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HCF Research Foundation Impact Review

Final Report

Prepared for: The HCF Research Foundation

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Abbreviations

CRE	Centre of Research Excellence
JCR	Journal Citation Reports
NHMRC	National Health and Medical Research Council

1 Executive Summary

The HCF Research Foundation has commissioned the Social Policy Research Centre (SPRC) at UNSW Australia (the University of New South Wales) to undertake a Research Impact Review of the ten most recently completed (by end of 2015) research projects funded by the Foundation.

This is the final research impact report. It outlines the review framework and methodology, findings from the bibliometric analysis, interviews with key researchers of the ten projects under review, interviews with other stakeholders (end-users of the research), as well as a brief literature review.

The aim of the research impact review was to assess the degree to which the HCF Foundation research funding from 2002-2010 had contributed to improving the understanding of health services in Australia, looking at the ten most recently completed research projects.

Findings

The literature review identified conditions that facilitate research which has a high impact. The implications for commissioning agencies such as HCF are that agencies can support impact in a number of ways:

- Identify important and relevant research questions when commissioning research
- Support research of high-quality by ensuring that independent experts participate in commissioning and reviewing research, and that researchers receive support and guidance
- Provide targeted support for dissemination
- Support and provide resources for translational activities

Appropriateness (broader impact on health), the extent to which the HCF research program is consistent with the Foundations' funding mission:

- The majority of grants (n=8) ranged from $50,000 to around $300,000 Australian dollars. One grant was under $50,000; seven grants were $100 to 350,000; and two grants were around one million, one 1.4 million.
- All projects contributed to either bridging the gap in evidence or building the existing evidence-base.

- Researchers all stressed the importance of the HCF Foundation funding to enable them to undertake research that would otherwise not have been possible.

- The selected projects have overall contributed to filling existing gaps in evidence and to improving the understanding of health services in Australia.

Overall body of evidence: the extent to which the Foundation funded research projects have bridged gaps in evidence.

- The majority of evidence was produced for academic audiences – articles in peer reviewed journals (n=32). This is a positive finding considering the short time span most projects had post post-project completion to disseminate their findings.

- The research was disseminated and presentations at international and national conferences (n=28), and more targeted audiences: conferences for practitioners (n=6), workshops and trainings to service providers (n=6), and various specialised forums.

Quality of research produced: as evidenced by high-impact publications and citations.

- The HCF Foundation funded research was published across 15 JCR listed journals and nine non-JCR listed (but all refereed journals).

- Research was published in a wide range of fields and subject areas. Some of the more frequently published in categories include: health care sciences and services (n= 6 publications); medicine, general and internal (n= 5 publications); and computer science, information systems (n= 3 publications).

- The funded research published in SCOPUS listed journals has been cited an average of 0.85 times (Table 7). The respective citation rate of the same articles on average is 1.25 when using Google Scholar.

- There is great variability in the citation rate between articles and across years. Articles published earlier (2012-2013) have a much higher citation rate than the more recent publications 2015 and 2016.

- Some factors that may have contributed to higher research outputs in some cases include: time since project completion; positive findings of the research/ intervention; being part of a larger research infrastructure/ research program; and resources to publish.

Research capacity: the extent to which the Foundation has contributed to building research capacity in the area of health service research more widely.

- In total four out of the ten projects had engaged graduate or post-graduate students as part of the HFC funded research, or as a result of it students were engaged following project completion to continue or extend the research topic.

- Some researchers highlighted that the HCF Foundation funding was limiting in terms of engaging students as it was generally short term funding for one to two years.

- Eight out of the ten projects had applied for subsequent funding after completing the HCF Foundation funded research project. In two cases the research teams were still awaiting a response from the National Health and Medical Research Council (NHMRC) reviewers on their application.

- Three out of the ten Foundation funded projects had NHMRC applications in place (two awaiting a response and one successfully granted). One of the ten projects received a highly competitive and respected Centre of Research Excellence grant awarded by the NHMRC.

- All researchers agreed that their involvement in the HCF funded projects was beneficial to them in terms of their research career: building a track record of successful funding applications, publications, and dissemination, applying for much larger research funding (i.e. NHMRC grants in four cases).

Facilitation of the translation of evidence into practice: opportunities for implementation of research in the short to medium term.

- Eight out of the ten projects were actively involved in promoting their research to a range of stakeholder groups (i.e. study participants and associated professionals, such as research partners, hospital management staff, hospital boards).

- The extent to which researchers held forums to non-academic and academic groups appeared to depended on the type of research the project was undertaking and the findings from the research (i.e. new evidence, consolidation of existing knowledge, controversial findings).

- Projects which had published a number of papers were more likely to present their research findings to various audiences, at a range of conferences, forums and meetings.

- Researchers reported mixed experiences with respect to their success in engaging policy and decision makers as a result of the HCF Foundation funding. The majority acknowledged that it was rather early for their research to have made a direct impact on the development of programs, protocols, or influence wider system change.

- They were overwhelmingly positive about establishing new and enhancing existing research relationships, partnerships and professional networks, mostly national but in three cases also international.

- For many this goal, influencing policy and practice, was part of a longer process and the HCF Foundation funding was considered a critical 'stepping stone' in that direction.

- Four projects reported awaiting or being awarded a NHMRC grant and other funding (Centre of Research Excellence) as a direct outcome of the HCF Foundation project. This is a positive outcome, not only for leverage of external funding, but also for the translation of evidence into practice in the medium term (i.e. validation and extension of innovative findings through a randomised control trail).

- The review found little evidence of the direct application of the research in the Australian health systems to date. This is not surprising, as the majority of projects were innovative and trailed new approaches.

Public impact: the extent to which the research program has raised and enhanced the profile of the Foundation.

- Overall the review found that the Foundation was well regarded by the researchers.

- Most researchers reported that they believed their projects had raised and enhanced the profile of the Foundation more widely, beyond their research teams, research partners or universities.

- Researchers also reported that the relationship between the HCF Foundation and the research community was mutually reinforcing, since they believed that the Foundation added prestige to their work.

Value and cost: the extent to which the cost of the funded research represents value for money.

- In total the HCF Foundation awarded around $4,265,700 dollars to the ten research projects.

- All projects produced new knowledge and added to the evidence base of understanding health services in Australia.

- In many cases, to supplement the HCF funding, researchers allocated extra resources and in-kind contributions from other sources to undertake or complete the research.

2 Introduction

The HCF Research Foundation has commissioned the Social Policy Research Centre (SPRC) at UNSW Australia (the University of New South Wales) to undertake a Research Impact Review of the ten most recently completed (by end of 2015) research projects funded by the Foundation. This final research impact report outlines the review framework and methodology, findings from the bibliometric analysis, interviews with key researchers of the ten projects under review, interviews with other stakeholders (end-users of the research), as well as a brief literature review. The aim of the research impact review was to assess the degree to which the HCF Foundation research funding from 2002-2010 had contributed to improving the understanding of health services in Australia.

2.1 Background to this review project

The Hospitals Contribution Fund (HCF) established the HCF Research Foundation in 2000 as the HCF Health and Medical Research Foundation to fund health and medical research for the benefit of all Australians. In 2008 the focus of the HCF Research Foundation moved towards health services research.

The objectives of the Foundation are to improve the prevention, treatment and cure of diseases in the general community by funding research and study proposals that enhance and utilise current knowledge to improve health and health services; and improve the quality, efficiency, access to and equity of provision of health services.

The HCF Research Foundation prioritises projects in applied or experimental research in the area of health services research. Priority is given to projects which:

- Can be classified as implementation research
- Have results which can be implemented in the short to medium term
- Are scalable in order that results can affect a larger number of Australians
- Are conducted by an investigative team from a range or backgrounds including career researchers and clinicians.

As of June 2016, the HCF Research Foundation has funded 36 research projects.

Overall the HCF Foundation is committed to making health care understandable, affordable, high quality and customer centric (HCF, 2015). The HCF Research Foundation Annual Report 2014/15 summarise the Research Foundations' vision statements as follows:

- To be known as independent funder of high quality research, demonstrating that investment in can contribute to the improvement of the health of Australians,
- To be easy to deal with so that researchers are not subject to onerous requirements with regards to applications and reporting in order that they can spend their time focussing on research, and
- To contribute to capacity building in the area of health services research by encouraging new researchers and service providers to partner with career researchers to develop sound project plans.

The Foundation's vision statements have guided this review, in particular to define the scope and aims of this research project.

2.2 The review aims

The aim of this review was to assess the degree to which the Foundation research funding from 2002-2010 had contributed to improving the understanding of health services in Australia, with a particular focus on the ten most recently completed research projects (completion by end of 2015).

Overall the review uses seven criteria (I to VII) to measure the research impact of the ten selected projects.

I. **Appropriateness** (broader impact on health): the extent to which the HCF research program is consistent with the Foundations' mission of funding projects that consider the most effective ways to organise, manage, finance and deliver high quality care; reduce errors; and improve patient safety.

II. **Overall body of evidence**: the extent to which the Foundation funded research projects have bridged gaps in evidence.

III. **Quality of research produced**: as evidenced by high-impact publications and citations.

IV. **Research capacity**: the extent to which the Foundation has contributed to building research capacity and the research workforce in the area of health services research.

