

**An Innovation Platform to Strengthen Primary Health Care Systems
for Aboriginal and Torres Strait Islander Australians: A
Methodologically Pluralist Evaluation**

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Statement of Originality

The work herein, now submitted as a thesis for the degree of Doctor of Philosophy from The University of Sydney, is the result of my own investigations, with any references to the ideas and work of other researchers specifically acknowledged. I have not submitted this material, either in full or in part, for a degree at this or any other institution or for other purposes.

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(3 February 2022)

Statement of Contribution

This PhD was conducted under the auspice of the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI), which was funded by the National Health and Research Council (NHMRC; project grant #1078927) from November 2014 to November 2019. I commenced my PhD candidature in January 2018 as a part-time student and served in a dual role as a research fellow and project manager at the CRE-IQI from January 2017 to December 2019.

In 2019, I was a recipient of a \$5,000 Cross-Cultural Public Health Research Award from The University of Sydney to support my PhD research. In July 2020, I commenced as a full-time PhD student on receipt of a University of Sydney Postgraduate Award (#SC0649). All my activities contributing to the work contained within this thesis were carried out during my candidature.

This thesis is presented as a series of six journal articles that have been published in peer-reviewed scientific journals. The ideas, development and writing of the publications were principally my responsibility. For all the publications, I had lead responsibility for the data collection, analysis and synthesis. Specific author contributions for publications are detailed below.

This thesis has benefited from multidisciplinary collaboration with input from CRE-IQI members. My PhD supervisors (Professor David Peiris, Dr Seye Abimbola, Professor Roxanne Bainbridge, Dr Frances Cunningham and Professor Megan Passey), CRE-IQI researchers (Drs Veronica Matthews, Alison Laycock and Kathleen Conte) and members of the CRE-IQI provided their respective expertise, input and guidance on the evaluation. It was edited by Ms Jane Yule and Elite Editing, and editorial intervention was restricted to Standards D and E of the *Australian Standards for Editing Practice*.

Abstract

Innovation platforms bring together diverse stakeholders to exchange ideas about addressing challenging problems. The inherent complex nature of innovation platforms poses challenges for evaluators, and although it is recommended that multiple evaluation methods be used, this is not commonly done in practice.

In this thesis, a methodologically pluralist approach was taken to evaluate and iteratively refine an innovation platform to strengthen primary health care for Aboriginal and Torres Strait Islander Australians. The thesis comprises four related sub-studies:

1. A *developmental evaluation* to inform the ongoing decision-making and reflection about, and adaptation of, the innovation platform. Examples of adaptations include the appointment of another Indigenous researcher to the leadership team and an increase in resources to develop policy submissions.
2. A *principles-focused evaluation* to explore both the implementation of, and outcomes from, a set of guiding principles developed as part of the governance of the innovation platform. These principles enabled members to navigate complexity and to embrace diverse and sometimes conflicting perspectives.
3. A *co-authorship network analysis* to understand the growth and emergence of research outputs. This demonstrated increased productivity over time, greater authorship diversity and expansion of research themes, which in turn reflected a decentralised network.
4. A *framework analysis* that used a learning collaborative taxonomy to identify factors that facilitated collaboration. For example, the duration of time that stakeholders worked together was influential, and underpinned the innovation platform's trusting relationships, a collective identity, and an inclusive approach to new members.

The methodologically pluralist evaluation yielded a nuanced understanding of the innovation platform that would have been difficult to achieve with any single evaluation method. Each sub-study, individually and combined, helped to open the 'black box' of the innovation platform, informing its formation and iteratively assessing its functions and outcomes.

Ethical Clearance

The research included in this thesis was approved by the following human research ethics committees:

- The University of Sydney Human Research Ethics Committee (Project 2018/206)
- The Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research (Project 2018-3105).

Acknowledgements

I wish to acknowledge and pay respect to the people and Elders of the Aboriginal and Torres Strait Islander nations who are the traditional custodians of Australia. During my candidature I had the privilege of living and working on Widjabul Wia-bal Country, of the Bundjalung Nation. I pay my respect to this nation's strength and resilience, and its people's continuing connection to land, waters, sea and community.

There are so many who need to be acknowledged for their contributions to this thesis. In particular, I would like to thank the chief and associate investigators of the CRE-IQI, along with those at other participating organisations: as a large collaboration, there are just too many of you to name individually. Thank you for your generosity in sharing and learning together, for your frank insights and inputs.

I consider myself extremely fortunate to have had five exceptional supervisors. First, sincere thanks to my primary supervisor, Professor David Peiris: your guidance and considered, quality advice has helped me to stay on track. Thanks also to my associate supervisors, Dr Seye Abimbola, Professor Roxanne Bainbridge, Professor Megan Passey and Dr Frances Cunningham, who have inspired me in many ways. You have all provided important insights and perspectives, and it has been a true honour and privilege to learn from such a range of experts.

I wish to acknowledge my long-term work colleagues and co-authors Dr Alison Laycock and Dr Veronica Matthews. Thank you for your many contributions, support and collegiality, and your willingness to work and learn together. In addition, I would like to thank Dr Kathleen Conte for being so willing to share ideas and provide critical intellectual input, and Ms Kerryn Harkin for meticulous detailed project support and good humour. Special thanks go to Associate Professor Nikki Percival, who has been a mentor and friend since I commenced my research journey—I will be forever grateful.

Personal note

My deepest gratitude to Ross for your tremendous, unwavering amount of support and endless encouragement. This would not have been possible without you.

Thank you to my loving parents, Rebecca and Reg, for the strong foundations and support. Finally, thank you to my children, Jasmin Summer, Jeddah Harry and Alice Misty. Your resilience and strength inspire me daily.

Publications

This thesis contains mostly published work in peer-reviewed journals, all of which has been published in open access, Quartile 1 journals. Citations are based on Google Scholar and downloads are based on full text downloads reported by journal metrics, both as at 3rd February 2022. Appendix 1 contains a description of the journals.

Chapter 2: Bailie J, Cunningham FC, Bainbridge RG, Passey M E, Laycock AF, Bailie R, Abimbola S, Peiris D. Comparing and contrasting ‘innovation platforms’ with other forms of professional networks for strengthening primary healthcare systems for Indigenous Australians. *BMJ Glob Health* 2018;3(3):e000683. doi:10.1136/bmjgh-2017-000683 (Citations: 17; Downloads: 3800)

Chapter 3: Bailie J, Laycock A, Peiris D, Bainbridge R, Matthews V, Cunningham F, Conte K, Abimbola S, Passey M, Bailie R. Using developmental evaluation to enhance continuous reflection, learning and adaptation of an innovation platform in Australian Indigenous primary health care. *Health Res Policy Syst* 2020;18:1–11. doi:10.1186/s12961-020-00562-4 (Citations: 8; Downloads: 2745)

Chapter 4: Bailie J, Laycock A, Conte K., Matthews V, Peiris D., Bailie R, Abimbola S, Passey M, Cunningham F, Harkin K, Bainbridge R. Principles governing ethical research in a collaboration to strengthen Indigenous primary healthcare in Australia—learning from experience. *BMJ Glob Health* 2021;6:e003852. doi:10.1136/bmjgh-2020-003852 (Citations: 3; Downloads: 5589)

Chapter 5: Bailie J, Potts B, Laycock A, Abimbola S, Cunningham F, Matthews V, Bainbridge R, Conte K, Passey M, Peiris D. Collaboration and knowledge generation in an 18-year quality improvement research program in Australian Indigenous primary health care: a co-authorship network analysis. *BMJ Open* 2021;11:e045101. doi:10.1136/bmjopen-2020-045101 (Citations: 4; Downloads: 2218)

Chapter 6: Bailie J, Peiris D, Laycock A, Bailie R, Matthews V, Conte K, Cunningham F, Bainbridge R, Passey M, Abimbola S. Utility of the AHRQ learning collaboratives taxonomy for analyzing innovations from an Australian collaborative. *Jt Comm J Qual Patient Saf* 2021;47(11):711–722. doi:10.1016/j.jcjq.2021.08.008 (Citations: 1; Downloads: not available)

Chapter 7: Bailie J, Cunningham F, Abimbola S, Laycock A, Bainbridge R, Bailie R, Conte K, Passey M, Peiris D. Methodological pluralism for better evaluations of complex interventions: lessons from evaluating an innovation platform in Australia. Health Res Policy and Syst 2022; 20, 14. <https://doi.org/10.1186/s12961-022-00814-5> (Citations: 0; Downloads: 338)

Other Related Outcomes from this Thesis, but not Included in the Main Body

In addition to the six peer-reviewed publications included in the body of the thesis, there are several other research outputs arising from this thesis: namely, two research reports (one as first author), two peer-reviewed publications, and 11 conference and seminar presentations (four as first author).

Research reports

1. Laycock A, Conte K, Harkin K, **Bailie J**, Matthews V, Cunningham F, Ramanathan S, Bailie R. Improving the quality of primary health care for Aboriginal and Torres Strait Islander Australians: CRE-IQI final report. Lismore, NSW: Centre for Research Excellence in Integrated Quality Improvement, University Centre for Rural Health, 2019. Available from: <https://ucrh.edu.au/wp-content/uploads/2020/02/CRE-IQI-Final-Report.pdf>.

This final report of the CRE-IQI details the research findings, engagement and impact. As a co-author, I contributed to the design, data collection, analysis and reporting. Of note, I also developed the visual representation of the elements of the CRE-IQI as an innovation platform. Appendix 2 presents this report in its entirety and is available in the link provided in the citation above.

2. **Bailie J**, Laycock A, Harkin K, Conte K, Bailie R. CRE-IQI Year 4 review progress report 2018: Strengthening the health system through integrated quality improvement and partnership. Lismore, NSW: Centre for Research Excellence in Integrated Quality Improvement, University Centre for Rural Health, 2018 September. Available from: https://ucrh.edu.au/wp-content/uploads/2019/12/CRE_Year4Review_Feb2019_FINAL.pdf.

The Year 4 review was a major activity related to the developmental evaluation. It was intended to summarise the first four years of operation of the CRE-IQI, and to guide and inform its work going forward. The report is accessible via the link in the citation above.

Peer-reviewed publications

1. Ramanathan S, Reeves P, Deeming S, Bailie R S, **Bailie J**, Bainbridge R, Cunningham F, Doran C, Bell K M, & Searles A. Encouraging translation and assessing impact of the Centre for Research Excellence in Integrated Quality Improvement: rationale and protocol for a research impact assessment. *BMJ Open* 2017;7(12),e018572.

This publication is related to the economic and impact evaluation of the CRE-IQI projects, and is presented in its entirety in the appendix of this thesis (Appendix 3). As a co-author on this publication, I contributed to the design and implementation of the study.

2. Cunningham F, Potts B, Ramanathan S, **Bailie J**, Bainbridge R, Searles A, Laycock A, Bailie R. Network evaluation of an innovation platform in continuous quality improvement in Australian Indigenous primary health care. Manuscript being prepared for submission.

This publication is related to the social network analysis carried out at two time points during the collaboration. It has been submitted to a journal and is currently under review. As a co-author on this publication, I contributed to the study's design, execution, data analysis, and interpretation and reporting.

Conference and seminar presentations

1. **Bailie J**, Potts B, Laycock A, Abimbola S, Cunningham F, Matthews V, Bainbridge R, Conte K, Passey M, Peiris D. Collaboration and knowledge generation in an 18-year quality improvement research program in Australian Indigenous primary health care: a co-authorship network analysis. In: Research Capacity Strengthening Seminar, Centre for Research Excellence in Strengthening Systems for Indigenous Health Care, 2020 October; Lismore, NSW [online].
2. **Bailie J**, Potts B, Laycock A, Abimbola S, Cunningham F, Matthews V, Bainbridge R, Conte K, Passey M, Peiris D. In: Collaboration and knowledge generation in an 18-year quality improvement research program in Australian Indigenous primary health care: a co-authorship network analysis. Higher Degree Student Seminar—The School of Public Health, 2020 August; Sydney [online].
3. **Bailie J**, Potts B, Laycock A, Abimbola S, Cunningham F, Matthews V, Bainbridge R, Conte K, Passey M, Peiris D. In: Collaboration and knowledge generation in an 18-year quality improvement research program in Australian Indigenous primary health care: a co-

authorship network analysis. Higher Degree Student Seminar Day—The University Centre for Rural Health,. 2020 July; Lismore, NSW [online].

4. **Bailie J**, Laycock A, Matthews V, Peiris D, Conte K, Bailie R, Cunningham F, Passey M, Abimbola S, & Bainbridge R. Application of a principles-focused developmental evaluation approach to a national research partnership to improve Australian Indigenous health outcomes. In: Australasian Evaluation Society, 2019 September; Sydney.
5. Ramanathan S, Laycock A, **Bailie J**, Matthews V, Bailie R, & Searles A. Maximising value by increasing usability of research findings: assessing the impact of a novel participatory approach to disseminating findings from an Indigenous primary healthcare project. In: NHMRC Symposium on Research Translation, 2018 November; Sydney.
6. Ramanathan S, Searles A, **Bailie J**, Cunningham F, & Bailie R. The impact of quality improvement research in Indigenous primary healthcare. In: PHC Research Conference. 2018 August; Melbourne.

Awards

2020

- University Postgraduate Award, The University of Sydney for ‘A University-funded scholarship awarded to assist students of exceptional research potential with their studies’. (\$35,000 tax-free per year)

2019

- Highly Commended—Best Health Services and Policy Research Paper, Health Services Research Association of Australia and New Zealand, 6 December 2019. (Chapter 2 of thesis)
- Cross-Cultural Public Health Research Award, The University of Sydney and the University of Western Sydney (\$5,000). (For PhD evaluation research)

Other outputs completed during candidature, but not related to this thesis, are listed in Appendix 4. These include 12 peer-reviewed publications (five as first author); three reports, including an evaluation design report; nine parliamentary and inquiry submissions (six as first author); three invited research translational articles (all as first author); and 11 conference and seminar presentations (four as first author).

Reflexivity: Why Me and Why This Topic?

As a non-Indigenous evaluator embedded within a collaboration focused on Aboriginal and Torres Strait Islander health, I feel compelled to introduce myself early in this thesis. As self-indulgent as this may seem, to be an ethical researcher I must be transparent, self-aware and critical of my worldview for its influence on, and its application in, this study—for knowledge is not produced context free. Introducing my positioning here enables the contents of this thesis to be read accordingly.

I am a non-Indigenous Australian with Scottish and Irish ancestry, born on Walbanga land, of the Yuin Nation (Batemans Bay, NSW). An awareness of my access to privileges, opportunities and resources came early: first as a primary school student living in Papua New Guinea and the Solomon Islands, and then as a high school Rotary Exchange Student in Johannesburg, South Africa, in 1990, just as apartheid was being dismantled. My undergraduate degree in Medical Anthropology, and my subsequent Graduate Diploma in Education and Master of Culture, Health and Medicine, further challenged me to reflect on how I can convert the opportunities I was given into opportunities I can share with others.

My early working life is a montage: a job as a schoolteacher in the Kimberly region of Western Australia, a position providing court support for women and children survivors of family violence, and acting as the manager of a large Aboriginal ‘Healthy for Life’ program to improve health outcomes for Aboriginal families through better chronic disease management. It was through the Healthy for Life work that I was first introduced to the concept of continuous quality improvement (CQI) and became involved in facilitating CQI activities in Aboriginal community-controlled health services and general practices.

This interest in CQI as an approach to achieving large-scale change was further developed in 2009 when I commenced with the Menzies School of Health Research as a CQI facilitator. Although much of my previous work had involved evaluative elements, it was not until 2010, when I was appointed as an evaluation coordinator with a team conducting a large-scale evaluation of a national Indigenous chronic disease program, that my interest in evaluation was firmly cemented.

In January 2017, I became a research fellow at the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI, from 2015 to 2019). In this role, I was responsible for project

management, budgeting and reporting for the CRE-IQI, along with research translation, developmental evaluation and the coordination of a multi-pronged evaluation. I had a long-standing collegiate relationship with many members of the collaboration because of my previous work on collaborative projects affiliated with the CRE-IQI.

In January 2018, I commenced my PhD candidature, initially part-time. I embarked on my doctoral research both to further my academic development and to pursue my personal commitment to improving health outcomes and equity for Aboriginal and Torres Strait Islander people. I was also drawn to the CRE-IQI leadership's clear vision of taking an evaluative approach that was methodologically nimble to circumstance, as it gave me the opportunity to implement a variety of evaluation design frameworks. In doing so, I and others in the collaboration developed new methodological skills.

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Abbreviations and Definitions

AHRQ	Agency for Healthcare Research and Quality
COREQ	consolidated criteria for reporting qualitative research
CQI	continuous quality improvement
CRE-IQI	Centre for Research Excellence in Integrated Quality Improvement
CRE-STRIDE	Centre for Research Excellence in Strengthening Systems for Indigenous Health Care
IP	innovation platform
NHMRC	National Health and Medical Research Council
PHC	primary health care

Aboriginal and Torres Strait Islander people are the Indigenous peoples of Australia. They are not one group but comprise hundreds of groups, each with their own distinct set of languages, histories and cultural traditions. Aboriginal and Torres Strait Islander people are respectfully referred to as ‘Indigenous’ in publications related to this thesis, acknowledging cultural and historical diversity, although in the body of the thesis ‘Aboriginal and Torres Strait Islander’ is used.

SECTION 1: INTRODUCTION

This introductory section contains two chapters. Chapter 1 provides an overview of complex interventions and the approach to evaluation. It concludes by summarising the thesis aims and scope, outlining its structure, and presenting the evaluation conceptual framework. Chapter 2 details the setting of the evaluation—an innovation platform established to strengthen continuous quality improvement (CQI) efforts in Aboriginal and Torres Strait Islander primary health care (PHC).

Chapter 1: Introduction to a Methodologically Pluralist Evaluation of a Complex Intervention

There is a moral imperative to address the disproportionate burden of disease and mortality faced by Indigenous peoples globally when compared with general populations.(1) Stronger health systems are identified as a vital requirement for meeting this challenge and improving health outcomes for all.(2) One way of strengthening health care systems is to use CQI, which aims to facilitate ongoing improvement in the quality of PHC through the use of objective information to analyse and improve systems, processes and outcomes.(3) CQI processes based in ‘plan, do, study, act’ cycles provide a theory-based, coherent and practical way for PHC services to identify, address and overcome priority evidence–practice gaps in care.(4)

CQI has been well accepted by Aboriginal and Torres Strait Islander PHC services and its sustained use has been shown to improve the delivery of best practice clinical care.(5-7) However, despite policy investment and support,(7) and a workforce motivated to improve Aboriginal and Torres Strait Islander health,(8) there has been wide variability in response to CQI initiatives.(9-12) No one model of CQI has proven to be more effective than others because, as is the case with most complex interventions, there are multiple influences on change.(13) A growing body of literature suggests that conditions for effective CQI include the following: the use of multifaceted approaches tailored to suit local contexts (14-15); strong data systems (16-17); a health workforce that is sufficient, stable and skilled (15, 17); and linkages and collaborations with the community and broader health system.(13-15, 18) These conditions require that stakeholders from a diverse range of organisations and sectors work together to develop solutions that may go beyond the role and capability of an individual PHC service.(6, 19, 20)

Innovation platforms are one such collaborative mechanism for bringing together diverse stakeholders to identify solutions to common problems or achieve common goals.(21, 22) An innovation platform is defined as ‘a space for learning and change. It is a group of individuals (who often represent organisations) with different backgrounds, expertise, and interests ... The members come together to diagnose problems, identify opportunities and find ways to achieve their goals.’(23 p1) Innovation platforms first emerged in the field of agricultural research as a departure from the historical linear approach to agricultural extension programs, by instead applying innovation systems ideas.(24-26) They have since been widely applied throughout

the agricultural research and development sector, mainly in Africa, to provide evidence of results achieved.(27-31) For example, in Ethiopia innovation platforms have been used to improve the transportation of milk from the farmers through to market.(32) They have also been applied, to a more limited extent, in health. For example, McHugh et al. found that multi-stakeholder alliances, a form of innovation platform, can encourage greater uptake of information technology to improve quality in medical practices.(33) In Chapter 2, I compare and contrast innovation platforms with other types of collaborations and describe in detail their design elements.

Given the multiple stakeholders engaged in innovation platforms, and the often intractable nature of the problems being addressed, they should be considered complex interventions. Complexity is described as ‘a dynamic and constantly emerging set of processes and objects that not only interact with each other, but come to be defined by those interactions’.(34 p42) In addition, interventions can be thought of as complex if they are dependent on the behaviours of those delivering and receiving them, if there are a range of possible outcomes, or if there is a need to tailor the intervention to different contexts and settings.(35) Consequently, developing a comprehensive understanding of how innovation platforms function requires diverse evaluation approaches that are sensitive to complexity.(36-38)

Thus, there have been increasing calls for emergent evaluation designs in which data collection and analysis procedures evolve over the course of a project in response to what is learned in the earlier parts of the study.(39) Such designs recognise that complex interventions and context are not easily or usefully separated, and that system disruptions may generate effects that are not captured by simplistic, linear causal pathways between intervention and outcome.(40) Rather, they often require a methodological pluralist approach that, in its simplest form, denotes a diversity of methods to address research questions. It stresses and values the use of more than one methodology and method, including the potential for more than one epistemological stance.(37, 41) In so doing, it can provide a more holistic and textured analysis, thereby allowing for a context-sensitive appraisal of an intervention and the mitigation of limitations inherent in any single method. Although there are clear calls for an endorsement of pluralism of evaluative approaches in principle, there have been few attempts to apply and examine these approaches in practice.(41)

1.1 Scope of Thesis

This thesis focuses on an evaluation of the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI), which operated between 2014 and 2019 and was preceded by more than 15 years of research partnerships in CQI.(42) The stated goal of the CRE-IQI was to establish an innovation platform to improve Aboriginal and Torres Strait Islander health outcomes by accelerating and strengthening system-wide CQI efforts in PHC at the health service, regional and national levels (see Chapter 2 for a detailed description of the CRE-IQI). The evaluation examines the CRE-IQI as the primary unit of interest. Appendix 3 contains the CRE-IQI Final Report, which I co-authored and the key research findings that emerged from the CRE-IQI.

The evaluation research described in this thesis was embedded alongside two other evaluation research projects—an economic and impact evaluation (43, 44) and a social network analysis.(45) This thesis does not examine the impact and economic evaluation of specific projects. However, Appendix 3 contains in their entirety the following, which I co-authored: the CRE-IQI Final Report detailing the key research findings, impact and engagement of the CRE-IQI (46); and a study protocol of the economic and impact evaluation of the specific projects of the CRE-IQI.(43) The social network analysis, which was led by a colleague, was carried out at two time points in the lifespan of the innovation platform.(45) A peer-reviewed publication detailing the methods and findings from the social network analysis, of which I am a co-author, is currently being prepared for journal submission. The evaluation for this thesis drew on early findings both from the social network analysis and from the economic and impact evaluation to inform the functioning of the innovation platform (detailed further in Chapter 3).

1.2 Research Objectives and Structure of Thesis

Through a series of related sub-studies, a methodologically pluralist approach was taken to evaluate the formation, functioning and outcomes of the CRE-IQI as an innovation platform (see Chapter 2).

Specific objectives include the following:

1. To refine the formation, functioning and outcomes of the innovation platform by supporting continuous reflection, rapid learning and adaptation (see Chapter 3).

2. To identify the mechanisms and contextual factors that enable innovation platforms to improve Indigenous PHC systems (see Chapters 4 and 6).
3. To assess the development of, and change in, innovation platform stakeholders over time (see Chapter 5).
4. To generate new knowledge on, and approaches to, evaluating complex interventions (see Chapters 7).

In carrying out these objectives, the aim of this thesis was to help refine the innovation platform in response to evaluative findings, to inform future evaluations of similar complex interventions, and to generate new knowledge on the role of innovation platforms in addressing complex challenges.

1.3 Evaluation Conceptual Frame

Lemire and colleagues' (47) 'evaluation tree', modified from Christie and Alkin's (48) 'evaluation theory tree', provides a conceptual framework with which to evaluate the innovation platform (see Figure 1). Using the metaphor of a tree provides a visual depiction both of the foundations (i.e. the roots) from which the evaluation of the innovation platform emerged and of the three branches of the evaluation tree (*methods*, *valuing* and *use*). These three branches speak to the defining characteristics of evaluation: the use of systematic data collection (*methods*), the central role of how we make evaluative judgements and by whom (*valuing*), and the central purpose of informing decision-making (*use*). (47)

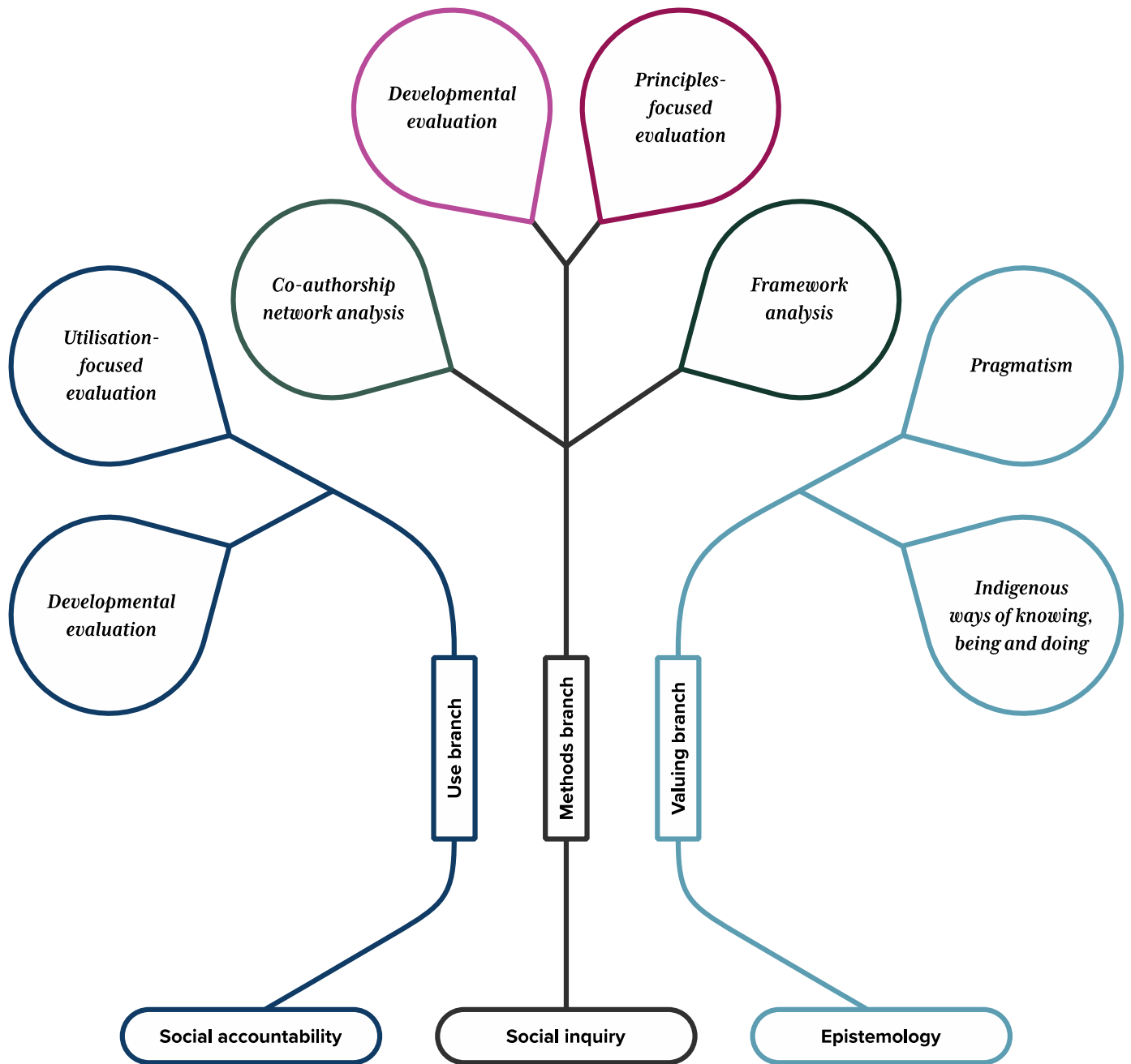


Figure 1: Key elements of the evaluation design of the innovation platform based on Lemire's(47) evaluation tree

The *use* branch on the evaluation tree grows from the *social accountability root* (the demand for programs to demonstrate positive outcomes or impact). It is concerned with how the evaluation is used, by whom and for what purpose, which I conceptualised as both ‘developmental’ (49, 50) and ‘utilisation-focused’.(51) Unlike traditional forms of evaluation, the focus of developmental evaluation is on reflection, learning and change to enable interventions to adapt to the emerging complex environments in which they are situated.(50, 52) This aligns with the need for innovation platforms to have a mechanism for continuous reflection, learning and adaptation, all of which support innovation. Ensuring that the evaluation findings were useful, and thereby would have a significant impact, was paramount because so many of the end users were participants in the research collaboration. Given that neither utilisation-focused nor developmental approaches advocate for any particular evaluation theory, methodology or methods,(53) I worked with the intended evaluation users to select the most appropriate approach rather than opting for data collection methods that were specified in advance.(51)

The central branch of the evaluation tree—*methods*—grows directly from the *social inquiry root* (a commitment to the systematic use of social scientific methods). Given the inherent challenges of evaluating complex collaborations, I drew on a variety of methodological approaches (also referred to as ‘design frameworks’), which included developmental evaluation (3) (Chapter 3), principles-focused evaluation (6) (Chapter 4), co-authorship network analysis (7) (Chapter 5), and framework analysis (8) (Chapter 6).

The third branch—*valuing*—grows from the *epistemology root* (considerations about the nature and validity of knowledge). It outlines how I determined the ‘merit’ and ‘worth’ (54) of the innovation platform, and what informed these perspectives. This third branch cuts across all thesis chapters as the evaluation was guided by a strengths-based approach that values and centres Indigenous ways of knowing, being and doing.(55, 56) A pragmatic perspective (51, 57) was also taken in the evaluation, based on the proposition that researchers should use the philosophical and/or methodological approach that works best for their particular research question and research context. Pragmatism embraces the use of a plurality of methods in which the focus is on the situation and opportunities that emerge, rather than on adherence to a specific methodological design.(58, 59)

Given the integrated nature of *methods*, *valuing* and *use* in evaluation practice, there is a necessary overlap between these three main branches.(47) However, only developmental

evaluation is placed on more than one branch because of the primacy of this important methodological approach (50) in informing the ongoing formation, functioning and outcomes of the innovation platform.

In Chapter 7, I revisit the overall thesis objectives and reflect on the evaluation approach taken. In doing so, I synthesise the learnings from undertaking a methodologically pluralist evaluation and identify issues to consider when planning and conducting evaluations of complex interventions such as innovation platforms.

Chapter 2: Comparing and Contrasting ‘Innovation Platforms’ with other Forms of Professional Networks for Strengthening Primary Health Care Systems for Indigenous Australians

2.1 Preface

Within this chapter, I compare and contrast the concept of innovation platforms with other types of networks and present an overview of how the CRE-IQI functioned as an innovation platform. One of the primary research aims of the collaboration was to monitor and evaluate the CRE-IQI as an innovation platform.

This chapter was written as a journal article, of which I am the principal author, and is presented here in its entirety. The article was published in *BMJ Global Health* and is available on the journal’s website at <https://gh.bmj.com/content/3/3/e000683>. In 2019, this journal article was highly commended for the Best Health Services and Policy Research Paper, Health Services Research Association of Australia and New Zealand.

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2.2 Author Contributions and Attribution Statement

Ms Jodie Bailie and Professor Roxanne Bainbridge conceived the manuscript, with Jodie taking the lead on writing all drafts, integrating feedback upon reviews and finalising the manuscript. All authors reviewed the drafts of the manuscript, provided critical intellectual input, and read and approved the final manuscript.

As supervisor for the candidature upon which this thesis is based, I can confirm that the authorship statement attribution is correct.

Professor David Peiris

31.01.22

2.3 Published Article

Comparing and contrasting ‘innovation platforms’ with other forms of professional networks for strengthening primary healthcare systems for Indigenous Australians

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ABSTRACT

Efforts to strengthen health systems require the engagement of diverse, multidisciplinary stakeholder networks. Networks provide a forum for experimentation and knowledge creation, information exchange and the spread of good ideas and practice. They might be useful in addressing complex issues or ‘wicked’ problems, the solutions to which go beyond the control and scope of any one agency.

Innovation platforms are proposed as a novel type of network because of their diverse stakeholder composition and focus on problem solving within complex systems. Thus, they have potential applicability to health systems strengthening initiatives, even though they have been predominantly applied in the international agricultural development sector.

In this paper, we compare and contrast the concept of innovation platforms with other types of networks that can be used in efforts to strengthen primary healthcare systems, such as communities of practice, practice-based research networks and quality improvement collaboratives. We reflect on our ongoing research programme that applies innovation platform concepts to drive large-scale quality improvement in primary healthcare for Aboriginal and Torres Strait Islander Australians and outline our plans for evaluation. Lessons from our experience will find resonance with others working on similar initiatives in global health.

INTRODUCTION

There is a moral imperative to address the global disproportionate burden of disease and mortality for Indigenous people when compared with general populations.^{1 2} Stronger health systems are identified as a vital requirement for meeting this challenge and improving health outcomes for all,^{3 4} with calls to apply systems thinking approaches and to mobilise networks.² At its core, systems thinking is focused on interactions

Summary box

- ▶ Health systems strengthening requires bringing together networks of stakeholders across traditional disciplines and fields in order to achieve relevant goals and objectives.
- ▶ Innovation platforms are distinguished from other networks by the diverse range of stakeholder groups they bring together, and their focus on solving complex and often entrenched systemic problems.
- ▶ We compare and contrast innovation platforms with other types of networks and reflect on our experience applying this concept to a large-scale quality improvement programme in primary healthcare for Aboriginal and Torres Strait Islander Australians, and outline our plans for evaluation.
- ▶ Policymakers should support further experimentation with innovation platforms as a strategy for engaging with multiple stakeholders in health systems strengthening initiatives.

and relationships between different components and levels of the health system—local, regional and national.²

Efforts to strengthen health systems require, in part, the utilisation of diverse, multidisciplinary stakeholder networks working across different levels of the broader health system to problem solve collectively, build the capacity and learning of stakeholders and to foster system-wide planning, evaluation and research.^{3 4} Networks are promoted as providing a general mechanism for exchanging information, spreading good practice, promoting experimentation and for knowledge creation.⁵ The term ‘network’ tends to be used interchangeably with (or as a catchall for) terms such as ‘partnership’,



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‘collaboration’, ‘group’ or ‘alliance’. It is also used to describe relationships through which people, groups or organisations connect to work effectively and synergistically together.⁶ Of most relevance to this paper, networks might be useful in addressing complex issues or ‘wicked’ problems, the solutions to which go beyond the control and scope of any one agency.⁷

Many networks are focused on one professional group or one part of the health system, and are primarily established to address a specific local-level problem or to implement evidence-based practice. They tend to be focused at the clinical microsystem level in small, functional front-line units that provide most healthcare to most people.⁸ However, a recent publication by Nix *et al*⁹ renews the call for expanded multidisciplinary networks that have both a system-wide lens, and include policymakers, researchers and health services. These authors also highlight the gap in the literature on understanding the factors that contribute to network effectiveness.⁹

The term ‘innovation platform’ describes a form of network that aims to overcome challenges occurring at the interface of systems through bringing together people from different parts of the system.^{10–11} Leaders of large-scale change have argued that innovation platforms create an opportunity for people working in different parts of the system to tackle challenging issues together.^{12–13} These platforms have been most extensively applied in the international agricultural development sector, and to a more limited extent in health. They are promoted as being different to other networks, mainly due to their diverse stakeholder composition and focus on problem solving that requires a whole of system response (ie, within and across micro, meso and macrolevels of the health system).

In this paper, we describe the application of the concept of innovation platforms—as a specific type of multidisciplinary network that engages stakeholders at national, regional and local levels to problem solve together—to our work in health services and health systems research in Aboriginal and Torres Strait Islander (hereafter respectfully referred to as Indigenous) primary healthcare (PHC) in Australia. We compare and contrast innovation platforms with other types of commonly used network concepts, reflect on our ongoing experience in using the innovation platform concept and outline our plans for evaluation.

