

US evidence indicates there is significant wastage in healthcare systems – some 20-30 per cent of today's care delivers no benefits. Medical error rates also remain high – about 10 per cent in hospitals. This suggests that by getting healthcare onto a more appropriate, evidence-based track we could simultaneously improve care and reduce costs.

A $10.8M CHALLENGE: TRANSLATING RESEARCH INTO BETTER CARE

AIHI is working to reshape the future of healthcare in Australia and internationally by moving beyond conventional small-scale, localised efforts to build theoretically sound new approaches that achieve systems-wide change.

Backed by a $10.8m NHMRC grant, the third largest program grant announced in 2012, the AIHI team and their international partners are focusing on the translational challenge for healthcare. That is, how we can implement sustainable, large-scale improvements across complex, dynamic healthcare systems.

Despite decades of research effort, patients in modern healthcare systems still receive care that is highly variable, frequently inappropriate and too often unsafe. Although there is widespread agreement among clinicians, academics, policy-makers and funding bodies that a

breakthrough is urgently needed, progress has been frustratingly slow. This is in large part because we do not yet understand the foundational processes of translating evidence into practice.

Five research streams are investigating and deploying effective, transferrable approaches to translating evidence into better clinical practice, while concurrently building our knowledge of the theory and science of implementation.

THE PROGRAM GRANT TEAMS ARE FOCUSING ON:

1. **Adaptive analytics**
   Employing emerging 'big data' methods to develop evidence-based clinical indicators for system feedback and to test their power to predict patient risk.
2. **Universal monitoring**
   Harnessing our evidence-based indicators to trial a universal approach to monitoring patient care and responding to clinical deterioration in general wards of acute hospitals.
3. **Leveraging e-Health**
   Focusing on medication orders using electronic systems across aged care, primary care and hospital settings.
4. **Consumer mobilisation**
   Overcoming barriers to engagement by both consumers and healthcare providers in monitoring and improvement processes.
5. **Implementation science**
   Unravelling how context shapes effective implementation by applying an explicit translational model to our improvement strategies (1-4 above), and by executing an international study assessing complex adaptive ecosystems in a collaborative project with eight countries in Europe.

NHMRC CENTRE FOR RESEARCH EXCELLENCE IN INFORMATICS AND E-HEALTH

The NHMRC Centre for Research Excellence (CRE) in e-Health commenced operation in 2012, and is funded for five years. Investigators in the CRE come from UNSW, Bond University, Sydney University and the University of South Australia. Professor Coiera directs the $2.5m CRE, whose work program includes new collaborative research between the Centre for Health Informatics at UNSW and its two partner universities. The other lead investigators of the CRE are Professor Paul Glasziou (Bond), Professor Teng Liaw (UNSW), Dr Vitali Sintchenko (Sydney), Professor Bill Runciman (South Australia), Dr Farah Magrabi (Macquarie) and Dr Blanca Gallego-Luxan (Macquarie).

The CRE targets **major evidence gaps in the safety and quality of clinical and consumer e-Health systems**. It also intends to contribute robustly to national e-Health policy, and urgently build national capacity in e-Health research to meet current and emerging national health priorities. The CRE is conducting a collaborative research program with three major aims, where research evidence is urgently needed, and opportunities for translational impact are high.

Aim 1	**A NATIONAL E-HEALTH INCIDENT MONITORING SYSTEM** To monitor the safety and quality of e-Health implementations as they roll out nationally, the CRE is developing, and will in the early stages operate, a national e-Health critical incident system. Analysis of incident reports can generate critical alerts for government, vendors, clinicians and the community, as well as contribute to the development of an international classification of information technology (IT) related incidents, and theoretical and empirical models of IT failure.
Aim 2	**CONSUMER E-HEALTH TRIALS** Despite the growing national investment in consumer personal health record systems, we know little about their impact on health outcomes, or the types of errors that are associated with their use. Given the importance of disease prevention and self-management in the chronically ill, the CRE is trialling a novel consumer e-Health system to measure it's potential impact on outcomes or service utilisation.
Aim 3	**EVIDENCE-BASED DECISION SUPPORT** Whilst current clinical decision-support systems typically improve clinical decisions overall, there are significant risks that clinicians can be misled in certain settings or circumstances, to make poorer decisions. The CRE is developing the next generation in evidence-based decision-support technologies, engineered to minimise risks with current systems that can mislead users, or fit poorly into practice. The CRE is pioneering the use of these technologies to support systematic review teams.