V. **Facilitation of the translation of evidence into practice**: opportunities for implementation of research in the short to medium term.

VI. **Public impact**: the extent to which the HCF Research Foundation research program has raised and enhanced the profile of the Foundation.

VII. **Value and cost**: the extent to which the cost of the funded research represents value for money.

3 Review Methodology

3.1 Review approach

There is shared understanding amongst academics and funding bodies that comprehensive monitoring and measurement of (health) research impact is a complex undertaking. Commonly review frameworks apply multi-dimensional categorisation and concepts to measure impact, including traditional measures, such as research outputs, publications, and research funding; and more recently 'broader' benefits, for example, capacity building, policy, product development, or societal and economic impacts (Milat, Bauman, Redman, 2015, p.6). According to the authors it is particularly challenging to attribute longer-term societal and economic benefits to any type of multi-dimensional research impact assessments:

> A major challenge is attribution of impacts and understanding what would have happened without individual research activity or what some describe as the 'counterfactual'. Creating a control situation for this type of research is difficult. (Milat, et al, 2015 p.7).

In this review we have utilised an amended Payback Framework developed by Hanney et al (2004) and adapted by Oortwijin et al (2008) and Kalucy et al (2009). The Payback Framework consists of two elements:

1) The multi-dimensional categorisation of the benefits of health research, which range from traditional knowledge production and research training and targeting, to impacts on policy and product development through to health and economic gains;

2) A logic model of how best to assess these impacts. The categories used in the framework are: knowledge production, research benefits, research transfer, informing policy, changing health practice, broader impact on health and public impact.

The framework was further refined to the needs of this research impact review (Table 1). Under research transfer we added a focus on translational outputs to capture so called stable and accessible outputs like radio, TV, articles in professional magazines, as well as active and on-going knowledge dissemination and networking. A recently completed study by Bauman et al (2015) found that health research was 'more likely to have policy and practice impacts if good quality translational resources were readily available to practitioners' (Bauman et al. 2015 p.34).

Table 1: Research impact review framework[1]

Domain	Criteria	Outputs and Activities	Benefits
Knowledge production	Academic impact (research community)	• number of peer-reviewed publications, cited articles, impact factor of journals • number of presentations • development of other media, books, websites and publications	• innovation • building and consolidating evidence
Research benefits	Esteem measures	• research degrees • subsequent funding (leverage of research grants) • staff development • awards, fellowships, appointments to Advisory Groups	• build researchers' capacity • enhance research capacity
Research transfer	Translational outputs	• forums and workshops with key end-users groups of research • accessible and stable delivery mechanisms (e.g. newspapers, professional magazines, radio, TV, websites, social media) • active, on-going dissemination and networking • lobbying government ministers or departments	• improved engagement with the community/ health sectors • improved relationships btw universities and the health sector • engagement of policy-makers (government/non-gov, and boards)
Informing policy	Applied measures	• NHMRC Guidelines, new medical devices/strategies or protocols • Produce knowledge about treatments, programs, organisational strategies aiming to improve health and health service delivery • Health education campaign	• innovation • contributed to evidence-based policy making • led to more equitable service delivery
Changing health practice	Facilitating change	• evidence of direct application or likely application in the future • used in clinical practice • implemented in service delivery	• led to more equitable service delivery • led to improved health outcomes
Broader impact on health	Long term outcomes	• evidence of benefits to systems, populations and society once research is implemented • other societal and economic impacts	• led to improvements in population health • economic benefits (more cost effective, efficient, equitable service delivery)
Public impact	Representation of HCF	• influenced the profile of HCF Research Foundation • influence consumer satisfaction with HCF Research Foundation	• objectives and vision of the HCF Foundation are upheld

[1] Payback Framework developed by Hanney et al (2004) and adapted by Oortwijin et al (2008)

3.2 Methodology

The three main methods we applied to conduct this impact review are:

1) bibliometric analysis

2) interviews with researchers (from the ten selected projects)

3) interviews with end-users of the research produced

4) targeted literature and evidence review around translation of research into policy and practice

Table 2: Review methods used to assess evaluation criteria

	Review Methods			
Evaluation criteria	Bibliometric data analysis	Interviews with researchers	Stakeholder consultations	Literature review
1. Appropriateness	✓	✓	✓	
2. Overall body of evidence	✓	✓	✓	
3. Quality of research produced	✓			
4. Research capacity		✓	✓	
5. Facilitation of the translation of evidence into practice		✓	✓	✓
6. Public impact		✓	✓	
7. Value and costs		✓	✓	

3.2.1 Bibliometric data analysis

Bibliometric analysis is the application of quantitative analysis and statistics to publications such as journal articles and their citation counts (Thomson Reuters, 2008). The simplest form of bibliometric analysis is counting the number of publications, which may be used as a measure of output. Bibliometric analysis has also frequently been used to show how many times a researcher's work has been cited in key literature, but it is increasingly being used as a measure of research impact.

Caution should be exercised in relying solely on bibliometric analysis to evaluate the impact of research, because the impact factor (see below) of a journal does not necessarily reflect the performance of any individual article published in that journal

in terms of the number of times that particular article has been cited. Nevertheless, publication of research in a prestigious journal does indicate an acknowledgement of scholarly achievement (Thomson Reuters, 2008).

The bibliometric analysis for this report was done to build a picture of the quality of research produced as a result of the Foundation funding. While the bibliometric analysis forms only one component of the research impact review, and results should be viewed in conjunction with the other methods, the extent and quality of dissemination is an indicator of the extent to which the HCF Research Foundation funded research bridges gaps in evidence.

Journal impact factor

The Journal Impact Factor is the average number of times articles from the journal published in the past two years have been cited in a given year, in this case 2014.

The Impact Factor is calculated by dividing the number of citations in 2014 by the total number of articles published in the two previous years. A higher Impact Factor is reflected in a higher score. An Impact Factor of 1.0 means that, on average, each article published one or two years ago has been cited once. An Impact Factor of 2.5 means that, on average, each article published one or two years ago has been cited two and a half times. Citing articles may be from the same journal, although most citing articles are from different journals (Thomson Reuters, 2008).

Journal ranking

Journals are ranked within each subject category (i.e. oncology, health care sciences and services) by impact factor. The journal with the highest impact factor is ranked number one on the list. For this review we have used *Journal Citation Reports* (JCR) to compare journals in each subject category.

JCR is a measurement based on the citation index database *Web of Science*, which draws on data from over 11,000 scholarly and technical journals. One limitation of using any form of measurement applied to journals is that no database can be fully comprehensive (of all existing, peer-reviewed journals). Journals, for example, which are very recent, or only appear on-line and provide open-access only, may not be found in any of the major citation index databases. Therefore these journals cannot be ranked against others in the same category.

Analysis

It was not feasible for the researchers to scan databases to identify output associated with the research projects under review due to the small number of research projects and the very recent completion date (at time of output data collection). The corresponding outputs, peer-reviewed and non-peer reviewed

publications, were identified by the lead researchers (or the whole team of investigators) during the researcher interviews.

This method of identifying and collating research outputs has the benefit that only outputs associated with the HCF Research Foundation funded projects have been included in this review.

The results of the bibliometric analysis of academic output are presented:

- By number of peer reviewed publications by project and completion date
- By number of publications in peer-reviewed journals (JCR & non-JCR) by year
- By journal tile and number of articles, impact factor, and subject category, and journal ranking
- By citation counts for journal articles published in SCOPUS
- By citation counts for journal articles found in Google Scholar only

Citations

The bibliometric analysis also considers the number of times each article has been cited. Citations refer to the number of times that a publication has been referenced by other authors. As such, it is one indicator of the impact of research (Hanney et al., 2004). In other words, a publication with many citations has been considered important enough to be referenced in other work and by other authors in the discipline.

Traditionally research impact reviews mostly include citation rates (the number of citations for each article) relying on scientific scholarly databases, to a much lesser extent Google Scholar. There are a range of benefits and limitations to these scientific databases and the citations they can capture, as they exclusively focus on scholarly peer-reviewed journals and output. Google Scholar captures a much wider range of citations, including those in policy documents and other non-reviewed outputs. No search engine is completely accurate, and Google Scholar in particular is known to be vulnerable to reporting inflated citation counts.

For this review we searched each article independently in SCOPUS, also Google Scholar, and recorded the number of times it had been cited in each of these data bases. We included citation rates for SCOPUS (a major scientific scholarly database) for journal articles found in this database, and for comparison citation counts from Google Scholar for the same articles. For the peer-reviewed articles which could not be identified in SCOPUS, we have listed Google Scholar citations counts only.

The citation analysis was conducted in April and completely updated in June 2016 for the final review report.

3.2.2 Researcher interviews

In-depth interviews (individual and small groups) were conducted with principal investigators and researchers from projects funded by the HCF Foundation. The purpose of these interviews was to examine the impact of the research projects in much greater detail than in the documentary analysis (final project research reports) and bibliometric analysis. In total, eleven research projects were contacted and ten agreed to participate and contribute to the review project. In total, 16 researchers participated in ten interviews. All interviews took place by telephone.