INTEGRATED QUALITY IMPROVEMENT IN INDIGENOUS PHC

Although Australia has a high-performing health system, underpinned by a universal health insurance scheme, it ranks low on measures of equity when compared with other Organisation for Economic Cooperation and Development nations.¹⁴ Indigenous Australians experience a disproportionate burden of ill health, shorter life expectancy and poorer access to PHC compared with the non-Indigenous population.^{15–16} These inequities are a pervasive legacy of colonisation, land dispossession,

displacement, disempowerment, social and economic exclusion and ongoing racial discrimination.¹⁷ Furthermore, at least 34% of the health gap between Indigenous and non-Indigenous Australians is linked to social determinants of health, rising to 53% when combined with behavioural risk factors, such as tobacco and alcohol use, dietary factors and physical activity.^{15–18}

Continuous, system-wide quality improvement—a systematic way of using data to guide changes to improve how PHC is organised, structured or designed—can significantly improve the quality of PHC service delivery.^{19–20} Recognising the need to enhance and scale up continuous quality improvement initiatives in Indigenous PHC, the National Health and Medical Research Council of Australia provided funding to develop a Centre of Research Excellence in Integrated Quality Improvement in Indigenous Primary Health Care (CRE-IQI) from 2015 to 2019. The CRE-IQI aims to improve Indigenous health outcomes by accelerating and strengthening system-wide PHC quality improvement efforts through working at all levels of the health system, and supporting quality improvement efforts at the health service, regional and national levels. The conditions for effective quality improvement include the use of multifaceted approaches that are tailored to suit local context, action and engagement sustained at multiple levels, investments in staff training and development, and access to resources such as information technology to support quality improvement.²¹ The CRE-IQI builds on the Partnership Learning Model that was developed in a previous phase of collaborative quality improvement research.²² The model hypothesises how large-scale change can lead to improved population health outcomes through the interaction of comprehensive PHC, integrated quality improvement and system-based research networks and participatory action research.

DISTINGUISHING INNOVATION PLATFORMS FROM OTHER TYPES OF NETWORKS

Types of networks that have been described in the PHC and quality improvement literature include (but are not limited to) communities of practice,²³ practice-based research networks²⁴ and quality improvement collaboratives.²⁵

Communities of practice

The concept of ‘communities of practice’ describes a group of people (either individually or as members of an institution or organisation) with shared interests, or a common set of problems or concerns, who come together on an ongoing basis to explore ideas and solve problems, and to extend their knowledge and expertise on a specific topic.^{23–26} Communities of practice have been applied in a number of sectors, such as education and health. Broadly used in healthcare,^{26–27} they are generally established for the purpose of bringing together people with a similar professional skill set to improve clinical practice or to assist

with the implementation of evidence-based practice: for example, a group of general practitioners developing a community of practice to improve the standard of referral letters written to specialists.²⁸

Practice-based research networks

Practice-based research networks are a collaborative learning mechanism comprising research academics and primary care practitioners. They link dispersed practices in collaborative research, drawing on front-line PHC teams to help frame practice-relevant research questions, catalyse local knowledge with academic expertise and create opportunities to address important research questions generated at the local primary care level.^{24 29 30} A good example of this in Australia is the North Queensland Practice-Based Research Network, which aims to develop and conduct locally important, clinically relevant, high-quality primary care research. It involves general practitioners and practice nurses conducting small research projects relevant to local needs, with academic support from James Cook University.³¹ Practice-based research networks aim to address specific research questions relevant to their participants rather than addressing broader health system challenges.

Quality improvement collaboratives

Quality improvement collaboratives bring together healthcare professionals within one organisation or across multiple sites to focus in a structured manner on a common problem related to a particular clinical issue or area, for example, setting targets and undertaking rapid cycles of change to improve quality of care.^{25 32} Experts in areas such as clinical and service performance improvement provide the group with periodic instruction and encourage teams to share both lessons learnt and examples of best practice. The most prevalent quality improvement collaborative approach is the Breakthrough Series developed by the Institute for Healthcare Improvement.³³

Innovation platforms

An 'innovation platform' is defined as:

A space for learning, action, and change. It is a group of individuals (who often represent organizations) with different backgrounds, expertise, and interests... The members come together to diagnose problems, identify opportunities, and find ways to achieve their goals. They may design and implement activities as a platform, or coordinate activities by individual members.¹¹ (p 1)

Elements of an innovation platform include:

- ▶ Linking people from a variety of backgrounds, expertise and interests.
- ▶ Identifying shared goals and interests along the supply chain, common problems and solutions.
- ▶ Leveraging research and/or technological expertise.
- ▶ Creating spaces for long-term learning and change, and providing opportunities for capacity building.

- ▶ Establishing effective managerial and administrative components to drive and coordinate the innovation platform.^{10 11 34 35}

To be effective, the facilitation of innovation platforms must recognise and value the diversity and knowledge of stakeholders. It also requires a high level of trust and willingness by stakeholders to share their information and knowledge to achieve a common goal.^{36 37} The role of researchers and research in innovation platforms is evolving, and there is recognition of their important role in improving the relevance and impact of research.^{34 35} The composition of an innovation platform often changes over time with people leaving and others joining. Innovation platforms have been most commonly applied in situations where interventions and solutions are required along a chain and at various levels of production, for example, in supporting small-scale farmers to improve productivity, including seed selection and availability, cultivation, harvesting and getting produce to markets efficiently.

In table 1 we compare and contrast various elements of innovation platforms with other networks applied in healthcare settings. Notably, other network structures or forms of networks in the health sector do not typically include such a diverse range of stakeholders across levels of the health system, and are less focused on addressing system-wide issues at local, regional and national levels.

APPLYING AN INNOVATION PLATFORM TO INTEGRATED QUALITY IMPROVEMENT IN INDIGENOUS PHC

The aims of the CRE-IQI are:

- i. To refine and build new clinical audit tools and processes.
- ii. To develop systems for reporting quality improvement data at different PHC system levels.
- iii. To facilitate the use of quality improvement data in clinical governance.
- iv. To build on quality improvement capacity in the Indigenous workforce.
- v. To identify what works for whom, why and under what circumstances in improving the quality of Indigenous PHC.

The CRE as an innovation platform

The CRE-IQI applies innovation platform concepts to the Partnership Learning Model²² by drawing on the experiences and learning gained from studying this model. The concept of innovation platforms inspired the inclusion of a wider range of stakeholder, such as policy-makers, using diverse quality improvement approaches across multiple levels of the health system to solve problems and innovate together (table 2). Consistent with an innovation platform, a range of organisations and people working in diverse roles and at different levels of the health system are involved in the CRE-IQI. They include researchers from universities and research organisations, policy officers from State and Territory health departments, project managers from State/Territory level support organisations established for Indigenous

Table 1 Key features and motivations of networks—communities of practice, practice-based research networks, quality improvement collaboratives and innovation platforms

Key features and motivations	Communities of practice	Practice-based research networks	Quality improvement collaboratives	Innovation platforms
Definition	Groups of people who share a concern or passion for something they do and learn how to do it better as they interact regularly. They usually form around a specific topic. ²⁷	Collaborations between primary healthcare services and academic institutions, conducting research focused on delivering care to the patients they serve ²⁹	Groups of professionals who come together, either from within an organisation or across multiple organisations, to learn from and motivate each other to improve the quality of health services ⁴⁶	A space for learning, action and change. It is a group of individuals (who often represent organisations) with different backgrounds, expertise and interests... The members come together to diagnose problems, identify opportunities and find ways to achieve their goals. They may design and implement activities as a platform, or coordinate activities by individual members. ¹¹
Predominant sector of application	Health	Health	Health	Agriculture
Purpose	To improve clinical practice or to assist with implementation of an evidence-based practice	To develop and undertake practice-relevant research	To focus on a common problem in a structured manner to achieve improvement in a specific area of care	To identify problems and shared solutions—typically to address system issues
Membership	Commonly people from a similar professional background	Typically general practitioners and practice nurses supported by researchers	Healthcare professionals either from within one organisation or across multiple organisations and sites	Multiple stakeholders from different backgrounds, organisations and levels of a system (or supply chain)
Opportunities for capacity building	Through sharing and learning within the community of practice	Through research support to clinicians	Through sharing and learning within the collaborative	Through harnessing required expertise, sharing and collective problem solving
As vehicles for knowledge and information sharing	Foster opportunities for knowledge and information sharing between members.	Mainly generate research, but also have a role in knowledge and information sharing. Provide opportunities for coproduction of research (by clinician/researchers or collaboration between researchers and clinicians) and improve the relevance, translation and impact of research.	Encourage sharing and learning between teams. Can energise learning and improvement, usually in short bursts.	Facilitate knowledge and information sharing and improve the relevance, translation and impact of research. Facilitate exchange of ideas and problem solving across multiple disciplines and levels of a system, essential for tackling large-scale systemic change. Uses diversity of members and their skills, experience and perspectives as a powerful source of knowledge generation.
Examples in health	Western Australian Community of Practice to improve the quality of referral letters to specialty clinics—Australia ²⁸ Senior Health Knowledge Network to improve the delivery of healthcare for seniors by facilitating knowledge translation among health professionals ³⁸	North Queensland Practice-Based Research—Australia ³¹ Agency for Healthcare Research and Quality ⁴⁷	Australian Primary Care Collaboratives ⁴⁸ Institute for Healthcare Improvement ⁴⁹	Grand Challenges—Canada ⁵⁰

community-controlled health services and practitioners from Indigenous health services.

By fostering knowledge exchange and collaboration, the CRE-IQI brings together stakeholders who offer diverse perspectives on identifying problems (or bottlenecks in the PHC system), propose innovative solutions and work collaboratively on implementation and evaluation of these solutions.

Our experience so far suggests that as an innovation platform, the CRE-IQI facilitates the collaborative development and translation of research projects. Priorities for research emerge fluidly, because PHC stakeholders articulate the knowledge gaps they want to address, and groups of research and health sector stakeholders form around topics. Transitioning from a priority research need to a research project requires the identification of

Table 2 Elements of an innovation platform and aspirations and examples of activities from the Centre of Research Excellence in Integrated Quality Improvement

Elements of an innovation platform	CRE-IQI innovation platform aspirations and examples of activities
Linking people from a variety of backgrounds and roles—multiple stakeholders	<ul style="list-style-type: none"> ▶ The CRE-IQI's aim is to accelerate and strengthen large-scale PHC quality improvement efforts. To achieve this vision, CRE-IQI brings together stakeholders from multiple roles and organisations across the system, including clinicians, researchers, policy and project management from health services, regional service support organisations, national support organisations, universities, research institutes and government. ▶ The CRE-IQI is designed as an open platform that encourages new partnerships and collaborations. This is achieved through sharing information widely to increase awareness of the platform; open calls for funding for projects in which organisations put forward new proposals; and biannual meetings that actively encourage participation from interested stakeholders. ▶ The innovation platform itself is a vehicle for integrated research and knowledge translation, with research, translation and learning occurring in the exchanges and interactions of service providers, policymakers and researchers.
Identifying shared goals and interests, common problems and solutions	<ul style="list-style-type: none"> ▶ A cornerstone of the CRE-IQI is the long-standing commitment from individuals and organisations to improving Indigenous PHC. ▶ Potential projects are identified through the CRE-IQI network, with the management committee determining priority projects for allocation of CRE-IQI resources. ▶ Vision, research aims and cross-cutting work programmes were collaboratively developed.
Harnessing research and/or technology expertise	<ul style="list-style-type: none"> ▶ Research organisations are represented in the CRE-IQI, and are seen as an essential component to facilitate large-scale change. The CRE-IQI is using quality improvement data in clinical governance, management and practice to strengthen health systems in Indigenous PHC. ▶ The innovation platform provides mechanisms for research findings to be translated into policy and practice through (A) strong involvement and leadership of Indigenous people and other end-users throughout the research process; (B) production of high-quality, credible and actionable evidence that addresses the priority needs of the Indigenous PHC sector; and (C) resourcing of collaboration at various levels.
Creating spaces for long-term learning and change, and providing opportunities for capacity building	<ul style="list-style-type: none"> ▶ A key element of the platform is to provide participants with ways to connect with each other beyond their professional teams or workplaces, to ask questions and to share problems and ideas, experiences and solutions through CRE-IQI biannual meetings and regular teleconferences. ▶ The innovation platform provides mechanisms for ongoing capacity building and learning. It provides opportunities for training new and existing researchers and the health workforce to engage in quality improvement research, to understand and apply quality improvement data and evidence and to show leadership in quality improvement. ▶ 'Developing the health research workforce' is an identified cross-cutting theme of the CRE-IQI and we aim to strengthen the research capacity through student scholarships on topics relevant to CRE-IQI; monthly research capacity building teleconferences and webinars with guest presenters external and internal to the network; funding to attend CRE-IQI biannual meetings; and supporting students to become project officers to lead the development of publications and conference presentations.
Establishing effective managerial and administrative components to drive and coordinate the innovation platform	<ul style="list-style-type: none"> ▶ A project lead or chief investigator is identified to progress a piece of work, and their role includes creating the conditions for collective problem solving, sharing of information and solutions and empowering others in driving change. ▶ A project coordinating centre is established to drive the CRE-IQI. People are connected through biannual meetings, regular teleconferences, newsletters, workshops, social media, collaborative writing of publications and presentations, and joint research submissions. ▶ A management committee comprising CRE-IQI chief investigators provides high-level strategic direction and governance oversight of the CRE-IQI. ▶ 'Facilitation of collaboration' is an identified cross-cutting theme of the CRE-IQI.

CRE-IQI, Centre of Research Excellence in Integrated Quality Improvement; PHC, primary healthcare.

an academic lead or chief investigator, who will be responsible for creating the conditions for collective problem solving across multiple stakeholders, sharing information and solutions and empowering others to drive change. Projects can receive some seed funding from the CRE-IQI, often for bringing together stakeholders to develop and refine the research proposal, but most project funds are leveraged from competitive research grant programmes or resourced by health sector stakeholders (usually government health departments). The CRE-IQI also actively supports the translation of research conducted under the auspice of the network.

A platform for innovation, knowledge exchange and collaboration

A portion of CRE-IQI resources is dedicated to providing the infrastructure that actively enables collaboration, learning and innovation (table 2). The core of this infrastructure is a small project coordinating team, who organise regular meetings, workshops and seminars or other events, and facilitate the flow of information. Biannual face-to-face meetings provide opportunities to progress project development and research translation, hear about project outcomes, share ideas and build relationships. The CRE-IQI includes cross-cutting programmes that strengthen research capacity, collaboration and research translation. Webinars and teleconferences enable members located across Australia to connect and engage with leaders in PHC research, and masterclasses are offered around each biannual meeting to increase the skills and knowledge of CRE-IQI members.

Opportunities and challenges

Progressing successful innovation platforms relies on strong engagement from all members, with a demonstrated willingness to work together and to trust each other. The CRE-IQI seeks to provide an open collaboration that actively encourages cooperation with other organisations and individuals to help achieve its aims. Over time, this sharing of information is expected to lead to an expansion of the membership, bringing additional capacity to the CRE-IQI and ultimately extending the potential impact of its programme of work. Changing membership with participating organisations requires constant effort to refresh and build relationships. The time frames for achieving change are long, which can make it difficult to maintain interest and engagement, particularly if people are expecting more rapid change. In particular, members in different roles may have different expectations in relation to time frames for achieving change. For example, clinicians usually work within short time frames when making care decisions with clients or in small teams within clinical microsystems for local continuous quality improvement (CQI) purposes; policy-makers work in short-to-medium time frames developing policy in response to need; and researchers are accustomed to the longer time frames required to develop, undertake, analyse and disseminate research.

The endeavour of creating multidisciplinary or inter-professional networks comes with substantial challenges.⁶ Power relations exist in all networks and play a role in all phases of innovation platform development—from stakeholder selection, agenda setting, identification of relevant research questions and the facilitation of dynamics between platform members.^{34 36} A key determinant of success, therefore, will be the extent to which the CRE-IQI is alert and responsive to power dynamics, and what actions it takes to facilitate the platform, promote reflexive practice and support stakeholders to maintain a commitment to collaboration.

Evaluation of the CRE-IQI as an innovation platform

Despite increased attention to networks in healthcare, evidence on their ability to influence systems change and contribution to improving long-term health outcomes generally yields equivocal findings.^{9 25 38} Undoubtedly, the challenges in assessing impact are driven by the complex environments in which such networks are implemented and the social practices that they are seeking to influence. It follows that the experience of networks in one setting might not necessarily be replicated in other settings, because effectiveness is intimately linked to context, purpose and composition.^{39 40}

Like these other networks, innovation platforms similarly run the risk of not being able to generate clear messages around their impact in terms of process, health and community outcomes. Given there is a general lack of published evaluations of networks and specifically of innovation platforms in the peer-reviewed literature, and the limited application of innovation platforms in the health sector, we seek to address these knowledge gaps by evaluating to what extent the concepts underpinning innovation platforms are applicable to the CRE-IQI and what impact they may be having on a range of outcomes. Specifically, the evaluation goal will be to study the formation, functioning and outcomes of the CRE-IQI as an innovation platform to drive large-scale change. Objectives include the following:

1. Assess whether the concept of innovation platforms translates from agricultural to health sectors.
2. Synthesise lessons learnt from the establishment, functioning and outcomes of the CRE-IQI as an innovation platform.
3. Generate new knowledge about the mechanisms and contextual factors that influence the ability of innovation platforms to generate positive impact in Indigenous PHC systems.
4. Contribute new knowledge on the optimal methodological approaches to evaluating innovation platforms.

Because of the inherent challenges with evaluating complex networks (including innovation platforms) we have designed a mixed-methods, multipronged evaluation, employing three evaluation approaches to learning about the establishment, functioning and outcomes of the CRE-IQI as an innovation platform: social network

analysis, developmental evaluation, and economic and impact assessment.

The social network analysis will document the extent to which the CRE-IQI has facilitated collaboration, and the extent to which it has addressed factors associated with effective network structures. A social network survey was administered at the midpoint of the 5-year life-cycle of the CRE-IQI and will be administered again in the final year. The economic and impact evaluation is using a mixed-methods assessment based on the application of the 'Framework to Assess the Impact from Translational health research'.⁴¹ Drawing on an embedded research model,^{42 43} we are conducting a developmental evaluation^{44 45} to synthesise and apply lessons from the establishment, functioning and outcomes of the innovation platform in real time. The findings from these approaches will be triangulated in a summative evaluation.

CONCLUSION

Promoted as a vehicle to stimulate and support multistakeholder collaboration, innovation platforms are considered particularly useful when there are complex, system-wide issues requiring coordinated action and collective problem solving. The innovation platform concept goes beyond that of other types of networks, and provides mechanisms to enable large-scale change with the potential to improve population health outcomes. Whether they can contribute to system-wide change, or if they are merely a continuation of 'business as usual', will largely be determined by their ability to achieve transformative change in the ways in which stakeholders engage with one another. Given the novelty of this concept, rigorous and critical evaluation is required to build the evidence base on impact of innovation platforms in Indigenous PHC and in other health system settings.

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Correction: Comparing and contrasting 'innovation platforms' with other forms of professional networks for strengthening primary healthcare systems for Indigenous Australians

Bailie J, Cunningham FC, Bainbridge RG, *et al.* Comparing and contrasting 'innovation platforms' with other forms of professional networks for strengthening primary healthcare systems for Indigenous Australians. *BMJ Global Health* 2018;3:e000683.

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SECTION 2: EVALUATION DESIGN FRAMEWORKS AND THEIR FINDINGS

In this section, I present each of the evaluation design frameworks used as part of the evaluation of the innovation platform and their respective findings—namely, developmental evaluation in Chapter 3, principles-focused evaluation in Chapter 4, co-authorship network analysis in Chapter 5, and framework analysis in Chapter 6—and outline each of the methods used, as depicted in the evaluation tree (Figure 1).

Chapter 3: Using Developmental Evaluation to Enhance Continuous Reflection, Learning and Adaptation of an Innovation Platform in Australian Indigenous Primary Health Care

3.1 Preface

Developmental evaluation is increasingly being used as an approach to evaluate innovative, emergent programs and collaborations. This is because it allows evaluators to provide rapid feedback to program implementers, who can then use the evaluation findings to guide changes and adaptations to the program of work.

In this chapter, I outline my approach and rationale for applying a developmental evaluation to enhance the formation, functioning and outcomes of an innovation platform. I provide examples to explain how the developmental evaluation findings were used for adaptation of the innovation platform, and to assess the extent to which our application of developmental evaluation was consistent with, and reflective of, its essential principles. A developmental evaluation approach created the opportunity to use other evaluation methods to address emerging issues, which is a central theme of this thesis.

This chapter was written as a journal article, of which I am the principal author, and is presented here in its entirety. The article was published in *Health Research Policy and Systems* and is available on the journal's website at <https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-020-00562-4>.

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3.2 Author Contributions and Attribution Statement

Ms Jodie Bailie, Dr Alison Laycock and Professor Ross Bailie conceived the manuscript, with Jodie taking the lead on the writing of all drafts, integrating feedback upon reviews and

finalising the manuscript. Alison provided expert input on developmental evaluation. All authors contributed to revising the manuscript and providing critical intellectual input, and all approved its final version.

As supervisor for the candidature upon which this thesis is based, I can confirm that the authorship statement attribution is correct.

Professor David Peiris

31.01.22

3.3 Published Article

COMMENTARY

Open Access



Using developmental evaluation to enhance continuous reflection, learning and adaptation of an innovation platform in Australian Indigenous primary healthcare

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Abstract

Effective efforts to strengthen health systems need diverse, multi-stakeholder networks working together on complex or ‘wicked’ problems such as prevention and control of chronic diseases, solutions to which go beyond the role and capability of one organisation. The contextual complexities inherent in ‘wicked’ problems mean that solutions warrant a systems approach that encompasses innovation and new ways of thinking about, facilitating and implementing collective decision-making processes and change practices.

Innovation platforms are a mechanism for facilitating communication and collaboration among diverse stakeholders, promoting joint action and stimulating innovation. Developmental evaluation is an approach that is increasingly being used to evaluate innovative and emergent programmes and projects, as it enables evaluators to provide real-time feedback so that evaluation findings can be used to guide development and adaptations. Developmental evaluation emphasises learning and adaptation, and aligns well with the implementation of innovation platforms that have continuous reflection, learning and adaptation as a specific design principle. Here, we outline our rationale for applying a developmental evaluation to enhance the formation, functioning and outcomes of an innovation platform aimed at accelerating and strengthening large-scale quality improvement efforts in Australian Aboriginal and Torres Strait Islander primary healthcare. We provide examples to explain how the developmental evaluation findings were used for adaptation of the innovation platform and assess to what extent our application of developmental evaluation was consistent with, and reflective of, its essential principles. Our evaluation aligned strongly with the principles of developmental evaluation, and the approach we took was well suited to situations with a developmental purpose, innovation niche and complexity such as innovation platforms. As a result, along with the increasing interest in multi-stakeholder platforms (e.g. innovation platforms) and the inherent challenges with evaluating these complex networks, we anticipate our use of this approach being (Continued on next page)

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(Continued from previous page)
of interest globally.

Keywords: Developmental evaluation, innovation platforms, Indigenous health, continuous quality improvement, innovation, health systems strengthening, primary healthcare, multi-stakeholder networks, co-production, systems thinking

Introduction

Effective efforts to strengthen health systems need diverse, multi-stakeholder networks working together on complex or ‘wicked’ problems such as prevention and control of chronic diseases, the solutions to which go beyond the role and capability of one organisation [1–3]. Promoted as a vehicle to stimulate and support multi-stakeholder collaboration, ‘innovation platforms’ are considered particularly useful when there are complex, system-wide issues requiring coordinated action and collective problem solving [4, 5].

As their name indicates, the objective of innovation platforms is innovation, which is stimulated when people come together to learn, share ideas and solve problems. Features that distinguish innovation platforms from other types of networks include bringing together people from different parts of the system to ensure a diverse stakeholder composition, and having shared goals and interests along the supply chain to focus on problem solving within complex systems [4]. Innovation platforms have been widely adopted in the agricultural research and development sector, mainly in Africa, but have only recently been applied to the health sector [4–6]. Given the novelty of this concept in health, rigorous and critical evaluation is required [4].

Developmental evaluation (DE) is increasingly being used as an approach to evaluate innovative and emergent programmes and projects [7, 8]. This is because it allows evaluators to provide rapid feedback to programme implementers who can then use the evaluation findings to guide programme changes and adaptations. Such an approach aligns well with the implementation of innovation platforms that have continuous reflection, learning and adaptation as specific design characteristics. In addition, there is an acknowledged gap in the literature on appropriate monitoring, evaluation and learning approaches to support innovation platforms [5, 9, 10]. There is also limited information on how collaborative and co-productive health research can be done effectively, including a lack of evaluation of collaborative research models more broadly [11].

In this paper, we outline the rationale for applying DE to enhance the formation, functioning and outcomes of an innovation platform in Aboriginal and Torres Strait Islander primary healthcare (PHC). We do this by providing an overview of the innovation platform, explaining the

fundamentals of a DE, and describing the methods we used in implementing the DE by assessing our approach against its essential principles. Given the focus on ‘learning and adaptation’ in taking such an approach, and the subsequent emergent design of the DE, it was neither possible nor appropriate to detail a priori the specific methods used. Thus, in this paper, we describe the rationale for our approach and how it aligned with DE methods and innovation platform functions. We also provide examples to explain how the DE findings were used to adapt the innovation platform’s functioning.

An innovation platform: Centre for Research Excellence in Integrated Quality Improvement

As with other colonised populations worldwide, Aboriginal and Torres Strait Islander Australians (hereafter respectfully referred to as Indigenous, acknowledging cultural and historical diversity) experience worse health outcomes and shorter life expectancy than non-Indigenous Australians. These inequities are a pervasive legacy of colonisation, land dispossession, displacement, disempowerment, social and economic exclusion, and ongoing racial discrimination [12]. Understanding and addressing the complexity of the causal relationships that underlie the health conditions of Indigenous Australians requires an innovative systems approach to thinking about, facilitating and implementing collective decision-making processes and change practices.

Recognising the importance of quality improvement initiatives in Indigenous PHC, the National Health and Medical Research Council of Australia funded a Centre for Research Excellence in Integrated Quality Improvement in Indigenous PHC (CRE-IQI) [4] for 5 years from 2015 to 2019. The stated vision of the CRE-IQI was to improve Indigenous health outcomes by accelerating and strengthening system-wide PHC through supporting quality improvement efforts at health service, regional and national levels.

To support this vision, and to be consistent with the operationalisation of an innovation platform, the CRE-IQI had, from its inception, embraced a range of organisations and people working in diverse roles and at different levels of the health system. They included researchers from universities and research organisations, policy officers from State and Territory health departments, managers and practitioners from State/Territory-level support organisations

established for Indigenous PHC services, and health practitioners from both Indigenous community-controlled and government-managed health services. Based on the literature [5, 13, 14] and our own experience [4], Table 1 outlines the key functions of an innovation platform [4, 5, 13], and describes how the CRE-IQI innovation platform’s activities and aspirations fulfilled these functions.

The CRE-IQI held biannual face-to-face meetings to provide its members with opportunities to progress project development and research translation, hear about project outcomes, share ideas and build relationships. It established cross-cutting programmes to strengthen research capacity, collaboration and research translation. Webinars and teleconferences enabled members located across Australia to connect and engage with leaders in PHC and Indigenous research, and masterclasses were offered around each biannual meeting to increase members’ skills and knowledge. A detailed outline of the aims and cross-cutting work programmes of the CRE-IQI, and how it functioned as an innovation platform, is available in other papers [4, 16].

Because of the inherent challenges with evaluating complex networks (including innovation platforms), we designed a mixed-methods, multi-pronged evaluation, with three complementary and partly overlapping components [4] – the DE, a network evaluation, and an impact and economic evaluation [17]. The DE drew on early findings from the other two components to shape the functioning of the innovation platform. Details of the methods and findings from the network evaluation, and impact and economic evaluation will be reported separately. In Fig. 1, we show the interlinking aspects of

the evaluation approaches, with a specific focus on the methods of data collection for the DE. This figure is further discussed in relevant sections of this paper.

DE was identified both as a way of attending to the complexity of evaluating the innovation platform, and as a way of supporting its design tenet of continuous reflection, learning and adaptation. Drawing on a range of data (e.g. administrative records, stakeholder interviews, network analysis surveys, impact metrics) to synthesise and apply lessons from the formation, functioning and outcomes of the innovation platform, the DE approach informed the innovation platform’s operations, work programmes and future directions.

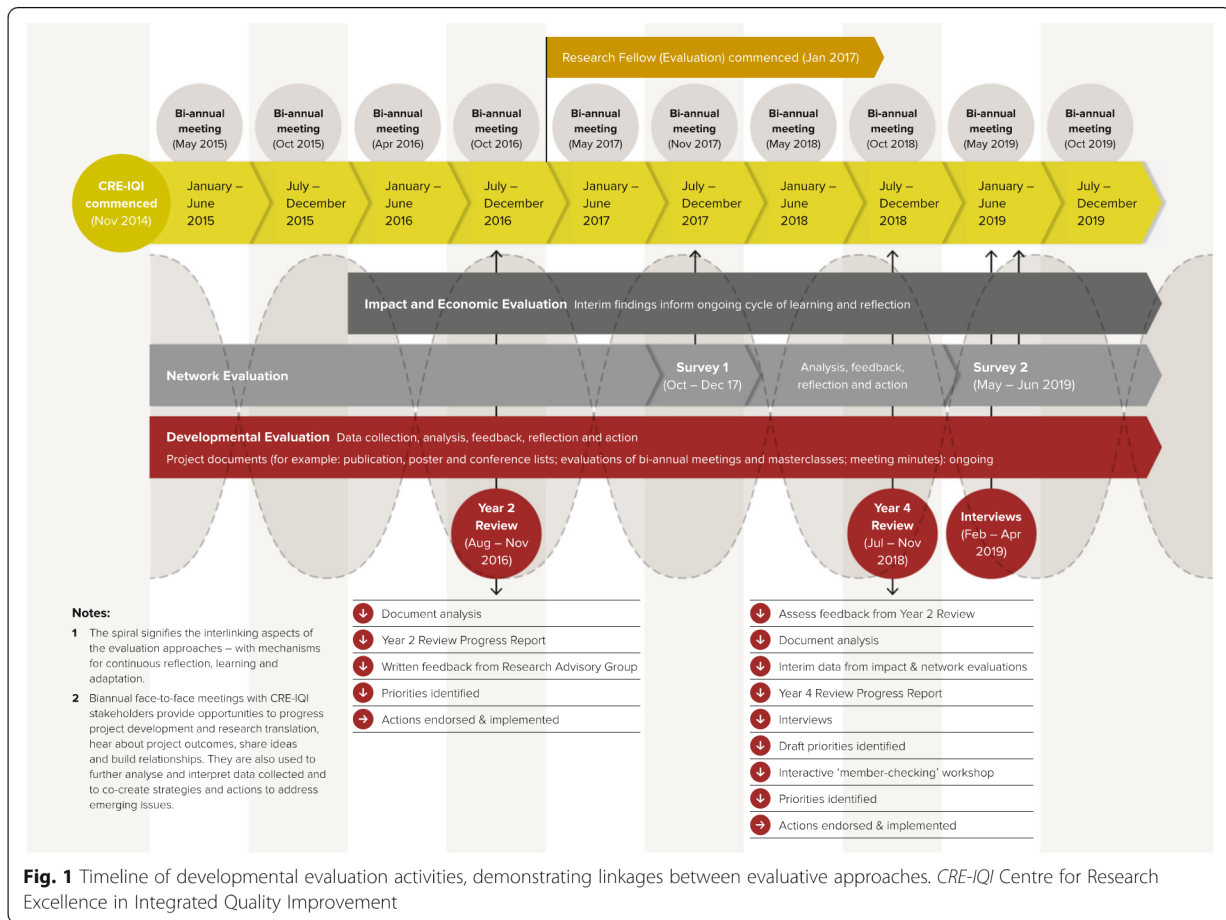
Developmental evaluation: supporting innovation and adaptation

DE was first described by Patton in the mid-1990s as a distinct approach to evaluation with the explicit purpose of helping to develop and shape an innovation, intervention or programme that is emergent, complex and dynamic [18]. Unlike traditional forms of evaluation, the focus of DE is on reflection, learning and change to enable interventions to adapt to the emerging complex environments in which they are situated [7, 18]. There are clear distinctions between DE and formative evaluation. Formative evaluation focuses on informing the planning of a defined initiative, tends to be conducted prior to or at an early stage of the initiative, and is aimed at improving, enhancing and standardising the initiative. By contrast, DE is applied throughout the life of a developing or emerging initiative in which knowledge is uncertain and/or the

Table 1 Key functions of the CRE-IQI as an innovation platform

Key functions of an innovation platform	CRE-IQI innovation platform aspirations and activities undertaken to fulfil key functions
Linking people from all levels of a system	Brought together people working at all levels of the health system with researchers, policy-makers and practitioners from Indigenous PHC services
Identifying shared goals and interests, common problems and solutions	Collaborated to develop the vision, research aims, priority projects for resource allocation and cross-cutting programmes of the CRE-IQI network
Leveraging research and/or expertise	Utilised members’ knowledge to leverage new resources, implement collective and coordinated action, and advocate for policy change
Enabling long-term learning and capacity-strengthening	Developed health research workforce capacity by sharing problems and experiences, developing learning opportunities and networking – adopting an ‘all teach, all learn’ approach [15]
Establishing effective governance	Set up a project coordinating centre (the CRE-IQI) and management committee to support and drive these key activities and provide high-level strategic direction and oversight
Encouraging continuous reflection, learning and adaptation	Implemented a developmental evaluation to support continuous reflection, learning and adaptation
Out-scaling and up-scaling knowledge to broaden impact	Facilitated horizontal diffusion of innovations by broadening the application (or ‘out-scaling’) of quality improvement to non-clinical areas of PHC through implementing, testing and improving its application; facilitated up-scaling innovations by embedding them at higher levels of the health system and other sectors
Generating and sharing knowledge	Established the innovation platform itself to be a vehicle for integrated research and knowledge translation, with research, translation and learning occurring in the exchanges and interactions of service providers, policy-makers and researchers

CRE-IQI Centre for Research Excellence in Integrated Quality Improvement, PHC primary healthcare



evidence base is under-developed or not clearly relevant. A DE enables the work to adapt quickly to any changes in the environment or to new learnings that emerge, thereby also generating and advancing knowledge about the intervention in the field.

DE is an approach rather than a specific method. Methods used within a DE approach intend to be evolving and flexible, with dynamic designs as the intervention unfolds. Unlike conventional evaluations that require fidelity to particular models or methods, a DE draws on evaluation knowledge, core ideas of innovation, complexity concepts and systems thinking to develop and apply the evaluation in context. The evaluation thus becomes part of the intervention as data are systematically gathered, interpreted and reported in a timely way to ensure that results are useful for end-users (or innovators). In 2016, Patton further developed his research in this area by identifying eight inter-related and mutually reinforcing principles of DE to guide this way of working [7]. These principles are described in Table 2.

Systematically applying developmental evaluation within the innovation platform

Drawing on team reflections and discussions, and by providing examples, we describe how our application of DE to an innovation platform reflected the principles of a DE approach (as listed in Table 2).

Developmental purpose – an ‘improving’ rather than a ‘proving’ approach

The CRE-IQI evaluation had a developmental purpose in that it aimed to inform and support the formation, functioning and outcomes of the innovation platform. Dedicated resources were allocated to gathering data that would provide feedback and support developmental decision-making and adaptations along the emergent path. This evaluative approach aligned with the need for innovation platforms to have a mechanism for continuous reflection, learning and adaptation. Examples of decisions and adaptations made in response to evaluation feedback are listed in Table 3.

Table 2 The eight principles of developmental evaluation

DE principles	Brief description of DE principles
Developmental purpose	The focus is on informing and supporting an innovation in its development, thereby differentiating DE from traditional evaluation methods that seek to assess the degree to which goals/aims were achieved
Innovation niche	DE is only possible if innovation is present or if efforts are being made to institute it
Complexity perspective	Adaptive evaluation design and processes enable the identification and analyses of emergent findings
Systems thinking	Key to DE is employing systems thinking to frame, design and address complex problems while attending to boundaries, perspectives and interrelationships
Evaluation rigour	To be credible and useful, DE needs to employ both rigorous thinking and evaluation methods
Co-creation	Simultaneously developing the innovation and the evaluation with diverse stakeholders stimulates and streamlines the change process
Utilisation focus	A strong utilitarian focus ensures that findings are useful for end-users
Timely feedback	Iterative, progressive processes ensure that feedback is ongoing and prompt to maximise utility

DE developmental evaluation. Table based on Patton et al. [7] and Patton [8].

Many innovation platform stakeholders had a history of working in quality improvement and participatory action research, and this provided a foundation for understanding some of the key concepts and processes used in DE. We collected and interpreted data, worked out change strategies, implemented them, evaluated how they worked and repeated the cycle with different sets of data and feedback. To do this, we used iterative cycles of development and testing that could be compared with the ‘Plan – Do – Study – Act’ method common in continuous quality improvement. The congruency between quality improvement and DE has been identified by Laycock et al. [19].

Innovation niche

An issue explored by the CRE-IQI innovation platform members was to define what innovation meant to them. For the purposes of the CRE-IQI, it was agreed through collaborative processes that the most appropriate definition of innovation was one that emphasised the “*non-directed, organic sharing of ideas and practices*” ([2], p. 207). Innovation, therefore, was composed of information, that is, learning through the exchange of ideas and the production of knowledge. However, continuous innovation and adaptation were required in how “*learning through the exchange of ideas*” was achieved as the collaboration evolved. However, with no examples in the literature to guide the implementation of an innovation platform in health, we also had to be innovative in our use of the innovation platform concept.