Students

PHD PROGRAM

Diana Arachi
Tom Bowden
Craig Campbell
Deborah Debono
Mary Potter Forbes
Frank Formby
Narcyz Ghinea
Klay Lamprell
George Larcos
David Lyell
Janine McIlwraith
Virginia Mumford
Hamish Robertson
Karen Ru Kwedza
Catherine Sharp
Anne Sinclair
Bella StClair
Scott Walter
Victoria Walton
Su-Jen Yap

MASTERS PROGRAM

Christoph Camphausen
Tobias Hodgson
Brian Johnston
Ken Lee
Natalie Page
Sasa Popovic
Werner Van Huffel

Grants

GRANT	INVESTIGATORS	GRANTING AGENCY	GRANT AMOUNT
Understanding the disruption-driven clinical environment to enable improvement in patient safety	**S Walter**	NHMRC	$78,437
Exploiting new opportunities with an electronic prescribing system to identify prescribers at risk of making prescribing errors	**M Baysari** **L Li** **R Day** K Richardson	St Vincent's Clinic Foundation Research Grant	$30,000
Examination of variation in hospital pathology investigations by Diagnosis-Related Groups and associations with outcomes and costs	**A Georgiou** **JI Westbrook** **L Li**	Department of Health and Ageing	$95,752
A benchmark study of the frequency and variability of haemolysis reporting across pathology laboratories – the implications for quality use of pathology and safe and effective patient care	**A Georgiou** M Mackay **L Li**	Department of Health and Ageing	$153,759
Development of an evaluation model for assessing the effectiveness of ICT to integrate services and improve service performance and client experience	**JI Westbrook** **A Georgiou**	ARC	$914,043
Video Consultation Capability Project – After Hours GP Helpline and the Pregnancy, Birth and Baby Helpline	**A Georgiou** **JI Westbrook**	Healthdirect	$300,657
Personally Controlled Electronic Health Records for young adults with communication disabilities: Charting the course for successful child to adult health service transition	B Hemsley S Balandin **A Georgiou** S Hill	NHMRC	$77,727
Can technology make communication in complex systems safer and more efficient? Evaluation of an electronic test management system in healthcare	J Callen **A Georgiou**	ARC	$260,000
Advancing understanding of health professionals' work and communication patterns and the effectiveness of work reform initiatives	**J Westbrook** W Dunsmuir C Duffield	ARC	$512,051
Assessment of the impact of four innovative technologies on the effectiveness and efficiency of the hospital workforce	**JI Westbrook** **A Georgiou**	Mater Misericordiae Health Services Brisbane Ltd	$52,795
Review of medication services for Healthdirect telephony and digital services	**MT Baysari** **L Li** **EC Lehnbom** **A Tariq** **MZ Raban** **JI Westbrook**	Healthdirect Australia	$96,698

*Names in **'Bold'** are AIHI staff members*

GRANT	INVESTIGATORS	GRANTING AGENCY	GRANT AMOUNT
Dynamic prediction of hospital length of stay, readmission, and death	**B Gallego-Luxan** F Martin-Sanchez **ASSOCIATE INVESTIGATORS:** K Hillman E Coiera R Day M Piccardi G Delaney V Sintchenko B Gardiner F Lin	NHMRC	$312,069
Real time surveillance for the early detection of e-Health related adverse events	**M Ong**	NHMRC	$299,564
Using collaboration networks to measure bias and inefficiency in the production and translation of evidence about cardiovascular risk	**A Dunn**	NHMRC	$214,182
Centre for Research Excellence in e-Health	**E Coiera** P Glasziou ST Liaw V Sintchenko W Runciman **F Magrabi** **B Gallego-Luxan**	NHMRC	$2,500,000
Near real-time identification of patient safety incidents reported by health professionals	**F Magrabi** W Runciman	NHMRC	$320,000
ME app. Development of cardiovascular calculator	**A Lau**	University of Sydney	$30,000
Mobile App for people with type 1 diabetics Mellitus who have stopped engaging with health services	**A Lau**	Novo Nordisk	$14,900