In June 2016, we sent emails to all ten project chief investigators, asking them to identify any new output data (publications, presentations, funding outcomes) for the Final Research Impact report. Four projects reported new publications, and one reported a conference attendance as part of the June 2016 (email update). These new data were included for this Final Report.

3.2.3 Stakeholder consultations

The research design has been developed to involve a range of stakeholder groups in the consultations for this review. All ten research projects were asked to nominate 'end-users' of the research produced to take part in interviews.

End-users, for this purpose are defined as stakeholders who may have benefited from and utlilised HCF Research Foundation research, for example, medical and professional staff in service delivery, hospital managers, policy makers, members on boards and advocacy bodies. Six out of the ten projects put forward details of possible end-users. We contacted in total nine people and four agreed to participate in short phone interviews. The interviews were conducted in June 2016 and included in this report.

3.2.4 Literature review

One aim of this research project was to identify factors and conditions that enhance, or deter the likelihood of research impact. We undertook a brief, targeted review of relevant literature to identify broader research factors, beyond the evidence arising from the ten selected case studies, with a specific focus on the following questions:

1. What is research impact (and how can it be measured)?

2. What strategic conditions that enhance or challenge the likelihood of research impact?

3. What implications can be drawn for the HCF Foundation?

3.2.5 Ethics

The research was approved by the University of New South Wales (UNSW) Human Research Ethics (HC approval number: HC15780). Researchers maintained high standards of ethical research practice: recruitment was arms-length, via invitation through the Funding body, and participation was voluntary. All participants/ researchers were given the opportunity to revoke consent at any time.

3.2.6 Data limitations

The findings presented in this report have a number of limitations.

The ten research projects included in this review were selected based on their completion at the time of nomination (for the review), as well as voluntary participation. The selection process was discussed and agreed upon with the Foundation, and the Foundation approached the ten most recently completed projects (between September and October 2015). The selected projects were then invited to take part and contribute to the review. It is not possible to generalise the findings of this review to other HCF Foundation funded projects as we do not know if the most recently completed projects are representative of the whole group.

As noted, the research design is based on the ten most recently completed projects (completion by September 2015). In terms of research outputs this means that publications will generally be too recent to have made an impact, as measured by traditional bibliometric analysis.

Recruitment to the review was smooth and most projects were positive about their participation. However, one nominated project did chose to withdraw their participation after reading the consent forms and before taking part in the researcher interview. This occasion demonstrates that not all researchers were confident about their participation, and some may have perceived the review as a form of monitoring or benchmarking their research performance against other projects with similar funding amounts. The research team ensured participants' confidentiality throughout the research process.

In the early design phase we proposed a direct comparison of project case studies. However, it appeared that such an approach was not fully feasible for this review due to the great variations between the projects. Projects varied greatly in terms of the funding and scope of the research; the stage they were in, at the time HCF Foundation funding was allocated (i.e. completely new research in which the HCF grant was considered seed funding, or on-going well established research agenda).

As part of the analysis we developed detailed case studies for each of the projects, and analysed them in the ‘bigger picture’ to other projects. This approach allowed us to draw out and identify contextual factors, which appeared to have driven certain research projects more strongly than others (i.e. in the production of translational outputs and strategies to engage policy makers).

4 Findings: Literature review

4.1 Measuring research impact

There exists a large body of literature measuring research impact in public health. This can include anything from measuring the decision-making impact of applied health research to identifying effective models and strategies to support knowledge translation (see for example, Lavis et al. 2003, Armstrong et al. 2006). Some have argued that when it comes to measuring impact, there is a tendency to count what can be measured, rather than measuring what counts in terms of enduring changes (Wells & Withworth, 2007). More broadly research impact comes in a number of outputs, outcomes and other forms (such as collaborations, relationships), and it is frequently assessed through mixed methods:

- Quantitative measures: citation rates, number of publications in peer-reviewed journals, leverage of research funding, guidelines and patents etc.
- Qualitative measures (newly formed, enhanced relationships, evidence dissemination through radio, TV and social media, esteem measures (awards, appointments to advisory groups/boards)

There exists some consensus that assessing the broader policy and public health impacts of research remains a challenging issue for funding bodies. Research impacts are commonly complex, follow non-linear pathways as they make a difference, and research productivity indices (peer-review, journal ranking etc) are not always a good indicator for understating health research impact (Milat et al., 2013, Kuruvilla et al. 2007).

4.2 Conditions that enhance research impact

We draw on two relevant case studies of internationally renowned health services research institutions. One is the National Institute for Health Research (NIHR)[2,] a UK based widely recognised centre of research excellence in health and social care. The second is the United States Agency for Healthcare Research and Quality's (AHRQ)[3]. Both institutions have a vison and mission to foster and promote high-quality research, advance knowledge of, and improve the delivery of health services. In recent years, both organisations have commissioned evaluation research to assess the research impact of their health research component.

[2] http://www.nihr.ac.uk/about/adding-value-in-research.htm
[3] http://www.ahrq.gov/professionals/systems/primary-care/cultural-competence-mco/idsrn.html

- In the UK example, the NIHR evaluation research reviewed the Health Research Health Technology Assessment Programme and its impact between 2003 and 2013 (Guthrie et al. 2015).

- In the US case, the Department of Health and Human Services established an Integrated Delivery Systems Research Network (IDSRN) to foster public-private collaboration between health services researchers and health care delivery systems. The evaluation of the IDSRN reviewed the impact and outcomes of 50 research projects and collaborations established under this scheme (Gold & Fries-Taylor, 2007).[4]

Based on the evaluation findings from these two studies, we summarise the key lessons and factors contributing to research impact, which relate to research design, collaboration and relationships, and research dissemination.

Research design

Research questions need to be relevant to patients, clinicians and the public. Research is 'demand-led' when practitioners and end users are involved in driving the research agenda. This approach may require strong collaborations and networks with a range of advocacy bodies, stakeholders and key players in a particular field or area of interest to understand the relevant research questions and issues. Studies with significant intervention effects have been found to more likely to have an impact than those without significant effects. Research findings which are consistent with or add to existing knowledge have been found to be more likely to have an impact (Milat et al. 2015).

It is important to distinguish between research that will aid understanding, and research with a practical application. Not all research can be directly fed into 'action', but may aid a greater understanding of a subject. Having a realistic and clear understanding of the intended outcomes will enable expectations about research impact to be managed.

Collaboration and relationships

Genuine connections between research and practice facilitate high-impact research. Practitioner and other end users should be involved in the research agenda (identification of questions) from the beginning so that the research is not deemed irrelevant once it is completed. The 'repackaging' of findings and policy-relevant results may be necessary to ensure that they are available and accessible.

[4] The findings reported in this section are based on published findings, as well as information accessed through the institutions' websites.

Networks, partnerships, collaborations, and face-to-face relationships are essential throughout the research process. These require significant contributions in terms of time and resourcing. Relationships and networks are not only useful in testing ideas, hypotheses and conclusions, but also in disseminating research findings. They play an important part in particular during the translation of research into practice phase.

Dissemination

Dissemination is critical to impact and full publication of every major piece of research supports this.

Findings should be distributed through a range of channels, having the intended audience in mind (translational resources). It should be easy for those on the practice or decision-making side to understand and use the findings (research is presented in peer-reviewed journals and publications, but also in infographics, videos, briefs, radio and podcasts, etc.). Use of open access, plain language, and peer input where this is feasible and possible.

Organisations and funding bodies can effectively help to communicate research. Organisations, including advocacy bodies, end users groups (eg. PHNs and GP practice alliance), funding bodies (Heart Foundation, Cancer Council, etc.) which more easily cross the research-practice and/or research-policy divide should assist in promoting research. These organisations can utilise and disseminate messages in ways that they know will be understood by relevant audiences.

Translation of research into policy and practice needs to be incorporated into research projects from the onset. Strategies to implement findings more broadly (where this is feasible and relevant), translation of research into policy and practice (networking, advocacy, and partnerships) need to be acknowledged as an important part of research process. This recognition needs to go hand in hand with the necessary resources in place: funded time and training for researchers and organisations to undertake ‘post-research’ translational activities.

4.3 Implications for commissioning agencies

The implications of these findings are that organisations which commission high-impact research use the following tactics. These organisations:

1. Identify important and relevant research questions

    a. Invest resources in the development and monitoring of funding guidelines and aims

    b. Support eligible applications for research likely to be funded elsewhere

c. Develop and maintain relationships with practitioners in different fields to identify areas of research ‘demand’ in particular domains/fields.

2. Support research of high-quality

    a. Ensure expertise in relevant fields informs the review process (robust, transparent, and at the same time open to innovative and controversial research)

    b. Provide overall guidance and support to researchers

3. Provide targeted support for dissemination

    a. Provide resources for dissemination and stakeholder engagement strategies

    b. Allow and encourage publication of final reports of all funded research

4. Support and provide resources for translational activities

5 Findings: Research impact review

5.1 Appropriateness

The first review criteria is about the appropriateness of the HCF Foundation's research program and the extent to which it is consistent with the Foundations' mission of funding projects that consider the most effective ways to organise, manage, finance and deliver high quality care; reduce errors; and improve patient safety and better outcomes.