Complexity and systems thinking perspectives – attending to non-linearity, feedback, emergence, relationships, boundaries and adaptation

The complexities of Indigenous PHC environments in relation to continuous quality improvement, and the multiple stakeholders engaged with the innovation platform, meant that an emergent evaluation design that did

not predefine the innovation platform was required. We needed scope to move away from a ‘what is planned needs to be achieved’ mindset to one that could continually adapt based on what we were learning. Given this non-linearity, the DE focused on the development of the innovation platform in an evolving context. We used opportunistic and planned iterative cycles of reflection and analysis to understand how, and how well, the innovation platform was functioning, and how it could be adapted in rapid-time to function more effectively. Our bi-annual meetings with stakeholders were a vehicle for the DE to identify emerging issues through consultation and discussions, and also to present back, discuss and refine proposed modifications based on stakeholder feedback.

Given the complex environment of the innovation platform, a systems thinking approach assisted us in gaining deeper insights into how best to adapt its formation and functioning. Engaging multiple perspectives, whilst paying attention to relationships and interactions, was a key design feature of the DE approach. We examined how participants in the innovation platform learn from and influence each other, and paid attention to those activities/events that are catalysts for relationship development (i.e. biannual meetings, funding for new grant development and other mechanisms that encourage ‘dynamics’ to develop).

Conclusions were rendered through a collaborative and interactive process involving stakeholders, leading us to modify CRE-IQI strategies and processes. These collaborative change decisions were recorded in evaluation logs and detailed in project records such as minutes of meetings and agendas. Given that the innovation platform was an ‘open collaboration’, we were sensitive to examining how the scope of the research and membership expanded or changed over time – beyond PHC contexts to policy and the social determinants of health; therefore, we examined the

Table 3 Examples of evaluation feedback, team decisions and adaptations

Evaluation findings	Decisions and adaptations
Increase the number, input and attendance of health service providers input and attendance at CRE-IQI bi-annual meetings	CRE-IQI bi-annual meeting agendas were amended to include 'health service showcases', in which health services staff could present their quality improvement work and discuss opportunities for research collaboration and knowledge translation. Presentation topics were determined through consultation processes at previous bi-annual meetings and with the management committee. The CRE-IQI funded health services staff members to attend these meetings, which were held in different locations to encourage participation by a range of groups
Increase attendance by Indigenous stakeholders at bi-annual meetings	Personalised invitations to bi-annual meetings were extended to Indigenous stakeholders via telephone rather than emails, with funds specifically allocated for Indigenous stakeholders to attend. Increased steps were taken to ensure a culturally safe environment at the meetings, including their formal opening and closing by Indigenous people
Explicitly promote the shared values and working principles of the CRE-IQI	The principles of practice of the innovation platform were highlighted and discussed at the start of all bi-annual meetings, and purposely applied when developing criteria for the allocation of funds for CRE-IQI activities, such as 'seed grants' to develop research
Focus on capacity-strengthening, particularly in relation to Indigenous direction of, and participation in, research	Dedicated funding was allocated for a 12-month 'research capacity-building' position and a lead group to oversee and provide guidance on capacity-building strategies and activities. The terminology was changed to 'capacity-strengthening' in recognition of the existing strengths and knowledge among stakeholders, and monthly online research capacity-strengthening meetings held using 'Zoom' software
Grow Indigenous leadership in CRE-IQI management and research	An additional Indigenous researcher was appointed to the CRE-IQI leadership. Purposeful encouragement of co-leadership arrangements was established, whereby all new research grants and projects were to have an Indigenous leader or a co-leadership arrangement with a non-Indigenous member of the team
Enable Indigenous members to engage in CRE-IQI direction and governance despite their high workloads and multiple leadership commitments	The decision was made to embed and disperse Indigenous leadership and participation across all levels of the innovation platform, rather than having one overall reference group. This included the appointment of an Indigenous researcher to the leadership team; purposeful engagement and funding to increase attendance by Indigenous people and organisations at all meetings; greater focus and attention on embedding the 'principles of practice' established at the start of the innovation platform; and co-leadership arrangements with Indigenous and non-Indigenous collaborators on all projects
Provide information to CRE-IQI stakeholders through mechanisms such as meetings, new publications and news from the network	Based on feedback, a monthly email to all CRE-IQI stakeholders was established that would later become a regular and official online CRE-IQI newsletter
Boost engagement with, and readership of, the CRE-IQI newsletter	To improve readability and engagement, the monthly newsletter was adjusted to include more illustrative material and articles from stakeholders. Following research into the most effective dissemination times, the monthly newsletter was disseminated on a Tuesday or Thursday at either 10 am or 2 pm
Ensure that administrative data collected by the CRE-IQI (e.g. attendance at bi-annual meetings, publications, grants awarded) is capable of the required data analysis	Data collection procedures were reviewed, specifically, what was being collected and how, and, importantly, what aspects would need to be reported and the aggregations required. Changes were made and standard nomenclature adopted
Increase the focus on and engagement in research translation	Research translation strategies were prioritised and developed over a series of workshops at bi-annual meetings and discussions at management committee meetings. CRE-IQI stakeholders were provided with training opportunities in knowledge translation skills, including the use of social media, influencing policy and other relevant topics. CRE-IQI social media accounts were established and reviewed, resulting in increased use of Twitter to communicate research activities and findings. A dedicated research translation working group was convened and a position established to support projects and translation across the CRE-IQI. In the final year, knowledge synthesis workshops were held in which members collaboratively identified and prioritised the overall findings and key messages from CRE-IQI research. Research translation products were produced in a range of formats targeting different audiences
Respond to CRE-IQI stakeholders' identified need for training in a range of relevant topics	Training needs were addressed through the establishment of webinar research seminars and face-to-face masterclasses. At each bi-annual meeting,

Table 3 Examples of evaluation feedback, team decisions and adaptations (*Continued*)

Evaluation findings	Decisions and adaptations
Strengthen CRE-IQI engagement with policy-making processes	participants were invited to suggest further topics to meet their professional development needs, such as social media training to extend research translation, engaging policy-makers in dissemination of research findings and using Indigenous methodologies Resources were directed into writing targeted policy and parliamentary submissions that drew on CRE-IQI research. Policy masterclasses were offered to members early in the CRE-IQI's establishment and again in its final year. Relevant policy-makers were invited to bi-annual meetings with the aim of having their input into the development of research products, such as key messages, and of building relationships with them over an extended period. Final products of research projects included policy briefs, and the publication of a summary of overall policy messages from the CRE-IQI's research. At the end of its funding period, the CRE-IQI targeted key policy-makers for briefings about the research findings
Prioritise further collaborative research in Indigenous primary healthcare quality improvement	Collaborative processes were undertaken to identify and refine the research priorities. These processes included presenting and working up ideas at bi-annual meetings, discussing research needs in management committee meetings and holding a series of smaller more focused workshops. A decision was made to develop a submission for funding beyond the innovation platform, with revised leadership arrangements to reflect the DE outcomes. This resulted in a proposal for a collaborative research network led by an Indigenous chief investigator, with 50% of the leadership team identifying as Indigenous

CRE-IQI Centre for Research Excellence in Integrated Quality Improvement, DE developmental evaluation

characteristics of participation in the innovation platform to understand any changes in boundaries and representation.

Evaluation rigour

An evaluation working group was established to guide the comprehensive evaluation of the innovation platform, including the DE. The group was comprised of those researchers implementing evaluations within the innovation platform – specifically, network evaluation, impact and economic evaluation, and DE – and other stakeholders with specific expertise in evaluation. Initially, the evaluation working group was virtual. However, as the work progressed, there was agreement that more regular focused meetings were needed to bring together the evaluation streams, streamline the data collection, implement a group analysis of emerging data, and provide evaluation project management oversight. From mid-2017, fortnightly teleconferences were facilitated by the developmental practitioner and 6-monthly face-to-face meetings were held. The methods of data collection for the DE included document review, the Year 2 and Year 4 Reviews, and key stakeholder interviews as detailed below, while an overview of the timelines, data collection sources and methods, and feedback processes can be found in Fig. 1.

Given the range of functions required of the developmental evaluator, strong methodological skills were required as well as experience with a wide range of methods. Having the DE embedded within a broader evaluation working group enhanced the methodological

rigour and provided exposure to different evaluation methods. Because the DE was situated within a broader evaluative strategy (Fig. 1), which included an impact evaluation, this helped to alleviate concerns that we had not developed a programme logic/theory of change at the start of the innovation platform. Instead, we worked to generate evidence in real time through flexible, situationally tailored evaluation design.

Members of the evaluation working group had some experience with applying DE techniques [19]. However, because of the uncertainty inherent in DE, and the paucity of literature describing the methods used within it, as a team, we had to reflect regularly on whether our evaluation was indeed developmental. The evaluation working group offered a forum for this reflection to occur.

Document review Administrative project records were used to provide ongoing intelligence on the CRE-IQI innovation platform development and context. Data sources included minutes from the management committee, bi-annual stakeholder meetings, publication, poster and conference lists, attendance lists and evaluations of bi-annual meetings, masterclasses and research capacity-strengthening teleconferences, research project applications, and student projects. Reports of other evaluation activities, such as the network evaluation, also provided data for the DE. These documents were then used to identify and clarify key issues, dates, events and tasks, and to track major decisions and developments in

the innovation platform formation, functioning and outcomes.

Year 2 and Year 4 Reviews Major activities of the DE were the Year 2 and Year 4 Reviews of the CRE-IQI, with the latter building on the learning and feedback from the former. The goal of both reviews was to obtain input on the progress to date of the CRE-IQI in terms of outputs and achievements; the key messages emerging from the CRE-IQI's collaborative research; assessing the extent to which the CRE-IQI was meeting its aims; and how best to optimise the ongoing operation of the CRE-IQI.

The Year 4 Review had the additional aim of reviewing progress on addressing key issues identified in the Year 2 Review and identifying priorities for the remaining 15 months of the CRE-IQI. Another major focus was the way in which Indigenous leadership and participation were being enacted and identifying steps that could be taken to strengthen this aspect of the CRE-IQI's work.

The scope of the Year 4 Review was collaboratively determined with the CRE-IQI management committee and included an analysis of feedback about the Year 2 Review process and report presentation. While both reviews developed reports to aid consultation and change processes, the Year 4 Review employed more active processes to gain feedback; these included interviewing key members of the innovation platform ($n = 28$) along with several external stakeholders ($n = 36$) (see Additional file 1 for interview questions). In addition to informing the final stages of work for the CRE-IQI, the Year 4 Review was intended to inform ongoing collaborative projects extending beyond its current lifespan. Figure 1 has a description of the methods used for the Year 2 and Year 4 Reviews.

The process of undertaking the Year 2 review identified several data management systems that needed to be established, or refined, to ensure that administrative data were collected in a timely and accurate manner. It was found, for example, that the way in which data were being entered into Excel spreadsheets made analysis for the Year 2 review more difficult, so the data entry system was adjusted accordingly.

Interviews As noted, interviews ($n = 28$) were conducted as part of the Year 4 Review, with a further round of interviews ($n = 36$) undertaken to explore emergent themes from the review (Additional file 2). Participants who were purposively sampled to obtain a broad range of perspectives from different organisations included CRE-IQI researchers, members of the management committee, and several national and international participants from bi-annual meetings, teleconferences and projects.

Ethics Obtaining ethics approval to undertake the DE allowed for the evaluation questions to be developed in response to emerging priorities and for appropriate methodologies to be implemented. The University of Sydney Human Research Ethics Committee (Project 2018/206) and the Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research (Project 2018–3105) approved the DE.

Co-creation

The CRE-IQI innovation platform concept and the DE were developed and refined together drawing on input from multiple stakeholders and on purposeful opportunities to garner further Indigenous input. Placing importance on context, and valuing Indigenous knowledge by centring the voices of participant populations in the research, data analysis processes occurred collaboratively to capture a variety of worldviews that also embedded 'member checking' processes (see Section above on complexity and systems thinking perspectives).

This collaborative data analysis approach provided immediate, useable feedback to engage CRE-IQI stakeholders in co-creating solutions, thus reflecting some of the strong principles of DE. The learnings and actions from the innovation platform were guided by facilitated reflection and analysis processes that drew on data collected as part of the DE as well as stakeholders' experiences and feedback. Questions used to guide these processes were: what? (what happened?), so what? (what do the results mean or imply? how did we influence the results?), and now what? (how do we respond? what should we do differently?). We focused on documenting the change decisions and on using collaborative analysis processes with CRE-IQI members to analyse and interpret the collected data further and to co-create strategies and actions to address emerging issues.

Embedded, not detached – the active role of the evaluator Consistent with a DE approach, a research fellow (evaluation), aka the DE practitioner (JB), was embedded within the innovation platform team. This meant that any changes to its direction and evaluation – based on insights, learnings and critically reflective conversations between the evaluator and CRE-IQI management and members – could be facilitated rapidly as needs emerged.

The CRE-IQI innovation platform was operationalised through a project coordinating centre, which meant there was dedicated resourcing for part-time positions in both project management and project administration. During the 'set-up' phase of the innovation platform, the DE had been envisaged as being the responsibility of the innovation platform's project manager, as there was a

significant amount of work needed to establish agreements, policies, procedures and governance structures. However, based on evaluative data, in late 2016, it was agreed by the management committee to reshape the project manager's role so that its primary focus was on implementing the DE and project management was secondary to the role. In January 2017, a research fellow (evaluation) (JB), aka the DE practitioner, was embedded within the team to lead the DE and to coordinate it with the other evaluation activities (Fig. 1), along with project management responsibilities. Restructuring the project manager position to predominately focus on the DE, with support from a project administrator, enabled us to handle large volumes of data. Although this investment in resourcing was reasonably small compared to the overall project budget, it did give us dedicated personnel who were both embedded within the team and able to action identified adaptations based on ongoing data collection and analysis processes. Being embedded with a dual role of DE practitioner and project management allowed the evaluator to be present at management committee meetings as well as at the evaluation working group and other meetings. Having the DE practitioner as a core member of the team enabled everyone on it to build a deep understanding of issues and to act in a timely manner.

Defining the boundaries between the DE practitioners role and project management was difficult and boundaries were often blurred. Having the DE practitioner role embedded within a broader evaluation working group (as detailed above), enabled the DE practitioner to liaise with a network of peers to progress the role and also to access mentoring from an evaluation working group member who was an experienced DE practitioner.

Utilisation focus – ensuring findings are useful for end-users

The innovation platform was a vehicle for integrated research, knowledge generation and sharing. Research, translation and learnings were intended to occur during structured and informal interactions between health service providers, policy-makers and researchers. Ensuring that our evaluation findings were useful was paramount, not least because many of our end-users were participants in the innovation platform.

Because the process focused on utilisation, making sense of emergent findings involved the evaluator working with innovation platform participants to analyse and understand the data, for example, the presentation of emergent findings from the Year 4 Review to the management committee, evaluation working group and to the broader network at the bi-annual meetings. The findings were further synthesised and prioritised during these interactions, and strategies to address them were identified through collaborative processes, for example,

by revising the research project guidelines to increase Indigenous leadership of research.

Timely feedback

Feedback occurred at pre-determined times, such as part of the planned Year 2 and Year 4 reviews, as well as opportunistically when it emerged that change decisions were required (for example, through discussions at bi-annual or management committee meetings). Timely feedback to CRE-IQI management and governance was essential to ensure that evaluation data could be used to strengthen the formation and effective functioning of the innovation platform.

Learning through knowledge exchange

In addition to reflecting the eight DE principles described by Patton, we observed that evaluating the innovation platform developmentally allowed for the acquisition of new knowledge and skills through multiple interactions with stakeholders. This 'learning through knowledge exchange' aligned well with one of the key elements of innovation platforms, which is "to enable long-term learning and capacity strengthening" and "knowledge generation and sharing" [4]. This design element went beyond co-creation because it emphasised the ongoing development of a learning culture.

Conclusion

The purpose of this paper is to provide a practical example of a DE by outlining the methods of applying it to an innovation platform in an Indigenous PHC setting. Although DE is gaining some traction and becoming recognised as a distinct and useful approach, it is also relatively new, so theory and practice are evolving [20]. As outlined above, in an attempt to define when an evaluation can be called developmental, Patton developed eight defining principles that should be evident [7, 8]. In assessing our approach against these eight principles, we found strong concordance between our DE and the principles he identified. However, because of the interrelatedness of these DE principles, it proved challenging to demonstrate adherence to each of the principles without being duplicative in explanation.

There is a nascent recognition of the suitability of DE in Indigenous contexts [19, 21–23], as it attends to complexity and systems thinking. Our experience with DE also shows it to be a good fit for innovation platforms that need to have continuous reflection and learning. Furthermore, DE embraces situations that have a developmental purpose, innovation niche and complexity such as innovation platforms.

To our knowledge, DE has not previously been applied to innovation platforms. We acknowledge, however, that previous evaluations might have had some of the

features of a DE, but that these have either not been labelled as such or have not been the focus of a publication. The insights provided here will be developed further when the DE findings are outlined and discussed in future publications. Even though this example is focused on an innovation platform in the Indigenous Australian PHC context, we expect it will be useful in other contexts because of the increasing interest in multi-stakeholder platforms (such as innovation platforms) and the inherent challenges with evaluating these complex networks.

Supplementary information

Supplementary information accompanies this paper at <https://doi.org/10.1186/s12961-020-00562-4>.

Additional file 1. Interview guide for Year 4 Review.

Additional file 2. Interview guide for further interviews exploring emergent issues related to the innovation platform.

Abbreviations

CRE-IQI : Centre for Research Excellence in Integrated Quality Improvement; DE: developmental evaluation; PHC: primary healthcare

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Authors' contributions

JB, AL and RSB conceived of the manuscript, with JB taking the lead on the writing of all drafts, integrating feedback upon reviews and finalising the manuscript. JB was the embedded DE practitioner from January 2017, with close support from AL, who holds specific expertise in DE. RSB is the Chief Investigator of the CRE-IQI and conceived the DE approach. All authors contributed to revising the manuscript and all approved its final version.

Author's information

RGB and VM are both Indigenous researchers: RGB is from the Gungarri/Kunja nations in South-Western Queensland and VM from the Quandamooka community on North Stradbroke Island, Queensland. JB, RSB, DP, AL, KPC, SA, MEP and FCC are non-Indigenous researchers. All authors have a long-standing commitment to improving health outcomes for Aboriginal and Torres Strait Islander people.

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Consent for publication

Not applicable.

Competing interests

The authors declare that this research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Chapter 4: Principles Guiding Ethical Research in a Collaboration to Strengthen Indigenous Primary Health Care in Australia—Learning from Experience

4.1 Preface

Principles-focused evaluation is a relatively new and emerging direction in evaluation, in which principles are the evaluand. In this chapter, I present how we used this approach to evaluate the implementation and outcomes of principles that underpinned the governance and operation of the innovation platform. The idea for this study emerged from evaluative feedback from the developmental evaluation, in which members of the innovation platform identified that further exploration was needed regarding how the principles were implemented in its operations, and what outcomes were produced by using them.

This chapter was written as a journal article, of which I am the principal author, and it is presented here in its entirety. The article was published in *BMJ Global Health* and is available on the journal's website at <https://gh.bmj.com/content/6/1/e003852?rss=1>.

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4.2 Author Contributions and Attribution Statement

Ms Jodie Bailie conceived and designed the study with guidance from Professor Roxanne Bainbridge, Dr Alison Laycock and Dr Kathleen Conte. Jodie and Alison undertook the interviews, and Ms Kerry Harkin the document review. Jodie drafted the initial manuscript, with close support from Roxanne, Alison and Kathleen. All authors provided critical intellectual input and feedback on drafts, and all read and approved the final manuscript.

As supervisor for the candidature upon which this thesis is based, I can confirm that the authorship statement attribution is correct.

Professor David Peiris

31.01.22

4.3 Published Article

Principles guiding ethical research in a collaboration to strengthen Indigenous primary healthcare in Australia: learning from experience

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ABSTRACT

Introduction Indigenous communities worldwide are leading calls for all research involving Indigenous people to be underpinned by values and principles articulated by them. Many researchers are explicitly adopting these principles to guide what, where, how and when research is undertaken with Indigenous people. With critical reflection to support the implementation of such principles largely absent from published literature, this paper explores both the implementation of, and the outcomes from a set of guiding principles used in a large-scale Australian research collaboration to improve Indigenous health.

Methods In this inductive qualitative study, we adopted a principles-focused evaluation approach. Based on interviews with 35 actors in the collaboration and a review of project documents, we generated themes that were then iteratively discussed, refined and categorised into (1) 'strategies'—activities by which implementation of our guiding principles were recognised; (2) 'outcomes'—results seen from implementing the principles and (3) 'conditions'—aspects of the context that facilitated and constrained implementation of the principles.

Results Respondents found it difficult to articulate how the guiding principles were actually implemented, and frequently referred to them as part of the fabric of the collaboration. They viewed the set of principles as mutually reinforcing, and as providing a rudder for navigating complexity and conflict. Implementation of the principles occurred through five strategies—honouring the principles; being dynamic and adaptable; sharing and dispersing leadership; collaborating purposefully and adopting a culture of mutual learning. Outcomes included increased Indigenous leadership and participation; the ability to attract principled and values-driven researchers and stakeholders, and the development of trusting and respectful relationships. The conditions that facilitated the implementation of the principles were collaborating over time; an increasing number of Indigenous researchers and taking an 'innovation platform' approach.

Key questions

What is already known?

- Researchers are beginning to adopt principles articulated by (or in collaboration with) Indigenous people to guide what, where, how and when Indigenous health research is undertaken in Indigenous communities.
- To date, there have been limited publications that critically reflect on how, to what end and even whether, such principles are being implemented.

What are the new findings?

- Respondents found it difficult to articulate how each principle worked individually; instead, they discussed the principles as operating as a mutually reinforcing set.
- The principles were implemented through five strategies—honouring the principles; being dynamic and adaptable; sharing and dispersing leadership; collaborating purposefully and adopting a culture of mutual learning.
- Respondents identified that implementing the principles led to increased Indigenous leadership and participation, the ability to attract principled and values-driven researchers and stakeholders, and the development of trusting and respectful relationships.
- The conditions that facilitated the implementation of the principles were collaborating over time, an increasing number of Indigenous researchers and taking an 'innovation platform' approach.

Conclusion Our findings show that principles guiding collaborations are valuable in providing a focus, direction and a way of working together when they are collaboratively developed, hold genuine meaning for all members and are implemented within a culture of continuous critical reflection, learning and adaptation, with ongoing reinterpretation of the principles over time.

Key questions

What do the new findings imply?

- ▶ Principles that are developed collaboratively, hold genuine meaning for all members, and are implemented within a culture of continuous critical reflection, learning, adaptation, and ongoing re-interpretation provide research collaborations with a focus, direction and a way of working together.
- ▶ Evaluating principles involves more than simply measuring implementation, but rather adopting a systems thinking perspective that asks how are principles apparent in the work, and in what ways do they influence the dynamics of the network as a whole.

INTRODUCTION

There remain concerns that Indigenous populations continue to be over-researched without corresponding improvements in their health.^{1,2} This has led Indigenous communities around the world to call for more ethical processes in the conduct of research and evaluation.¹⁻⁴ In Australia, national documents guiding research with Aboriginal and Torres Strait Islander people (Aboriginal and Torres Strait Islander peoples are hereafter referred to respectfully as Indigenous Australians, acknowledging cultural and historical diversity) specify that all research must be underpinned by values and principles that are important to, and defined by Indigenous people.^{5,6} Despite this, the available literature provides limited critical reflection and evaluation of how such research principles are meaningfully implemented.⁷

Practical examples of how principles are implemented and evaluated could help to strengthen implementation and learning across settings.^{7,8} To this end, a principles-focused evaluation approach has recently emerged which examines ‘(1) whether principles are clear, meaningful and actionable, and if so, (2) whether they are actually being followed and, if so, (3) whether they are leading to the desired results.’⁹ (p.3) Patton explains that principles-focused evaluation is an approach rather than a methodology, with an essential component that examines evidence to ask ‘how does the principle work and with what results, if any?’⁹ (p.6)

The terms ‘principles’ and ‘values’ are at times conflated or used interchangeably. Figure 1 shows our perspective on the relationship between these two concepts and how they relate to ‘practices’. Values describe what is important in the life of an individual or community (eg, what is valued by an Indigenous population). Values rarely change. However, principles are based on norms, values, beliefs, experience and knowledge, and provide direction as a basis for action.⁹ They guide us in how to think and behave. While values are enduring, principles can evolve and change based on circumstances. As such, they are continuously contextualised and situationally interpreted⁷ (eg, to guide the way health research is done with Indigenous people). Practices are how principles are expressed and actioned (ie, applied in research practice).

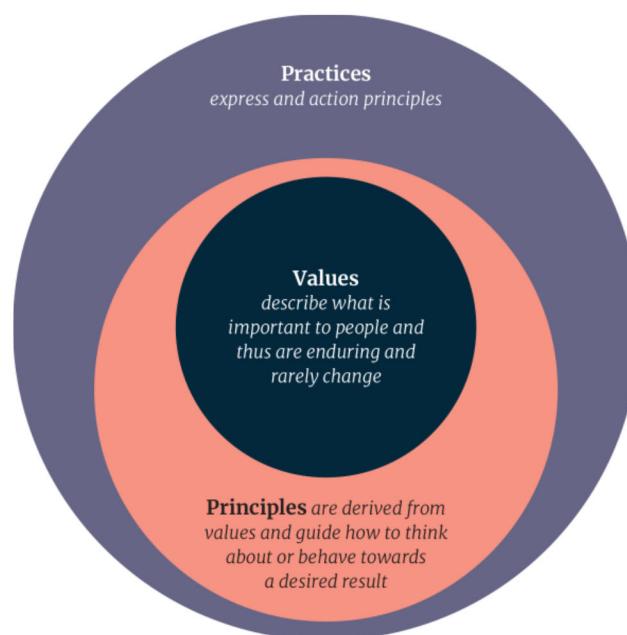


Figure 1 Relationship between values, principles and practices.

The study draws on a principles-focused evaluative approach to explore the processes by which a set of guiding principles were implemented, and the outcomes of this implementation, in the context of a large-scale Indigenous health research collaboration—the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI).^{10,11} We address the question: How was the set of principles we developed to guide the research collaboration implemented, and, what were the outcomes? Addressing this question enabled the CRE-IQI to be more cognisant of the process and outcomes of applying our principles, thereby learning from self-reflection. The findings provide an opportunity for others to learn from our experience with this relatively under-reported evaluation approach.

METHODS

Study setting

Indigenous Australians have demonstrated extraordinary cultural strength, adaptability and resilience across time. Yet they continue to experience worse health outcomes and shorter life expectancies than other Australians.¹² These inequalities result from a pervasive legacy of colonisation, land dispossession, displacement, disempowerment, social and economic exclusion and ongoing racial discrimination.¹³

With the vision of improving Indigenous health outcomes by strengthening primary healthcare (PHC) systems through continuous quality improvement (CQI) efforts, Australia’s National Health and Medical Research Council funded the CRE-IQI from 2015 to 2019.^{10,14,15} Building on more than two decades of participatory CQI research and development with Indigenous communities,

and operating as an ‘innovation platform’,¹⁰ the CRE-IQI purposefully brought together PHC centres (both Aboriginal community-controlled and Government-managed), research institutions, government health departments and key regional support organisations (such as health councils) to work on ways of strengthening system-wide CQI.^{10 16 17} Innovation platforms are characterised by collective problem solving, the exchange of ideas and the sharing of expertise to generate knowledge and change. Continuous reflection, adaptation and learning are also key elements.¹¹

The CRE-IQI was implemented as an ‘open collaboration’ in which new members were welcomed to join the collaboration. Within the scope of ‘IQI’¹⁷ research priorities were collaboratively developed and refined to address the needs of key stakeholders. This approach enabled PHC practitioners and policy-makers to articulate the knowledge gaps, and to work with researchers and health sector stakeholders on relevant research topics.^{10 16} New collaborations were encouraged through sharing information, open seed-funding calls for the development of projects and the promotion of collaborative research. Stakeholders participated in biannual face-to-face meetings that provided opportunities to progress project development and research translation, hear about project methodologies, findings and outcomes, share ideas and build relationships. Masterclasses were offered around each bi-annual meeting to increase the skills and knowledge of CRE-IQI members. Further details about the aims and functions of the research collaboration are published elsewhere.^{10 11 14}

Development of the guiding principles for the research collaboration

CRE-IQI investigators and members brought considerable experience in Indigenous PHC and CQI research to the collaboration, including experience in articulating and applying principles for guiding their work.¹⁸ Many members were familiar with the national guidelines on ethics and values in Indigenous health research and were committed to putting values into practice through principled research. The CRE-IQI drew on the principles developed by a closely associated Indigenous-led national research collaboration (DISCOVER-TT)¹⁹ as a basis for their research principles. The DISCOVER-TT research principles were refined, with permission, through consultation with the CRE-IQI members. The outcome of this process was the collective development of eight guiding principles to encompass and lead the work of the research collaboration (box 1).

Study design

Interviews were conducted with a purposive sample of 35 respondents in the CRE-IQI research collaboration. The study used an inductive qualitative approach deemed appropriate both for Indigenous settings and for questions where there is little prior research and participant voices have previously been rendered invisible.^{3 20}

Box 1 Principles of the research collaboration

- ▶ Respect the past and present experiences of Indigenous people.
- ▶ Work in partnership.
- ▶ Ensure Indigenous leadership and direction of research—in all stages of the process.
- ▶ Conduct ethical research.
- ▶ Get the research question right.
- ▶ Design research that will be feasible, produce outcomes and build capacity.
- ▶ Identify and provide the right resources and training
- ▶ Establish systems and practices to support the application of evidence to improve Indigenous primary healthcare and health outcomes

We adopted a constructivist perspective, which assumes that neither data nor theories are discovered but rather are constructed based on the shared experiences of researchers and respondents.^{3 20 21} Design and reporting of our study were guided by the Consolidated criteria for Reporting Qualitative research guidelines²² (online supplemental additional file 1).

Participants

Purposive sampling techniques were used to ensure that we captured a diversity of relevant views from members in the CRE-IQI,²³ with the aim of including wide representation from Indigenous people, organisations and roles. Study respondents met one or more of the following criteria:

1. Be an investigator or a member of the management committee listed on the original research grant.
2. Hold a past or currently funded position in the research collaboration.
3. Be a chief investigator of research that was aligned with the research collaboration.
4. Be a student or early career researcher aligned with the research collaboration.
5. Be a member of the Indigenous Advisory Committee or Research Advisory Committee listed on the original research grant.

Patient and public involvement

No patients or members of the public were involved in the design, analysis or reporting of this study.

Data collection

Individual interviews

We developed an interview guide, published elsewhere,¹¹ which used open-ended questions to explore perceptions on how the CRE-IQI principles were developed; the importance and meaning of the principles to respondents and the collaboration; how implementation of the principles occurred; critical points in the collaboration where the principles were modified or elevated in response to emerging issues or contexts and the outcomes of implementing the principles.

The first two authors, JB and AFL, conducted interviews in the final year of the research collaboration (April to May 2019) using videoconferencing or by telephone. As interviewers, we encouraged respondents to tell stories and provide examples of their experience. We also critically reflected on our own assumptions to promote a heightened awareness of listening to stories as openly as possible. Respondents were reminded of the principles of the research collaboration prior to the interview to allow them time for reflection. Interviews averaged 39 min (range 21–75 min), were audiorecorded and professionally transcribed.

Document review: administrative project records

Data sources from administrative project records included minutes from meetings; lists of publications, presentations, students and grants; preliminary findings from a network analysis and impact assessment; and results from the developmental evaluation of the CRE-IQI published in year 2 and year 4.^{11 14}

Data analysis

To assist the qualitative analysis, a reflective summary was generated after each interview. The first two authors (JB and AFL) met regularly to identify and discuss emerging themes and the direction of subsequent interviews—with the analysis commencing during the interview process. It became apparent early in our analysis that respondents referred to the principles as a set, rather than individually. This realisation led us to focus subsequent interviews and analysis on the principles in a more general and complementary sense, rather than on each specific principle.

Interviews, documents and reflective summaries were loaded in NVivo qualitative data management software for coding, searching and organising data. The lead author (JB) read all the interview transcripts multiple times, making reflective notes in the process. JB open coded the data, with AFL independently coding 10 interviews, followed by joint review and discussion of the initial coding to ensure consistency in the analytic process.²⁴ Following this, there was then an iterative process of more focused coding,²⁵ with the refinement of codes being discussed with AFL, KPC, KH, VM and senior author RGB—with a focus on exploring interconnections in an iterative process of analysis.

Through this process of coding and discussions themes were identified, refined and categorised into three higher order categories including: (1) ‘strategies’—specific activities by which implementation of the principles were recognised; (2) ‘outcomes’—results seen from implementing the principles and (3) ‘conditions’—aspects of context that facilitated or constrained implementation of the principles. ‘Outcomes’ sometimes operated as strategies, or as conditions. The distinction was not always clear. We categorised strategies/conditions/outcomes according to their predominant ‘influence’ or ‘function’ as identified through interviews and the iterative analysis

process, and as reflected in the frequency and relative importance that each theme was associated with each category.

To deepen our understanding of the interview findings, project documents were analysed concurrently, using an iterative process to identify major decisions and developments in the collaboration, and to clarify key issues, dates and events. The robustness of the findings were enhanced by: comparing, contrasting and seeking consensus of findings between coauthors; presenting early findings at meetings of the research collaboration as a way to member check findings; and triangulation with findings from document reviews.

RESULTS

We approached 52 people via email to participate in the study, of whom 35 (67%) agreed to be interviewed. The majority of respondents were researchers, although many had dual roles, for example, clinician and researcher. Eight respondents identified as Indigenous and a further seven were employed in organisations established to support Indigenous health services (table 1).

Respondents initially found it difficult to articulate how the principles were implemented and many referred to them as being intrinsic to the collaboration, as illustrated by the following quote:

In terms of [a] practical application of them, I find that hard to comment on because most of them are... just kind of non-negotiables that you really couldn't be [working] in this space if you didn't adhere to them. So, I would say that applies to a lot of people in this CRE... it's so much ingrained in what you do... they're just very much woven into the fabric of everything, every activity. (Researcher, Non-Indigenous, University / Research Institute)

The principles were viewed as a guide to a way of working, of providing a direction rather than being prescriptive. Importantly, the principles were viewed by most respondents as a package comprising integral parts that reinforced one another and were not to ‘be unpicked and separated’. Given this consistently expressed view, we discuss implementation of the principles as a set rather than individually.

The specific activities undertaken to implement the principles (‘strategies’), the results seen from implementing these principles (‘outcomes’), and the aspects of context that facilitated or constrained implementation of the principles (‘conditions’) are depicted in figure 2.

Strategies

The implementation of the principles within the CRE-IQI occurred through the five overlapping strategies of honouring the principles; being dynamic and adaptable; sharing and dispersing leadership; collaborating purposefully; and adopting a culture of mutual learning.

Table 1 Individual interview respondent characteristics by organisation type, position type, jurisdiction and gender

	Interview respondents
Interviews total	35
Organisation types	
Indigenous community-controlled or government-managed health centre	2
Government health department	2
University/research institution	26
Indigenous community-controlled sector support organisations	5
Position types*	
Nurse, doctor, specialist	1
Researcher/academic	24
Middle/senior management, board member	5
Policy officer	4
Aboriginal and/or Torres Strait Islander practitioner	1
No of respondents identified as Indigenous	
Indigenous	8
Non-Indigenous	27
Jurisdictions where respondents were based†	
New South Wales	12
South Australia	1
Queensland	15
Western Australia	2
Northern Territory	4
Victoria	1
Gender	
Female	27
Male	8

*We reported on primary position, but many respondents held dual roles, for example, clinician and researcher.

†As respondents could have a national role or work across a number of jurisdictions, we reported where their primary organisation was physically based.

Honouring the principles

There was strong agreement about the importance of having the principles in place ‘from the outset’, and explicitly honouring them in the work of the collaboration. This was done by displaying and discussing them at the start of biannual meetings; requiring that they be addressed in all applications for seed funding; and listing them in the front of the majority of CRE-IQI reports.

I think it’s been really good to be continually reminded and to have [the principles] articulate very clearly what we’re about, and to refer back to that again and again... when we’re thinking about new pieces of work... (Program Manager, Non-Indigenous, Indigenous Community-Controlled Sector Support Organisation)

Further examples included instigating research co-leadership arrangements between Indigenous and non-Indigenous members; prioritising funding support to Indigenous people and/or organisations; and encouraging Indigenous people and organisations to present and lead sessions whenever members met.

Our values and principled approach meant a deepening, over time, in the relationship between the collaboration and the Indigenous Elder who regularly provided the Welcome to Country at face-to-face biannual meetings. The implementation of the principles led to her feeling comfortable to remain for part of the meeting, and to listen, share stories and provide insights on our discussion, thus joining the collaboration itself.

Respondents new to working in Indigenous health particularly valued having the principles articulated and discussed at the biannual meetings of stakeholders and in applications for funding to develop research. The principles were seen as ‘a kind of scaffolding’ that enabled newcomers to the collaboration to identify with, and participate in, our way of working. Some did suggest, however, that they would have benefited from further discussions of what the principles meant and how to implement them appropriately.