*Names in **'Bold'** are AIHI staff members*

GRANT	INVESTIGATORS	GRANTING AGENCY	GRANT AMOUNT
Large-scale IT systems failure in healthcare: Quantifying the risks to patient safety	**F Magrabi**	UNSW: Goldstar	$40,000
Bacterial DNA grammars: A bioinformatics method for understanding antibiotic resistance	**G Tsafnat**	UNSW: Goldstar	$40,000
External evaluation expertise and advice to NSML Care Co-ordination Program (CCP) Pilot with Private Health Insurers	**J Braithwaite** **P Hibbert**	Northern Sydney Medicare Local	$40,000
Evidence check on Healthcare Performance Reporting Bodies	**J Braithwaite** **P Hibbert**	Sax Institute	$25,000
Prince of Wales joint project	**J Braithwaite** P Bolton	POWH	$132,000
ISU escalation plan evaluation	**R Clay-Williams**	Townsville Hospital and Health Service	$23,375
PhD Awards for Improvement Science	**N Taylor**	University of Leeds	$8,530
Assessing patient cognition and behaviour in specialised MND multidisciplinary care: A feasibility study	**A Hogden** X Cal J Caga **D Greenfield**	MND Victoria	$100,000
The appropriateness of healthcare delivered to Australian Children: CareTrack Kids	**J Braithwaite** A Jaffe L White C Cowell M Harris **PARTNERS:** BUPA; The Sydney Children's Hospital Network; NSW Kids and Families; SA Department of Health, Children's Health Queensland, Clinical Excellence Commission	NHMRC	$1,263,318 $120,000 $120,000 $120,000 $120,000

*Names in **'Bold'** are AIHI staff members*

GRANT	INVESTIGATORS	GRANTING AGENCY	GRANT AMOUNT
The appropriateness of healthcare delivered to Australian Children: CareTrack Kids	**J Braithwaite** L White C Cowell A Jaffe W Runciman G Wheaton H Williams **P Hibbert** T Hunt N Hannaford	BUPA	$400,000
Population Health and Health Services Research Support Program Round 4 Conduct multidisciplinary research into health sector practices, organisation and management, to directly enhance the delivery of high-quality, safe, efficient and affordable healthcare	**J Braithwaite** (for the AIHI)	NSW Health	$1,000,000
Evaluation of In Safe Hands: Acquisition of baseline data	**J Johnson** **R Clay-Williams** **D Debono**	CEC	$29,942
Identification of performance indicators used internationally to publicly report on healthcare organisations and local health systems	**J Braithwaite** **P Hibbert** N Hannaford **J Long**	NHPA	$79,535
Building quality, governance, performance and sustainability in Primary Health Care Research Institutes	P Batalden J Dunbar J Fuller C Jackson C Nicholson P Reddy S Wilkinson **J Johnson**	CRE Shared Grant	$68,500
Creating safe, effective systems of care: The translational challenge	**J Braithwaite** **J Westbrook** **E Coiera** W Runciman R Day K Hillman	NHMRC	$10,855,710
Strengthening organisational performance through accreditation research: The ACCREDIT project	**J Braithwaite** **J Westbrook**	ARC	$2,350,000
Evaluating communities of practice and social-professional networks: The development, design, testing, refinement, simulation and application of an evaluation framework	**J Braithwaite** **J Westbrook**	ARC	$1,580,000

*Names in **'Bold'** are AIHI staff members*

Our staff

NAME	POSITION
ACADEMIC STAFF	
DIRECTORS/PROFESSORS	
Jeffrey Braithwaite	Director AIHI and Director CHRIS
Enrico Coiera	Director CHI
Johanna Westbrook	Director CHSSR
ASSOCIATE PROFESSORS	
Joanne Leighton Callen	Associate Professor
Andrew Georgiou	Associate Professor
David Greenfield	Associate Professor
Farah Magrabi	Associate Professor
SENIOR RESEARCH FELLOWS	
Melissa Baysari	Senior Research Fellow
Adam Dunn	Senior Research Fellow
Blanca Gallego-Luxan	Senior Research Fellow
Ling Li	Senior Research Fellow
Guy Tsafnat	Senior Research Fellow
RESEARCH FELLOWS	
Rosanna Cazzolli	Book Researcher
Robyn Clay-Williams	Research Fellow
Anne Hogden	Research Fellow
Annie Ying Shan Lau	Research Fellow
Oscar Perez Concha	Research Fellow
Joyce Siette	Research Fellow
Natalie Taylor	Research Fellow
Ying Wang	Research Fellow
POST-DOCTORAL RESEARCH FELLOWS	
Brette Blakely	Post-Doctoral Research Fellow
Miew-Keen Choong	Post-Doctoral Research Fellow
Deborah Debono	Post-Doctoral Research Fellow
Heather Douglas	Post-Doctoral Research Fellow
Elin Lehnbom	Post-Doctoral Research Fellow
Mei-Sing Ong	Post-Doctoral Research Fellow
Mirela Prgomet	Post-Doctoral Research Fellow
Magdalena Raban	Post-Doctoral Research Fellow
Amina Tariq	Post-Doctoral Research Fellow
Xujuan Zhou	Post-Doctoral Research Fellow