Table 3 lists the ten selected research projects for this review. The table details the HCF Foundation grant amount, project start year, and completion dates. The majority of grants (n=8) ranged were from $50,000 to around $300,000 Australian dollars. One grant was under $50,000; seven grants were $100 to 350,000; and two grants were around one million, one 1.4 million.

All of the projects with grants ranging from $50K to $350K (small to medium) were completed within one to three years. The two major projects, with larger grants (for a randomised-controlled-trail) took between four and seven and half years to be completed.

Table 3: HCF funded research projects (included in the review)

Project title	Grant amount	Start year	Completion date	Project time
Use of surgical and radiology checklists in Australian hospitals	$311,195	2013	Sept 2014	1.7 years
A multi-site audit of current in-hospital falls prevention practices and assessment of the effectiveness of best practice implementation strategies	$265,000	2013	June 2014	1.5 years
Preventing relapse of major depressive disorder in young people	$199,959	2013	June 2015	2.6 years
An assessment of patient and provider satisfaction with shared medical appointments as an adjunct method for chronic disease management in primary care	$ 47,895	2014	Jan 2015	1 year
An integrated electronic decision support system for cardiovascular disease management (consumer health portal)	$298,000	2013	Jan 2015	1.5 years
Minimising post-operative risk through post-anaesthetics care tool (PACT)	$138,000	2012	May 2015	3.2 years

A mobile phone administered weight management program tailored for young adults	$309,202	2012	May 2015	3.2 years
Reducing variation in clinical practice: a twin track approach to support improved performance	$314,194	2012	June 2014	2.6 years
ICARUSS Reducing disability in older Australians through secondary stroke prevention	$1,382,224	2007	Feb 2015	7.5 years
An independent national clinical evidence service	$988,855	2008	Sept 2011	3.9 years

Note: The order in which the projects are listed here does not correspond to the project de-identifiers (Project 1 to 10) used in other Tables of this report.

The review of the ten final research reports (detailing the methodology, research approach, and research findings) showed that the selected projects were overall appropriate to meet the funding criteria of the Foundation and the HCF Foundations' mission statements overall. All projects contributed to either bridging the gap in evidence or building the existing evidence-base:

- developed new devices (for example, specialised software, or intervention approaches (mobile health, integrated communication software),
- tested and trialled existing, internationally used and approved strategies and approaches (for example, shared medical appointments in primary health care, or WHO recommended surgical checklists), and
- reviewed evidence or amended guidelines and trainings for service providers (for example, post-anaesthetic care tool).

All of the ten projects, regardless if they developed new, or applied existing approaches to the Australian context – designed their research with the overall aim of meeting patients' and providers' unmet needs, improving efficiency, quality and costs effectiveness of health care service provision. Many projects focused on improving health care services by looking at the communication amongst service providers, or between health care providers and patients, and putting people in need for care and their preferred ways of accessing information, information and support (health behaviours) at the centre of the research design (for example, mobile and eHealth applications).

The selected projects have overall contributed to filling existing gaps in evidence and to improving the understanding of health services in Australia.

5.2 Knowledge production

5.2.1 Overall body of evidence

This section of the review examines the extent to which HCF Foundation funded projects have bridged gaps in evidence and contributed to building stronger evidence by looking at the knowledge production and dissemination outputs of the ten projects as a whole.

In the interviews with researchers all stressed the importance of the HCF Foundation funding to enable them to undertake research that would otherwise not have been possible. The research grants were by some considered as 'seeding grants' to undertake innovative, sometimes experimental or technical projects, as well as highly applied health services research. According to many researchers the National Health and Medical Research Council (NHMRC) of Australia would not have funded the majority of research projects under review. Table 4 below provides an overview of the overall body of evidence produced across the ten projects (by June 2016). The majority of evidence was produced for academic audiences, namely articles in peer reviewed journals (n=32), and presentations at international and national conferences (n=28). The research was further disseminated to more targeted audiences, for example, at conferences for practitioners (n=6), workshops and trainings to service providers (n=6), and various specialised forums and symposiums (e.g. at the Suicide Prevention Summit hosted by Facebook Inc at their Silicon Valley headquarters; Eastern Health Research Forum presentations to health managers).

Table 4: Number and types of evidence produced (presentations and publications peer- and/ non-peer reviewed)

Presentations	**n**
Conference for academics	28
Conferences for practitioners	6
Workshops/ trainings to practitioners service providers	6
Presentations at forum/symposium	4
Poster presentation at conferences	3
Publications	**n**
Peer reviewed publications	32
Non-peer reviewed articles	5
Service implementation reports	9
Lecture (published)	1
Thesis publication	2

Presentations	n
Other (journal articles under peer-review, not yet accepted)	3

Source: Final research reports, researcher interviews (data collected in March and up-dated in June 2016).

Presentations

On average each project presented their findings 3.8 times at a conference (academics/practitioners) or a forum/symposium. One project had (at the time of data collection)[5] not presented any findings in public. The main reason for this was that the central project paper had not yet been published and peer-reviewed. In this particular case, the intervention findings were negative, which may have been a disincentive to publish findings more quickly than in other projects. However, the researchers confirmed, that at the time of the interview, they were working on four publications and two were about to be submitted (April 2016).

The researchers from one project were highly regarded in their field and the research community overall, evidenced by the fact that of the ten occasions on which they presented findings, nine were invited. This demonstrates excellence in that particular field as well as appropriateness of the HCF Foundation funding overall.

Overall, projects which had published a number of papers were more likely to present their research findings to various audiences, at a range of conferences, forums and meetings. This is an important finding for the translation of research into policy, as other evidence shows that 'studies with published results are more likely to have policy and practice impacts' (Bauman et al, 2015).

Publications

Overall the ten projects published 32 peer-reviewed papers (by June 2016). This is a positive finding considering the short time span most projects had post post-project completion to disseminate their findings. Six projects completed their research between January and July 2015, and three projects between June and September 2014, and therefore had only a short time post completion (see Table 5). Table 5 shows that projects with the furthest completion date (2011) have the highest number of peer-reviewed publications (Project 10, n=7), compared to more recently completed projects in 2015 (which have published between one and six journal articles).

Table 5: Number of peer reviewed publications by project and project completion date

Project code (de-identified)	Completion date	n

[5] Researcher interviews were conducted during February and March 2016, data up-dated by email in June 2016.

Project code (de-identified)	Completion date	n
Project 1	May 2015	6*
Project 2	July 2015	3
Project 3	May 2015	1
Project 4	January 2015	5*
Project 5	June 2015	3*
Project 6	February 2015	1
Project 7	June 2014	2
Project 8	June 2014	4
Project 9	September 2014	0
Project 10	September 2011	7
Total		32

Source: Final research reports, researcher interviews (information collected between February and March, up-dated in June 2016), * indicates the projects which have applied for a NHMRC grant in 2014/ 2015.

Of the six projects which delivered their final reports in 2015, two published five to six papers, compared to the other projects (completed in the same year), which published one to three papers. These two projects (Project 1* and Project 4*), also applied for an NHMRC grant and one was successful with the application, while the other project was (at the time of writing the final report) still awaiting an outcome. A third project completed in 2015 (Project 5*) also put forward a NHMRC application.

It appears that there may be a relationship between a higher number of publication outputs (close to completion of the project) and applying for a larger research grant (for example, putting in a NHMRC application (whether or not it is successful)).

In the case of the three identified projects (Project 1, 4, and 5), which did apply for external funding straight after submitting the final report to the HCF Foundation (in 2014-2015), we identified a number of common denominators which may have contributed to these outcomes (i.e. applying for significant external funding and higher number of publications post-project completion):

- the intervention/ research showed positive effects/ findings,
- they were part of a larger, well-resourced research centre, or university,
- researchers had the capacity, resources and past experience to apply for larger grants, and
- their research project was part of a broader research area/ agenda they were working in, or part of.

Only two projects provided information on non-peer reviewed publications/ resources (Table 4). In one case the research included implementation and findings reports (n=9) from each of the hospitals involved in the study. These reports were later used as an internal resource/ document to share progress, outcomes and recommendations within each of the health services where the research took place. It was noted by the researchers that having such internal resources was important in their case, as it demonstrated commitment and ownership of the involved hospitals and facilitated change in practice. Another project published the only recorded non-peer reviewed articles in professional journals, magazines and newspapers (n=5). This project team made particular efforts in at disseminating research: they also held workshops and trainings for practitioners, presented at academic and professional conferences, and published in peer-reviewed journals. In this case the lead researchers were experienced and committed to translate research into practice, which was a key part of the research project itself.

It is possible that the number of non-peer reviewed outputs and publications is 'under recorded' in this report. While all researchers were asked about their publications and the range of outputs they had produced (academic and non-academic), publications in peer-reviewed journals tend to be recorded more systematically by individual researchers and institutions than newspaper articles and other forms of dissemination.