Being dynamic and adaptable

The principles were observed as being dynamic, with their implementation evolving over time, based on reflection, discussion and feedback. Continual reflection on the principles was viewed as a positive strategy for refining and implementing them, keeping them valid and relevant, and enabling them to evolve alongside the CRE-IQI.

I think they’re a good thing to have from my perspective, but you have to operationalise them in some way... you’ve done that. The other thing, as you have done, is just reemphasising that these are not a static sort of set of principles, they have to be continually evolving as the work and people and new issues emerge. (Researcher, Indigenous, University / Research Institute)

Having the principles clearly articulated and regularly reflected on offered collaboration members an accountability lens through which they could question whether or not the collaboration was adhering to its principles—for example, indicators were developed and reported on over time to enhance efforts to ensuring adherence to the principle of increasing Indigenous participation and leadership.

Sharing and dispersing leadership

Many respondents described how, over time, leadership roles became increasingly shared and dispersed. This process was perceived as an example of implementing the principles through different forms of interactive leadership.

The CRE-IQI research capacity strengthening programme focused on facilitating Indigenous leadership and participation at all levels.²⁶ Coleadership arrangements were established between Indigenous and

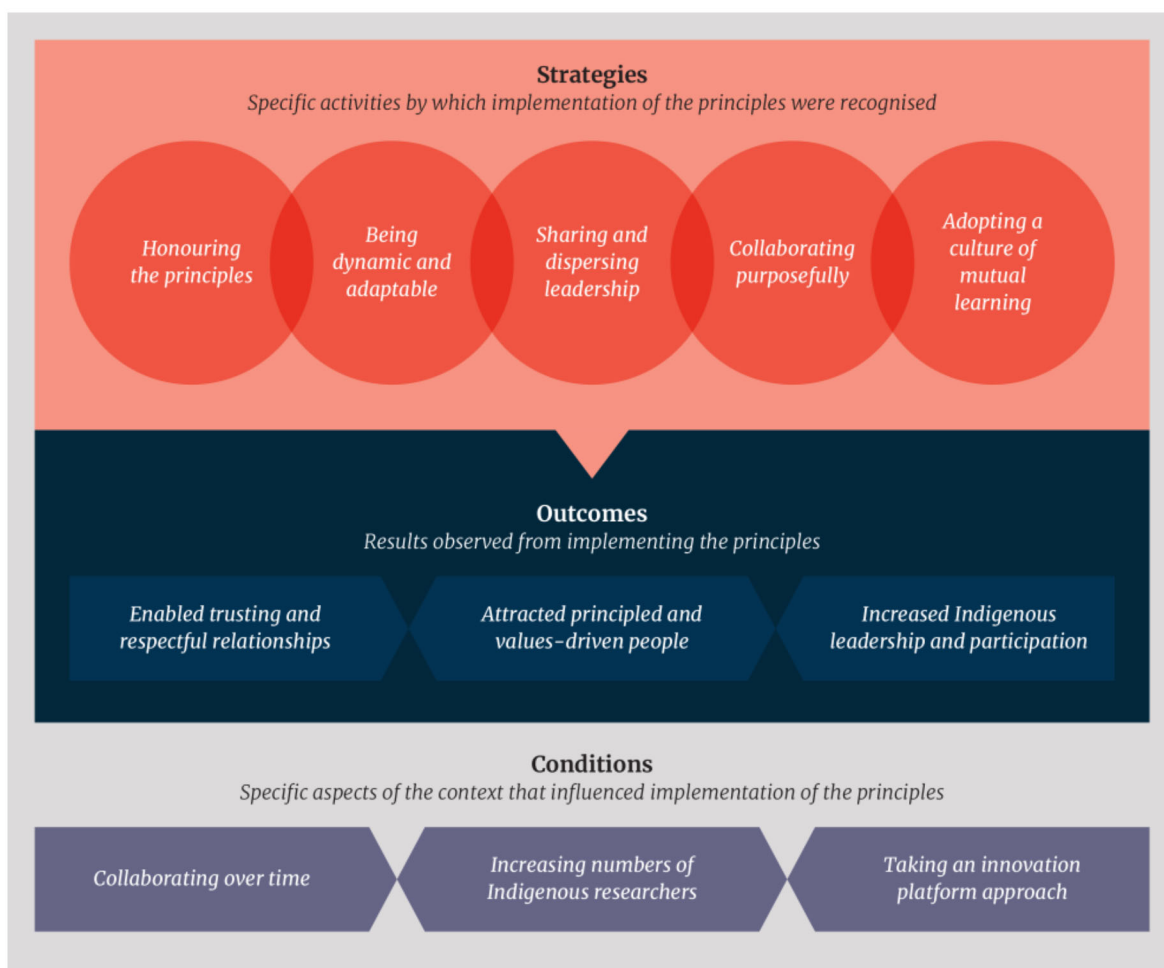


Figure 2 Strategies, outcomes and conditions related to how principles were implemented in the research collaboration.

non-Indigenous researchers in many of the CRE-IQI projects, which in turn created bonds of interdependence, respect and trust.

So, when we have our weekly meetings, while [XX] is away they're led by [two Aboriginal academics], and even before that there was that real respect between the co-leaders, and... ensuring that it wasn't tokenism, that there was true decision-making. (Researcher, Non-Indigenous, University/ Research Institute)

Coleadership arrangements were consistently highlighted as a strategy through which to implement the principles, but they were also perceived to be a tangible outcome of operationalising the principles through increased Indigenous leadership and participation. This is an example of the overlap between outcomes and strategies in which a strategy was implemented, and the outcome was the successful realisation of that strategy—namely, an increase in Indigenous leadership and participation.

Most respondents expressed enthusiasm for the concept of co-leadership, with some noting that use of the term co-leadership 'breathes new life' into the pursuit of not-so-new arrangements. However, tensions relating both

to co-leadership arrangements and to Indigenous and non-Indigenous ways of doing business were also identified. Funding applications for competitive grants, for example, may benefit from using a conventional hierarchical structure for investigators and showing traditional academic track records for improving chances of success within current assessment processes. Some respondents spoke about the need to keep pushing boundaries and to disrupt traditional views of research leadership. The importance of not overwhelming the perceived 'relatively small pool' of Indigenous researchers was also identified as a point of tension, as expressed here:

There is a tension of ensuring leadership and participation but also ensuring people aren't overloaded. (Researcher, Indigenous, University / Research Institute)

A few respondents sensed that some non-Indigenous people felt threatened by the concept of Indigenous-led and co-leadership arrangements, and what this could mean for their jobs.

The risk of losing something means that people will keep the status quo, because they haven't done the thinking through... that losing means gaining. But when you create

a void, something new comes in. (Researcher, Indigenous, University / Research Institute)

Several project managers with experience of co-leadership arrangements spoke about having to be deliberate in their actions to make space and to ‘take a step back’, neither of which was necessarily an easy thing to do. There needed to be a negotiation of roles and expectations, and finding new ways of working. Having the principles in place helped, because there was a shared commitment to making arrangements work and to prioritising these arrangements.

Collaborating purposefully

The concept of ‘collaborating purposefully’ was reflected in the effort and resources allocated to increasing the participation of both Indigenous people and of representatives from Indigenous organisations at CRE-IQI meetings, which were generally perceived as safe spaces to voice concerns and discuss issues openly.

I felt that the implementation of the principles was deliberate, it was certainly done with absolute intention. (Researcher, Non-Indigenous, University/ Research Institute)

Purposeful collaboration brought people together in respectful ways to operationalise the principles by encouraging participation and creating mechanisms for further collaboration and increased Indigenous leadership. In turn, the meetings provided opportunities to plan further implementation of the principles and programmes of work.

Many respondents identified a specific bi-annual meeting midway through the collaboration life-cycle as an important turning point for implementing the principles. The Indigenous Advisory Committee had not been operating as conceived (because of overcommitment by Committee members), and at this biannual meeting there were deliberate discussions about how to uphold the principles and to bring more Indigenous people into the collaboration to ensure Indigenous leadership and governance. Several respondents recalled the tension in the ensuing discussions, and how the principles helped to guide the CRE-IQI as it navigated tension.

I think there was a little bit of conflict, that might not be the right word, but I guess it is close enough. I think ... we all were probably a bit threatened by the whole conversation because there was an element of frustration from our Indigenous colleagues in feeling that they don’t always have equal voices. Whenever anyone gives you any push-back it does make you feel a bit awkward, a bit uncomfortable because your genuine intent is to have really good engagement. ... The principles helped us navigate this tension. (Program Manager, Non-Indigenous, Indigenous Community-Controlled Sector Support Organisation)

Respondents also recognised the importance of being able to bring different perspectives safely to the surface.

It’s OK to have the tensions and disagreements ... because they bring out a level of understanding and appreciation for where priorities are for different people and organisations, but there has to be a safe space for this to occur. Like in the CRE where ... the principles helped to guide this tension related to Indigenous leadership and participation. (Researcher, Indigenous, University/ Research Institute)

Adopting a culture of mutual learning

Recognising the need to nurture a culture of mutual learning, the collaboration established a funded position and programme for research capacity strengthening.

The capacity strengthening program, this is where the rubber meets the road in terms of implementation of principles. It was about actually putting it into practice... in a more collaborative way, more deliberative dialogue, without it being a tokenistic thing, genuinely having Aboriginal co-leadership, valuing mutual learning through an ‘All teach, all learn’ approach. (Program Manager, Non-Indigenous, Indigenous Community-Controlled Sector Support Organisation)

The capacity strengthening programme created a strategy of ‘All teach, all learn’, which placed value on mutual learning among all members of the collaboration - Indigenous and non-Indigenous researchers, research users, and communities—in the collaboration.²⁶ Importantly, the research capacity strengthening programme and its ethos, which embodies the value of both Indigenous and Western knowledge, was seen to put the principles into action.

I think we see [the application of Principles]... in the bi-directional learning and that whole sort of expert-learner dyad, and the dynamic around that. And the certain creation of a safe space for people to move between those two poles... plays out throughout those few days when everyone’s together for the bi-annual meetings and masterclasses. (Researcher, Non-Indigenous, University/ Research Institute)

Outcomes

The implementation of the principles enabled trusting and respectful relationships, attracted principled and values-driven people, and increased Indigenous leadership and participation.

Enabled trusting and respectful relationships

Many respondents described the principles as working like a ‘code of conduct’, which assisted members in building relationships embodying the principles and supporting their implementation. The principles were seen to enable trustful and respectful relationships by providing guidance on navigating conflict, developing shared values and communicating respectfully. Having clearly articulated principles facilitated our understanding of how to work together to find common ground.

There have been points of conflict, points where agendas didn’t quite meet or where we felt threatened or uncomfortable by certain directions, but we’ve been able to have

discussions with... [the] chief investigators and... senior researchers, and have nearly always been able to come to a happy balance, to accommodate each other's needs. The principles worked as a code of conduct to help us navigate tensions and develop trusting relationships. (Program Manager, Non-Indigenous, Indigenous Community-Controlled Sector Support Organisation)

In the historical context of research not providing benefits for many Indigenous communities, several respondents hypothesised that trust was a necessary precursor to enabling this successful collaboration.

Attracted principled and values-driven people

As an open collaboration, new individuals and organisations were encouraged both to join and to feel able to leave as circumstances required. Openly articulating the principles attracted people whose values aligned with those of the collaboration.

I feel like I trust all those [long-standing researchers] that have been around. I trust their values—that you want to be involved with researchers who have similar values. (Health Service Manager, non-Indigenous, Aboriginal Community-Controlled Health Service)

Increased Indigenous leadership and participation

Implementing the principles was perceived to increase the number of Indigenous people attending meetings and events over time and to firmly establish Indigenous leadership.

I actually looked around the room and thought 'Wow, look how much this group's changed'. There were just lots more Indigenous people in the room, and in leadership roles. (Researcher, Non-Indigenous, University / Research Institute)

The application of the principles also shaped the successful funding twice daily for a new CRE in Strengthening Systems for Indigenous Health Care Equity (CRE-STRIDE).²⁷ The leadership structure of this next phase of collaborative research has seen a significant increase in Indigenous representation—with the collaboration led by an Indigenous researcher and with 50% of the other investigators also Indigenous—an outcome most respondents perceived as resulting from the implementation of the principles.

[A] practical example of our application of principles is the new CRE-STRIDE. The fact that we have got an Indigenous Chief Investigator and at least 50 percent Indigenous investigators is a signal of the application of the principles. (Researcher, Indigenous, University/ Research Institute)

Conditions

The three conditions that facilitated the implementation of the principles were collaborating over time, an increasing number of Indigenous researchers and taking an innovation platform approach.

Collaborating over time

As many of the CRE-IQI members had been working together for nearly two decades, they had a shared purpose and understanding of applied CQI research, similar experiences in Indigenous health, and knowledge of each other's strengths and weaknesses. This close collaboration over time helped to build trust among members, which ultimately facilitated the implementation of the principles.

Articulating principles for the collaboration was not a new concept, as a set of principles had been developed to promote research values and guide researchers in the early years of community-based CQI research.¹⁸ However, the 'bedrock of trust' that had been built over two decades provided new collaborators with a strong foundation and a model for working with others to put the CRE-IQI principles into practice:

There's new people that have come in, but it's coming to a base of a strong network already. Being a new person as well, I think there is a sense of security in that. It's very clear from the network analysis that [the collaboration is] quite robust and it's fairly stable in terms of its capacity to bring people in and integrate them into that network as it's so strong already. (Researcher, Non-Indigenous, University/ Research Institute)

Increasing numbers of Indigenous researchers

Another enabling condition relates to what one respondent referred to as the 'rising tide of Aboriginal researchers' in the research environment generally, with the increase in numbers facilitating the implementation of Indigenous research principles. For the CRE-IQI, increased interest in CQI research from Indigenous researchers was coupled with a greater expectation on growing the leadership and participation of Indigenous researchers within the collaboration. However, respondents highlighted a tension associated with this aspect of Australian health research funding, whereby the nation's major health research funder demands strong academic track records from a limited pool of researchers with the requisite background and experience. An example offered by respondents was the CRE-IQI's original concept of having an Indigenous Advisory Committee in its governance structure. Attempts to operationalise this committee did not progress as planned, however, because those initially identified as members held 'high-profile' positions in Indigenous health, which meant that they had multiple, often competing demands on their time. As noted by one respondent who was listed as a member of the original Committee:

... while you can have Indigenous people on your grant applications with good track records and high profiles... there needs to be a discussion with some of those people about what kinds of roles are actually feasible for them to take on, and what the best way of using their time is. Just in terms of the demands, [there are] so many multiple demands on people's time. (Researcher, Indigenous, University/ Research Institute)

Despite this, the increase in the number of Indigenous researchers involved in the collaboration was almost certainly in part because of the existing positive relationships between researchers, the development of new and diverse research projects, collaboration expansion, and the previously described efforts to promote Indigenous leadership and governance of the CRE-IQI.

Taking an innovation platform approach

The third condition that enabled implementation of the principles was having the collaboration operate as an innovation platform.¹⁰ An innovation platform is a collaborative arrangement in which diverse members representing different parts of a system are brought together to promote mutual learning, identify problems collectively, and achieve shared solutions. The strategies respondents identified as being directly responsible for how the principles were implemented in the research collaboration—that is, sharing and dispersing leadership; collaborating purposefully; adopting a culture of mutual learning; and being dynamic and adaptable—were similar to those strategies generally required for the successful operation of an innovation platform. Thus, the innovation platform approach worked synergistically to enable the outcomes of implementing principles in the research collaboration.

DISCUSSION

In this qualitative study, we identified strategies and conditions by which a set of principles were implemented in the context of a large-scale Indigenous health research collaboration, and the outcomes of implementing these principles. Implementation occurred through five strategies: honouring the principles; being dynamic and adaptable; sharing and dispersing leadership; collaborating purposefully; and adopting a culture of mutual learning. These strategies resulted in increased Indigenous leadership and participation and enabled trusting and respectful relationships between principled and values-driven people with a shared commitment to improving Indigenous health outcomes. Conditions within the research collaboration were important—not least because collaboration over time between many members had engendered trust, there was an increasing number of Indigenous researchers and taking an innovation platform approach facilitated the implementation of the principles.

The principles were viewed as an integrated whole, with overlap between individual principles. As respondents saw the principles interactively reinforcing and complementing each other, there was no corresponding ordering of the principles in relation to priority, with all determined to be important and interdependent. Collectively, the principles became the rudder for navigating complexity and conflict. Fluidity between the strategies, conditions and outcomes, and was also evident. For

example, the outcome ‘increased Indigenous leadership and participation’ at times was a deliberate strategy.

The difficulty respondents had in articulating how the principles were actually implemented, and the common reference to them as part of the fabric of the collaboration, reveals congruency between ‘tacit knowledge’ and principles. This is in keeping with Polanyi’s²⁸ famous expression—‘we know more than we can tell.’ Tacit knowledge, like the principles in our collaboration, is embedded within the context of work and, as such, is not easily communicated.^{29 30} Like tacit knowledges, the principles functioned as ‘situation-specific’ and ‘subconsciously understood’ ‘knowledge-in-practice’ which is ‘developed from experience and action’, and is ‘difficult to articulate’.³¹

We identified several ways in which the principles were implemented, although sometimes tacitly. For instance, consider the ‘purposeful collaboration’ example in which concerns were raised about the low levels of Indigenous leadership. In this example, we observe how the principles were present not only in guiding a process towards generating solutions and a marked turning point, but also in enabling respondents to identify and articulate the specific concern in the first place. Without explicit principles that prioritised respect for Indigenous peoples (ie, working in partnership, ensuring Indigenous leadership, etc) being articulated and agreed on by the collaboration, concerns about Indigenous participation and leadership might not have been raised or, critically, not given high priority.

The principles functioned like a compass, like setting a direction. Travelling in the desired direction requires ‘implementation’ of the principles. This involves (1) interpretation—and reinterpretation—of what achieving the principle looks like under current conditions; (2) taking stock of the current position in relation to the intended direction; and (3) identifying and taking steps to course-correct considering conditions and outcomes. In our example, the principles helped respondents identify when they were ‘drifting’ from the desired course, engage in discussion to reinterpret what the principles meant in practice, and course-correct through new specific actions towards a shared direction. Such events, although described as ‘tense’ or ‘uncomfortable’, may be necessary for moving towards a deeper understanding and fuller implementation of principles in practice. Thus, evaluating principles involves adopting a different perspective—shifting away from measuring implementation to asking: how have principles been articulated, how are principles apparent and in what ways do they lead to desired outcomes?

A focus on principles may lead to isomorphic mimicry, as principles may be written down and processes established by imitation, to falsely appear as if they are being followed, but not in actual practice.^{32 33} However, such imitation may be necessary to initiate a process of real change. Our research implies that principles are not static, because their meaning and implementation must

change as our understanding of them deepens. Establishing a process for ongoing reflection and reinterpretation reflects ‘triple-loop’ learning, in which we learn how to learn, and how to make decisions about what is right.^{34–36} ‘Triple-loop’ learning can involve evaluator roles, and an openness both to unfavourable evaluation findings (eg, that principles are not being adequately followed), and to making change as a result of such findings (eg, from top-down collaborative practices to adopting equity and justice principles).³⁷ Evaluators who engage with such collaborations must, when necessary, be willing to speak truth to those in powerful roles about the necessity of upholding principles and advancing goals, and to manage the consequences of doing so.³⁷

Strengths and limitations

The strengths of our analysis include the use of a multi-methods approach, diversity of respondents and long-term repeated engagement with collaboration members who contributed to interviews, data analysis and interpretation. In addition, we had Indigenous representation and input, with Indigenous researchers and collaboration members having a role in the design, data analysis, and interpretation of this study.

Patton⁹ posits that it is useful to explore the extent to which principles are meaningful and evaluable. However, as the principles in our research collaboration were developed based on extensive consultation and discussion, we did not feel it was appropriate to assess how meaningful they were. In the context of Indigenous-related research, our experience points to the importance of having a collaborative process for developing principles, one that is driven by Indigenous stakeholders and does not impose, or focus on, principles based on their ‘evaluability’, a concern echoed by others.^{38–39} As articulated by Maori researchers, Were *et al*,³⁹ there are important future discussions to be had about how Indigenous knowledges and approaches might intersect with principles-focused evaluation.

The findings from this study must be considered within the limitation that most of the authors are either embedded researchers or investigators within the collaboration, and that the respondents could also be viewed as having a vested interest in presenting the study in a positive light. However, factors that enhance the credibility of our findings included having two researchers undertake the interviews, the participatory nature of the research process, our familiarity with the setting and the topic, and the systematic comparisons between our data, themes and categories. Additional information about authors is available in online supplemental file 1, with their roles detailed in the author contributions.

While Patton’s principles-focused evaluation⁹ approach is well cited, we have only been able to identify one peer-reviewed publication on this approach to date,³⁷ although other reports may exist in the grey literature. Likewise, little has been published on the role of principles in the design and implementation of innovation

platforms,^{10–11–16} even though these collaborative network forms have been gaining traction as a way of bringing people together to learn, share ideas and solve problems. Given that the focus of innovation platforms is on empowering local actors to solve problems collaboratively, and as lessons on their use accumulate,^{40–41} the findings from our study suggest that there is scope to be more explicit about the principles governing them and to embed, constantly monitor and reflect on their role within innovation platforms.

CONCLUSION

The principles in our collaboration—implemented through a set of five overlapping and mutually reinforcing strategies that interactively reinforced and complemented each other—became the compass we relied on to navigate complexity and conflict. Given the challenges inherent in evaluating complex collaborations, our experience may be useful for future principles-focused evaluation of multistakeholder collaborations (such as innovation platforms). Like tacit knowledge, how principles are enacted in practice might never be completely revealed, and the conditions and outcomes of their implementation may be nuanced. However, our experience points to the importance of having a collaborative process for developing and implementing principles within a culture of continuous reflection, learning and adaptation, and a process for ongoing recalibration as the context and the interpretation of the principles meaning changes over time.

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Chapter 5: Expansion of Collaboration and Knowledge Generation in an 18-Year Quality Improvement Research Program in Australian Indigenous Primary Health Care Settings—A Co-Authorship Network Analysis

5.1 Preface

In this chapter, I use co-authorship network methods to examine the growth and change in the research outputs from the collaboration. Specifically, I addressed the following questions: to what extent did the CRE-IQI's research network bring together people from a variety of organisations; what were the structural characteristics of the network; what was the level of equity in authorship relative to Aboriginal and Torres Strait Islander status and gender; what capacity-strengthening efforts were implemented based on student authorship; and what were the changes (if any) in research themes over time? The idea for this study emerged from the developmental evaluation findings on the need to examine any growth and change in the network, recognising that the innovation platform emerged from long-standing collaborations.

This chapter was written as a journal article, of which I am the principal author, and is presented here in its entirety. The article was published in *BMJ Open* and is available on the journal's website at <https://bmjopen.bmj.com/content/11/5/e045101>.

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5.2 Author Contributions and Attribution Statement

Ms Jodie Bailie initially conceptualised and designed the study in consultation with Mr Boyd Potts, Professor Ross Bailie and Professor David Peiris. Jodie and Boyd collated and curated the data, with Boyd doing the network analysis and Jodie the descriptive analysis. Dr Frances Cunningham provided expert input on network analysis throughout the process. Ross provided input into the categorisation of the publications by research themes. All authors provided critical intellectual input and feedback on drafts, and all read and approved the final manuscript.







As supervisor for the candidature upon which this thesis is based, I can confirm that the authorship statement attribution is correct.

Professor David Peiris

31.01.22

5.3 Published Article

BMJ Open Collaboration and knowledge generation in an 18-year quality improvement research programme in Australian Indigenous primary healthcare: a coauthorship network analysis

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ABSTRACT

Objectives Though multidisciplinary research networks support the practice and effectiveness of continuous quality improvement (CQI) programmes, their characteristics and development are poorly understood. In this study, we examine publication outputs from a research network in Australian Indigenous primary healthcare (PHC) to assess to what extent the research network changed over time.

Setting Australian CQI research network in Indigenous PHC from 2002 to 2019.

Participants Authors from peer-reviewed journal articles and books published by the network.

Design Coauthor networks across four phases of the network (2002–2004; 2005–2009; 2010–2014; 2015–2019) were constructed based on author affiliations and examined using social network analysis methods. Descriptive characteristics included organisation types, Indigenous representation, gender, student authorship and thematic research trends.

Results We identified 128 publications written by 308 individual authors from 79 different organisations. Publications increased in number and diversity over each funding phase. During the final phase, publication outputs accelerated for organisations, students, project officers, Indigenous and female authors. Over time there was also a shift in research themes to encompass new clinical areas and social, environmental or behavioural determinants of health. Average degree (8.1), clustering (0.81) and diameter (3) indicated a well-connected network, with a core-periphery structure in each phase ($p < 0.03$) rather than a single central organisation (degree centralisation=0.55–0.65). Academic organisations dominated the core structure in all funding phases.

Conclusion Collaboration in publications increased with network consolidation and expansion. Increased productivity was associated with increased authorship diversity and a decentralised network, suggesting these may be important factors in enhancing research impact

Strengths and limitations of this study

- A study strength was the long time frame of 18 years of publications from an Australian quality improvement research network.
- To the best of our knowledge, this study is the first to describe a continuous quality improvement research network using coauthorship network analysis.
- Our analysis does not include the multiple affiliations of many of the authors and so may under-report the level of collaboration.
- Coauthorship is only one indicator of collaboration, though it has several advantages to relying on it as a proxy for assessing research collaboration including its verifiability, stability over time and availability in the public domain.
- Many other collaborative efforts are not reflected in coauthorship metrics, such as collaborations that continue to occur through coauthorship, grant submissions and conference presentations.

and advancing the knowledge and practice of CQI in PHC. Publication diversity and growth occurred mainly in the fourth phase, suggesting long-term relationship building among diverse partners is required to facilitate participatory research in CQI. Despite improvements, further work is needed to address inequities in female authorship and Indigenous authorship.

INTRODUCTION

Over the past two decades, continuous quality improvement (CQI) programmes have been widely taken up by primary healthcare (PHC) services caring for Aboriginal and Torres Strait Islander people (hereafter respectfully referred to as Indigenous people,



acknowledging their cultural and historical diversity) across Australia.^{1,2} CQI—a set of methods for improving the quality of care, through continuous measurement and problem-solving techniques^{3,4}—has been found to improve the quality of care delivered in Indigenous PHC.^{1,5}

While evidence indicates no single model of CQI outperforms others, the most successful applications of CQI are multisite and multifaceted approaches that aim to achieve change at various levels of the health system.⁶ We and others have argued the need for multidisciplinary research networks to support the practice and effectiveness of CQI^{6,7} and to foster coproduction and sharing of knowledge. However, despite research networks often being touted as a solution for enhancing knowledge translation into policy and practice, their characteristics and emergence over time are poorly understood.^{8–10} Furthermore, evaluation challenges can be considerable because research networks are often loosely defined and manifest in different forms with formal and informal organisational structures.^{11,12}

We sought to better understand the development and growth of a multidisciplinary research network in Indigenous PHC quality improvement, and how these aspects reflected the vision of the network with respect to capacity strengthening, equity and membership diversity. Coauthorship network analysis offers one feasible strategy for evaluating the growth and emergence of research networks, because publications are well documented and reflect collaboration.^{13–15} The study uses coauthorship network analysis to examine the growth and change in an 18-year CQI research network in Australian Indigenous PHC. We address the question: How did the research network expand and change over time? Specifically we will investigate the extent to which the research network brought together people from a variety of organisations; the structural characteristics of the network; the level of equity in authorship relative to Indigenous status and gender; capacity strengthening efforts through examining student authorship; and changes in research themes over time.

The setting

Although Australia has a high-performing health system, underpinned by a universal health insurance scheme, it ranks low on measures of equity when compared with other Organisation for Economic Co-operation and Development nations.¹⁶ This ranking is reflected in consistent underperformance in addressing inequities in healthcare access, quality of care and outcomes for Indigenous people.^{17–19} These inequities are underpinned by a legacy of colonisation, land dispossession, displacement, disempowerment, social and economic exclusion and ongoing racial discrimination.^{19,20}

To help address these inequities, the Audit and Best Practice in Chronic Disease (ABCD) participatory action research programme was initiated in 2002. Drawing on international evidence about the effectiveness of

system-wide CQI approaches to improve the quality of PHC service delivery,²¹ the ABCD programme employed a systems approach to support the CQI efforts of PHC services established to provide care for Indigenous Australians.^{1,6,22} Connected to this research programme, in 2010 a national, not-for-profit, CQI support entity—One21seventy—was established to support Indigenous PHC services in implementing CQI cycles using standardised, evidence-based, best practice clinical audit and systems assessment tools. Notably, 175 of the over 275 PHC centres involved provided the research network with deidentified data derived from their use of the CQI tools and processes. The studies published by network members reporting analyses of these data form a comprehensive picture of the quality of PHC received by Indigenous people around Australia.¹ Between 2010 and 2016, ABCD research accounted for 42 of the 60 (70%) peer-reviewed publications identified in a systematic review on CQI in Indigenous PHC in Australia,² and also made a significant contribution to international CQI research.²³ Importantly, although there were demonstrated improvements in quality of care in some areas of clinical care, there was continuing wide variation between PHC centres and jurisdictions.^{1,5}

Table 1 sets out the four distinct phases of the ABCD programme's evolution from 2002 to December 2019, its research aims, systems-strengthening dimensions and main findings. The intention of the resulting network was an 'open collaboration' that actively encourages cooperation with other organisations and individuals to help achieve the programme's aims. The current phase of research (2020–2024) is included in table 1 but was not part of this study.

METHODS

We used social network analysis, as described by Fonseca *et al*¹³ in their health sector coauthorship network analysis, to retrieve scientific publications, standardise entries for authors and organisations, visualise the network and calculate metrics.

Data retrieval

Details of peer-reviewed journal articles and books (the 'publications') were retrieved from administrative records held by the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI) coordinating centre, and included all publications published from 2002 to 2019.

Data categorisation, standardisation and cleaning

Publications were sorted into categories and research themes that were iteratively developed and defined by JB and RSB. We describe the process for categorisation of included publications below.

Organisations

The affiliations of the authors (as per their citation on publications) were coded into universities and research

Table 1 Phases and research focus of the ABCD programme, an action research project implementing quality improvement in Indigenous PHC, 2002–2019

	Phase 1 exploring feasibility and acceptability of CQI tools and processes	Phase 2 exploring scalability and expansion of CQI	Phase 3 supporting wide-scale implementation of CQI and development of partnership learning model	Phase 4 embedding CQI approaches in systems wide CQI	Current phase (not part of study) strengthening leadership and engagement in system wide CQI
	ABCD (2002–2004)	ABCD Extension (2005–2009)	ABCD National Research Partnership (2010–2014)	One21seventy (2010–2016) service support arm	CRE in Strengthening Systems for Indigenous Healthcare Equity (CRE-STRIIDE) 2020–2024*
Research aims	Explore whether a CQI approach was feasible and effective in Indigenous PHC. ⁴³	Identify support requirements for large-scale implementation of the ABCD model. ⁴⁴	Understand variation in quality of care and strategies for improvement. ⁴²	Primarily a service support function. Voluntary contribution of data by services for research purposes, and potential for other involvement of services in research.	<ul style="list-style-type: none"> Accelerate and strengthen large-scale CQI efforts. Explore the feasibility/functioning of an 'innovation platform'.^{32,33} Extend CQI methods to sectors beyond the PHC clinical environment.⁴¹ Enhance community participation in CQI processes.
Health system strengthening dimension	<ul style="list-style-type: none"> Using participatory action research, a CQI process was introduced to 12 Indigenous PHC centres in one jurisdiction (Northern Territory) with a focus on the prevention and management of chronic disease.⁴⁵ CQI approach embraced to improve (and demonstrate) quality of care. Systems assessment tool provided a mechanism for ongoing local system improvement and integration with other organisations and sectors.⁴⁶ 	<ul style="list-style-type: none"> Geographic scope of the project was extended to include 69 Indigenous PHC services in several jurisdictions across Australia. Scope was broadened to address other priority areas of PHC, with audit tools for additional areas of care. Informed health system planning and policy by showing how the ABCD approach could be scaled up, and examined barriers/enablers to engagement and improvement. 	<ul style="list-style-type: none"> More than 175 Indigenous PHC services across Australia involved in ABCD programme.⁴⁷ Brought together stakeholders from across jurisdictions and levels of the health system to support and guide research on priority PHC health system issues, and to contribute to refining CQI tools and processes, interpreting data, applying findings and sharing lessons.⁴⁴ 	<ul style="list-style-type: none"> Provided CQI training and tools with systems thinking focus, and web-based data analysis and reporting system able to provide local and aggregated data reports, with benchmarking, 275+ health services used ABCD tools and 2500 PHC staff were trained in the use of CQI tools and processes.⁴⁷ 	<ul style="list-style-type: none"> Adapted and extended the Partnership Learning Model, developed through previous phases of the research, by engaging with a wider range of stakeholders responsible for Indigenous PHC to solve problems and innovate together. Emphasis on research capacity strengthening and research translation.³⁸ Develop new knowledge to strengthen integration in comprehensive PHC and embed CQI at all levels of the PHC system. Strengthen Indigenous community input into improving CQI processes. Extend CQI processes and collaborations across sectors.
Research findings	<ul style="list-style-type: none"> CQI approach was well accepted, demonstrated the feasibility and application of tools and processes, and showed improvements in care and intermediate health outcomes. 	<ul style="list-style-type: none"> Identified key barriers and enablers to scaling up in an Indigenous context.⁴⁵ Established the need for further tools to support the implementation of CQI in Indigenous PHC. 	<ul style="list-style-type: none"> Demonstrated improvements in quality of care in some areas, and continuing wide variation between PHC centres and jurisdictions.^{1,5} Developed Partnership Learning Model to achieve large-scale improvements in quality of care and population health outcomes.⁵ 	<ul style="list-style-type: none"> +70% of PHC centres engaged in One21seventy provided their de-identified data to the ABCD National Research Partnership for use in research. 	<ul style="list-style-type: none"> Established that clinical and other areas such as community health promotion and prevention outcomes can be improved by using evidence-based CQI tools and processes.³⁰ Identified factors that support the effective use of CQI by PHC teams and services, and improvements in delivery of care.⁵¹ Identified priorities for strengthening PHC systems to achieve large-scale health improvements.^{52,53}

Continued



Table 1 Continued

	Phase 1 exploring feasibility and acceptability of CQI tools and processes	Phase 2 exploring scalability and expansion of CQI	Phase 3 supporting wide-scale implementation of CQI and development of partnership learning model	Phase 4 embedding CQI approaches in systems	Current phase (not part of study) strengthening leadership and engagement in system wide CQI	
Funding source†	ABCD (2002–2004) NHMRC Fellowship. Grant No: *289.303 Cooperative Research Centre for Aboriginal Health	ABCD Extension (2005–2009) Cooperative Research Centre for Aboriginal Health and the Australian Commission on Safety and Quality in Healthcare	ABCD National Research Partnership (2010–2014) NHMRC Partnership Scheme *54267	One21seventy (2010–2016) service support arm Not-for-profit/cost-recovery service agency	Centre for Research Excellence in Integrated Quality Improvement (CRE- STRIDE) 2015–2019 NHMRC Centres of Research Excellence Scheme *1078927	CRE in Strengthening Systems for Indigenous Healthcare Equity (CRE- STRIDE) 2020–2024* NHMRC Centres of Research Excellence Scheme *1170882

Adapted from Baillie *et al.*⁶

*CRE-STRIDE is the current form of the network, and its successful funding underscores the research programme's longevity and stability.

†Although the projects were supported by research funding, it is important to note there were financial contributions and in-kind support from a range of community-controlled and government agencies. ABCD; audit and best practice for chronic disease; CQI; continuous quality improvement; NHMRC; National Health and Medical Research Council; PHC; primary healthcare.

institutes; government departments; health services; affiliates; primary health networks and non-government organisations. Where authors had more than one affiliation listed on the publication, we used the first affiliation provided. Other key points in the categorisation of publications were as follows:

- ▶ We used the author's university rather than their specific department and, if named, the research institute rather than the university.
- ▶ Where an author's affiliation was nominated as a hospital we used the State Health Department with which these organisations were affiliated.
- ▶ 'Affiliates' refers to regional support organisations established to support Indigenous health services, such as Aboriginal Medical Services Alliance Northern Territory.
- ▶ 'Health Service' refers to services established primarily to provide PHC to Indigenous people, and includes Aboriginal community-controlled services, government services and private general practice.
- ▶ Primary health networks refer to independent regional PHC organisations across Australia that commission rather than provide services, as established by the Australian government in July 2015.
- ▶ Non-government organisations refer to not-for-profit organisations that operate independently of government, typically with the purpose of addressing a social or political issue.

Research themes

Publications were assigned to one of the following three research themes:

1. CQI-related programme activities that address clinical care delivery in the PHC setting: publications that focus on the quality, and variations in delivery, of clinical care, and the application of, or learning from, CQI techniques in relation to a specific aspect of clinical care, for example, child health and chronic illness care.
2. CQI-related programme activities that address social, environmental or behavioural determinants—that is, community health promotion or prevention activities: publications that focus on the application of, or learning from, CQI with a focus on areas such as health promotion, social and environmental conditions, housing, food security and family well-being in general community settings.
3. CQI-related processes and approaches: publications related to CQI programme development (such as study protocols and reviews informing CQI approaches), health systems strengthening, and the development and evaluation of research collaborations and their impact.