3 DIRECTORS/ PROFESSORS

4 ASSOCIATE PROFESSORS

5 SENIOR RESEARCH FELLOWS

8 RESEARCH FELLOWS

10 POST-DOCTORAL RESEARCH FELLOWS

37 ACADEMIC STAFF

7
RESEARCH ASSISTANTS

9
PROFESSIONAL STAFF

NAME	POSITION
ACADEMIC STAFF	
RESEARCH ASSISTANTS	**7**
Emily Hogden	Research Assistant
Rebecca Lake	Research Assistant
Gina Lamprell	Research Assistant (Part-Time)
Yu Jia Julie Li	Research Assistant
Danielle Marks	Research Assistant (Part-Time)
Charlotte Molloy	Research Assistant
Elia Julian Vecellio	Research Assistant
PROFESSIONAL STAFF	
Susan Christian-Hayes	Manager CHRIS
Sheree Crick	Manager CHSSR
Margaret Jackson	Administrative Assistant
Vitaliy Kim	Computer Systems Officer
Jingbo Liu	Computer Systems Officer
Jackie Mullins	Administrative Assistant
Victoria Pye	Statistician
Denise Tsiros	Administrative Manager CHI
Scott Walter	Statistician

NAME	TITLE	POSITION
VISITING STAFF		
Marie-Catherine Beuscart-Zephir	Dr	Visiting Fellow
Andrew Carson-Stevens	Dr	Visiting Fellow
Angus Corbett	Associate Professor	Visiting Fellow
Frances Cunningham	Dr	Visiting Fellow
Timothy Devinney	Professor	Visiting Professor
Oliver Groene	Dr	Visiting Fellow
Reece Hinchcliff	Dr	Visiting Fellow
Erik Hollnagel	Professor	Visiting Professor
Tamara Hooper	Ms	Visiting Fellow
Paula Hyde	Professor	Visiting Professor
Tor Ingebrigtsen	Professor	Visiting Professor
Brian Johnston	Mr	Visiting Fellow
Wendy Lipworth	Dr	Visiting Fellow
Paul Long	Mr	Visiting Fellow
Lena Low	Dr	Visiting Fellow
Russell Mannion	Professor	Visiting Professor
Yukihiro Matsuyama	Professor	Visiting Professor
Max Moldovan	Dr	Visiting Fellow
Virginia Mumford	Dr	Visiting Fellow
John Øvretveit	Professor	Visiting Professor
Charles Pain	Dr	Visiting Fellow
Marjorie Pawsey	Dr	Visiting Fellow
Sylvia Pelayo	Dr	Visiting Fellow
David Pereira	Dr	Visiting Fellow
Jennifer Plumb	Dr	Visiting Fellow
Geetha Ranmuthugala	Dr	Visiting Fellow
Maureen Robinson	Ms	Visiting Fellow
William Runciman	Professor	Visiting Professor
Charles Shaw	Professor	Visiting Professor
Alison Short	Dr	Visiting Fellow
Rosa Suñol	Professor	Visiting Professor
Richard Thompson	Professor	Visiting Professor
Robert Wears	Professor	Visiting Profesor
Mary Westbrook	Professor	Conjoint Fellow
Louise Wiles	Ms	Visiting Fellow

35
VISITING STAFF

Publications 2014

BOOKS

2014

1. **Johnson J,** editor. *Learning from Patient Stories*. Jones and Bartlett; 2014.

BOOK CHAPTERS

2014

2. **Baysari MT**, **Westbrook JI**, Richardson K, Day RO. Optimising computerised alerts within electronic medication management systems: A synthesis of four years of research. In: Grain H, Martin-Sanchez F, Schaper L, editors. *Studies in Health Technology and Informatics*. 2014. (204) p. 1-6.

3. **Clay-Williams R, Johnson J, Debono D, Braithwaite J**. The path from policy to practice: Resilience of everyday work in acute settings. In: Waldorf S, Pedersen A, Ferlie E, Fitzgerald L, editors. *Managing Change – From Health Policy to Practice*. London: Palgrave Macmillan; 2014. (Accepted 3 Oct 2014.)

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