5.2.2 Quality of research

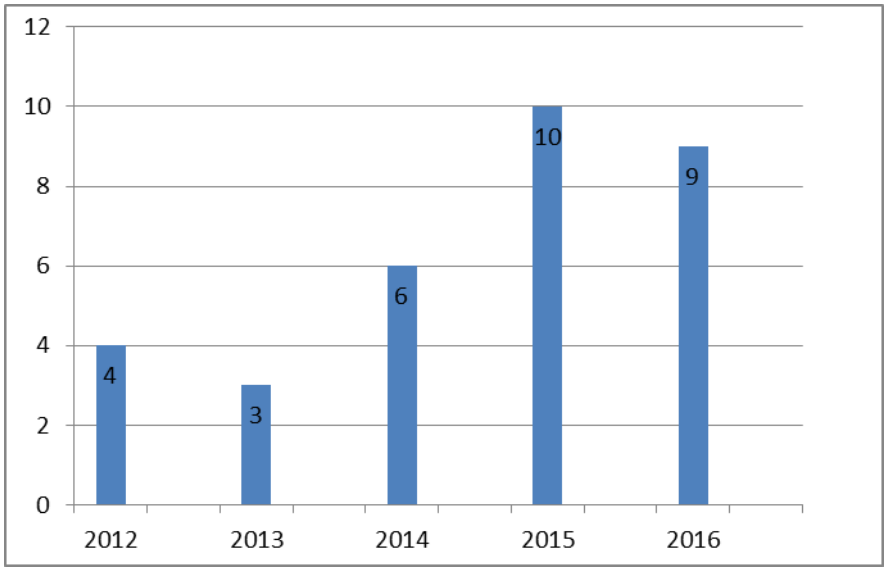
Peer reviewed publications

This section of the report reports on the quality of the research funded by the HCF Foundation, as evidenced in the range and quality of journals in which findings were published and the number of citations of each publication.

As part of the researcher interviews and email updates in June 2016, we identified in total 32 publications in peer-reviewed journals, which have emerged out of the ten HCF Foundation funded research projects. The publication dates ranged between 2012 and 2016. As discussed throughout this section, there are a number of factors which may have influenced publication outputs of the ten projects. Some of these have been identified by the researchers in the interviews, others become visible when comparing the projects overall. Key factors include: time since project completion; positive findings of the research/ intervention; being part of a larger research infrastructure/ research program; resources to publish; a perspective/ or intention of applying for a larger research grant (e.g. NHMRC).

Figure 1 below shows the number of referred publications by year. The majority of research projects in this review, seven out of the ten, had signed their HCF Foundation funding agreement between 2012 and 2013 (project start date, see Table 3). In the following two years we see a growing and steady increase in the number of publication outputs, six in 2014, ten in 2015, and nine by June 2016.

Figure 1: Number of publications in peer-reviewed journals (JCR & non-JCR) by year



We used JCR (Journal Citation Reports) as a database for the comparison of journals and their ranking (impact factor) within a particular subject category. The impact factor (IF) of an academic journal is a measure reflecting the yearly average number of citations to recent articles published in that journal. Although JCR is one of the most frequently used databases for bibliometric analysis in science and social science research, it is not comprehensive (as discussed in Section 3.2). Therefore not all referred journals, where HCF Foundation funded research was published in, are also listed in JCR. HCF Foundation funded research was published across 15 JCR listed journals, and nine non-JCR listed, but all refereed journals. Table 6 below presents only the journals listed in JCR, their impact factor, and journal ranking in that particular subject category.

HCF Foundation funded research was published in a wide range of fields and subject areas. Some of the more frequently published in categories include: health care sciences and services (n= 6 publications); medicine, general and internal (n= 5 publications); and computer science, information systems (n= 3 publications). HCF Foundation funded research was published in journals with varying impact factors.

The journals in Table 6 are listed by impact factor (ranking journals with the highest impact factor first).

Table 6: Published HCF Foundation funded research in journals listed in JCR only

Journal Title	Number of articles	JCR Impact Factor	SNIP 2013[a]	Subject Category	Journal Ranking
Nature Reviews Cardiology	1	9.183	1.467	Cardiac & Cardiovascular Systems	5 of 123
Stroke	1	5.761	2.74	Peripheral Vascular Disease	5 of 60

Journal of the American Medical Informatics Association	2	3.504	2.829	Computer Science, Information Systems	8 of 139
Journal of Medical Internet Research	4	4.532	1.948	Health Care Sciences & Services	5 of 87
Early Intervention in Psychiatry	1	2.889	0.885	Psychiatry	49 of 140
International Journal of Clinical Practice	2	2.566	1.106	Medicine, General & Internal	35 of 154
BMJ Open	1	2.271	1.153	Medicine, General & Internal	40 of 154
International Journal of Medical Informatics	2	2.004	2.262	Computer Science, Information Systems	24 of 139
International Journal for Quality in Health Care	1	1.756	1.547	Health Policy & Services	30 of 71
BMC Health Services Research	1	1.712	1.231	Health Care Sciences & Services	42 of 88
Trials	1	1.731	1.032	Medicine, Research & Experimental	81 of 123
Asia-Pacific Journal of Clinical Oncology	1	1.542	0.469	Oncology	175 of 211
Australian Journal of Rural health	1	1.225	0.939	Public, Environmental & Occupational Health	109 of 165
Australian Family Physician	3	0.759	0.501	Medicine, General & Internal	106 of 151
Australian Health Review	1	0.730	1.101	Health Care Sciences & Services	76 of 88

[a] SNIP (Source Normalized Impact per Paper) measures contextual citation impact by weighting citations based on the total number of citations in a subject field. A SNIP of 1 indicates that the journal

is performing at the average of the subject area; a SNIP of 1.5 indicates it is performing 50% greater than the average and a SNIP of 0.5, that it is performing 50 % less than the average.

Citations

Traditionally research impact reviews mostly include citation rates using scientific scholarly databases, to a much lesser extent Google Scholar. There are a range of benefits and limitations to these scientific databases and the citations they can capture, as they exclusively focus on scholarly peer-reviewed journals and output.

For this review we have included citation rates for SCOPUS (a major scientific scholarly database) for journal articles found in this database, and citation counts from Google Scholar for the same articles. For the peer-reviewed articles which could not be identified in SCOPUS, we have only listed Google Scholar citations counts.

The HCF Foundation funded research that has been published in SCOPUS listed journals has been cited an average of 0.85 times (Table 7). The respective citation rate of the same articles on average is 1.25 when using Google Scholar.

Table 7 further shows the great variability in the citation rate between articles and across years. Articles published earlier (2012-2013) have a much higher citation rate than the more recent publications (2015 and 2016). While these results can be expected, as over time citation rates typically increase, in this specific case the publication outputs in 2012-13 are from an innovative research project which subsequently received a highly distinguished multi-year Centre of Excellence (CRE) grant (which also explains the higher than average citation rates).

Table 7: Citation counts for journal articles in SCOPUS

Year	Number of publications	Mean number of citations Scopus	Minimum citations	Maximum citations	Google Scholar mean citation comparison
2012	2	10	5	15	18.5
2013	2	4	2	6	9.5
2014	4	3.75	1	9	6
2015	7	1.72	0	5	4.86
2016	8	0	0	0	0.75
Total	23	0.85	0.35	1.52	1.72

The average citation rate of peer-reviewed articles only found in Google Scholar was 4.56 (Table 8).

Table 8: Citation counts for Journal articles found in Google Scholar only

Year	Number of publications	Mean number of citations	Minimum citations	Maximum citations
2012	2	4	3	5
2013	1	31	0	31
2014	2	0	0	0
2015	3	6	3	10
2016	1	0	0	0
Total	9	4.56	0.67	5.11

The highest number of citations in SCOPUS is 15 for an article published in the Journal of the American Medical Informatics Association (impact factor 3.504). The publication with the most citations overall (15 in SCOPUS and 27 in Google Scholar) is published in a journal titled *Trials*, which focuses on publishing research protocols.

5.2.3 Barriers and facilitators to research

This section describes a number of facilitators and barriers identified by the researchers as important when undertaking their projects.

Barriers to research

Several researchers indicated that completing the research on time or producing outputs as planned was challenging due to a number of reasons. The most frequently mentioned barriers were around recruitment and access to data (i.e. hospital records). The recruitment of respondents to the study could be challenging, for example, in a changing policy environment, in this case the introduction of Medicare Locals. Accessing data was an issue encountered by several projects. For some it meant delays in getting or amending ethics approval, for others, it was around dealing with multiple stakeholders and getting access to hospital data sets

This may indicate that researchers tended to underestimate the realistic timeframes required to undertake some of these innovative and novel research projects. At the same time, challenges experienced in undertaking research or completing the project on time didn't pose a major problem. The researchers reported the HCF Foundation was responsive and flexible in working around delays, amending timeframes and delivery dates, if necessary, except in one case. A research team reported that they had felt a little pressured to produce the final report in time, although they had experienced significant delays in data collection out of their control.

The majority of research teams emphasised the approachability of the HCF Foundation in dealing with delays and unforeseen circumstances. Only one out of the ten projects interviewed raised concerns about the Foundations' support mechanisms in difficult circumstances. This was a particular case and the circumstances causing significant delays were probably out of the scope of the Foundation to intervene and manage from the outside. It did however mean that this particular project run significantly (several years) over time, and it may not have delivered the expected outputs to date. As reviewers, we have limited knowledge of the history of the project, the HCF Foundations' perception of what happened and other contextual factors to draw any conclusions from this case.