In categorising the publications by research themes, abstracts of publications were retrieved and screened by blinded reviewers (JB and RSB). Inconsistencies in reviewer assessments were resolved by consensus.

Role type

We identified all authors who were students or project officers at the time of the publication, and who had authored

in this capacity. The student category included Public Health Trainees, and Masters, PhD and Medical Honours students. Project officers were identified as those whose primary role supported research, and/or related either to healthcare administration and/or to project work.

Indigenous status

Coordinating centre records flagged authors who identified as Indigenous.

Gender

Authors were assigned a male or female category through a number of ways—reviewer knowledge of authors and Google searches.

Where there was uncertainty in allocating the above categories, JB checked with RSB and, when necessary, with the corresponding authors of the manuscripts. Data were entered into an Excel spreadsheet, and then standardised and cleaned by JB and BAP.

Network assembly, visualisation and analysis

The evolution of the research network was analysed over the four phases displayed in [table 1](#), with the analysis split into three parts: (1) an analysis of publications by type of organisation represented, research themes, the role of authors, and the Indigenous status of authors; (2) the network analysis of coauthorship between organisations

and (3) a core-periphery analysis of organisational position within the network.

Python programming language V.3.7.4²⁴ and the Jupyter Notebook²⁵ application accessed through the Anaconda Navigator²⁶ interface were used to script all data manipulation and analytical work. Network analyses used the Python package NetworkX,²⁷ with visualisations produced with the open-source Gephi program.²⁸

We first created a node list containing every organisation and its attributes (unique identifier, organisation name, type and years published), and an edge list representing coauthorship as pairwise combinations of each organisation listed on a publication and its unique attributes.

A single, undirected edge of weight=1 was assigned for each organisation pair that shared at least one publication in each phase of the network. For publications that involved only authors from the same organisation, a self-loop edge of weight=0 was assigned. No additional weight was given to the number of publications or authors involved or any other attribute. This approach was chosen so that results of the analysis could be directly interpreted in the context of interorganisational collaboration.

Networks were analysed discretely across the four phases. Several network measures (defined in [table 2](#)) were used to understand the resulting networks.

Table 2 Theoretical definitions of social network analysis measures, and their meaning in this study

Measure	Definition, meaning in this study and importance
Node	The basic unit of a network. Nodes represent organisations. The node size is proportional to the no of publications.
Edge or tie	An edge or tie connects two nodes in a network, and indicates a relationship between the two. An edge between two organisations indicates coauthorship of at least one publication.
Density	The density of a network is the total no of edges divided by the total no of possible edges. It is a widely used measure that reflects the level of cohesion among network organisations, or the extent to which organisations collaborated with every other organisation in the network.
Average degree	Degree is a count of the no of connections for any given node: the higher the average degree, the more connected the network. The average no of interorganisational collaborations per organisation.
Clustering coefficient	Clustering is a measure of how many of the nodes connected to a given node are also connected to each other, which is expressed as a proportion of the total possible connections. The overall clustering coefficient is the average across the network. Where density tells you how connected the network is, the clustering coefficient tells you how well connected the various neighbourhoods of the network are. A high clustering coefficient and low density can be an indication of lots of small groups, loosely connected.
Path/path length	The path is any connected series of edges between two nodes. The length of a path is the no of steps (edges) and shows how quickly organisations can communicate with each other through their links.
Geodesic distance	The geodesic distance is the shortest path of all possible options between two nodes in the network. The no of steps it takes to get across a network is a useful measure of how quickly information can be disseminated to the entire network.
Diameter	The diameter of the network is the ‘longest short path’ between nodes and indicates the maximum no of steps it would take to get between nodes that are furthest away from each other in the network. The diameter gives a useful indication of how broad the network is.
Centralisation	This reflects how tightly the organisations are connected around the most central point of the network and how reliant the network may be on a central node.
Discrete core-periphery model	A network with a core-periphery structure has a ‘core’ of nodes densely connected to each other and to others, and ‘periphery’ nodes in the less-connected ‘periphery’ that are connected only to core nodes.



The analysis of network position at the organisational level uses discrete core-periphery analysis²⁹ to identify organisations that are well connected to each other (the core) as distinct from those less well connected (the periphery). To detect the core-periphery, we used the Borgatti and Everett²⁹ algorithm and the non-parametric statistical test devised by Kojaku and Masuda.³⁰

Patient and public involvement

No patients or members of the public were involved in the design, analysis or reporting of this study.

RESULTS

We identified 128 publications written by 308 authors, with a median of six authors per publication (IQR=4–9.25), representing 79 different organisations (table 3). Most authors (182 or 59.5%) contributed just one publication, while 18 (5.9%) contributed 10 or more. The chief investigator (RSB) of the original ABCD programme coauthored 97 of the 128 publications (online supplemental file 1).

Linking people from a variety of organisations

As shown in table 3, there was an increase in the number and type of different organisations in the network, with considerable growth from phase 3 (24 organisations) to phase 4 (72 organisations). Of note, the number of universities and research institutes increased from 15 in phase 3 to 45 in phase 4, while Health Services rose from 2 to 11 and international organisations increased to 8. This growth in different organisations participating in the research network over time was a result of existing organisations continuing to publish together (yellow nodes), and new organisations coauthoring (blue nodes) (figure 1). A few organisations ceased publishing as part of the network (red nodes), shown as ‘isolates’.

Relationships of organisations and structural characteristics

The structural characteristics of the networks are based on the indicators shown in table 3. Our analysis of the network data shows a decrease in the network density. In phase 2 and 3, the research network was relatively well connected with ~46% of all possible relationships in the network actualised. However, in phase 4, with ~11% of all possible links existing between organisations, there was less connectivity between organisations. The decrease in network density was linked to an increase in the number of organisations publishing together in phase 4, as noted above (table 3), and an increase in the scope of CQI publications. However, the average clustering coefficient remained high across all phases (1, 0.80, 0.86 and 0.81, respectively), indicating a strong tendency for multiple organisations to be collaborating on individual publications. Part of this high effect is a natural consequence of authors publishing together—it introduces triangles of collaborating authors, thereby increasing the clustering coefficient.

From table 3, we note that the average number of organisations collaborating directly on publications (average node degree) steadily increased from 2 in phase 1, to 5, 10.9 and then 8.1 in subsequent phases. This is a sign that organisations collaborated more widely over time, with a small decrease in phase 4. On average, publications involved 3.4 organisations, with 3.5 publications per organisation. This indicates a maturation of organisational relationships, typically creating more than one publication from each collaboration. Furthermore, network diameter was at-most 3 (phase 4) and geodesic distance was at-most 2.1 (phase 4). This indicates a close-knit cohesive network in which organisations were connected by no more than two other organisations, resulting in the network being unlikely to fragment and able to disseminate information quickly.

The degree-centralisation from phase 2 was 0.65 followed by 0.57 and 0.55 in the subsequent phases. Conversely, the core-periphery analysis produced strong results in each phase (see table 3). These analyses indicate that in all four phases the network was not connected via a single dominant central organisation but rather by a core-periphery structure that points to a more collaborative network. Intersectoral collaboration (research, government and/or health services) were represented in the core for phases 2 and 3 (green nodes in figure 2). In phase 4, the organisations comprising the core were all universities or research institutes, indicating that government departments and health services were more likely to publish with them than with each other.

Equity in authorship

Female first authors increased over time, growing from none in phase 1 to 84% (n=76) in phase 4 (table 3), with about 28% of the publications having a female senior or last author in all phases after the first. Although the number of publications led by Indigenous authors remained low, over time there was an increasing number and percentage with at least one Indigenous author. The greatest expansion was observed from phase 3 to phase 4 when the number of publications with at least one Indigenous author increased from 13 to 56 (table 3).

Providing opportunities for capacity strengthening

Over time there was also an increase in absolute number (but a decline in percentage) of publications with at least one student or project officer author, from 2 in phase 1 to 52 in phase 4 (table 3). Phase 4 also saw an increase in student or project officer as lead author, with the largest growth in phase 4 (28%, n=25) representing a twofold increase from phase 3 (14%, n=3).

Expansion of research themes

As the network evolved there was a notable growth in publications related to CQI and clinical care, an increase in publications related to social, environmental and behavioural determinants of health, and on the development of processes and approaches for CQI (table 3). The

Table 3 Coauthorship characteristics, by phases and total 2002–2019

Indicator	Phase 1: 2002–2004	Phase 2: 2005–2009	Phase 3: 2010–2014	Phase 4: 2015–2019	Total: 2002–2019
No of publications	2	15	21	90	128
No of different authors	5	33	67	263	308
No of authors per paper (median, IQR)	5 (5–5)	5 (3.5–8.5)	9 (4 - 13)	6 (5 - 9)	6 (4–9.25)
Organisational involvement					
No of nodes (organisations)	3	12	24	72	79
No and type of different organisations					
University or research institute	3	8	15	45	48
Government department	–	2	3	9	10
Affiliate	–	1	4	2	5
Health service	–	1	2	11	11
Non-government organisation	–	–	–	4	4
Primary health network	–	–	–	1	1
No of publications with an author who has an international affiliation	0	1	0	8	9
Capacity strengthening					
No and percentage of publications with a student/project officer as a lead author	0 (0%)	2 (13%)	3 (14%)	25 (28%)	30 (23%)
No and percentage of publications with at least one student/project officer as an author	2 (100%)	12 (80%)	13 (62%)	52 (58%)	79 (62%)
Addressing equity					
No and percentage of female authors	1 (25%)	20 (60%)	39 (58%)	171 (65%)	192 (62%)
No and percentage of publications with a female first author	0 (0%)	2 (13%)	14 (67%)	76 (84%)	92 (72%)
No and percentage of publications with a female last author	0 (0%)	4 (27%)	6 (29%)	25 (28%)	35 (27%)
No and percentage of publications with at least one Indigenous author	0 (0%)	6 (40%)	13 (62%)	56 (62%)	75 (59%)
No and percentage of publications with an Indigenous lead author	0 (0%)	0 (0%)	2 (10%)	3 (3%)	5 (4%)
No and percentage of publications with an Indigenous last author	0 (0%)	3 (20%)	0 (0%)	0 (0%)	0 (0%)
Thematic trends in publications					
Thematic areas, no and percentage					
CQI-related activities in clinical care	2 (100%)	6 (40%)	8 (38%)	44 (49%)	60 (47%)
CQI activities in areas such as community-based health promotion and prevention	0	2 (13%)	5 (24%)	16 (18%)	23 (18%)
Processes and approaches for CQI	0	7 (47%)	8 (38%)	30 (33%)	45 (35%)
Coauthorship network structural characteristics					
Density	1	0.45	0.47	0.11	0.13
Average degree (organisations)	2	5	10.9	8.1	9.8
Centralisation (degree)	0	0.65	0.57	0.55	0.53
Clustering	1	0.8	0.86	0.81	0.79
Geodesic distance	1	1.5	1.5	2.1	2.1
Diameter	1	2	2	3	3
Core-periphery structure	0	1 (p=0.03)	1 (p=0.01)	1 (p<0.001)	0.42 (p=0.83)

CQI, continuous quality improvement.

growth in research themes in phase 4 was consistent with the increase observed in the number of publications and organisations involved in this phase, and the emergence of new core organisations. Online supplemental file 2 contains a listing of all publications and their assigned category of research themes.

DISCUSSION

This study examined the growth of and changes in an Australian quality improvement research network over an 18-year period by assessing coauthorship of publications using network analysis. Key findings include an expansion in the number of publications; a greater number and diversity of organisations coauthoring; improvements in capacity strengthening measures reflected in increased

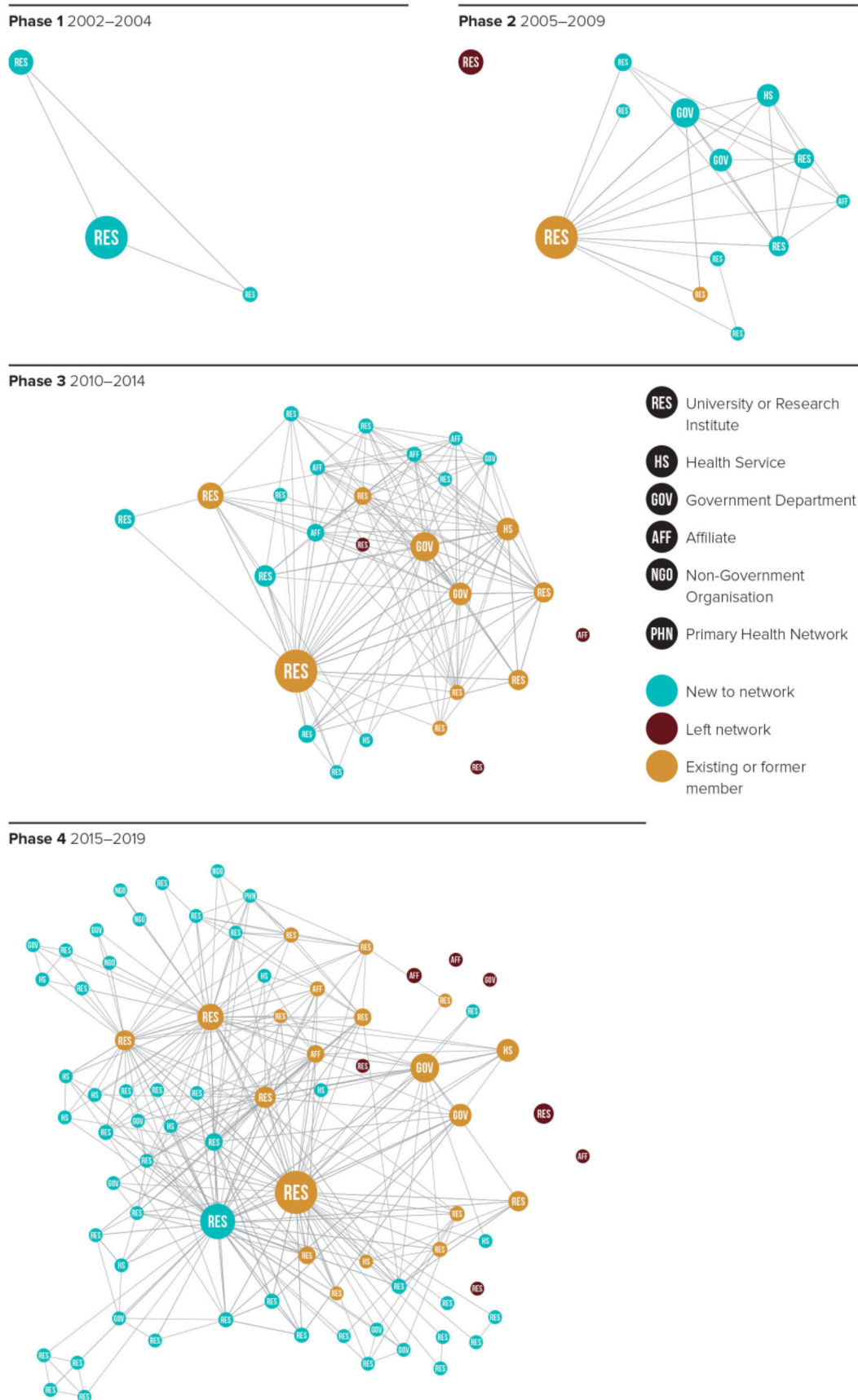


Figure 1 Evolution of the quality improvement research network, 2002–2019.

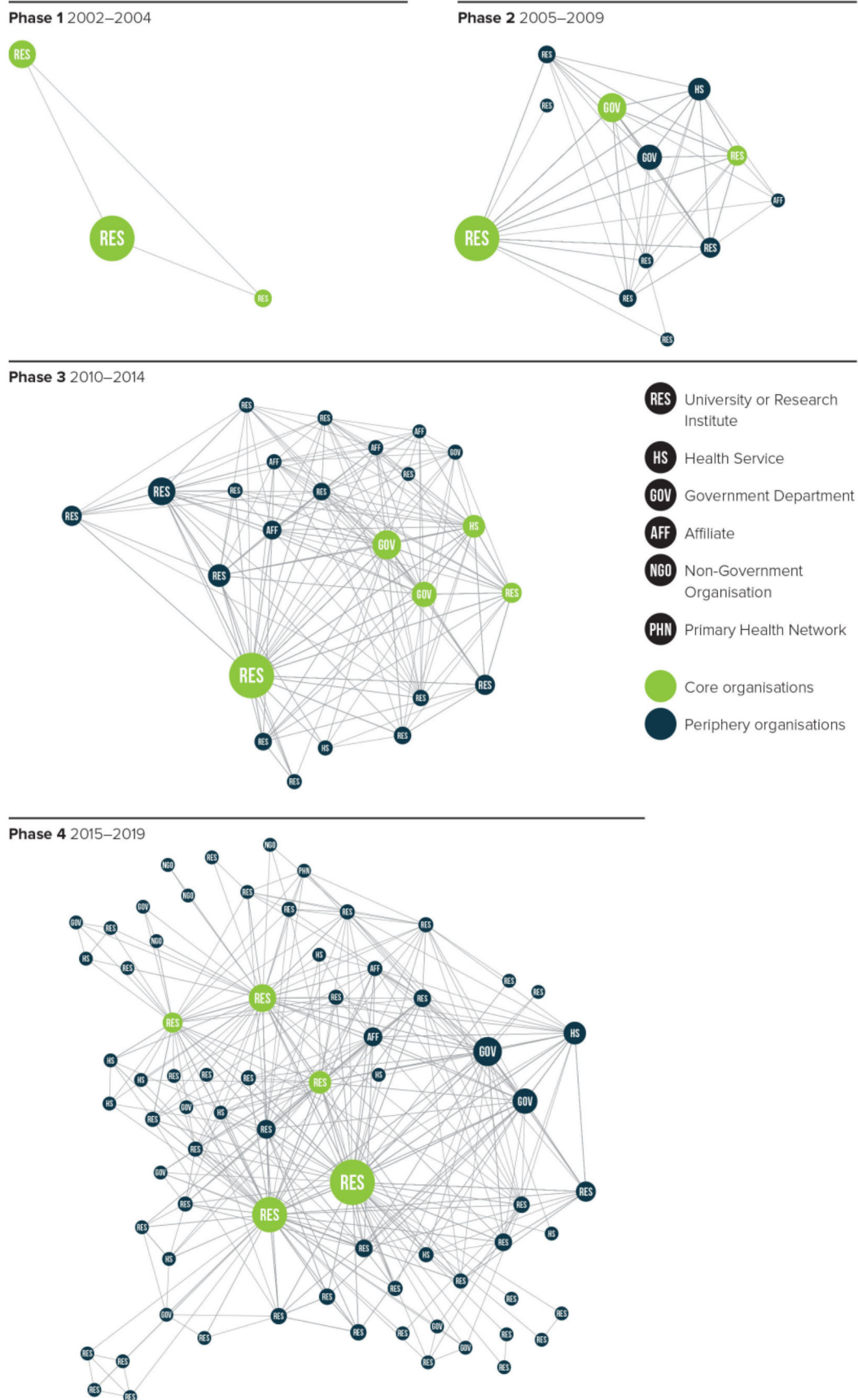


Figure 2 Core periphery analysis by phases, 2002–2019.



student and project officer authorship and first author position; and a broadening or scaling-out³¹ of quality improvement work to other thematic areas. There is evidence, too, that the research network linked people from a variety of organisations, including universities or research institutes, PHC services and government departments, who might otherwise have never worked together. This expansion potentially extended both the impact of the network and of the organisations involved.

The characteristics of the network showed a strong collaborative structure and a maturation of organisational relationships, with more than one publication typically developed by each collaborating organisation. Network analyses indicated a core-periphery structure of organisations connected to each other in each phase, rather than a network structured around a single central organisation. As there was the same chief investigator throughout the study period, this finding of a core-periphery structure indicates the network expanded to have other core organisations over time, and was not just centred on the chief investigators organisation. In phases 2 and 3, the relationships between research institutions and government departments were well represented in the network core. The network's founding partners maintained a consistent presence as members of the core, indicating that it remained dependent on these partners for collaboration. However, new core organisations emerged when key authors changed institutions, reflecting that individuals stimulated the expansion of core members. For example, a result of key individuals moving institutions and growing the publishing base was a phase 4 core comprised solely of universities and research institutes, while health service and government organisations were part of the core in the earlier phases. This change occurred despite a large increase in the number and type of organisations involved in the network in phase 4.

Network growth was greatest in phase 4, when funding was received from the Australian government's National Health and Medical Research Council (NHMRC) to establish a CRE and the network's structure and function¹² evolved to that of an 'innovation platform'.³² Used as a vehicle to stimulate and support multistakeholder collaboration and learning, 'innovation platforms' provide a space of interaction to facilitate the development and emergence of innovations when there are complex, system-wide issues requiring coordinated action and collective problem solving. Most extensively applied in international agricultural development, and to a limited extent in health, innovation platforms differ from other networks by the incorporation of a wider network of stakeholders at multiple levels of the system and in different roles; the concept of 'sector boundary spanning' that brings in stakeholders from other sectors to assist in developing healthcare solutions; and application of continuous reflection, learning and adaptation as central design elements.^{32 33}

These findings support previous literature that researchers tend to collaborate with like-minded others,

but that this tendency toward homophily can be disrupted by implementing policies that encourage interdisciplinary collaboration and purposeful research translation—such as was done with the innovation platform.¹⁴ Although the purposeful adjustment to an 'innovation platform' was associated with an expansion of activity among the network and new thematic scope in publications, this acceleration could also reflect other inter-related factors, such as longer-term relationships, and an increase in funding.

Furthermore, the earlier phases were focused on supporting PHC services to implement and embed quality improvement techniques through participatory action research. Access to the CQI dataset formed the basis of research collaborations between those services and university and research institutes to undertake data analyses that resulted in publications up to 2019. Though there were 175 PHC services providing data to the research collaboration, only 11 health services co-authored publications. While not necessarily coauthors, health services made important contributions to implementing research, collecting data and importantly—to interpretation and analysis of findings.

Our findings build on a prior social network analysis of partners in the research network which was undertaken as part of an interim evaluation in phase 3 of the research network. Cunningham *et al*³⁴ found an increase in network density (43%–59%) from 2013 to 2014, indicating an increase over time in connectivity and communication between partner organisations. A major element in achieving the goals of that phase of research was the network's focus on developing a shared database of deidentified CQI data from Indigenous PHC centres.³⁴ The importance to the research network of collecting and sharing data is supported by the experiences of other research collaborations.^{35 36} Furthermore, the high level of trust identified across the network is indicative of a properly functioning collaboration.³⁷ The growth in phase 4 leveraged the high level of trust already established. The decreasing degree of centralisation scores are consistent with findings reported by Cunningham *et al*³⁴ and reflect the shift towards more organisations taking a greater role in publishing. Increasing the number of diverse collaborations and creating a more decentralised network has been shown to improve productivity and increase the potential for high-impact science.³⁸

Equity and capacity strengthening are promoted as core elements of research networks.^{12 39} The research network, particularly when operating as an innovation platform, made some progress in addressing concerns about the imbalances between Indigenous and non-Indigenous authors when writing about Indigenous issues. However, despite an increased number of publications with Indigenous authors, especially in phase 4, there remains a paucity of Indigenous first or senior/last authors. Further work is needed to redress the inequities these imbalances represent, a concern echoed in global health literature.⁴⁰ The latest iteration of the research network was recently

launched with funding for a new CRE in Strengthening Systems for Indigenous Health Care Equity (2020–2024 (NHMRC Grant Id #1170882)). This Centre marks the beginning of a new Indigenous leadership structure for the research network with more than half of the research investigators, including the chief investigator, identifying as Indigenous. It also aims to extend and further support the use of CQI methods in sectors with responsibility for addressing social and cultural determinants of health and to enhance community participation in CQI processes.⁴¹

Strengths and limitations of the study

A study strength was the long time frame of 18 years of publications. Although coauthorship is only one indicator of collaboration, there are several advantages to relying on it as a proxy for assessing the level of research collaboration, including its verifiability, stability over time, availability of data in the public domain and ease of measurement.¹¹

As the aim of the study was to assess growth and change in the research collaboration over time, we applied an unweighted method to the network analysis. This approach was chosen for a number of reasons. First, the interpretability would be compromised by weighting edges, in the context of the questions we wished to answer. We moved all of the information that would have otherwise been embedded into a weight to separate descriptive analyses available in [table 3](#). Second, given the temporal nature of collaborations we did not wish to make erroneous assumptions that quantity of publications is a substitute for quality. For example, it is difficult to compare a collaboration that generates only one high impact publication to a collaboration that may produce a larger number of lower impact publications. Weighting by publication numbers could therefore introduce a bias that may lead to erroneous interpretation of the findings.

Limitations of this study include: (1) many collaborative efforts are not reflected in coauthorship metrics. We are undertaking other studies to address this as part of the overall evaluation of the CRE-IQI. Other measures of collaborative ties include having coinvestigators on submitted or funded grants, on conference presentations and as authors of grey literature, all of which may be useful to broaden the definition of collaboration in our innovation platform. However, we assumed that, in most cases, coauthorship indicates an active cooperation between partners beyond the simple exchange of material or information. (2) This analysis does not capture the collaborations that continue to occur through coauthorship or other means that are not necessarily related to the research network. For example, a collaboration formed by coauthoring on a CRE-IQI manuscript might lead to collaboration on other projects and research not reflected in this analysis. (3) Because there is a substantial lead time for an academic publication, a writing collaboration that might have commenced in an earlier phase of work may not have been published until a later phase. Thus, publication in one phase can arise from substantial

work in a previous phase. (4) Although multiple authorship affiliations are increasingly recognised as facilitating knowledge exchange and becoming more widespread,⁴² our analysis does not include the multiple affiliations of many of the authors and so may under-report the level of collaboration. Similarly, only representing the university affiliation, and not the actual department in which an author works, obscures collaboration between departments in the same university. (5) Three of the 11 authors on this manuscript (RSB, JB and VM) had published more than 20 manuscripts included in this analysis, and RSB was the chief investigator on the research network during this period. Given this, and to mitigate against bias, BAP who has not published as part of this network undertook the network analysis and there was a blind review process for categorising the manuscripts, with discrepancies discussed.

To the best of our knowledge, this study is the first to describe a CQI research network using coauthorship network analysis. While the generalisability of the findings may be limited to similar networks, the methodological approach could readily be transferred. In this study we did not set out to demonstrate a link between an expansion of the collaboration and engagement with impact or improvement in the quality of care. However, it is widely recognised in the literature, that increasing collaboration and engagement across health services, researchers and policy-makers is a critically important element along the causal change pathway to improving the quality of care and achieving impact. Methods such as coauthorship analysis are useful for demonstrating a pathway to research impact related to engagement, which traditionally tends to rely on the quantity of outputs rather than on the strengthening of networks and the scope of work undertaken.

CONCLUSION

Over the 18-year time frame, collaboration in publications increased with network consolidation and expansion. Publication outputs accelerated in the final phase, coinciding with a broader thematic focus and an increase in the number and diversity of participating organisations. This expansion occurred largely due to the cumulative effect of building trust and relationships over time, including the development of a comprehensive dataset for use by all stakeholders. The findings highlight the benefits of long-term relationship building among diverse partners to support participatory research in quality improvement. Increased productivity was associated with increased authorship diversity and a decentralised network, suggesting these may be important factors in enhancing research impact and advancing the knowledge and practice of CQI in PHC. Despite improvements, further work is needed to address inequities in female authorship and Indigenous authorship. The coauthorship analysis has been useful for demonstrating research impacts related



to collaboration, which are not well captured by metrics such as quantity of outputs.

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Contributors Study conceptualisation: JB, BAP, RSB, DP Data curation: JB, BAP, RSB Formal analysis: BAP, JB Data interpretation: JB, BAP, AFL, SA, RSB, FCC, VM, RGB, KPC, MEP, DP Funding acquisition for study: RSB, JB Methodology: JB, BAP, FCC, RSB, DP Project administration: JB Supervision: DP, FCC Data visualisation: JB, BAP Writing - original draft: JB, BAP Writing, critical intellectual input & review: JB, BAP, AFL, SA, RSB, VM, RGB, KPC, MEP, DP

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Author note RSB was the chief investigator of the research network from 2002 to 2019. RSB, JB, VM, AFL, FCC, RB and AFL had published five or more publications as part of this research network. RGB and VM are both Indigenous researchers: RB is from the Gungarri/Kunja nations in South-Western Queensland and VM from the Quandamooka community on North Stradbroke Island, Queensland. JB, BAP, RSB, DP, AFL, SA, KPC, MEP and FCC are non-Indigenous researchers. All authors have a long-standing commitment to improving health outcomes for Aboriginal and Torres Strait Islander people.

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Chapter 6: Utility of the AHRQ Learning Collaboratives Taxonomy for Analysing Innovations from an Australian Collaborative

6.1 Preface

This chapter presents a framework analysis of the innovation platform using a taxonomy to characterise attributes according to four primary elements—innovation, communication, time and social systems. The analysis contributes knowledge to understanding how and why the innovation platform generated innovations, and what these innovations were.

This chapter was written as a journal article, of which I am the principal author, and is presented here in its entirety. The article was published in *The Joint Commission Journal on Quality and Patient Safety* and is available on the journal's website at <https://www.sciencedirect.com/science/article/pii/S1553725021002099>.

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6.2 Author Contributions and Attribution Statement

Ms Jodie Bailie and Dr Seye Abimbola conceived and designed the study with guidance from Professor David Peiris. Jodie undertook the collation and analysis of data. Dr Alison Laycock completed the interviews with Jodie. The initial manuscript was drafted by Jodie with support from Seye and David. All authors provided feedback on drafts of the manuscript and read and approved the final manuscript.

As supervisor for the candidature upon which this thesis is based, I can confirm that the authorship statement attribution is correct.

Professor David Peiris

31.01.22

6.3 Published Article

Utility of the AHRQ Learning Collaboratives Taxonomy for Analyzing Innovations from an Australian Collaborative

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Background: Despite the proliferation of learning collaborations such as innovation platforms, the factors contributing to their success or failure are rarely documented. The Agency for Healthcare Research and Quality learning collaboratives taxonomy provides a framework for understanding how such collaborations work in different settings according to four primary elements: *innovation, communication, time, and social systems*. This study applied the taxonomy to assess an innovation platform and the utility of applying the taxonomy.

Methods: The study focus was a five-year national research collaboration operating as an innovation platform to strengthen primary health care quality improvement efforts for Indigenous Australians. The study team analyzed project records, reports and publications, and interviews that were conducted with 35 stakeholders. Data were mapped retrospectively against the taxonomy domains and thematically analyzed.

Results: The taxonomy proved useful in understanding how and why the innovation platform generated innovations. It revealed that time was particularly important, both to see innovations through and to establish a social system that enabled interconnectivity between members. However, the taxonomy did not provide useful guidance on identifying the types of innovations from the collaboration or the importance of a culture of continuous adaptation and learning. The study also found that the primary and secondary elements of the taxonomy were not discrete, which meant that it was difficult to align themes with only one element.

Conclusion: To improve the utility of the taxonomy, several elaborations are proposed, including reconfiguring it to a more dynamic form that recognizes the interconnections and links between the elements.

There are recurrent calls to center the role of learning in efforts to strengthen health systems.^{1–4} This is because learning is a social process that results from and supports the exchange of ideas and knowledge production and facilitates implementation and diffusion of innovation.^{5–8}

Learning collaboratives—an umbrella term for communities of practice, learning networks, learning communities, and quality improvement collaboratives^{5,9}—are mechanisms to hasten diffusion and innovation. They do this by bringing together multiple members to develop joint solutions for a common goal and collectively create knowledge.⁸ Although learning collaboratives have different purposes and structures, at their center is the collective production of knowledge through the social activity of learning.^{5,9,10}

Despite the proliferation of and investment in learning collaboratives, the factors contributing to their success or failure are rarely studied.^{5,9,11,12} With calls for more studies identifying their context, composition, and impact, the

literature is expected to grow.⁵ Given this, Nix et al. recommend the use of a taxonomy that can be applied to support the development, evaluation, and study of learning collaboratives.⁵

THE AHRQ LEARNING COLLABORATIVES TAXONOMY

Based on a synthesis of literature and analysis of data related to implementation of about 15 learning collaboratives through the Agency for Healthcare Research and Quality (AHRQ), Nix et al. created a learning collaboratives taxonomy.⁵ The taxonomy describes the attributes of learning collaboratives in a coherent manner to facilitate the description and understanding of these efforts. In an iterative process, they layered existing theoretical perspectives on diffusion of innovation¹³ and collaborations,¹⁴ with key elements identified from AHRQ-sponsored learning collaboratives.⁵ Further, through a consensus-based process of layering, they integrated additional attributes (which had not been previously identified in the theoretical models) to develop a set of primary, secondary, and tertiary taxonomy elements.

The taxonomy consists of four primary elements (*innovation, communication, time, and social systems*), 19 sec-

ondary elements (see Figure 1), and 78 tertiary elements.⁵ *Innovation* recognizes the importance of the type of change sought, degree of prescription, breadth of focus, and available supporting tools. *Communication* acknowledges the importance of how, when, and where members and convenors of collaborations, along with invited experts, communicate and share their messages, knowledge, resources, and insights. *Time* recognizes the length of time needed to make decisions on change, adopt new practices, and ensure the sustainability of the innovation. *Social systems* acknowledges the social aspects of learning and how it is fostered by leadership and governance, membership characteristics, and shared vision, and that outcomes—in this case, knowledge—are created and formed through interconnectivity between members.

INNOVATION PLATFORMS: A TYPE OF LEARNING COLLABORATIVE

Innovation platforms (IPs) are a type of learning collaborative to which the taxonomy could be applied, as one of their key objectives is to innovate by bringing people together to learn, share ideas, and problem solve collaboratively.^{15,16} IPs differ from other types of collaborations in that they incorporate a wider network of members operating at multiple levels of a system (for example, a health system) and in different roles within it, they embrace the concept of boundary spanning by bringing in members from other sectors, and they have continuous reflection, learning, and adaptation as central design elements.¹⁵

The recent introduction of IPs into the health field has created a need for rigorous evaluation,¹⁵ with Nix et al.⁵ suggesting that external application and validation of the taxonomy would strengthen its utility. In this article, we use the taxonomy to identify key attributes of an IP in Aboriginal and Torres Strait Islander primary health care (PHC)—the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI)—and address the following questions: (1) What were the attributes of the IP that enabled or constrained implementation? and (2) How effectively did the taxonomy encompass the key attributes of the IP?

METHODS

Setting: An Innovation Platform—The CRE-IQI

The CRE-IQI operated in Australia as an IP from 2014 to 2019.^{15,17,18} Its vision was to improve health outcomes for Aboriginal and Torres Strait Islander Australians (hereafter respectfully referred to as *Indigenous Australians*, acknowledging their cultural and historical diversity) by strengthening PHC systems through continuous quality improvement (CQI). Building on more than two decades of participatory CQI research and development with Indigenous communities, the IP purposefully brought together PHC centers, research institutions, government health departments, and

key regional support organizations (such as health councils) to work on ways of strengthening systemwide CQI. As with other IPs, the CRE-IQI was characterised by a focus on innovation, collective problem solving and learning, the exchange of ideas, continuous reflection and adaptation, and the sharing of expertise to generate knowledge and change.¹⁵

As the name indicates, IPs have innovation at their core. But what actually constituted an innovation for the CRE-IQI? Innovation is “an idea, practice, or object that is perceived as new by an individual or other unit of adoption,” noting that this newness “may be expressed in terms of knowledge, persuasion or a decision to adopt.”^{13(p.12)} Nix et al. noted that innovation is underpinned by the “nondirected, organic sharing of ideas and practices that, in the end, might or might not be objects of diffusion.”^{5(pg.207)}

The IP was implemented as an open collaboration that new members were welcome to join. Research priorities were collaboratively developed and refined to address the needs of members, which enabled PHC practitioners and policy makers to articulate their knowledge gaps and work with researchers on relevant research topics. New collaborations were encouraged through information sharing and open seed-funding calls for the development of projects. Members participated in biannual face-to-face meetings to progress project development and research translation; hear about project methodologies, findings, and outcomes; and share ideas and build relationships. They also attended master classes to increase their skills and knowledge. Three crosscutting programs aimed to build collaboration, strengthen research capacity, and translate research outcomes into policy and practice.^{15,17} Further details about the aims and functions of the IP are published elsewhere.^{15,17,19,20}

Study Design

The taxonomy was applied retrospectively, using primary (interviews of IP members) and secondary (IP publications and reports to date) data. Design and reporting of our study were guided by the consolidated criteria for reporting qualitative research guidelines²¹ (Appendix 1, available in online article).