Contact management – facilitators to research

Overwhelmingly all researchers interviewed for this study reported that they were very satisfied with dealing with the Foundation. The HCF Research Foundation and their processes for applying for grants (Expressions of Interest), grant application templates, nomination process, reporting requirements, funding allocation and administration were all highly regarded, especially in comparison to other funding bodies (in particular the NHMRC, which has more onerous application processes). The researchers felt that the Foundation was overall very supportive, flexible and understanding in adjusting timelines, or rolling over funds, if required.

> Look, as a researcher it was entirely professional. The grant was delivered. There were the various stages, the payment stages, the flexibility was there, obviously as experienced researchers we knew what would be coming and when it would be coming, we knew what we had to deliver as far as reports and feedback goes. It wasn't – it was very well organised and seamless.

Many researchers were also satisfied with the personal contact with the Foundation. They found it useful to put a 'face to a name' and have that 'little bit of personal engagement and contact', which was perceived as unusual by some researchers (especially those used to dealing with the NHMRC).

> We thought it was fantastic that you know, while we were just names on a piece of paper so actually [the HCF contract manager] came to see who the faces were, and to see a bit behind the project.
>
> This project for example, the final report was delayed by a couple of months and they were really fantastic to work with. It was straight off the phone, they were easy to get in touch with if we couldn't – the research managers got straight back with us, straight back in touch and they appreciated the complexities of doing research where people are involved.

Some researchers had received input from the Foundation's Board on their research proposal and found that the input was a very useful process. For some it had strengthened their research. However, in other cases, the Board's proposition did not lead to a more comparative approach. Overall the input from the Board was seen as an opportunity to achieve the best possible outcomes with limited budget and within set timeframes, and having the opportunity to adapt the research, if required.

Dealing with the Foundation was recognised as an 'efficient' process overall but especially at the funding application stage:

> I can honestly say for the entire process, and the HCF applications go through expression of interest, and whether they're shortlisted or invited onto a full proposal, and personally I find that a much more satisfactory way to approach research funding than writing a detailed proposal that then goes nowhere.

Overall the review found that the HCF Foundation was well regarded amongst the researchers. They described the Foundation as 'approachable', 'professional', and 'less bureaucratic' in their processes than other funding bodies. From the researchers' perspective all these factors were beneficial, as they contributed to greater efficiency and allowed them to focus on their research, rather than administrative processes.

5.3 Research capacity

This section of the report explores esteem measures, which demonstrate that the HCF Foundation funded research had wider benefits for the researchers and professional staff involved to build research capacity, to gain broader recognition in the academic community (subsequent funding), and overall strengthen and grow research capacity in the field of health services research (for example, due to a growing interest and number of students working in this area of research).

5.3.1 Research degrees

In total four out of the ten projects had engaged graduate or post-graduate students as part of the HFC funded research (students helped to conduct and disseminate the research), or as a result of it (students were engaged following project completion to continue or extend the research topic).

Three of the researchers reported that they had engaged students as part of the HCF Foundation funded research, who were now, that the project was complete, continuing on this topic. For example, one study is conducting a qualitative PhD study looking into the barriers and facilitators of translating the research findings into practice. In one case, the project had engaged two students who intended to complete Honours degrees after they complete their nursing degrees. Students did not only assist in undertaking the research but also contributed to the dissemination of findings through publishing their thesis and presenting at conferences:

> So, for example, the International Society […] last year had their conference in Edinburgh. They have over 1100 delegates and there were two oral presentations [from our project] that were successful, and they were given by the PhD student.

Some researchers highlighted the challenges to fully attribute the engagement of students to the HCF Foundation funded research; in some cases it was less clear to draw a relationship between one research activity and another outcome.

> So it's really hard to attribute it 100% to that specific project but yes we are expanding on our pool of students who are working with us, so it looks like I'll be supervising an honours student this year as a result of that specific HCF project, so that's one clearly. We have a new PhD student starting in the team who was involved in writing content for this HCF funded project, that's it that's specific at the moment.

Some researchers highlighted that the HCF Foundation funding was limiting in terms of engaging students as it was generally short term funding for one to two years.

5.3.2 Subsequent funding

Eight out of the ten projects had applied for subsequent funding after completing the HCF Foundation funded research project. In two cases the research teams were still awaiting a response from the NHMRC reviewers on their application. Three NHMRC applications, two awaiting response and one successfully granted, were directly linked to the HCF Foundation projects, which were described as 'seeding grants' for bigger funding applications and investigation of that particular topic on a much larger scale (for example, a randomized control trail).

The other projects had applied for a range of other funding grants (for example, the College of General Practice) but had not been successful with their applications. One project applied successfully for an international European research grant, in collaboration with researcher with whom relationships had been built as a result of the Foundation funded research.

One of the ten projects received a highly competitive and respected Centre of Research Excellence (CRE) grant awarded by the NHMRC. The grant was according to the researchers directly linked to the HCF Foundation funded project. A second project was awarded a CRE grant while they were still undertaking the HCF research project. In their CRE grant application they proposed to apply the same methodology as in the Foundation research. The team members reported that having the Foundation grant, and successfully applying the methodology in practice had strengthened their case to the NHMRC, 'so it gave us the leverage to get the CRE'.

5.3.3 Staff development

Research capacity

In the interviews all researchers agreed that their involvement in the HCF funded projects was beneficial to them in terms of their research career including building a track record of successful funding applications, publications, and dissemination. It

was also recognised as having built their research capacity in other areas, for example, gaining new skills and experience which go with a particular research approach or method.

> I'm sure you're aware, in the field of – in research across Australia, a lot of it depends also on track record. I think being awarded this grant to all of us certainly has improved our track record, certainly on paper, we certainly did learn, as [my colleague] said just in terms of our own personal capacity, and I'll speak for myself here about managing multi-site projects […] I certainly learnt a great deal about working on clinical sites, ethics and being able to access data and medical records and what hospitals, will let you touch and what they won't let you touch, and what you can actually feasibly do within a research project, the time limits, and the budget.

In three projects the researchers reported that the clinical or medical staff associated with the research projects, for example, nurses or hospital coordinators undertaking data collection and monitoring patients had benefited and grown in their careers as a result of their involvement.

> So we actually had two research dieticians on the project. The first one was from the US. She's gained full time academic employment in the US and is currently undertaking her PhD in the States in a community based project […]. Then the other person was a post-doc, [...] and she actually - when she left us she was able to get another postdoctoral position this time with the […] Hospital and doing a clinical project. But she has, in fact, brought myself in on that project. So that project is going in for an NH&MRC project grant. She is clearly applying some of the skills she learnt with us in a clinical area in that new project.

Nominations (awards, fellowships)

While all researchers agreed that the projects had increased their capacity to undertake research and continue their research activities, they were also clear that being awarded specific recognitions, such as promotions, awards, or fellowships was difficult to assign to a single project or outcome.

Some researchers pointed out that in due course of their completion of the HCF Foundation funded research and successful applications for larger grants one person was awarded a one year fellowship, several researchers were promoted one to Associate Professor and two to a more senior research position. Another researcher was awarded a prestigious Future Fellowship.

Two projects reported awards directly linked to the HCF Foundation funded research, in one case a research paper received a prestigious award at an international conference, and in the other case, the student working on the project received an award for her PhD thesis, connected to the Foundation project.

Overall this section of the review shows that the HCF research funding contributed to build research capacity in various ways and in particular through enabling

researchers to apply for larger grants, NHMRC funding in at least four cases, two of them successful to date (two still awaiting a response).

5.4 Translation of evidence into practice

In their large scale review of policy and practice impacts of NHMRC funded projects, Bauman et al. (2015) found that a number of factors can positively influence the successful translation of evidence into practice. Some of the identified key factors include:

- Researchers having 'something to sell', for example, positive findings of their intervention study, or consolidation of existing evidence,
- Availability of good quality 'translational resources' such as accessible media, websites, or radio and TV available to practitioners,
- Engaging with a range of decision makers, and
- Researchers are experienced in the dissemination and translation of findings, believe it is part of their role, and invest significant time beyond the study completion in these activities.

This section of the report explores the outcomes of the projects in the area of research transfer: that is the translation of evidence into practice in the short and medium term.

5.4.1 Forums and workshops with key end-users groups

Eight out of the ten projects were actively involved in promoting their research to a range of stakeholder groups: study participants and associated professionals (eg. research partners, hospital management staff, hospital boards in the region, GP networks, and other practitioners) and a range of key end-user groups of their research (e.g. regional, national and international research groups; universities; interest/ advocacy groups). In some projects the training and involvement of end-user groups was central to the research itself, as workshops and trainings for example with GPs were held nation-wide, to recruit GP clinicians to the study project. The extent to which researchers held forums to non-academic and academic groups (beyond conference attendance) also depended on the type of research the project was undertaking, the findings from the research, and timing. The two projects which were at the time of the interviews only starting to publish their findings were not yet actively engaged in sharing and disseminating their findings post project completion. One researcher highlighted the challenges of 'spreading the word' prior to the research findings being peer-reviewed:

> The issue with our […] research is, it is a difficult area to get people to do something, to take part in the research. Some people simply don't like it, and feel it is like surveillance. […] In this area of research you first need to have your research backed-up, through peer-reviewed publications, before you can go to the media. Otherwise you will only attract critics who want to put your findings down. [This research] is often perceived as an attack, rather than constructive improvement.