Participants

Purposive sampling techniques ensured a diversity of relevant views from IP members,²² with wide representation from Indigenous stakeholders. Interviewees needed to meet one or more of the following criteria:

1. Be an investigator or a member of the management committee
2. Hold a past or currently funded IP position
3. Be a chief investigator of aligned research
4. Be a student or early career researcher aligned with the IP

Primary elements	Secondary elements	Description of secondary element
Innovation	Type of change	Innovation can take many forms, e.g., producing new evidence through research, implementation and evaluation, improving quality, safety and efficiency at a lower cost, and developing and honing expertise.
	Degree of prescription	The level of prescribed activity within the collaborative is set either by the organising body and/or chief investigator, determined and agreed to by its members or a combination of both.
	Scope	A collaborative can decide upon a narrow scope, such as adopting a particular innovation or focusing on a specific location, or more general aims such as quality improvement and knowledge acquisition.
	Supporting tools	These resources, products and technology – e.g., manuals, apps, software, audiovisuals, toolkits – support the implementation, adoption and knowledge of the innovation/s.
Communication	Mode or venue	Meeting in person and/or virtually to progress the collaborative’s agenda can be achieved via teleconferences, webinars, bi-annual face-to-face meetings, coaching and mentoring phone calls, emails and having access to a dedicated website.
	Directionality	Communication can also be supported on different levels, e.g., among peers and/or between experts and peers.
	Frequency	The frequency of meetings can be varied depending on the needs of members and the collaborative’s agenda.
	Degree of formality	Not all communication has to be structured and organised by the collaborative; there needs to be scope for informal meetings.
Time	Duration of learning collaborative	The lifespan of a collaborative is dependent on factors such as the amount of work that needs to be achieved within a certain timeframe and external funding cycles.
	Duration of member recruitment	Recruiting members into the collaborative involves deliberation both by existing members and by potential recruits who will need to assess the benefits of joining and/or discuss their participation with their employer.
	Rate of attainment or adoption	Potential members who are inclined to take risks, are ready for change and engage easily with the work of the collaborative readily make the decision to join, according to Rogers (2003), as they have the required ‘innovativeness of the adopter’.
	Sustainability of learning collaborative	Collaboratives must consider whether they need to become sustainable after their initial period of funding, as this will determine the ways in which they operate both in the short and long term.

Figure 1: Shown here are the elements in a taxonomy to support the development, evaluation, and study of collaborations with learning as central to their work, based on Nix et al. Learning collaboratives: insights and a new taxonomy from AHRQ’s two decades of experience. *Health Aff (Millwood)*. 2018;37:205–212.

Social systems	
Degree of credibility of host or convenor and leadership	The credibility and integrity of all parties in the collaborative – the organising body, chief investigator, researchers and other members – affects its ability to recruit and retain its membership.
Membership characteristics	A collaborative's work is shaped by its size, its openness to new members and its homogeneity or otherwise, e.g. are its members from multidisciplinary backgrounds and varied geographical locations.
Governance	Good governance is needed to ensure accountability and optimum engagement. This can be done more formally – with a Steering Committee, Advisory Board or Governance Council and Memoranda of Understanding – or less formally by members agreeing to policies and rules decided on collectively by the collaborative.
Purpose and degree of shared vision	All collaboratives must agree on their shared vision and purpose, either through explicit, documented means or more organic, evolutionary processes.
Culture of learning collaborative	All members should have a commitment to a shared culture of collaboration, responsibility and accountability. This includes a degree of trust, understanding, respect, flexibility, compromise, adaptability, inclusivity and a vested interest in developing the collaborative's resources, processes and outcomes.
Members activity level	Members' participation in the collaborative can be active (task oriented) or passive (observational), mandatory (as a representative of their employing agency) or voluntary, but the degree to which they are involved will affect how the collaborative operates and performs.
Roles, process and structure	Defining roles, processes and structures will assist with setting and achieving a collaborative's goals. Senior leadership roles include being an expert, a champion and a strategist, all of which facilitate members' engagement. Other roles are associated with research and writing, information technology, project management, communications, finance and administration. Defined processes and structures assist leaders in managing the collaborative and in evaluating its success.

Figure 1: Continued

5. Be a member of the Indigenous or Research Advisory Committee

Two of the study authors [J.B., A.L.] conducted interviews in the final year of the IP (April to May 2019) via videoconferencing or telephone. Interviews averaged 39 minutes (range: 21–75 minutes) and were audio recorded and professionally transcribed.

Data Collection

Primary Data Set: Interviews. An interview guide, published by Bailie et al.,¹⁹ used open-ended questions to elicit informants' perceptions on the constraints and en-

ablers related to the formation, functioning, and outcomes of the CRE-IQI as an IP. Interview prompts were informed by literature on collaborations,¹⁴ IPs,²³ the AHRQ taxonomy,⁵ and principles-focused evaluation.²⁴

Secondary Data: Innovation Platform Publications and Reports. Secondary data sources were produced for different audiences and included publications and reports from the IP as a whole (Table 1^{15,17,18,20,25–29}), but not from individual projects affiliated with it, as those projects were not about the IP itself.

Table 1. Summary of Publications and Reports from the Innovation Platform Used in the Analysis

Lead Author and Title	Empirical Focus and Data Used
Baillie et al. ¹⁵ <i>Comparing and contrasting 'innovation platforms' with other forms of professional networks for strengthening primary health care systems for Indigenous Australians</i>	Describes the application of the concept of an IP and outlines our plans for evaluation.
McPhail-Bell et al. ²⁵ <i>An "all teach, all learn" approach to research capacity strengthening in Indigenous primary health care continuous quality improvement</i>	Presents the development of the IP "all teach, all learn" research capacity strengthening approach, which embodies the value placed on mutual learning (drawing on tacit and formal knowledge) between Indigenous and non-Indigenous researchers, research users, and communities to ensure sustained benefit from CQI research.
Baillie et al. ¹⁸ <i>Year 4 Review Progress Report 2018: Strengthening the Health System Through Integrated Quality Improvement and Partnership</i>	Summarizes the first four years of the IP, its progress to date, key research messages, whether it is meeting its research aims, and priorities and recommendations for the remaining term.
Baillie et al. ²⁶ <i>Submission to 'Closing the Gap Refresh' (on behalf of the Centre for Research Excellence in Integrated Quality Improvement)</i>	This submission to the Australian Government Taskforce to progress the Closing the Gap agenda synthesizes research from the IP.
Cunningham and Potts ²⁷ <i>Network Evaluation of the CRE in Integrated Quality Improvement as an Innovation Platform—Report on Survey 1</i>	A survey of 49 IP members and the use of network methods to evaluate the effectiveness of the IP at midterm (2017).
Cunningham and Potts ²⁸ <i>Network Evaluation of the CRE in Integrated Quality Improvement as an Innovation Platform—Report on Survey 2 and Comparative Findings Across Network Evaluation</i>	A survey of 47 IP members and use of network methods to evaluate the effectiveness of the IP in its final year (2019).
Laycock et al. ¹⁷ <i>Improving the Quality of Primary Health Care for Aboriginal and Torres Strait Islander Australians; Centre for Research Excellence in Integrated Quality Improvement 2015–2019: Messages for Action, Impact and Research</i>	The final report of the IP research findings and activities, with messages for action to improve PHC delivery and a document review.
Baillie et al. ²⁹ <i>Collaboration and knowledge generation in an 18-year quality improvement research program in Australian Indigenous primary healthcare: a co-authorship network analysis</i>	Co-authorship networks were constructed based on peer-reviewed publications, to analyze interorganizational relationships and changes over time. Descriptive characteristics included organization types, Indigenous representation, gender, student authorship, and thematic research trends.
Baillie et al. ²⁰ <i>Principles guiding ethical research in a collaboration to strengthen Indigenous primary healthcare in Australia: learning from experience</i>	This qualitative study, based on 35 interviews and document analysis, explored how a set of guiding principles were implemented and the outcomes of implementing them.

IP, innovation platform; CQI, continuous quality improvement; CRE, Centre for Research Excellence; PHC, primary health care.

Data Analysis

Verbatim interview transcripts and identified publications and reports were uploaded into NVivo³⁰ for coding, searching, and organizing data. One author [J.B.] read all data multiple times and made reflective notes.

We developed codes a priori to guide our analysis based on the primary and secondary elements in the taxonomy,⁵ as described in Figure 1. Initially, one author [J.B.] engaged in a deductive process in which broad codes were applied on the primary elements of the taxonomy and then subcoded with the secondary elements. The same author made reflexive notes throughout on any emergent themes not fitting into the predefined taxonomy. Following this, in an inductive step, the data were further reviewed, along with the author's reflexive notes to identify attributes not encompassed in the taxonomy. During this process we identified *continuous reflection and adaptation* as an additional attribute, under the primary element of *social systems*.

During the coding of data to the secondary element *type of change* under the primary element of *innovation*, it became apparent that we needed a way to classify the innovations emerging from the IP. To do this, we drew on scholarship categorizing the outputs of collective knowledge production as (1) artifacts: articles, books, databases, guidelines, and tools; (2) ideas: intangible content, creative vision, information, and knowledge; and (3) facilities: libraries, and archives.^{7,31} These outputs constitute the scholarly ecosystem of knowledge production and adequately describe the innovations emerging in the IP.

The robustness of the findings was enhanced by multiple review cycles, the application of constant comparison³² whereby each interpretation and finding was compared with existing findings as they emerged from the data analysis process, and multiple discussions between the interviewers. Finally, using descriptions of the elements of the taxonomy provided by Nix et al.,⁵ all authors checked if the

Table 2. Individual Interview Participant Characteristics by Organizational Type, Position Type, Jurisdiction, and Gender

	Interview Participants
Interviews total	35
Organization types	
Indigenous community-controlled or government-managed health center	2
Government health department	2
University/research organization	26
Indigenous community-controlled sector support organization	5
Position types*	
Nurse, physician, specialist	1
Researcher/academic	24
Middle/senior management, board member	5
Policy officer	4
Aboriginal and/or Torres Strait Islander practitioner	1
Number of interview participants who identified as Indigenous	
Indigenous	8
Non-Indigenous	27
Jurisdictions where participants were based†	
New South Wales	12
South Australia	1
Queensland	15
Western Australia	2
Northern Territory	4
Victoria	1
Gender	
Female	27
Male	8

* We reported on primary positions, but many participants held dual roles, such as clinician and researcher.

† As participants could have a national role or work across a number of jurisdictions, the jurisdictions reported here are where their primary organization was physically based.

findings were consistent with their perceptions and understanding based on their experience as IP members and as authors of the documents used for analysis.

RESULTS

Of the 52 people invited to interview via e-mail, 35 (67.3%) agreed to be interviewed. The majority of these were researchers, although many had dual roles, such as clinician and researcher. Eight interviewees identified as Indigenous, and a further 7 were employed in organizations established to support Indigenous PHC (Table 2).

Findings are presented according to the primary elements identified in the taxonomy.⁵ Notably, we identified an eighth secondary element—*continuous reflection and adaptation*—that we placed within *social systems*. Appendix 2 (available in online article) presents the findings according to primary and secondary elements. We found that these elements were not independent, with some findings relevant to more than one element, so we described them according to their predominant element and most important influence.

Innovation

For the IP, innovation was learning through the exchange of ideas and collective knowledge production.

Sidebar 1^{15,25,33–35} presents innovations that emerged—type of change and scope—in terms of artifacts, ideas, and facilities,³¹ and the supporting tools and processes.

Innovation was stimulated by bringing people together to learn, share ideas, and solve problems, with Indigenous participation and leadership at the core of our research agenda-setting.^{20,25} The initial aims and crosscutting work programs were developed as part of the original grant application process, which was undertaken in consultation with members and included wide representation from Indigenous PHC services.¹⁵ The focus of the IP varied with time, given the prevailing needs and in response to feedback from the developmental evaluation.¹⁹ However, there was a consistent focus on the application, and a purposeful scaling out³⁶ of CQI from clinical areas in PHC to areas related to social determinants of health.^{17,18}

Communication

With resources provided to establish a central coordinating center, the IP funded part-time positions in project management, support and evaluation, grant writing, research translation, and research capacity strengthening. This enabled us to assess how we communicated (internally and externally) and to make adjustments based on user feedback.

Communication occurred in person at biannual meetings and virtually through monthly newsletters, teleconferences, and research capacity strengthening webinars.²⁸ It

Sidebar 1. Types of Innovations That Emerged and Supporting Tools and Processes from the CRE-IQI as an Innovation Platform

Artifacts (articles, books, databases)

The IP was home to the production of a large number of artifacts, including the following:

- 92 peer-review publications, 81 conference presentations, 27 research and technical reports, and 26 newsletters.
- 16 master classes and 31 research capacity strengthening webinars.

Ideas (intangible content, creative vision, information, knowledge)

Advancing knowledge production to improve the health of Indigenous people was core to the work of the IP and led to the development of four key ideas:

1. Applying an IP in the context of Indigenous PHC¹⁵ by bringing together a diverse group of people to implement, reflect on, evaluate, and disseminate quality improvement research.
2. Developing and implementing an “all teach, all learn” approach²⁵ that values mutual learning among all members in the collaboration.
3. Applying quality improvement research themes to new clinical areas and in areas related to social, environmental, or behavioral determinants of health.
4. Instigating an interactive data dissemination process to identify priority gaps, barriers, enablers, and strategies to improve care.^{33,34}

These ideas were generated through (1) purposeful collaboration at biannual member meetings; (2) having 24 student (PhD, master's, and undergraduate) placements that attracted \$2,600,920 in scholarship and fellowship funding; and (3) hosting 18 research projects with investigators from 27 different organizations and \$31,998,410 in collaborative research grants.

Facilities (libraries, archives)

Establishing a Central Coordinating Center:

1. To operate the IP virtually, with members located across Australia.
2. To hold records of all outputs generated by the IP.
3. To curate and enable access to a comprehensive data set developed in an earlier phase of the collaboration on the quality of care delivered by Indigenous PHC (175 PHC centers; 56,000 patient records held from 2005 to 2014).³⁵

Supporting Tools and Processes

- Designated seed funding for projects to stimulate ideas and collaboration.
- Publications, conference presentations, newsletters, reports, and social media to disseminate research findings.
- Biannual meetings to identify and develop new projects based on feedback of need.
- Funded positions for supporting and implementing research capacity strengthening and knowledge translation, grant writing, and evaluation.

was also targeted for different purposes, with policy briefs developed to influence policy agendas, and presentations given to researchers (for example, on using social media to promote research).

Biannual meetings were consistently identified as important by members because they promoted social interaction, networking, and information sharing; fostered efficient peer-to-peer learning; and allowed for expert–peer interactions.^{18,28} To encourage engagement from new and interested members, meetings were held in various locations. This helped to build relationships while providing attendees with dedicated time out of their busy schedules to progress research ideas. The biannual meetings were also a place where ideas were contested. The long-standing relationships and the trust developed within the collaboration enabled this contestation to occur safely, which was generally viewed as a positive process that advanced ideas and thinking.²⁰

Time

Although the IP was time-bound, with external funding, it was built on a long-standing research collaboration of more than 15 years.²⁹ Related to this history, the collaboration was described as having a “bedrock of trust”^{20(p. 8)} that al-

lowed new members to build relationships from a strong foundation. The positive role that trust played in progressing the collaboration was highlighted in the interviews and network analysis.²⁸

As the boundaries of the IP were porous, with members free to come and go, challenges emerged in defining member retainment and affiliations. Given there was no official membership process other than encouraging people to participate, some interviewees noted they were initially unsure how to contribute. Due to the often-competing demands on members' time and resources, individual activity levels varied over time.

Sustainability of the collaborative was always of concern, with time and resources allocated to identify, prioritize, and develop emerging research ideas. Taking the work of the CRE-IQI forward was enabled through the successful bid for a new Indigenous-led Centre for Research Excellence in Strengthening Systems for Indigenous Health Care Equity (CRE-STRIDE), which secured National Health and Medical Research Council funding from 2020 to 2024.^{17,37}

Social Systems

A secondary element emerged within the *social systems* primary element that we have termed *continuous reflection and*

adaptation. What we observed was a strong culture and investment in a process that supported continuous learning and adaptation, such as a developmental evaluation that would facilitate and support the culture of learning, reflection, and adaptation.^{19,33} Furthermore, the “all teach, all learn”²⁵ strategy placed value on mutual learning among all members—Indigenous and non-Indigenous researchers, research users, and communities—in the collaboration.

Underpinning and guiding the collaboration was a set of collaboratively developed principles to govern practice, which were frequently highlighted as being critical to defining and setting the network’s course.²⁰ Thus, operationalizing them throughout all IP activities was seen as core to building the necessary integrity and credibility of the leadership and network as a whole.²⁵ In particular, by articulating our principles of practice we attracted members from a wide range of disciplines who shared our vision and ways of working.²⁰

At the beginning of each biannual meeting, time was set aside to establish shared knowledge and connections—or acknowledge the lack thereof—among attendees. This activity, despite taking about two hours at the start of a two-day meeting, was highly valued, both at the meetings and in the interviews, as being an important collective identity and relationship-building exercise.

Deliberate efforts were made to increase Indigenous participation at all levels,^{19,20,25,28,29} including the appointment of an additional Indigenous researcher as a chief investigator and prioritizing funding for Indigenous members to attend meetings. As a result, the social network analysis found that the IP was rated highly by respondents for its inclusion of people with different levels of professional seniority and for its active support of Indigenous participation.²⁸ As the network expanded and grew, with more Indigenous people participating over time,^{20,29} there were calls for the collaboration to increase its involvement with PHC services and Indigenous people and organizations. This was balanced by a recognition that, as research was not the core business of PHC services, they may have limited capacity to participate.

Formal governance structures were established, with several amendments over time.¹⁹ Learning and reflection processes contributed to these amendments.^{19,20} Initially, an Indigenous Advisory Committee had also been established; however, given its members’ workloads, changes in roles, and overcommitment, it was discontinued. Other mechanisms for seeking feedback and leadership from Indigenous people were sought, as well as their more purposeful engagement and involvement at all levels and stages of the collaboration.²⁰

DISCUSSION

In this study, we applied the AHRQ learning collaboratives taxonomy—which serves as a classification scheme for

collaboratives with learning at their core—to our IP, the work of which was influenced by innovation, communication, time, and its social system. In terms of time, the long-standing nature of the relationships between many collaborators enabled trusting relationships and an entry path for new members. Face-to-face biannual meetings were viewed as a critical communication mechanism and a valued forum for people to problem solve, come up with new ideas, further develop relationships, and translate research findings. The structure of the IP was collaborative and open, with researchers, health services, and policy makers all involved. There was, however, an ongoing need to focus on increasing the engagement of, and leadership by, both health services and Indigenous people.

Time was a particularly important primary element in the IP, as it also enabled us to see innovations through, to ensure communication was well tailored to the needs of the collaboration, and to establish the social system within which the IP operated. Time was also crucial to the feedback and iterative process needed to improve the workings of the IP.

Our finding about the importance of long-standing relationships in producing a more informed and cohesive group is supported by Mattessich and Johnson,¹⁴ who identify this as an influential factor in successful collaborations. Similarly, stable representation from collaborating organizations and individuals is needed to develop strong personal connections. If members turn over too rapidly or differ from meeting to meeting, strong links are more difficult to forge. Importantly, our results suggest that it is critical for collaborations and alliances to have a broad range of stakeholders at multiple levels, as they promote initial participation and engage other champions. In our study, these collaborations were based on long-standing historical relationships,²⁹ a forged collective identity,^{20,38} and attention and focus on power dynamics.^{15,25}

Policy makers should be aware that collaborations are more likely to succeed if enough time is factored in to establish good working relationships among members, and long-term dedicated funding is provided. Many of the benefits of the IP reported here are because of work that significantly preceded the IP itself—a long-standing collaboration that aimed to improve health outcomes for Indigenous people through CQI.^{2,29} This demonstrates the importance of investing in ongoing collaboration with existing strong infrastructure—particularly those that have mechanisms to continue to innovate and build new relationships.

The importance of collaborations that work cross-culturally to engage in an ongoing process of learning and improvement was also highlighted by Mattessich and Johnson.¹⁴ This was pertinent to our IP, given its cross-cultural focus, not only between Indigenous and non-Indigenous people but also in the ways in which it purposefully brought together stakeholders from different roles, organization types, and sectors.

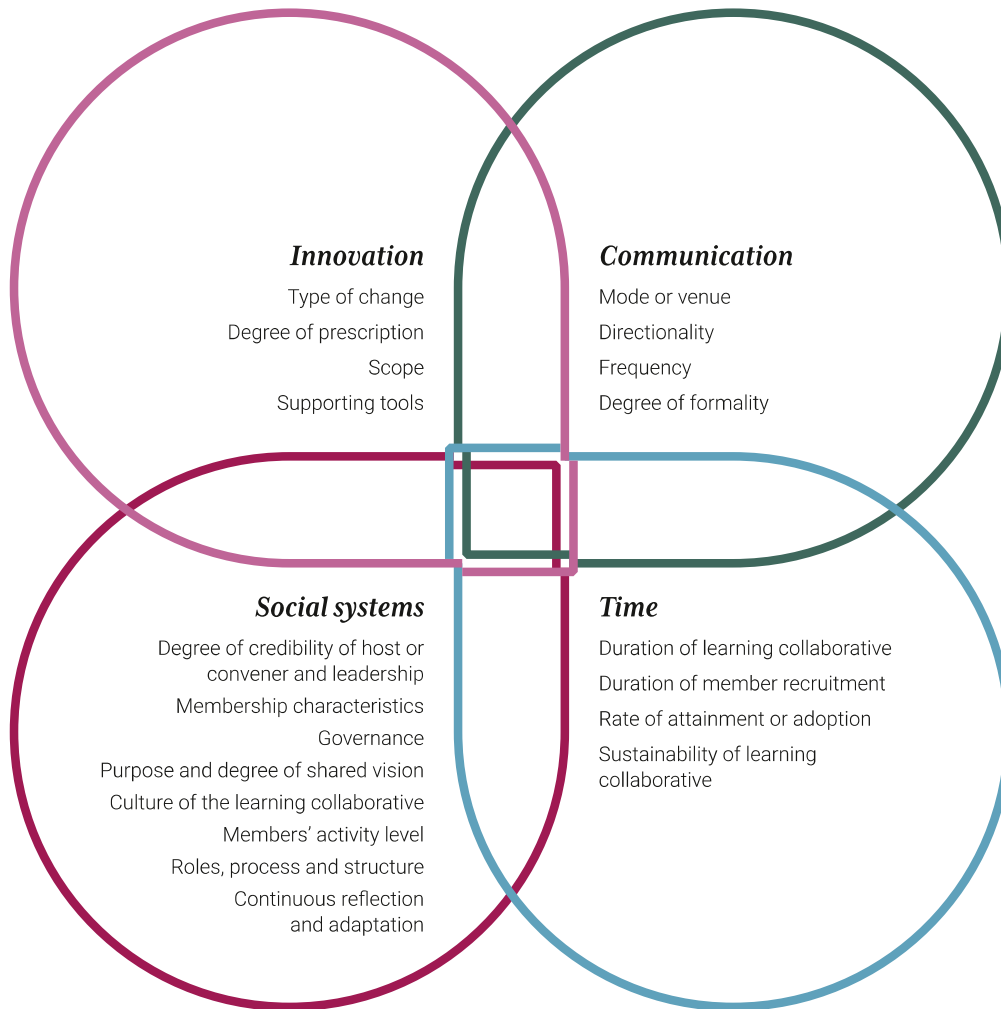


Figure 2: Shown here is the proposed, more dynamic, form of the taxonomy that recognizes the interconnections and links between elements.

How Did the Taxonomy Add Value?

First, the taxonomy proved useful for understanding how and why the IP generated innovations, but it did not provide guidance on categorizing the types of change or the innovations emerging. However, by using the concepts of artifacts, ideas, and facilities,^{7,31} we could identify the types of innovation emerging. Then, by adding these three concepts to the secondary element of *type of change* under the primary element of *innovations*, we could characterize the innovations. Interestingly, Walker et al., in their use of the taxonomy, also grappled with categorizing emerging innovations, and identified *data infrastructure* as a possible secondary element under *innovations*.³⁹ We would argue that rather than narrowing the categorization, there is value in using the broader concepts introduced by artifacts, ideas, and facilities. We also identified the importance of a shared database for enabling the collaboration.

Second, through our analysis we discovered the secondary element of *continuous reflection and adaptation* un-

der the primary element of *social systems*. Like others, we identified the value of engaging in continuous reflection and adaptive learning to ensure the effectiveness of a collaboration, particularly in a cross-cultural context.^{14,19,40,41} Dixon-Woods et al. argued that, although rare, conducting a concurrent evaluation alongside an intervention can generate a high-quality description and theoretical understanding of interventions and facilitate continuous reflection, learning, and adaptation.⁴² Thus, a key feature of the IP was undertaking a concurrent developmental evaluation.¹⁹

Third, in applying the taxonomy, we found that the primary and secondary elements were not discrete, which meant that it was difficult to align themes with only one element. For example, within the primary element of *time*, the theme of trusting relationships was acknowledged as resulting from long-standing collaboration. In turn, we linked the concept of trust with the primary element of *social systems*. Walker et al. also identified this as a challenge when they applied the taxonomy, noting that the elements were

closely intertwined and, therefore, combined in their analysis.³⁹ It was important to recognize these strong links, interrelationships, and interdependencies between the elements when analyzing and interpreting the data. The taxonomy was, however, unclear on the extent to which the elements are expected to be discrete.

Finally, we propose a reimagining of the taxonomy to a more dynamic form that recognizes the interconnections and links between elements (Figure 2). The graphic representation of the original taxonomy (in table form) appears to reflect the underlying assumption that the elements being presented were discrete. Systems and complexity thinking provide an alternative paradigm to these linear or tabular approaches by bringing attention to interactions and links between the elements. Furthermore, categorization of data into specific elements of the taxonomy without an acknowledgement of the dynamic nature of systems might be overly Western-centric.⁴³

Strengths and Limitations

Our findings must be considered within the following limitations. We had good representation of people working in Indigenous organizations, although the interviewees were primarily non-Indigenous people and researchers. Most of the authors are embedded within the collaboration, and many of the interviewees could also be viewed as having a vested interest in presenting the collaboration in a positive light. The generally positive findings may also be attributed to survivorship bias⁴⁴—in other words, the interviewees were people who had continued to work with the collaboration; people who had left the collaboration may have had a less favorable experience, and their views are not represented in the data. However, relatively few had left the collaboration,²⁹ and their views would not be expected to substantially change the overall favorable experience of the collaboration. Furthermore, the narratives of long-standing collaborators may result in recall bias and positivity bias. However, the credibility of our findings is enhanced by having two researchers undertake the interviews, the participatory nature of the research process, our familiarity with the setting and topic, the use of a multimethods approach, drawing extensively on data sources such as project documents, the diversity of interviewees, probing to identify and explore negative experiences (consistent with developmental evaluation and continuous improvement approaches), and long-term and frequent engagement with collaboration members who contributed to interviews, data analysis, and interpretation.

Although the taxonomy has been well cited,^{9,15,45} we have so far identified only one other application of it in the peer-reviewed literature.³⁹ This study shows that the taxonomy can be applied retrospectively to extend work undertaken as part of collaborations and also identifies ways it may be further refined to improve its utility.

CONCLUSION

Our study highlights the important role of time, underscored by a long history of working together, which can enable trusting relationships, forge a collective identity, and provide a foundation for new people to join. Our study also suggests that policy makers may need to change their funding time lines for learning collaborations that demonstrate emerging success and have a clear strategy as to how they will continue to innovate, consolidate relationships formed, and bring in new stakeholders. To improve the utility of the taxonomy, we propose a number of elaborations, including reconfiguring it to a more dynamic form that recognizes the interconnections and links between elements.

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SUPPLEMENTARY MATERIALS

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SECTION 3: DISCUSSION, RECOMMENDATIONS AND CONCLUDING REMARKS

This section comprises one chapter and concluding remarks. Chapter 7 forms the discussion and recommendations. The concluding remarks contain implications for policy and practice as a result of this body of work.

Chapter 7: Methodological Pluralism for Better Evaluations of Complex Interventions—Lessons from Evaluating an Innovation Platform in Australia

7.1 Preface

In this chapter, I outline the different evaluation designs used in each sub-study, the respective findings and how they link to the evaluation objectives. What is described herein emerged over time through reflection and learning. Insights and lessons from undertaking a methodologically pluralist evaluation are outlined, along with issues to consider when planning and conducting evaluations of complex interventions, such as innovation platforms.

This chapter was written as a journal article, of which I am the principal author, and is presented here in its entirety. The article was published in *Health Research Policy and Systems* and is available on the journal's website at: <https://doi.org/10.1186/s12961-022-00814-5>

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7.2 Author Contributions and Attribution Statement

Ms Jodie Bailie and Professor David Peiris conceived of the manuscript, with Jodie taking the lead on the writing of all drafts, integrating feedback upon reviews and finalising the manuscript. All authors provided feedback on drafts of the manuscript, and read and approved the final manuscript.

As supervisor for the candidature upon which this thesis is based, I can confirm that the authorship statement attribution is correct.

Professor David Peiris

31.01.22


7.3 Published Article

COMMENTARY

Open Access



Methodological pluralism for better evaluations of complex interventions: lessons from evaluating an innovation platform in Australia

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Abstract

Complex interventions, such as innovation platforms, pose challenges for evaluators. A variety of methodological approaches are often required to build a more complete and comprehensive understanding of how complex interventions work. In this paper, we outline and critically appraise a methodologically pluralist evaluation of an innovation platform to strengthen primary care for Aboriginal and Torres Strait Islander Australians. In doing so, we aim to identify lessons learned from the approach taken and add to existing literature on implementing evaluations in complex settings, such as innovation platforms. The pluralist design used four evaluation approaches—developmental evaluation, principles-focused evaluation, network analysis, and framework analysis—with differing strengths and challenges. Taken together, the multiple evaluation approaches yielded a detailed description and nuanced understanding of the formation, functioning and outcomes of the innovation platform that would be difficult to achieve with any single evaluation method. While a methodologically pluralist design may place additional pressure on logistical and analytic resources available, it enables a deeper understanding of the mechanisms that underlie complex interventions.

Keywords: Innovation platforms, Developmental evaluation, Principles-focused evaluation, Network analysis, Collaborations, Utilization-focused, Systems thinking, Complex interventions

Background

Innovation platforms are complex interventions [1–3] and, as such, present challenges for their evaluators [4–6]. They are characterized by actors from diverse disciplines and stakeholder groups collectively problem-solving, exchanging ideas from different perspectives, and sharing expertise to generate new knowledge and solutions that could not be achieved by one discipline, or stakeholder group, alone [7, 8]. Innovation platforms

differ from other types of collaborations in several ways [7–9]. Firstly, they incorporate a wider network of members operating at multiple levels of a system and in different roles within it. Secondly, they embrace the concept of “boundary spanning” by bringing in members from other sectors to assist in developing solutions to challenges [9]. And, finally, they have continuous reflection, learning and adaptation as central design elements to support innovation [3, 7]. Despite the importance of evaluating these collaborations, there are a few critical appraisals of the different approaches that can be taken in such evaluations.

To build a complete and comprehensive understanding of how complex interventions work requires various

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evaluation approaches [4, 6, 10–12]. The value of this methodological pluralism, which in its simplest form denotes diversity, is seen in its ability to provide a more holistic and textured analysis, allowing for a complete understanding of the situation, and in its potential to redress the limitations inherent in any single method [11, 13–17]. Methodological pluralism thus refers to an approach which applies more than one methodology and method, and at times, more than one epistemological stance [14]. However, using pluralist methodologies raises several challenges, including assembling an evaluation team with the skills and experience across multiple evaluation approaches and methods; acquiring the resources to implement data collection using a variety of strategies; and undertaking the analysis and synthesis of collected data using multiple and diverse approaches [18].

In this paper, we outline and critically appraise a methodologically pluralist evaluation of an innovation platform in Aboriginal and Torres Strait Islander (hereafter referred to respectfully as Indigenous Australian, acknowledging cultural and historical diversity) primary healthcare (PHC). The paper first gives the setting of the innovation platform and then describes its evaluation and the four evaluation approaches employed: developmental evaluation [3]; principles-focused evaluation [19]; network analysis [20]; and framework analysis [21]. We then identify the lessons learned from undertaking a methodologically pluralist evaluation, and issues to consider when planning and conducting evaluations of complex interventions such as innovation platforms. In doing so, we provide an opportunity for others to learn from our experience, extending the literature on evaluating complex interventions. This paper is based on the critical reflections of the authors, many of whom were part of the evaluation team.

Evaluation setting: an innovation platform

Indigenous Australians have extraordinary cultural strength, adaptability and resilience, and yet continue to experience poorer health outcomes and shorter life expectancy compared to other Australians [22]. The reasons for this are complex but are rooted in the pervasive legacy of colonization—land dispossession, displacement, disempowerment, social and economic exclusion, and ongoing racism [22, 23]—and centuries of government paternalism and neglect, which Indigenous Australians continue to challenge and work to redress.

Established in November 2014, the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI) aimed to improve Indigenous health outcomes by embedding and strengthening continuous quality improvement (CQI) in PHC [20, 24]. The CRE-IQI, funded for 5 years by Australia's National Health and Medical Research Council (NHMRC) as an innovation platform [7], fostered and built on relationships between Indigenous community-controlled health organizations, government-managed PHC centres, research institutions, government health departments and key regional support organizations (e.g. health councils) to embed system-wide CQI. Indeed, some of its stakeholders had already worked together for more than 15 years in participatory CQI research and development with Indigenous PHC [20].

Continuing the spirit of the collaboration from previous years, the innovation platform of the CRE-IQI was an “open collaboration” that encouraged and welcomed new members. Within the scope of “integrated quality improvement” [25], it collaboratively developed and refined both research priorities to address key stakeholder needs and a set of principles to govern practice [19]. The innovation platform enabled PHC practitioners and policy-makers to articulate knowledge gaps and work with researchers and health sector stakeholders on relevant research topics [7]. It also encouraged new collaborations by sharing information, open seed-funding calls to develop projects and promoting collaborative research.

By participating in biannual face-to-face meetings, stakeholders could build relationships, progress project development and research translation, and share the project methodologies, findings and outcomes of their research. Similarly, masterclasses were hosted around each of the biannual meetings with a focus on enhancing the skills and knowledge of innovation platform members on a variety of topics related to CQI. Online monthly research capacity-building seminars were also held.

Further details about how the CRE-IQI operated as an innovation platform [3, 7, 24], results from the respective evaluative approaches [7, 19–21, 26] and research findings of the CRE-IQI are published elsewhere [21, 24, 26]. In Box 1 we summarize the CRE-IQI research findings, engagement and impact [20, 21, 24].

Box 1: CRE-IQI key research findings, engagement and impact [20, 21, 24]

Key research findings from the CRE-IQI [24]

1. CQI has been widely accepted and applied in Indigenous health services and in PHC settings, with some resulting improvements in clinical care, service systems and the social determinants of health
2. Indigenous leadership and participation in PHC services and research improves the quality of care delivered
3. Clinical and non-clinical health outcomes can be improved by using evidence-based CQI tools and processes
4. Access to accurate and timely data across the scope of practice is essential for CQI in comprehensive PHC and for informing and driving health service, intersectoral and community action
5. Priorities have been identified for strengthening PHC systems to achieve large-scale health improvement for Indigenous people

Engagement and impact of the CRE-IQI

Research translation

- 90 peer-reviewed publications [20] (450+ citations and 185,000+ downloads)
- 7 policy/parliamentary submissions; 27 research and technical reports; 81 conference presentations
- 26 CRE-IQI newsletters, with an average of 70 individual opens per newsletter

Collaboration

- 72 different organizations had contributing authors on CRE-IQI peer-reviewed publications, with 263 individual authors [20]
- 47 different lead authors from 22 different organizations
- Strong connections between CRE-IQI members with 43% of CRE-IQI members collaborating with people they did not know before their involvement in the CRE-IQI [24]
- Coauthorship of publications shows an increasing core-periphery structure of the CRE-IQI, as opposed to a single dominant organization (this points to a more collaborative network) [20]
- 10 biannual meetings to bring together collaborators in 4 different locations across Australia, with 120 individuals attending at least one biannual meeting
- \$31,998,410 leveraged in collaborative research grants

Research capacity-strengthening

- 24 students affiliated (PhD, masters, undergraduate placements)
- 31 research capacity-strengthening seminars held
- 28% of peer-reviewed publications had a student/programme officer as lead author, and 58% of publications had at least one student/project officer as an author [20]
- 16 masterclasses enabled researchers and service providers to access professional development on topics identified by CRE-IQI members, with 166 individuals attending at least one masterclass
- \$2,600,920 leveraged in scholarship and fellowship funding

Indigenous leadership and participation

- 62% of peer-reviewed publications had at least one Indigenous author [20]; 67% of presentations had at least one Indigenous author [24]
- 46% of individual attendees at biannual meetings were Indigenous and/or representing an Indigenous organization
- Participation by Indigenous people and organizations increased from 27% in the first biannual meeting to 44% in the final 2019 meeting
- Established co-leadership arrangements between Indigenous and non-Indigenous researchers
- 39% of individual attendees at masterclasses were Indigenous and/or representing an Indigenous organization

Evaluation model

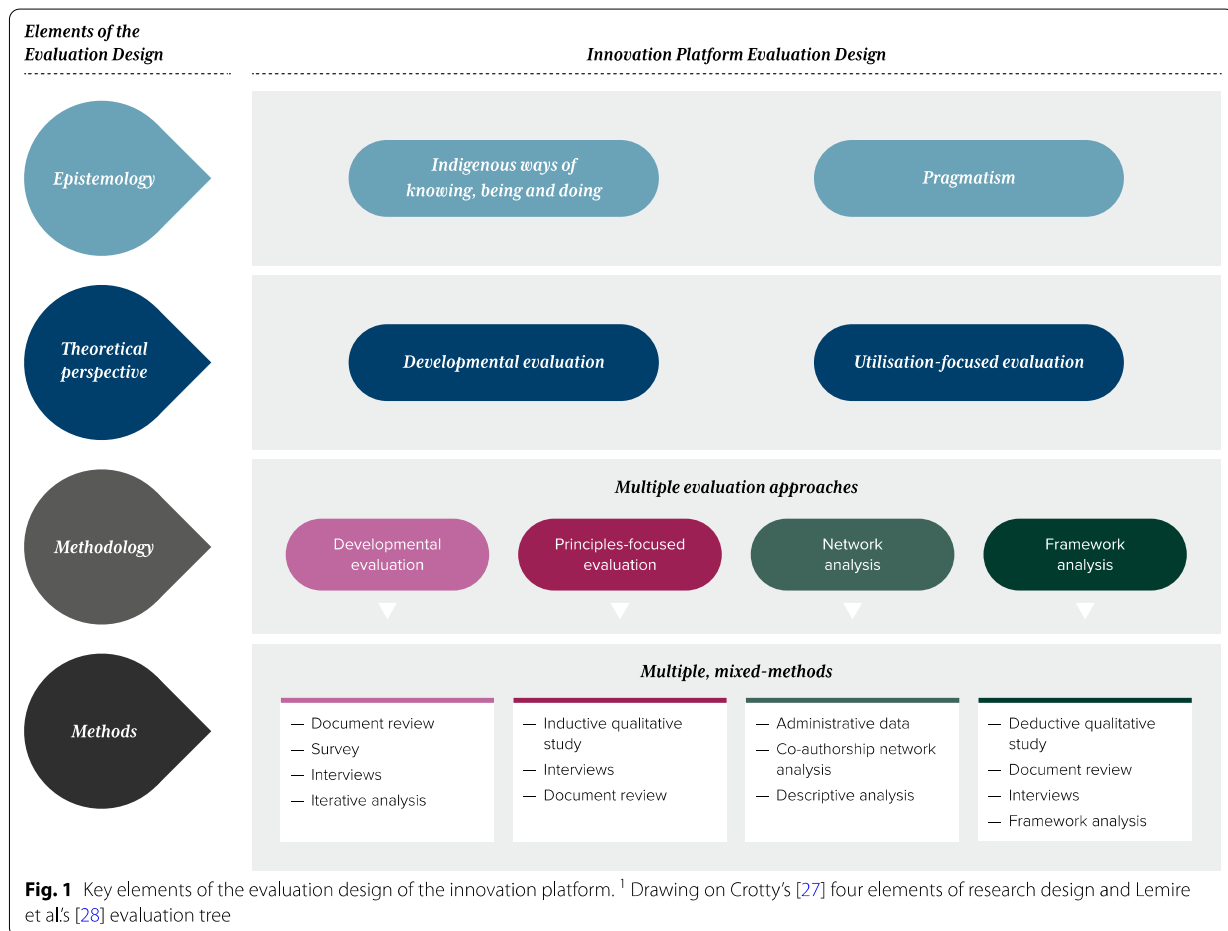
One of the primary aims of the CRE-IQI was to monitor and evaluate the CRE-IQI as an innovation platform. The overall evaluation goal was to study the formation, functioning and outcomes of the CRE-IQI as an innovation platform. The evaluation had the following objectives:

1. To refine the formation, functioning and outcomes of the innovation platform by supporting continuous reflection, rapid learning and adaptation.
2. To identify the mechanisms and contextual factors that enable innovation platforms to have a positive impact on Indigenous PHC systems.
3. To assess the development of, and change in, innovation platform collaborators over time.
4. To generate new knowledge on, and approaches to, evaluating innovation platforms.

The effective conduct of the evaluation was one of the primary responsibilities of the CRE-IQI research fellow (evaluation) (JB) (herein referred to as “evaluation fellow”). This position had dual responsibilities related to coordination and implementation of the evaluation, and CRE-IQI project management. An evaluation working group provided oversight and guidance for the evaluation. The group chaired by an Indigenous researcher/evaluator comprised researchers with specific evaluation skills and responsibilities within the CRE-IQI. Initially, the evaluation working group was virtual, but as the work progressed it was agreed that more regular focused meetings were needed to bring together the evaluation strands, streamline the data collection, implement a group analysis of emerging data, and provide evaluation project management oversight. From mid-2017, fortnightly teleconferences were facilitated by the evaluation fellow and six-monthly face-to-face evaluation specific meetings held.

In designing the key evaluation components of the innovation platform, the evaluation working group drew on Crotty’s [27] four elements of research design and Lemire and colleagues’ [28] “evaluation tree”, modified from Christie and Alkin’s [29] “evaluation theory tree”. These components are outlined in Fig. 1 and further discussed in relevant sections of this paper.

The *epistemology* layer is concerned with what informs our perspectives [27]. As shown in Fig. 1, the evaluation of the innovation platform had an Indigenous perspective, which valued and centred Indigenous knowledge systems [30, 31] by taking a strengths-based approach and adopting an emergent interactive design. The evaluation was guided by a set of co-created principles, for example, respecting the past and present experiences of Indigenous peoples, working in partnership, and ensuring Indigenous leadership and direction of research in all stages of the process [19]. The evaluation also took a pragmatic philosophical approach [13, 32] based on the proposition that researchers should use the philosophical and/or methodological approach that works best for the particular research question and research context [33–35]. Pragmatism embraces the use of a plurality



of methods in which the focus is on the situation and opportunities that emerge, rather than on adherence to a fixed design [17, 18, 36]. Moreover, it encourages evaluation questions to search for useful and actionable answers [36]. Grounded in Indigenous ways of knowing, being and doing and coupled with a pragmatic philosophical approach, we adopted a constructivist perspective, which assumes that neither data nor theories are discovered but rather are constructed based on the shared experiences of researchers and respondents [30, 31].

The *theoretical perspective* layer relates to how the evaluation will be used, by whom and for what purpose [28]. Following the pragmatic epistemology, our theoretical perspective was driven by the evaluation use and purpose, which we conceptualized as both “developmental” and “utilization-focused” (see Fig. 1) [32, 37, 38]. Developmental purpose aligned with the need for innovation platforms to have a mechanism for continuous reflection, learning and adaptation to support innovation [3]. To this end, we collected and interpreted data, developed and implemented change strategies, evaluated how well

they worked, and repeated the cycle with different sets of data and feedback, thereby informing and supporting the innovation platform’s formation, functioning and outcomes.

A focus on utilization was paramount, not least because many of our end-users were participants in the innovation platform. As evaluators, we facilitated a learning and decision-making process that focused on how the evaluation’s findings and experiences would be used to encourage its ownership by users and create momentum for them to implement the findings [32, 38].

The *methodology* layer in Fig. 1 details the methodologically pluralist design, which included the following evaluation approaches: developmental evaluation [3], principles-focused evaluation [19], network analysis [20] and framework analysis [21]. The *methods* layer describes the specific methods employed for each evaluation approach.

Given the integrated nature of methods and use in evaluation practice [28], it is inevitable that there is congruency and flow between the *theoretical perspective* and

methodology layer. For example, developmental evaluation is placed on more than one layer because of the primacy of the approach in the use of the evaluation, that is, to inform the ongoing formation, functioning and outcomes of the innovation platform, and as an important methodological approach.

Utilization-focused nor developmental evaluation advocate for a standardized methodology or a priori evaluation objectives [38]. Rather, situational responsiveness guides an emergent process between the intended users of the evaluation and the evaluator to select the most appropriate approach for their needs and to adapt it reflexively as circumstances and evaluation objectives evolve [32]. Given the focus on “learning and adaptation” in this approach, it was neither possible nor appropriate to detail a priori evaluation methods, objectives or outcomes [32]. This is in contrast to other evaluation approaches which aim to answer a priori research questions or which focus on refining programme theory within predefined configurations (e.g. realist evaluation).

In addition to the four evaluation approaches outlined in Fig. 1 and Table 1, we conducted an impact and economic evaluation. As the impact and economic evaluation was of specific research projects associated with the innovation platform, they are reported in separate publications [39, 40]. Figure 2 depicts the evaluation of the CRE-IQI over time and the linkages between the evaluations. This figure is further discussed in relevant sections of this paper.

Table 1 briefly outlines the rationale for the evaluation approaches, their implementation, respective key findings and how they link with the objectives of the evaluation. What is described in Table 1 emerged over time because of reflection and learning. For each evaluative approach there is a publication that has more detailed background, rationale, methods and findings [3, 19–21].

Evaluation approach 1: Developmental evaluation to inform the continuous reflection and adaptation of the innovation platform

The developmental evaluation, reported in full elsewhere [3, 26], had several strengths. Firstly, the methodology embraced situations with a developmental purpose, innovation niche and a focus on complexity, which is highly apposite for innovation platforms. Secondly, the collaborative data analysis approach provided immediate, useable feedback to engage innovation platform members in co-creating responses to findings. For example, feedback was received through biannual meetings and other mechanisms about the need to strengthen engagement with policy-making processes. In response, training was provided on engaging with policy-makers, and resources were directed into writing targeted policy and

parliamentary submissions that drew on the research of the innovation platform. Thirdly, we observed that evaluating the innovation platform developmentally allowed for the acquisition of new knowledge and skills through multiple interactions between stakeholders.

The developmental evaluation encouraged and allowed the generation of evidence in rapid time through a flexible, situationally tailored evaluation design. It provided the space to identify new evaluation questions and, therefore, new evaluation approaches to emerge, for example, the principles-focused evaluation and coauthorship network analysis. Importantly, it was congruent with the CQI focus of the innovation platform itself, such as collecting and interpreting data, developing, implementing and evaluating change strategies and then repeating the cycle. Thus, innovation platform members were already familiar with this way of thinking, and this likely increased their receptivity to this style of feedback and action planning.

Evaluation approach 2: Principles-focused evaluation to explore how the innovation platform functioned

Principles-focused evaluation is a relatively new and emerging direction in evaluation, in which principles are the evaluand [41]. Operation of the innovation platform was governed by a set of collaboratively developed principles such as Indigenous leadership and direction in all stages [19]. These principles were critical to defining and setting the course for the collaboration, that is, the primary way of navigating the complexity of the collaboration. As previously mentioned, the principles-focused evaluation [19] arose in direct response to the developmental evaluation findings, in which members of the innovation platform identified a need for further exploration of how the principles were implemented in its operations and what outcomes were produced as a consequence of using the principles. There was keen interest and engagement from innovation platform members in the novel evaluative approach in which the development and application of the principles themselves are the evaluand.

We used an inductive qualitative approach that was appropriate for Indigenous settings and for tackling questions about which there was little prior research [30]. The evaluation also gave “voice” to members of the innovation platform through a series of interviews and iterative analytical processes.

Evaluation approach 3: Widening our focus by using network analysis to assess collaboration and knowledge generation

Findings from the developmental evaluation and the principles-focused evaluation pointed to the over 15-year

Table 1 Evaluation design of the innovation platform and key findings

Objectives of the evaluation	Methodology—evaluation approaches	Rationale for the chosen methodology and methods	Implementation, data collection and analysis	Brief overview of evaluation findings
<p>Objective 1: To refine the formation, functioning and outcomes of the innovation platform by supporting continuous reflection, rapid learning and adaptation</p>	<p><i>Evaluation approach 1:</i> Developmental evaluation [3]</p>	<ul style="list-style-type: none"> To inform the formation, functioning and outcomes of the collaboration, we focused on the use of data to inform ongoing decision-making, reflection and adaptation—e.g. operations of the innovation platform, work programmes and future directions Developmental evaluation embraces innovation, complexity and systems thinking. Innovation platforms are complex systems and have continuous reflection and adaptation as design elements 	<ul style="list-style-type: none"> Administrative project records provided ongoing intelligence on the innovation platform development and context, e.g. minutes from the management committee and biannual stakeholder meetings; publications, posters and conference papers; attendance lists and evaluations of biannual meetings, masterclasses and research capacity—strengthening teleconferences; research project applications; and student projects Major contributions were the CRE-IQ/Year 2 and Year 4 Reviews Interviews as part of Year 4 Review (n = 28) Further round of interviews to explore emergent themes from Year 4 Review (n = 36) Analysis and feedback, iterative and ongoing 	<ul style="list-style-type: none"> Developmental evaluation was well suited to innovation platforms, where there is a developmental purpose, innovation niche and complexity Adjustments made to the operation of the innovation platform based on the evaluative feedback included adding an Indigenous researcher to the innovation platform leadership team; targeting resources for policy and parliamentary submissions; implementing collaborative processes to identify and refine research priorities; and discussing principles of the innovation platform at the start of regular six-monthly meetings We used opportunistic and planned iterative cycles of reflection and analysis to understand how, and how well, the innovation platform was functioning and meeting its goals and how it could be adapted in rapid time to function more effectively
<p>Objective 2: To identify the mechanisms and contextual factors that enable innovation platforms to have a positive impact in Indigenous PHC systems</p>	<p><i>Evaluation approach 2:</i> Principles-focused evaluation [19]</p>	<ul style="list-style-type: none"> Emerged from feedback from innovation platform members, as part of the developmental evaluation, on the importance of the principles in guiding our work. From this, we agreed to a principles-focused evaluation to address objective 2 To examine in depth how the principles we developed to underpin the governance of the collaboration were implemented and their expected outcomes 	<p><i>Data collection</i></p> <ul style="list-style-type: none"> Purposive sampling to capture a diversity of views from interviews with innovation platform members (n = 35) by two researchers Reflective summary generated after each interview Document review of administrative project documents, results from developmental evaluation, publications, etc. <p><i>Data analysis</i></p> <ul style="list-style-type: none"> Data inductively coded and categorized into strategies, outcomes and conditions Member-checking processes included presenting early findings at innovation platform meetings; comparing, contrasting and seeking consensus of findings between co-authors; and triangulation with findings from document reviews 	<ul style="list-style-type: none"> Implementation of the principles occurred through five strategies: honouring the principles, being dynamic and adaptable; sharing and dispersing leadership; collaborating purposefully; and adopting a culture of mutual learning Outcomes included increased Indigenous leadership and participation; the ability to attract principled and values-driven researchers and stakeholders; and the development of trusting and respectful relationships The conditions that facilitated the implementation of the principles were collaborating over time; increasing the number of Indigenous researchers; and taking an “innovation platform” approach Given that the focus of innovation platforms is on empowering local actors to solve problems collaboratively, and as lessons on their use accumulate, the findings from our study suggest that there is scope to be more explicit about the principles governing them and to embed, constantly monitor and reflect on their role within innovation platforms

Table 1 (continued)

Objectives of the evaluation	Methodology—evaluation approaches	Rationale for the chosen methodology and methods	Implementation, data collection and analysis	Brief overview of evaluation findings
	<p><i>Evaluation approach 3: Framework analysis</i> [21]</p>	<ul style="list-style-type: none"> To gain an understanding of the elements that enabled the innovation platform Emerged when it became evident that the evaluation working group needed to find an appropriate way to answer critical questions about the attributes of an innovation platform 	<p><i>Data collection</i></p> <ul style="list-style-type: none"> Purposive sampling to capture a diversity of views from innovation platform members ($n = 35$) by two researchers Document review of publications and reports from the innovation platform <p><i>Data analysis</i></p> <ul style="list-style-type: none"> Framework analysis using a taxonomy as framework. [41] Data were deductively coded to the four primary elements—innovation, communication, time and social system. Though primarily a deductive qualitative approach, we remained “nimble to emerging attributes”, and this application enabled us to identify emergent attributes not encompassed within the taxonomy Findings compared and contrasted, and a consensus process from authors undertaken through multiple reviews; triangulation of findings and discussions 	<ul style="list-style-type: none"> The long history of working together enabled trusting relationships, a collective identity and a foundation for new people to join Time was identified as a crucial element Innovation was stimulated by bringing people together to learn, share ideas and solve problems, with Indigenous participation and leadership at the core of the research agenda-setting The innovation platform outputs exceeded 92 peer-reviewed publications; 81 conference presentations; 27 research and technical reports; 26 newsletters; 16 masterclasses; 31 research capacity-strengthening webinars; 24 students (PhD, masters and undergraduate) The innovation platform had 18 research projects with investigators from 27 different organizations and \$31,998,410 in collaborative research grants There was an ongoing need to focus on increasing the engagement of and leadership by Indigenous and health service stakeholders

Table 1 (continued)

Objectives of the evaluation	Methodology—evaluation approaches	Rationale for the chosen methodology and methods	Implementation, data collection and analysis	Brief overview of evaluation findings
Objective 3: To assess the development of and change in, innovation platform co-laborators over time	<i>Evaluation approach 4</i> : Network analysis [20]	<ul style="list-style-type: none"> To understand why and how the collaboration has grown and changed over time Coauthorship approach emerged from the developmental evaluation and discussions with members who wished to explore the growth and change in membership, in particular, its Indigenous representation 	<p><i>Coauthorship network analysis</i></p> <ul style="list-style-type: none"> Peer-reviewed journal articles and books published by authors from the network <p><i>Data analysis</i></p> <ul style="list-style-type: none"> Co-author networks across four phases of the network (2002–04; 2005–09; 2010–14; 2015–19) were constructed based on author affiliations Social network analysis methods Descriptive characteristics included organization types, Indigenous representation, gender, student authorship and thematic research trends <p><i>Social network analysis</i></p> <ul style="list-style-type: none"> Surveys of those defined as active members of the innovation platform at two time points (2017 and 2019) Social network analysis methods 	<p><i>Coauthorship network analysis</i></p> <ul style="list-style-type: none"> Publications accelerated when the collaboration changed to an “innovation platform”, which coincided with a broader thematic focus and an increased number and diversity of participating organizations This expansion occurred largely due to the cumulative effect of building trust and relationships over time, including the development of a comprehensive data set on CQI in Indigenous PHC for use by all stakeholders Network analyses indicated a core/periphery structure of organizations connected to each other, rather than a network structured around a single central organization Increased productivity was associated with increased authorship diversity and a decentralized network, suggesting these may be important factors in enhancing research impact and advancing the knowledge and practice of CQI in PHC Despite improvements over time, further work is needed to address inequities in both female and Indigenous authorship <p><i>Social network analysis</i> [24, 26]</p> <ul style="list-style-type: none"> There was more sharing of knowledge and collaborating between those who had prior knowledge of each other. However, 48% also reported sharing and 37% collaborating with people of whom they had no prior knowledge. This shows both a broadening of relationships and a sharing of knowledge not only with existing partners but also new ones In addition, 36% of sharing occurred outside immediate collaborative partnerships, indicating good network support Further reporting is expected on how well the innovation platform worked as a collaborative network over time
Objective 4: To generate new knowledge on and approaches to evaluating innovation platforms	The application of the multiple evaluation approaches listed above speak to this objective	As listed above	As presented in this manuscript	As presented in this manuscript

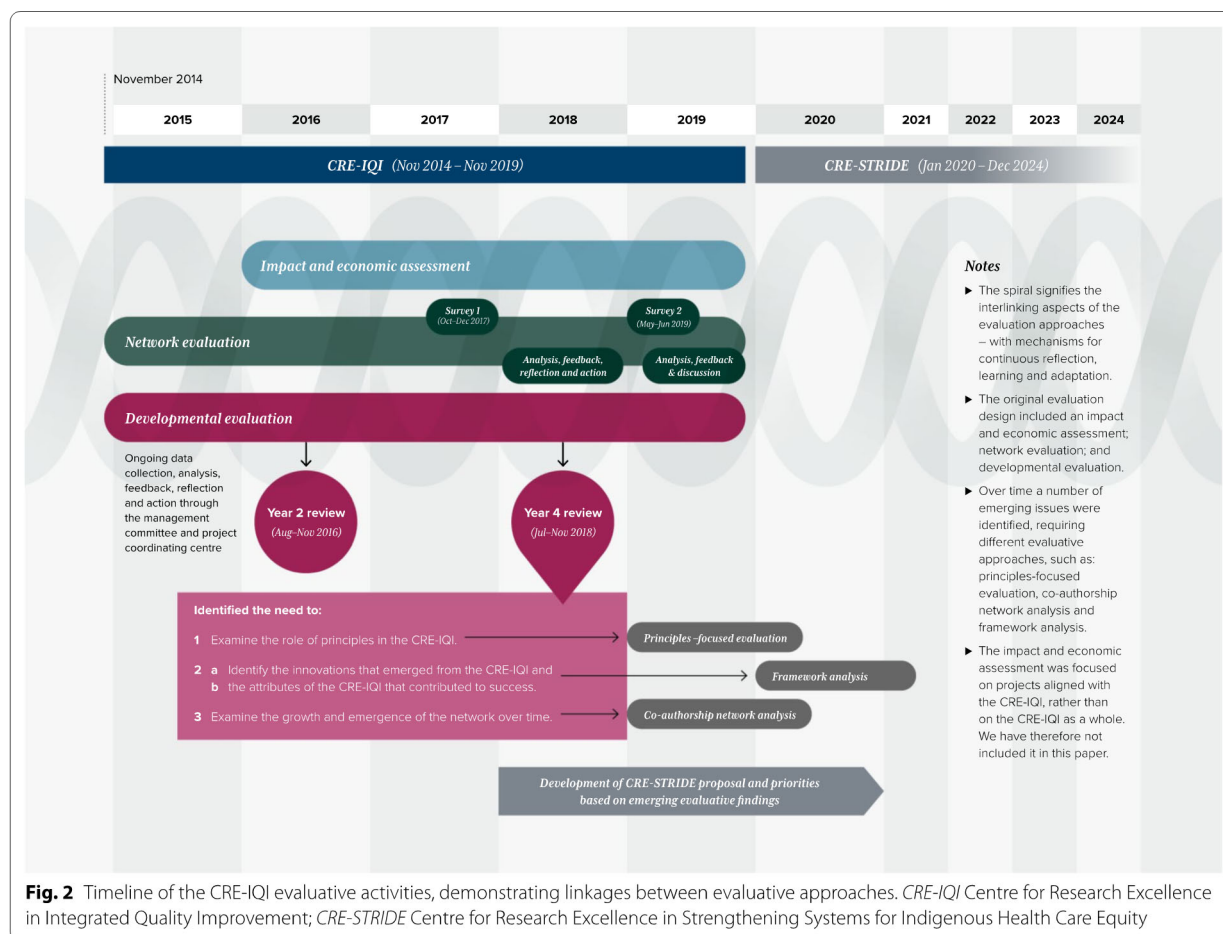


Fig. 2 Timeline of the CRE-IQI evaluative activities, demonstrating linkages between evaluative approaches. *CRE-IQI* Centre for Research Excellence in Integrated Quality Improvement; *CRE-STRIDE* Centre for Research Excellence in Strengthening Systems for Indigenous Health Care Equity

history of the collaboration (commencing in 2002) on which the innovation platform was built, and the primacy of this positive history of working together in enabling its effectiveness [20]. Unexpectedly, we needed to look wider than the planned social network analysis, at the big picture, or “zoom out” to examine the growth and emergence of the innovation platform; specifically, how the CRE-IQI was addressing its vision of strengthening capacity, equity and membership diversity. Network analysis [20], with its good visualization tools, offered us a feasible strategy for widening our evaluation focus which would allow us to capture deep collaboration through multiple authorship. As publications are available in publicly accessible databases and previously collated for other reporting purposes, there was minimal burden on other evaluative activities of collaboration members. We recognize, however, that coauthorship is only one indicator of collaboration, and it may not reflect our many other collaborative outputs, such as grant submissions and conference presentations.

Evaluation approach 4: Framework analysis to understand how and why the innovation platform functions

The framework analysis emerged from discussions within the evaluation working group and among innovation platform members, on the need to gather perspectives on how the innovation platform functions and to identify the drivers of its success. In this approach, we mapped primary data (interviews with innovation platform members) and secondary data (publications and reports related to the innovation platform as a whole) to a taxonomy that characterized the attributes (innovation, communication, time, social systems) of the innovation platform [21, 42]. In doing so, we produced a new theorization that could shed further light on and extend lessons from both our research and completed evaluations. The approach was primarily a deductive qualitative approach, though we remained “nimble to emerging attributes”; and this application enabled us to identify emergent attributes not encompassed within the taxonomy.

Insights and lessons learned from our evaluation approach

Using different approaches enabled a complex systems perspective, generating a more detailed and textured evaluation

From the outset, it was clear that no single approach would achieve all the evaluation objectives. Having multiple evaluation approaches and methods supported a complex systems perspective and is congruent with calls by Indigenous scholars for system science approaches to address complex issues [30]. It enabled us to examine and identify individual mechanisms and their interconnections that supported the desired functioning and operation of the innovation platform while also providing a view of the system as a whole and the collective outputs produced. Furthermore, multiple evaluation approaches enabled us to acquire a more comprehensive and textured account of the innovation platform's formation, function and outcomes. For example, the principles-focused evaluation allowed us to inductively develop an understanding of how the innovation platform's guiding principles led to increased Indigenous leadership and participation, and, in turn, the coauthorship network analysis demonstrated the growth and change in Indigenous participation by examining coauthorship patterns.

An evaluation working group and an embedded evaluation fellow enabled streamlining of data collections, course corrections and decision-making

Dedicated resourcing for an evaluation working group and the appointment of a part-time evaluation research fellow helped to (1) coordinate evaluative activities and streamline data collection opportunities; (2) make necessary course corrections by providing a forum to discuss emergent issues and options, while remaining focused on the overall evaluation goals; and (3) provide a forum to discuss proposed methodological approaches and interim findings. Importantly, this group also guided decisions about data use and storage and protocols for acknowledgement of data sources and authorship [43].

Consistent with a developmental evaluation approach [3, 44], the evaluation fellow was an embedded team member rather than a traditional external evaluator [45]. As the position required dual responsibilities of both project management and implementation of evaluation, this allowed the evaluation fellow to formally participate in the management committee, evaluation working group and other relevant meetings. Attendance at core governance and operational meetings facilitated an understanding of emergent issues and the need for timely action among key decision-makers. This embeddedness meant that any changes to the innovation platform's direction

and evaluation—based on insights, learnings and critically reflective conversations between the evaluation working group and innovation platform management and members—could be expedited as needs arose. Being alert to the potential for positivity bias as an embedded evaluator meant that we sought to ensure there were processes in place to enhance the credibility of findings. Strategies undertaken included (1) the inclusion of two researchers to undertake data collection; (2) highly participatory analysis and interpretation in which researchers not actively engaged in the CRE were included in the analysis team; and (3) use of a variety of data sources to triangulate findings.

The evaluation fellow had a long-standing history of working with innovation platform members on previous research projects and collaborations and an in-depth understanding of CQI and PHC. This background knowledge of the context and existing relationships with end-users catalysed engagement with the evaluation. In other situations, with an evaluator less familiar with the field and/or the evaluation participants, more time would likely be required to conduct a formal situational analysis to understand the context in which the innovation platform exists and to ensure the evaluation design takes this into account.

The active involvement of “users” in the evaluation while judiciously avoiding evaluation fatigue was key to success

Experience points to the importance of identifying and involving “end-users” of the evaluation, which, in our case, included innovation platform members such as health service providers, researchers and policy-makers. An example of this was the presentation of emergent findings from the developmental evaluation's Year 4 Review [26] to the CRE-IQI management committee, evaluation working group and the broader network at the biannual meetings. The findings were further synthesized and prioritized during these interactions, and collaborative strategies to address them identified. The active engagement of users in these collaborative analysis processes and discussions to make sense of emergent findings enabled early action and early acquisition of new knowledge rather than waiting for a final report or publication. For example, early findings from the principles-focused evaluation identified the importance of explicitly promoting the shared values and principles of the innovation platform. On discussion with innovation platform members of these early findings, a review of further opportunities to promote the principles was discussed, and it was agreed that the principles were to be applied as criteria on all “seed-funding” applications to develop research.

Given the focus on involving end-users there is, however, a risk of evaluation fatigue if the activities are not

well coordinated and perceived as meaningful to participants. Enthusiasm for the involvement of end-users must also consider their primary work responsibilities and demands on their time. For example, in the innovation platform, many of the members were busy health service providers, and some balanced dual clinician/researcher roles. Opportunities for generating engagement included maintaining a focus on innovation platform members' needs and learning rather than the evaluation itself; being mindful of the capacity of users when planning the collection and analysis of evaluation data; collecting data at one point for multiple purposes; and provision of routine updates and collaborative analysis processes at management committee and scheduled biannual meetings.

Leveraging data sources for multiple purposes created efficiency gains in data collection efforts

Given our concerns of evaluation fatigue and to limit the burden of evaluation for Indigenous people [30], we proactively looked for opportunities to use existing and practical data sources (i.e. routinely collected data) for multiple purposes and to maximize the output of data collection efforts, rather than continuously collecting new primary data for each evaluation sub-study. For example, we drew on existing collated lists of publications required for project reporting for use in the coauthorship network analysis to understand the growth and emergence of the innovation platform. A further example is the use of existing publications and reports produced by the evaluation of the innovation platform as secondary data for the framework analysis. Thus, while pluralistic methods require more data collection and effort, taking advantage of the existing synergies between the four design frameworks and using practical data sources reduced some of the burden and assisted with a systems thinking approach to explore the complexity of the innovation platform.

Balancing the need for an emergent evaluation that responded to changing circumstances while remaining focused on the overall evaluation goals and objectives

Methodological pluralism enabled us to respond promptly to the "emergent" nature of a complex system. The findings from the developmental evaluation [3] were important determinants of the subsequent design of the principles-focused evaluation [19], network analysis [20] and framework analysis [21] (Fig. 2). The downside of being responsive to emergent issues is the risk of distraction by interesting but less important issues. Therefore, remaining focused on the goals and objectives of the overall evaluation while valuing flexibility was important. The regular evaluation working group meetings were instrumental in this regard,

allowing us to strike a balance between the flexibility required to adapt rapidly to emergent findings and evolving stakeholder needs, and the availability of evaluation resources.

The co-creation of evaluative knowledge was deeply relational, engaged and underpinned by principles of practice

The Indigenous context we were working in required evaluative knowledge to be co-created with CRE-IQI members. At the core of the "all teach, all learn" motto of the CRE-IQI is the valuing of Indigenous cultures, knowledge and expertise alongside Western research and knowledge—it embodies the value placed on mutual learning [46].

Over time, the CRE-IQI and the evaluation had increasing leadership and participation of Indigenous people, in response to evaluative feedback and subsequent focused and deliberate strategies to achieve this. At the outset, the evaluation did not explicitly state that we were being guided by Indigenous ways of knowing, being and doing. Rather we adopted the "all teach, all learn" motto [46] and were guided by an agreed set of principles of practice [19]. As outlined above, these included Indigenous leadership and direction of research, a partnership approach and respect for the experiences of Indigenous peoples. Using a strengths-based approach, ensuring we were contextually responsive, implementing systems and relational approaches, and an emergent, interactive design supported the operationalization of the principles [19]. There were many conversations amongst CRE-IQI members about what an Indigenous way of working would be and how it would look, as we worked to progress these over time. These conversations may not have taken place, and concerns about Indigenous participation and leadership may not have been raised or given high priority, without the continuing focus on principles of practices and the relational aspects of the CRE-IQI. Meaningful engagement with Indigenous people must occur early through codesign and be sustained throughout the evaluation to co-produce actionable knowledge.

The commitment of leadership to the developmental evaluation enabled evaluation resourcing, innovation and adaptation

Highly collaborative, methodologically pluralist evaluations are resource intensive, requiring the evaluation team to encompass a wide range of skills and experiences. Because it is unlikely that any single evaluator would have sufficient methodological diversity to tackle all evaluation elements, we needed to strike a balance between what was practically feasible in terms of the resources, time

Table 2 Recommendations to optimize the benefits of evaluations of collaborations using pluralistic approaches

Ensure that leaders are willing to invest resources in the evaluation to allow it to be undertaken within an adequate time frame, and that leaders are open and flexible to making changes when required.
Assemble an evaluation team with a variety of evaluation expertise and negotiate scope to contract specific methodological expertise as required.
Engage evaluators with high-level facilitation skills to engage and sustain participation.
Use an embedded evaluator to optimize the evaluator's ability to engage stakeholders in the evaluation and ensure findings are translated into practice.
Keep the overall goal of the evaluation in mind and reflect on the goal regularly when considering emergent and responsive approaches to evaluation findings.
Consider evaluation approaches that allow for "zooming in" on details, but also on "zooming out" to see the big picture and the interconnections within the system.
Be alert to possibilities for maximizing data collection opportunities and coordinate evaluation activities in a way that will avoid evaluation fatigue of collaboration members.
Take advantage of synergies and use of routinely collected data sources where possible to reduce the burden of collecting new data for each evaluation approach.
Enthusiasm for the involvement of end-users in the evaluation must be tempered with clear definitions of who they are and an understanding of the demands on their time.
Create space for reflection and provide flexibility for new user perspectives and new questions to emerge, with the evaluation team or management group offering a forum for this to occur.
Include opportunities in the evaluation plan for reflection on the experience of using pluralist methodologies and on whether methodological changes need to be made.
Include opportunities in the evaluation for feedback to and from stakeholders, e.g. when results from each method are available and at the end of the evaluation for input to integrate the findings.

and skills of the evaluation team, and the scientific rigour needed to address the evaluation's questions.

Reflecting the commitment to undertaking a comprehensive evaluation, resources were budgeted at the grant submission stage for the evaluation (e.g. the evaluation research fellow), supportive structures (e.g. the evaluation working group) and research operations to support collaboration throughout the evaluation (e.g. participatory data analysis). This underscores the need for substantial leadership commitment to the evaluation, not just in terms of resourcing but also in being flexible and open to making changes when required. Leadership commitment to the developmental evaluation and its findings supported the innovation and adaptation of both the evaluation and the innovation platform.

Sufficient time was needed for the participatory analysis and synthesis of findings, and for feeding back preliminary findings from the different evaluation approaches. This feedback proved to be especially important, because some of the final products (i.e. publications) could not be completed until after the innovation platform funding period. Fortunately, we were successful in securing funding for the next 5-year iteration of the innovation platform—through an Indigenous-led Centre for Research Excellence in Strengthening Systems for Indigenous Health Care Equity (CRE-STRIDE). This allowed us to share our learnings and final findings, a process that will in turn inform the evaluation of CRE-STRIDE [20, 47]. In Table 2, we have summarized recommendations for evaluators

based on our experience of taking a methodologically pluralist approach to evaluating a complex intervention.

Conclusion

A methodologically pluralist evaluation of an innovation platform to improve Indigenous health generated different and complementary insights that would be difficult to achieve with a single-methodology evaluation. Application of the multiple evaluation approaches in this study yielded a detailed description and nuanced understanding of innovation platforms as an "emergent" complex system. While a methodologically pluralist design may place additional pressure on logistical and analytic resources available, it enables a deeper understanding of the mechanisms that underlie complex interventions. Attending to complexity in the design and implementation of the evaluation requires ways of working that are thoughtful, planned and relationally driven.

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Authors' contributions

JB and DP conceived of the manuscript, with JB taking the lead on the writing of all drafts, integrating feedback upon reviews and finalizing the manuscript. All authors provided feedback on drafts of the manuscript. RSB was the Principal Investigator of the Centre for Research Excellence in Integrated Quality Improvement. All authors read and approved the final manuscript.

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Availability of data and materials

Not applicable.

Declarations**Ethics approval and consent to participate**

University of Sydney Human Research Ethics Committee (Project 2018/206) and the Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research (Project 2018-3105).

Consent for publication

Not applicable.

Competing interests

The authors declare that this research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Chapter 8: Conclusion

Prior to this work, there was a general lack of published evaluations of innovation platforms in the health setting. Because of the inherent challenges with evaluating complex interventions, such as innovation platforms, I implemented a methodologically pluralist evaluation as a part of this thesis.

The overall thesis aims were to:

- 1) refine the innovation platform in response to evaluative findings;
- 2) inform future evaluations of similar complex interventions; and
- 3) generate new knowledge on the role of innovation platforms in addressing complex challenges.

In addressing these aims, the purpose was to inform efforts to strengthen PHC systems for Aboriginal and Torres Strait Islander people. The work presented in this thesis has identified important areas for additional research and practice. New work in some of these areas is already underway, as described herein.

Refining the Innovation Platform in Response to Evaluative Findings

The thesis highlighted the suitability of developmental evaluation in informing the formation and functioning of innovation platforms as it supports their design tenets of continuous reflection, adaptation, and learning. This was achieved through opportunistic and planned iterative cycles of reflection and analysis to understand how, and how well, the innovation platform was functioning, and adaptations in rapid time to enable the innovation platform to function more effectively. Many innovation platform stakeholders had a history of working in quality improvement and participatory action research, and this provided a foundation for understanding some of the key concepts and processes of taking a developmental evaluation approach. Further work is required in applying emergent evaluation designs, such as developmental evaluation, as an alternative to the more traditional process evaluations approaches.