5.4.2 Accessible and stable delivery mechanisms

Researchers from eight research projects were ready to share their findings: the research had produced outputs such as publications and conference presentations, and positive intervention results. Six of these used accessible and stable delivery mechanisms as an dissemination strategy. At least four projects reported using radio and/or TV as a means of spreading their findings and engaging stakeholders in the relevant discussions. Two projects focused on the on-line dissemination of findings to practitioners and other end-users, one project relied on their in-house national evidence dissemination platform, and another project provided short summaries of their project findings for download on relevant websites (for example the area health services network).

> It's [the study findings] made a difference there. I've presented all the findings to managers at Eastern Health, managers at research forums and therefore to researchers, to executives, to all the nursing people involved. I've disseminated the findings throughout Eastern Health really well, I think anyway. I've also done PowerPoint presentations which have been converted into PDFs, and I've again, been disseminated within the organisation but strictly limited until the publications come out. *You've had to be hiding somewhere* to not know about the study and the outcomes.

Several projects noted that their projects were featured in a number of daily and weekly newspapers (print and on-line editions) and professional magazines. However, none of the researchers highlighted the importance of Twitter or other social media to spread their findings and engage the broader public and relevant stakeholders in the conversation. This could be because social media is, amongst some academics, still not well-regarded as a relevant and measurable means for dissemination of research findings. Traditionally also the focus of impact reviews has been on academic and peer-reviewed output, however the acknowledgment of the importance of other forms of outputs – in particular when it comes to influencing policy and practice – is slowly growing.

5.4.3 Advocacy, networking, on-going dissemination

In total six projects reported being involved in discussions and at regular meetings with policy- and other decision makers. For many researchers these networks were part of their broader involvement with policy and advocacy. Some projects they had

only more recently established or revived these relationships and networks as part of the HCF Foundation grant or due to other activities in their research area.

> It's worth pointing out that we try to keep track of the impact of our research, and sometimes it's difficult to do because you're not sure exactly of where it's hitting and who it's hitting and who's interested, but here at the […] institute we focus on evidence based healthcare, we also form panels of experts – we sit on panels of expert providers for the NHMRC, the Department of Health and the Australian Commission of Quality and Safety in Healthcare.

Some of the researchers were more strongly focused on discussing and advocacy with Government or government bodies (eg. Medicare, NHMRC) to take notice of their findings. One project was in close contact with a key player in their field (a major health foundation). The researchers actively advocating seeked to promote their work, gain decision-makers' interest and commitment, as well as keep the broader public and end-users informed and engaged. Some researchers reported that they used their networks to get a better sense of the current 'thinking' in a particular state or government Department with respect to an emerging form of health promotion (i.e. mobile health interventions; on-line peer-to-peer health platforms).

> Our strategy will be directly able to be implemented into primary care software. […] So we're kind of building along the way the stakeholder engagement plus the detailed process starter to inform translation. So that at the finish [of the broader research], we can progress in that direction. So yes. That would be where we are going […] is aligned with the e-health initiatives going on from the federal government.

Several of the more active researchers in this domain appeared to have significant experience, extensive relationships and networks, and interest in the translation of research into practice:

> I suppose as a researcher you always have a sort of policy, I mean I'm very much policy driven […].That's lucky because I don't have a busy practice to – I'm a researcher so I can get involved in research and research translation more broadly. So I probably can't increase the amount that I do that, that's very much part of what I do.

The findings resulting from the HCF Foundation funded projects provided new impetus for some to advocate the government, or continue with their networking activities. It appears however that the researchers which were involved in active, on-going lobbying on a higher level were doing this as part of a broader research agenda, rather than simply due to the HCF Foundation funded project itself.

> I'm a regular person who gets involved in that area. So I can't – I don't think I can attribute that [my lobbying] to this grant [HCF], certainly aspects of it, talking about [our recent findings] and my engagement with this grant.

Researchers reported mixed experiences with respect to their success in a policy and decision makers as a result of the HCF Foundation funding. They were however

overwhelmingly positive about the opportunities to establish new and enhance existing research relationships, partnerships and professional networks, mostly national but in three cases also international.

5.4.4 Informing policy and changing health practice

Section 5.4 of this report discusses *how* the research projects have facilitated evidence into practice. This section looks at the applicability, or likely application of the research to policy and practice in the future (*what* has been achieved and how does or will it make a difference).

Half the projects (n=5) have developed and tested highly applicable outputs including new e-intervention and communication technology and devices, GP and user interconnected platforms, mobile health intervention. The other half developed new, or expanded and tested existing protocols, procedures and approaches for practitioners. One project reported that their research directly influenced the NHMRC guideline development on that topic area. Another project reported that the statistical method for comparison of hospital performance data was considered in a state wide hospital review.

Overall all projects produced new knowledge and added to the evidence base of understanding health services in Australia. Most projects had a strong focus on consumer centered and integrated service delivery. All researchers, except one, were hopeful that their research could in the future find greater application in health program development, treatment and practice recommendations, or the alignment of organisational strategies to achieve better outcomes for patients and consumers, and more efficiency in service delivery.

The majority of researchers acknowledged that it was rather early for their research to have made a direct impact on the development of programs, protocols, or influence wider system change. For the research to become fully applicable, in most (not all cases), the researchers' response was, 'we need more research' – a stronger evidence base and greater applicability of the research (to other population groups, communities etc.) for policy and decision makers to consider its implementation. For many this goal, influencing policy and practice, was part of a longer process and the HCF Foundation funding was considered a critical 'stepping stone' in that direction.

> It would be very difficult to deliver a project as one package with a $300,000 grant that directly influences policy and practice. So I guess for us and the way, that's a stepping stone and you get that ripple effect all the way down the line. I mean even our NH&MRC grant won't be a directly applicable, you know, we'll then have to do further work, further building of relationships and collaboration.
>
> Well, I think that there is additional work that needs to be done in terms of translation and dissemination into practice more widely. But I do think that

> it's [the research] added to the evidence base for this particular demographic. […] I suppose demonstration of using mobile health probably means that New South Wales Health, for example, recognises that this is a viable valid means of communicating. So the idea of text messaging, the idea of apps, I think those things New South Wales Health would be seeing that they could incorporate into their health promotion practice; if not necessarily at this point in time, it's about taking our programme into that arena.
>
> There was always an aim to pilot this in Australia. What's the point in going to Medicare or anyone like that or going to anyone saying "Hey we've got this new idea, we're going to do it.
>
> I would think it's rather early in the day to be really looking for an impact upon policy making and further programme development. It's only six months ago since we published the results from [the study]. So we've demonstrated effectiveness in this one particular group of participants, but now we really need - if we really do want to influence policy and future programmes – we really need to discover how this result can be expanded and generalised to other populations.

Changing health practice

The review found little evidence of the direct application of the research in the Australian health systems to date. This is not surprising, as the majority of projects were innovative and trailed new approaches. So, for the new evidence to leave a lasting mark, there needs to be a substantial body of research or larger application of the findings to other population groups and settings.

On a small scale, however, the researchers and end-users interviewed reported that some of the new developments, strategies and approaches had been introduced and were already making a difference to clinicians, service delivery and more widely to patients in the local communities (i.e. at a local hospital level) where the research had been undertaken. In some cases, the tested guidelines/protocols remained part of everyday service delivery processes in that health district, hospital, or jurisdiction.

According to the interviews with end-users, a successful post-project completion evidence implementation was more likely to occur when:

1) the research had been carried out in a participatory approach, where management and practitioners or patients (end-users) were included and part of the research design, conduct and implementation of findings, and

2) there was strong leadership on the ground (so called 'change-pioneers'), who remained connected and interested in the implementation of the findings (or new approaches) and invested time and resources to educate and advocate for the system and service delivery approach changes, and

3) the project produced accessible and targeted information and resources for diverse audiences, including clinicians, practitioners and management responsible for implementation of change.

Apart from the need to undertake further research – to strengthen the evidence base for some of the new applications – in other cases, researchers identified political will as the main barrier to changing health practice and investment in health services on a larger scale. Political commitment to allocating new funding was perceived easier when researchers could demonstrate greater cost-effectiveness, or no-cost increases of the new measures/ approaches.

> We have been involved obviously with other groups of GPs and, most importantly, Medicare and through their development of new item numbers. At the moment if GPs cannot have a model of charging for [this new application/approach], and that's been the stumbling block. And of course, this is with all health systems, there's that political end and there's that wish to get it done and there's always the fear that this is going to cause a blow out in healthcare expenses even though we show that patients will feel that they'll attend a doctor less as a result of this.

For one project completing the cost-effectiveness component of their study was hampered as they had used all their HCF Foundation funding and had not attracted additional funding.

Several researchers firmly believed that if they could demonstrate the positive outcomes for consumers and cost-effectiveness of their applications (through further research), their early findings will have the potential to lead to more equitable service delivery, in particular for some groups who experience barriers in accessing health services and quality care (i.e. young people, or Indigenous people).

> Just having come back from the conference in the UK, what's becoming really apparent is that people that don't have internet on the computer at home still have smart phones. So the actual advice that was coming out for equity was to be utilising the features of a smart phone. That it would be more equitable to disadvantaged groups. That probably goes against the grain of what people think.

Longer term outcomes such as improvements in population health, benefits to the broader Australian health systems and the wider population could not yet be observed as part of this review. However, many researchers were confident that their research had delivered important evidence which may (with the right political will, funding investments, change management processes) in the future contribute to better health outcomes and service provision for all Australians.

5.5 Public impact

This section draws out findings on the extent to which the HCF Foundation research program/funding as raised and enhanced the profile of the Foundation in the public domain.

Overall the review found that the Foundation was well regarded by the researchers (approachable, efficient, flexible, professional) and end-users interviewed for this research project. From the researchers perspective, these factors contributed to greater efficiency and allowed the research teams to focus on their work, rather than administrative processes.

Most researchers reported that they believed their projects had raised and enhanced the profile of the Foundation more widely, beyond their research teams, research partners or universities. All researchers who had presented their findings to the public (seminars, newspapers, conferences, advisory bodies) stated that they acknowledged the funding of the HCF Foundation when presenting their research.

Researchers also reported that the relationship between the HCF Foundation and the research community was mutually reinforcing, since they believed that the Foundation added prestige to their work.

Only one researcher reported some challenges when collaborating with the Foundation. The majority were highly satisfied with the application process, funding and project management and support they received from the Foundation. More than anything, they believed that the research they had undertaken would not have been possible without the Foundation funding.

5.6 Projects and achievements across domains

Table 9 provides limited information on the achievements of individual projects across domains. However, it is important that the projects are not directly compared, as publication conventions, citation potential and policy impact varies significantly between disciplines and fields of study. For example, analysis by Thomson Reuters shows that over the 10 year period to 2010, the citation average for computer science was 3.75, compared to a citation average of 11.26 for psychiatry/psychology over the same period (n.a., 2011). In addition to the differences between projects in terms of aims and scale, discipline-specific conventions make it very difficult to compare the impact of individual projects.

Table 9: Projects and achievements across domains

Project code	1	2	3	4	5	6	7	8	9	10
Knowledge production – Innovation, building and consolidating evidence base										
Discipline field (using journal subject category)	Medicine, Research & Experimental	Medicine, General & Internal	Medicine, General & Internal	Medicine, General & Internal	Health Care Sciences & Services	Medicine, General & Internal	Health Policy & Services	Health Policy & Service	Health Policy & Services	Computer Science, Information Systems
Peer-reviewed publications	✓	✓	✓	✓	✓	✓	✓	✓		✓
Presentations at academic/ practitioners **conferences**	✓	✓	✓	✓	✓	✓	✓	✓		✓
Publications non peer-reviewed	✓			✓			✓			
Research benefits (to future research) – esteem measures										
NHMRC/ CRC applications (successful and pending)	✓			✓	✓					✓
Other leverage of funding		✓				✓				

Project code	1	2	3	4	5	6	7	8	9	10
Research **degrees**	✓			✓	✓					
Awards/ fellowships	✓			✓	✓					✓
Research transfer – translational outputs										
Forums/ workshops/ meetings with **key end-user groups**	✓	✓	✓	✓	✓			✓		✓
Stable delivery (radio, TV, professional Magazines)	✓	✓	✓		✓		✓	✓		✓
Informing policy – applied measures										
New medical devices/ systems protocols/ NHMRC other guidelines			✓	✓	✓					✓
Produced **new knowledge**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Project code	1	2	3	4	5	6	7	8	9	10
Changing health practice – facilitating change (likely more equitable service delivery and improved outcomes)										
Likely **broader application** in the future										
In clinical practice	✓	✓		✓	✓					✓
In service delivery	✓	✓	✓	✓	✓		✓	✓		✓

5.7 Value and cost

In total the HCF Foundation awarded around $4,265,700 dollars to the ten research projects. All projects produced new knowledge and added to the evidence base of understanding health services in Australia.

Although a formal cost-effectiveness analysis was not feasible, it seems likely that the projects represented good value for money, as they were reportedly efficiently and effectively managed. The projects produced 32 peer-reviewed publications, and disseminated evidence through a range of other avenues (presentations and workshops, conferences, symposiums with a range of stakeholders). Several projects successfully applied for prestigious NHMRC or Centre of Research Excellence grants (two successful, two awaiting an outcome) which attest credibility of the research and its importance to the academic and wider community more broadly.

Most projects had a strong focus on consumer-centred and integrated service delivery, which is one of the aims of the HCF Foundation.

Half the projects (n=5) developed and tested highly applicable outputs, including new e-intervention and communication technology and devices, GP and user interconnected platforms, mobile health interventions. The other half developed, expanded and tested existing protocols, procedures and approaches for practitioners.

In many cases, to supplement the HCF funding, researchers allocated extra resources and in-kind contributions from other sources to undertake or complete the research.

The overall message from the researcher interviews was that the HCF Foundation grants had been ‘absolutely essential’ to undertaking many particularly innovative and highly applied research projects. Many considered the funding as a ‘seeding grant’ to apply for much larger funding schemes (NHMRC, CRE) after the research showed positive intervention findings.

> This grant has been absolutely essential in being able to provide the clear message that this is acceptable to Australian doctors and Australian patients. That was the grant.

In most cases (except the two large grants), the HCF Foundation research grants were considered too small to fund all the research activity associated with the projects. Several projects had other funding associated with the research (for example, APA Scholarships to fund PhD candidates working on the research). Some projects received substantial amounts of ‘in-house’ support (from their institutions), and in-kind’ support (for example, from the collaborating hospitals, GP practices, and practitioners, who were not paid to facilitate or coordinate the

research or collect the data). The research could only be completed due to the commitment from all involved partners, researchers, and practitioners which demonstrates that the projects overall provided good value for money to the HCF Research Foundation.

This excluded the two larger projects, as they were received more substantive funding to undertake complex research (randomised control trial). It appears that the larger funding commitments delivered very different outcomes, in one case substantial subsequent funding, academic and applied outputs and prestige, in the other case, comparatively low outputs in terms of publications, presentations, and media engagement.

Several researchers reported that the HCF Foundation funding was well regarded in scholarly circles and receiving a HCF Foundation grant was perceived as a prestigious recognition.

> Well as a foundation, it's well regarded at the University […], so if a group gets an HCF Foundation grant, that is quite well regarded.

The main limitation of the HCF Foundation funding, for some researchers, was around timeframes and their limitations (commonly one to two years). Some researchers felt that for projects aiming to implement new procedures or protocols and change service providers behaviours (the way people think, act and delivery services), longer time frames were required to assess the benefits or lack thereof of such highly complex 'social interventions'.

> "This particular project might have benefited if it could have been funded for a longer period. If we could have repeated the [intervention] perhaps for another year, we might have then started to see reductions [….], but I think that the maximum funding time is two years, if I'm right. […] For projects like this if one really is trying to have a real impact on changing what is happening in health systems, you do need I think a longer period of time I think if you're talking about moving from Aspirin to Panadol, then you just move from Aspirin to Panadol, it's much simpler thing to do than to *change how people think and feel and act*."

6 Conclusions

This HCF Research Foundation research impact review was undertaken between October 2015 and June 2016. The impact review is based on the ten most recently completed (by August 2015) research projects, funded by the Foundation.

In total the HCF Foundation awarded around $4,265,700 dollars to the ten projects. All research projects produced new knowledge and added to the evidence base of understanding health services in Australia.

The following findings are particularly noteworthy:

- The ten projects under review projects produced 32 peer-reviewed publications by June 2016.
- The researchers reported that they had disseminated evidence through numerous ways: presentations at conferences, symposiums, workshops, and through popular media, such as TV and radio. In total the combined number of presentations to academics, key stakeholders and practitioners reported for this report (not including popular media) were 47 (see Table 4).
- The citation rate for the publications under review varied considerably by publication and time of publishing. Research published in SCOPUS listed journals has been cited an average of 0.85 times, respectively 1.25 times when using Google Scholar (Table 7).
- It is important to note that there is often a time-lag between projects finishing and outputs occurring, and between outputs being published and citations occurring. Hence, the average citation rates in this report need to be read with caution.
- Several projects were successful in leveraging highly prestigious external funding. Two projects were still awaiting their NHMRC application outcome. One project was successful with a European research grant scheme.
- The HCF Foundation funded research increased the research capacity of researchers involved, and their project partners (such as collaborating practitioners, hospitals, and students).
- The Foundation funded research projects were mostly innovative and several tested new applications or tools (i.e. ehealth, mobile health applications), protocols and approaches, or cost-effectiveness analysis methods to improve service delivery processes and outcomes for patients.

- Researchers also reported that the relationship between the HCF Foundation and the research community was mutually reinforcing, since they believed that the Foundation added prestige to their work.

- Many of the HCF funded project grants (n=8) ranged from $50,000 to around $300,000 Australian dollars, and can be considered as pilot studies. This means their impact is more indirect (i.e. the evidence provides the basis to apply for much larger grants, such as NHMRC funding).

- It is difficult to measure the extent to which the HCF Funded projects have made an impact on health systems and practice more widely. Most researchers believed that, if the positive findings from their research could be confirmed, through more research (i.e. expanded application of evidence to other populations or conditions), then their research has the potential to make a real difference: to improve the quality, efficiency, access and equity of provision of health services in Australia.

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