The thesis was completed under the auspice of the CRE-IQIs next iteration, the Aboriginal and Torres Strait Islander-led Centre for Research Excellence in Strengthening Systems for Indigenous Health Care Equity (CRE-STRIDE). Both the CRE-IQI and CRE-STRIDE were

funded by the NHMRCs Centre of Research Excellence program. As a direct result of evaluative feedback from the evaluation of the CRE-IQI, the CRE-STRIDE is Indigenous-led, and has embedded Indigenous ways of knowing, being and doing from the outset. The evaluation of the CRE-STRIDE has drawn on the learnings from the CRE-IQI evaluation to inform its evaluative plans. For example, the CRE-STRIDE evaluation will also take a methodologically pluralist approach, with early developmental evaluation being central to continuously refining and adjusting the operation of the CRE-STRIDE.

Informing Future Evaluations of Similar Complex Interventions

The findings from the developmental evaluation supported a prompt response to the “emergent” nature of a complex system and this was an important determinant of the subsequent evaluation design core elements including the principles-focused evaluation, network analysis and framework analysis. However, to benefit from developmental evaluation, it must be conceived of and implemented early if it is to meaningfully support and build a culture of evaluation throughout the life cycle of a complex intervention.

Having multiple evaluation approaches and methods aligns well with a complex systems perspective and is congruent with calls by Indigenous scholars for system science approaches to address complex issues. There is a clear and an ongoing need to focus on engagement with, and leadership by, Indigenous people in evaluations and programs of work related to them. To this end, further research and development is needed to assess the quality of evaluations of collaborations from an Indigenous perspective and to develop metrics for evaluation that are driven by Indigenous perspectives. The CRE-STRIDE provides a strong foundation to shed new light on these issues.

Generation of New Knowledge on the Role of Innovation Platforms in Addressing Complex Challenges

The thesis has sought to generate new knowledge about the role of innovation platforms in addressing complex challenges in the health setting – an area in which they have had little implementation to date. As their name implies, innovation platforms are focused on new ways of doing things to address a problem. For the CRE-IQI, innovation was achieved by learning through the exchange of ideas and collective knowledge production. I drew on one key method to assess the innovations emerging from the innovation platform by analysing research outputs

and conducting a co-author network analysis. This method is relatively easily implemented as it relies on existing data and can shed valuable insights into the dynamic nature of multi-stakeholder collaboration over time.

Given that innovation platforms purposefully bring together stakeholders from different roles, organisation types and sectors to develop collective solutions to common problems or to achieve a common goal, more research is needed on the power dynamics and representation within innovation platforms. Furthermore, in cross-cultural contexts, innovation platforms can be influenced significantly by forms of power that may not always be visible or easily challenged. In theory, members of the innovation platform are equally able to identify problems and articulate potential solutions, but in practice this may play out quite differently. Unless this is recognised and dealt with, an innovation platform can reinforce these inequalities. For this reason, my findings on being explicit about the role of principles in the design and implementation of innovation platforms, and to embed, constantly monitor and reflect on these principles is likely to be a critical mitigating factor in addressing power imbalance among members.

In conclusion

Tackling ‘wicked problems’ in health care usually requires complex interventions. The methodologically pluralist evaluation of an innovation platform for Aboriginal and Torres Strait Islander CQI in PHC yielded a nuanced understanding of a complex intervention that would have been difficult to achieve with any single evaluation method. When multiple methods produce similar findings on a singular topic, these findings are further strengthened, contributing to the rigor of the evaluation. As such, each sub-study, individually and combined, was able to open the ‘black box’ of the innovation platform, informing its formation and iteratively assessing its functions and outcomes. This thesis demonstrates the value of emergent and innovative evaluation methods, with a particular emphasis on participatory approaches. Such methods can enhance our understanding of the impact that complex interventions have on strengthening health systems and providing high quality care for all.

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APPENDICES

List of Appendices

Appendix 1: Description of journals

Appendix 2: Final report of the CRE-IQI research findings, engagement and impact

Appendix 3: Peer-reviewed publication with direct relevance to thesis

Appendix 4: Outcomes Authored during Candidature—Not Related to this Thesis

Appendix 1: Description of Journals

Impact factors are taken from 2020 Clarivate InCites Journal Citation Reports. Quartiles are taken from 2020 SCImago Journal and Country Rank. Descriptions of journals are taken directly from the home page of each journal.

BMJ Global Health

BMJ Global Health is an open access, online journal dedicated to publishing content relevant to those involved in global health, including policymakers, funders, researchers, clinicians and frontline health care workers. The journal is currently considered a Quartile 1 journal (Health Policy; Public Health, Environmental and Occupational Health), has an impact factor of 5.558, and is in the top 5% of journals globally for public health.

Health Research Policy and Systems

Health Research Policy and Systems covers all aspects of the organisation and use of health research—including agenda setting, building health research capacity, and how research as a whole benefits decision-makers, practitioners in health and related fields, and society at large. The journal is currently considered a Quartile 1 journal (Health Policy; Medicine, miscellaneous), has an impact factor of 3.318, and is in the top 25% of journals globally for health policy and services.

BMJ Open

BMJ Open is an online, open access journal, dedicated to publishing medical research from all disciplines and therapeutic areas. The journal is currently considered a Quartile 1 journal (Medicine, miscellaneous) and has an impact factor of 2.692.

The Joint Commission on Quality and Patient Safety

Published monthly, *The Joint Commission Journal on Quality and Patient Safety* is a peer-reviewed publication dedicated to providing health professionals with the information they need to promote the quality and safety of health care. The journal is currently considered a Quartile 1 journal (Leadership & Management) and has an impact factor of 1.65.

Appendix 2: Final Report of the CRE-IQI Research Findings, Engagement and Impact

This section contains the final report of the CRE-IQI research findings and activities, with messages for action to improve PHC delivery. I am a co-author on this report, and it is available at [CRE-IQI-Final-Report.pdf \(ucr.h.edu.au\)](#).

Laycock A, Conte K, Harkin K, **Bailie J**, Matthews V, Cunningham F, Ramanathan S, Bailie R. Improving the Quality of Primary Health Care for Aboriginal and Torres Strait Islander Australians: CRE-IQI final report. Lismore, NSW: Centre for Research Excellence in Integrated Quality Improvement, University Centre for Rural Health, 2019.



Improving the Quality of Primary Health Care for Aboriginal and Torres Strait Islander Australians

**Centre for Research Excellence in Integrated
Quality Improvement, 2015–2019:
Messages for Action, Impact and Research**

December 2019

Improving the quality of primary health care is essential for Closing the Gap in health and wellbeing disparities between Aboriginal and Torres Strait Islander people and other Australians.

The Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI) brought together service providers, communities, policy makers and researchers to work on strengthening the primary health care system through quality improvement.

This is a final report of the CRE-IQI research findings and activities, with messages for action to improve primary health care delivery.

About the CRE-IQI

Aboriginal and Torres Strait Islander people's health outcomes, life expectancy and access to health care should be equal to that experienced by other Australians. To address both the current inequalities and improve primary health care for Aboriginal and Torres Strait Islander people and communities, we need a whole-of-system view that uses evidence, innovative thinking and Indigenous-led, collaborative, strengths-based approaches.

The vision of the Centre for Research Excellence in Integrated Quality Improvement in Indigenous Primary Health Care (CRE-IQI) is to improve Aboriginal and Torres Strait Islander health outcomes by accelerating and strengthening large-scale quality improvement efforts. Continuous quality improvement (CQI) is a systematic way of using data to guide ongoing improvements to the quality and consistency of primary health care (PHC) as well as to its organisation, structure and/or design. Recognising the need to scale-up CQI efforts in Aboriginal and Torres Strait Islander health, Australia's National Health and Medical Research Council funded the CRE-IQI from 2015 to 2019 (#1078927). The CRE-IQI brought together researchers, service providers and policy makers – from Aboriginal Community Controlled Health Organisations, government-managed health centres, research institutions, government health departments and key regional support organisations such as health councils – to work on ways to strengthen system-wide quality improvement.

Building on more than two decades of participatory CQI research and development involving Indigenous communities, health services and researchers across Australia, the CRE-IQI research aimed:

- + To refine and build new audit processes and tools
- + To improve data reporting systems at all levels of primary health care
- + To increase the use of quality improvement data in clinical governance, management and practice
- + To strengthen quality improvement capacity in the Aboriginal and Torres Strait Islander health workforce
- + To monitor and evaluate the impact of the innovation platform.

Three cross-cutting work programs aimed to build collaboration, strengthen research capacity and translate research outcomes into health policy and practice. For details see <https://ucrh.edu.au/cre-iqi/>.

Note on terminology

In this report, we primarily use the term 'Indigenous' to refer to Aboriginal and Torres Strait Islander peoples and groups whose ancestors pre-date colonisation and who identify as such; 'Aboriginal and/or Torres Strait Islander' is also used where appropriate.

Abbreviations

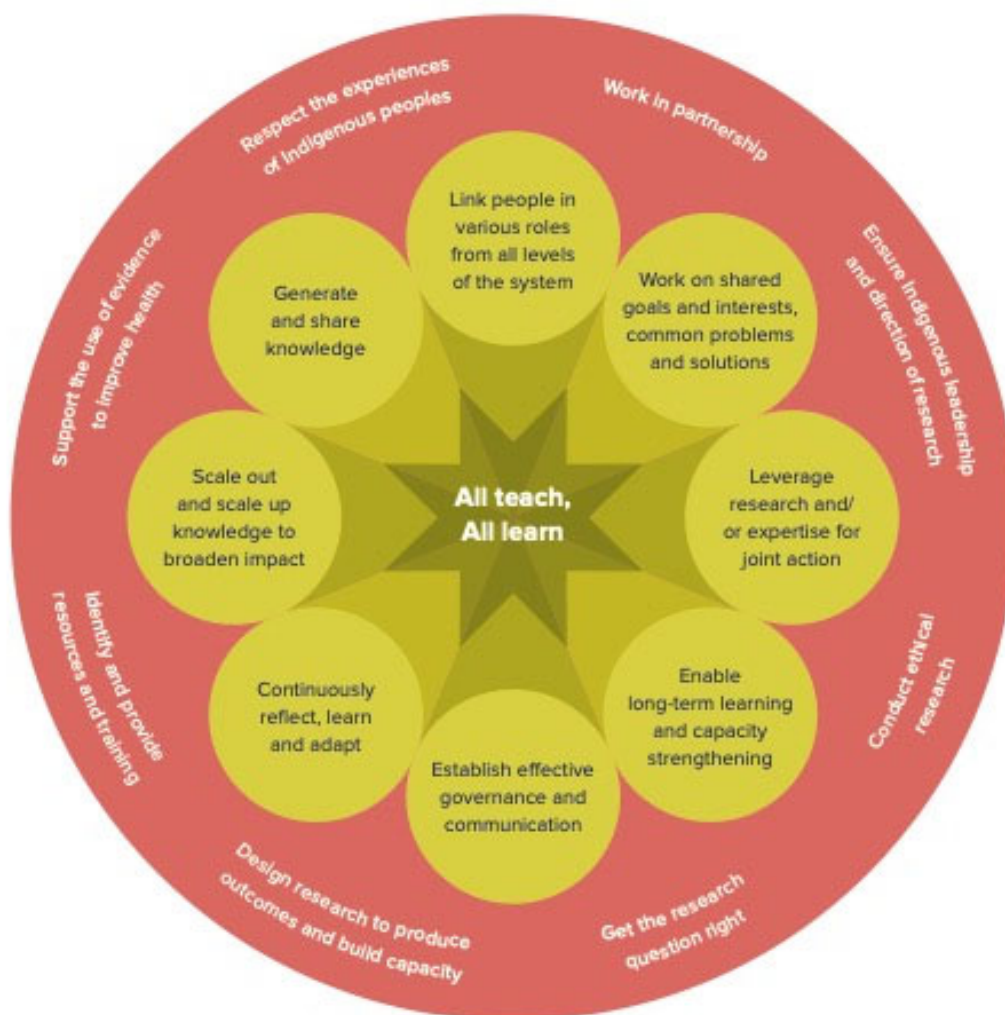
ABCD	Audit and Best Practice for Chronic Disease
ARF/RHD	acute rheumatic fever/rheumatic heart disease
CQI	continuous quality improvement
CRE-IQI	Centre for Research Excellence in Integrated Quality Improvement
PHC	primary health care

How CRE-IQI Members Have Worked Together – An 'Innovation Platform'

The CRE-IQI used an 'Innovation Platform' concept (1). This is an open network of members from diverse roles and organisations who come together to work on shared goals, find solutions to common problems, learn from each other and take collective action.

Figure 1 shows the Key Functions of the CRE-IQI listed in the eight circles, with our Guiding Principles encircling them. These were collaboratively developed using Aboriginal and Torres Strait Islander leadership and direction of research as a key principle. At the centre is our overarching aim of 'All teach, all learn', which reflects the value placed on mutual learning between everyone involved in the CRE-IQI's research.

Figure 1: Elements of the CRE-IQI Innovation Platform



Findings and Insights from the CRE-IQI

The diversity of the CRE-IQI's membership and its collaborative way of working have ensured that our research is grounded in the real world. We used a collaborative process that drew on CRE-IQI publications and the collective knowledge and experience of our members to identify the most important findings and insights from our research program.



CQI has been widely accepted and applied in Australian Aboriginal and Torres Strait Islander health services and in PHC settings, with some resulting improvements in clinical care, service systems and the social determinants of health.

Our research shows that sustained use of CQI can improve the delivery of evidence based PHC (2–13). Participatory CQI approaches can be adapted for identifying and addressing improvement priorities across a range of program settings and at different system levels (5, 14–20).

The CRE-IQI identified the following factors as enabling teams to engage effectively in CQI at different system levels.

At the policy level they include:

- + Backing of higher level policy, CQI infrastructure and regional-level support (9, 14, 21, 22).
- + Whole-of-organisation approaches to CQI supported by leadership at all levels and funding for CQI processes (21, 93, 23).

At the health service level they include:

- + A stable and well-prepared workforce, with teams that have a mix of skills, and clear roles and responsibilities (10, 14, 22–25, 93).
- + Stable CQI systems and supports, teamwork and collaboration between staff (14, 23, 24).
- + Strong community engagement, and linkages and partnerships with external organisations (14, 15, 24).
- + Participatory CQI approaches that are contextually relevant and responsive to local needs (10, 15, 17, 24, 26).
- + Adapting CQI approaches to suit program or service settings (5, 14–20).
- + Skilled facilitation in supporting CQI (20–23, 27–30).



Aboriginal and Torres Strait Islander leadership and participation in PHC services and research improves the quality of care delivered.

- + Aboriginal and Torres Strait Islander staff are crucial to improving the delivery of evidence-based care (11, 28, 31), including access to culturally safe PHC and continuity of care (15, 31, 32).
- + Local-level leadership and decision-making for health and wellbeing services can improve the implementation of CQI and service delivery (15, 33, 34).
- + PHC services with leadership by, and engagement with, Aboriginal and Torres Strait Islander people and communities consistently achieved high improvement in the delivery of evidence-based care (14, 15). In these high-improving services, there was a mix of Indigenous and non-Indigenous staff with deep knowledge and understanding about the communities in which they were working and the most appropriate ways to deliver PHC (14, 15).
- + Our work has reinforced the need for more Aboriginal and Torres Strait Islander control, ownership and leadership of CQI research. This can be achieved through formalised processes that embed principles of practice into ongoing research (35), and funding that is controlled and led by Aboriginal and Torres Strait Islander people (17, 94).
- + The strengthening of research capacity needs to be embedded in health research activities and programs (35, 95).

The ABCD program built CQI capacity across 270 health centres and involved more than 1200 health providers. Every dollar spent created between \$1.61 and \$4.80 in value, with the economic benefit coming from leveraged research and scholarship funding, new CQI positions and savings in the 'downstream' costs of care.

(Unpublished impact assessment findings)



Clinical and non-clinical health outcomes can be improved by using evidence-based CQI tools and processes.

- + ABCD CQI tools and processes are available to health services, and have proved reliable and valid for monitoring and improving the key functions of PHC (27, 29, 96). Use of CQI tools and approaches has proved feasible for improving the delivery of chronic illness care (6, 9, 36, 97), child health (3, 7, 98), maternal health (2, 4, 99), preventive health (44, 100), mental health and wellbeing (8, 101), sexual health (22, 38), and acute rheumatic fever and rheumatic heart disease (ARF/RHD) care (10, 39, 102).
- + CQI tools developed through the ABCD project are adaptable to context, including the health promotion and systems assessment tools (27, 29), but there is limited use of some important CQI tools by PHC services (36, 101).
- + CQI can strengthen systems to support comprehensive PHC (40) that attends to the social determinants of health (40, 41). CRE-IQI research shows that a CQI approach is feasible and promising for health promotion (5), wellbeing empowerment programs (17), strengthening food security systems (16), management development (12), child protection processes (43), and in school settings (42).
- + Applying CQI tools and processes supports team building and learning (5, 30). It also has benefits for planning, decision-making and capacity building at the health centre level (24).
- + Systems and infrastructure are needed to support staff training in CQI, including in the use of information systems and clinical audits (44, 45).



Access to accurate and timely data across the scope of practice is essential for CQI in comprehensive PHC, and for informing and driving health service, intersectoral and community action.

- + Clinical information systems that are fit for purpose and context can provide relevant data and support improved practice (36); there is also a link between clinical information system quality and integration, and service quality (14, 24, 36). However, many of these systems are not designed to provide data for CQI (5, 25, 44) leading to critical gaps both in client data (45, 46, 96) and health promotion activity data (5).
- + Clinical audits are vital in generating data in areas not adequately covered by existing clinical information systems and for monitoring the quality of data recorded in them (14, 30).
- + Regional and/or higher level standardised clinical information systems enable identification of system-wide gaps, the monitoring and evaluation of trends in best practice care, and the longer term impacts of CQI on practice and health outcomes (100, 102).

Engaging stakeholders in the interpretation of ABCD findings through the ESP project led to greater use of the data to inform policy and practice (30).



Priorities have been identified for strengthening PHC systems to achieve large-scale health improvement for Aboriginal and Torres Strait Islander people.

Many aspects of care are being done well in health services, including the measurement of weight, blood pressure and glycated haemoglobin (HbA1c), and the ordering of tests for clients with chronic illness (47, 97). The successful delivery of health assessments is associated with superior preventive care (11, 36). However, there are many other aspects of care that need to be improved. Identified priorities for improving PHC delivery are as follows:

- + Increasing follow-up of abnormal clinical results in chronic illness care (25, 47, 97), child health (25, 44, 98), maternal health (99), preventive health (28, 100), mental health and wellbeing (8, 101), and ARF/RHD care (102).
- + Enquiring about behavioural risks to each client's health, and providing brief intervention as required, is a priority across the scope of clinical PHC (48, 97–102).

- + Ascertaining social and emotional risk factors and, when risks are identified, providing brief intervention and support was an identified need in maternal health (4, 49, 99), preventive health (8, 28, 100) and chronic illness care (97).
- + Improving documentation of the care provided (98).
- + Providing better referral systems (in-service and externally) and service options, particularly locally for referred clients (8, 49).
- + Addressing barriers to the delivery of quality care in the suitability and use of clinical information systems, workforce, staff skills/training, financial resources and community engagement (97–102).

CRE-IQI research shows wide variation in the delivery of care between health services and between jurisdictions, which is largely explained either by health centre factors (5–7, 37, 38, 47, 50–53) or policy-level factors (21, 22, 36, 50, 51, 53). This indicates the need to strengthen systems for delivering PHC at different levels of the health system.

Our Research Projects

6 Flagship projects

- + Engaging stakeholders in identifying priority evidence–practice gaps and strategies for improvement in primary health care (ESP project)
- + Ongoing analysis and reporting of data from the ABCD National Research Partnership
- + Quality improvement in Aboriginal primary health care: Lessons from the best to better the rest
- + CQI approaches to sustainable implementation of social and emotional wellbeing programs and services
- + Strategies for improving provision of maternal health care for Aboriginal and Torres Strait Islander women
- + Monitoring and evaluation of the CRE-IQI as an innovation platform

12 Aligned priority projects

- + Quality improvement in Indigenous PHC – The Leveraging Effective Ambulatory Practices (LEAP) project
- + WOMen’s action for Mums and Bubs (WOMB): A pragmatic trial of participatory women’s groups to improve Indigenous maternal and child health
- + Opening doors: Evaluation of the Maari Ma Health Aboriginal Corporation’s Chronic Disease Strategy
- + Implementation of health promotion quality improvement tools and processes in the Northern Territory
- + Development of indicators and quality improvement tools for tobacco control programs in Indigenous communities
- + Evaluating the CQI approach for program impact and diversification of the Remote Management Program: A feasibility study
- + Aremelle Arratyenye-ileme – Doing it right: Research knowledge generation and translation in Central Australia
- + B.strong: Queensland Health Aboriginal and Torres Strait Islander brief intervention training program
- + Assessing and guiding system improvement for delivery of preventive health care for Aboriginal and Torres Strait Islander Australians: Validating a data collection and measurement tool
- + VOICE: Validating Outcomes by Incorporating Customer Evaluation
- + Health from the grassroots: Consulting community about health and research priorities
- + System-level integration to promote the mental health of Indigenous children: A community-driven mixed methods approach

For project descriptions and aims see <https://ucr.edu.au/cre-iqu/>.

- 6 Improving the Quality of Primary Health Care for Aboriginal and Torres Strait Islander Australians

Evaluation of the CRE-IQI

The CRE-IQI implemented a developmental evaluation, a network evaluation and an impact assessment. Using developmental evaluation, we have been able to draw on feedback in different ways across all levels of the CRE-IQI to inform our operations, work programs and future direction. We have achieved this through continuous reflection, learning and adaptation. Based on feedback from members, a key activity was to increase the leadership and participation of Indigenous people in all aspects of our work.

The network evaluation was applied across the lifecycle of the CRE-IQI to identify strategies for improvement and to evaluate its operation using network methods. The CRE-IQI built on long-standing partnerships and helped members to build new relationships – a marker of the success of the innovation platform – leading them to rate ‘Facilitating collaboration’ as the CRE-IQI’s most strongly recognised achievement. Members strongly agreed that the CRE-IQI had met its goals, and assisted them in their work and/or in their health service (103).

The impact assessment used the Framework to Assess the Impact of Translational Health Research to evaluate three of our ‘flagship’ projects to understand their impact on knowledge, policy, the health system, health care, health outcomes and the economy. The most significant combined impacts were in capacity building of health services and in policy.

The innovation platform approach, based on a partnership-learning model (54), brought together a diverse group of people (1, 102, 55) to implement, reflect on, evaluate and disseminate CQI research (95). It inspired collaboration with a wide range of stakeholders and quality improvement approaches across multiple levels of the health system (1, 94). Aboriginal and Torres Strait Islander leadership, collective priority setting and problem solving supported learning and change across the CRE-IQI (35).

The ‘Lessons from the best to better the rest’ project used the findings from consistently high-improving services to leverage \$1.1 million to strengthen striving services and develop a CQI toolkit.

(Unpublished impact assessment findings)

Messages for Action, Impact and Research



For health services

- + Invest in PHC workforce recruitment and retention strategies that address high staff turnover.
- + Increase and support the Aboriginal and Torres Strait Islander health workforce at all levels and establish professional pathways and opportunities for training and two-way mentoring.
- + Improve identification of Aboriginal and/or Torres Strait Islander clients in patient records in PHC settings.
- + Modify and integrate clinical information systems, as required, to generate data for improving care coordination and delivery.
- + Advocate for training and development in CQI facilitation skills.
- + Allocate time and resources for staff at all levels and roles to participate in CQI training and activities.
- + Facilitate Aboriginal and Torres Strait Islander community engagement in CQI, and in planning and evaluating health and wellbeing programs.
- + Focus on preventive health care and health promotion using culturally appropriate and strengths-based approaches.
- + Continue to collaborate in CQI research.



For policy, government and support organisations

- + Resource jurisdiction- and regional-level service providers to implement the 'National Framework for CQI in Primary Health Care for Aboriginal and Torres Strait Islander People 2018–2023'.
- + Strengthen the use of information systems within PHC to record brief interventions for lifestyle risk factors, enable follow-up of abnormal results, and further incentivise through the Medicare Benefits Schedule.
- + Encourage the use of CQI to strengthen systems for addressing the social determinants of health.
- + Work with communities to incorporate Indigenous perspectives on care quality into the measures of quality used in CQI.
- + Allocate funding for dedicated CQI roles/functions and processes and for staff at all levels and roles to participate in CQI training and activities.
- + Support the use of tools and processes that enable services to identify and address local priorities for improvement, in addition to meeting their reporting requirements.
- + Invest in data literacy and data analysis skills at all levels of the health system to build understanding and capacity in generating and using data to inform decision-making.
- + Further develop systems to improve data quality at PHC level, to aggregate data at different system levels and to monitor trends in best practice care, CQI impact and whole-of-system responses.
- + Continue to invest and collaborate in CQI research in Indigenous PHC.



For researchers and service-policy-research collaborations

- + Encourage and support diverse collaboration in CQI research.
- + Empower community members and service providers to co-lead projects and collaborate in research teams, including formal opportunities to learn and apply research skills.
- + Conduct implementation studies to address the variation across services in delivery of care.
- + Undertake more research to understand why and how CQI works in different contexts, and to advance facilitation techniques.
- + Develop CQI tools to monitor client experiences of PHC.
- + Further refine the ABCD (Audit and Best Practice for Chronic Disease) tools to meet the ongoing CQI implementation needs of PHC services.
- + Advance the application of CQI for health system strengthening and for engaging intersectoral action to improve health and wellbeing.
- + Conduct economic studies to understand more fully the return on investment in CQI.
- + Establish clear objective measures to monitor the impact of CQI on the broader health system.

Engagement and Impact

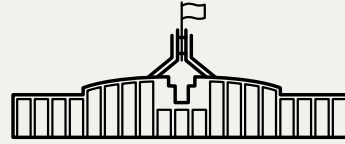
Research translation



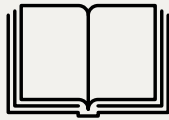
92
peer-reviewed publications
450+ citations
184,800+ downloads



26
newsletters
70
average of 70 individual opens per newsletter



7
policy/parliamentary submissions



27
research and technical reports



81
conference presentations



2600
responses received through an interactive data dissemination process to identify priority gaps, barriers, enablers and strategies to improve care



Funded position to support research translation

Collaboration

85
different organisations had contributing authors on our peer-reviewed publications



47 different lead authors from 22 different organisations

10
biannual meetings to bring together collaborators

- **4 locations:** Brisbane, Alice Springs, Darwin and Cairns
- **120 individuals** attended at least one biannual meeting

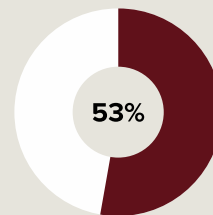
\$31,998,410
leveraged in collaborative research grants

18
affiliated projects
— investigators from 27 different organisations on CRE-IQI projects

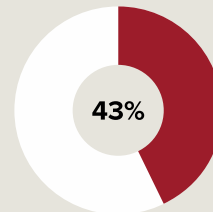


Network evaluation found that collaboration and networking opportunities were highly valued by members

Strong connections between members supported the sharing of information across the network



of CRE-IQI members shared information, and



collaborated with people they didn't know before their CRE-IQI involvement

8 Improving the Quality of Primary Health Care for Aboriginal and Torres Strait Islander Australians

Research capacity strengthening



24

students affiliated (PhD, Masters, undergraduate placements)



31

research capacity strengthening seminars held



publications had a student/program officer as lead author



Funded position to support research capacity strengthening

- established lead group
- developed 'All teach, all learn' framework



16

masterclasses enabled researchers and service providers to access professional development on topics identified by CRE-IQI members

166

individuals attended at least one masterclass

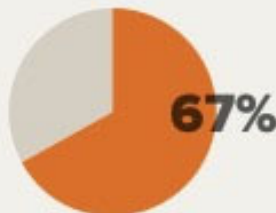
\$2,600,920

leveraged in scholarship and fellowship funding

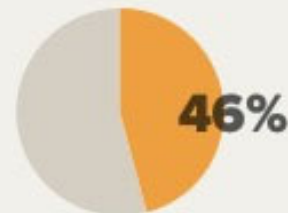
Indigenous leadership and participation



64 of 73 articles about research conducted with Aboriginal and Torres Strait Islander communities or using ABCD CQI data had at least one Indigenous author



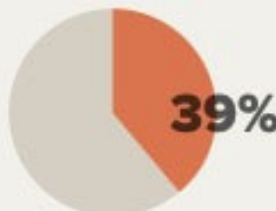
of presentations had at least one Indigenous author



of individual attendees at biannual meetings were Indigenous and/or representing an Indigenous organisation

28% ↗ 44%

Participation by Indigenous people and organisations increased from 28% in the first biannual meeting to 44% in the final 2019 meeting



of individual attendees at masterclasses were Indigenous and/or representing an Indigenous organisation

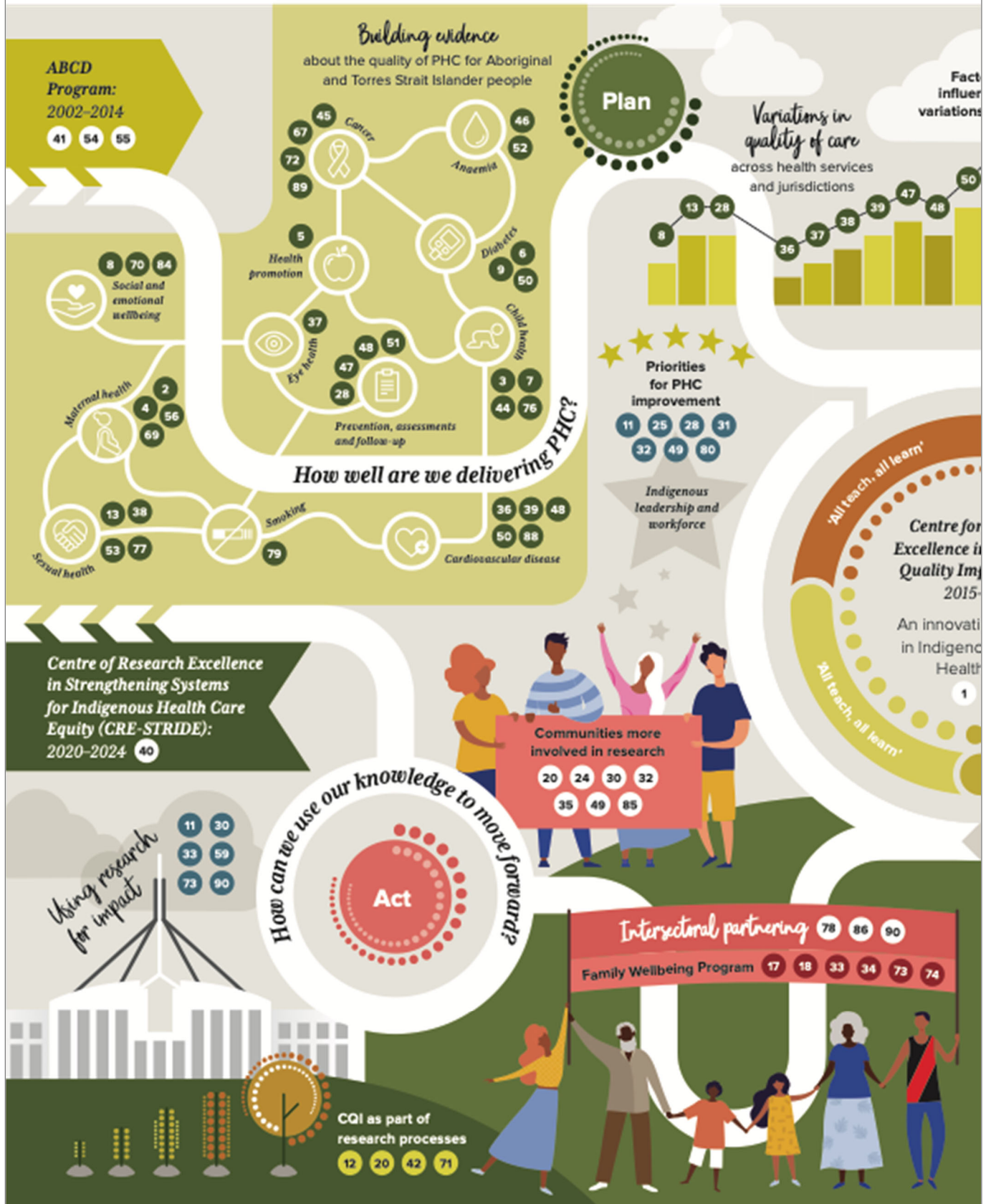


Established co-leadership arrangements between Indigenous and non-Indigenous researchers

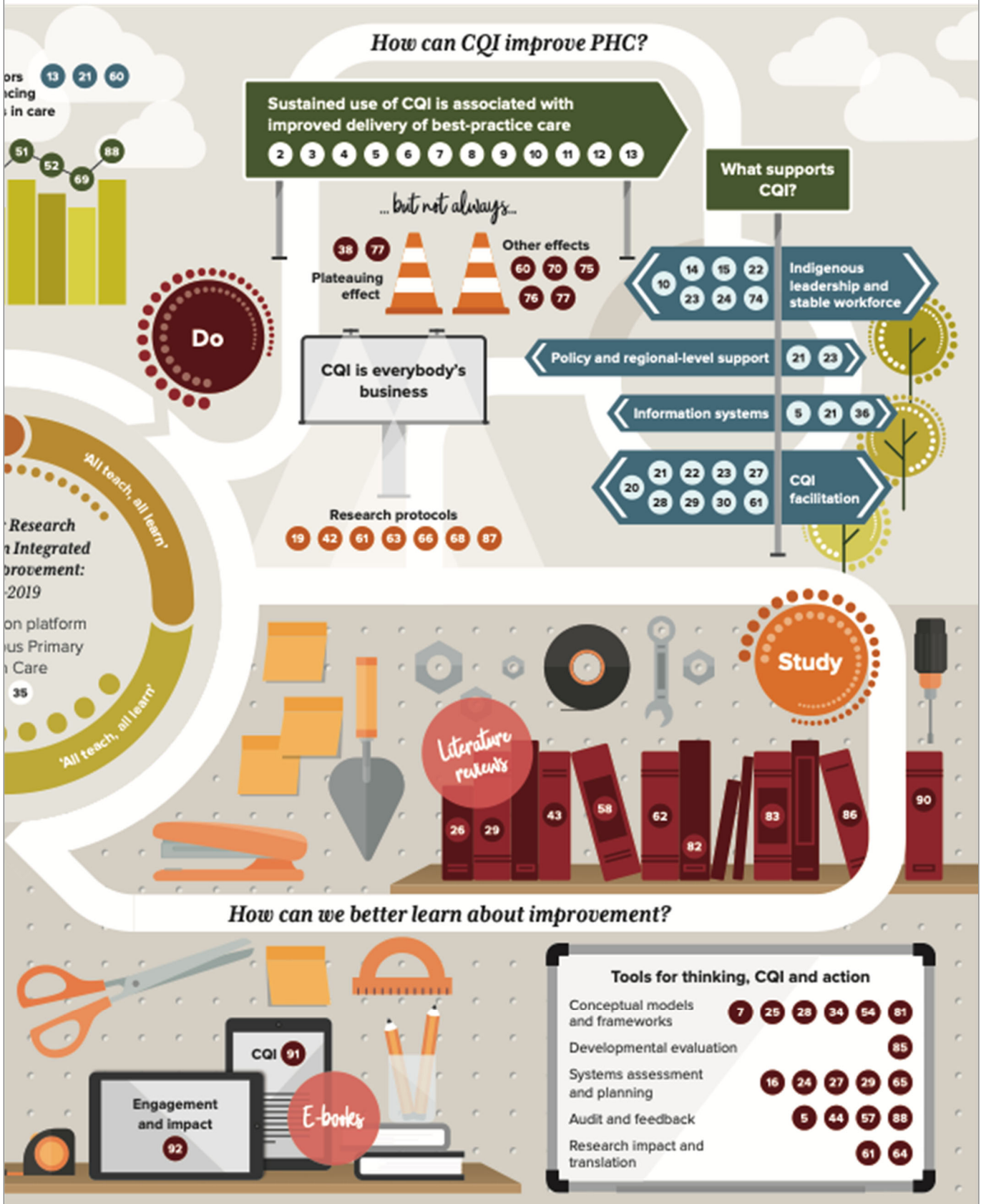
CRE-IQI Research: A Visual Bibliography of our Publications

Developed by K Conte, A Laycock with members of the CRE-IQI. Illustration by Studio Elovenses | December 2019

*Each number corresponds and links to an article in the List of References in this report (see pp. 12–14).



The CRE-IQ has produced 92 peer-reviewed articles and books, which we have numbered* 00 and organised into interrelated themes that reflect how our research explored and extended the use of CQI in Aboriginal and Torres Strait Islander primary health care (PHC). Together these publications show the research journey of the CRE-IQ, and the contributions of the many members who are part of this dynamic system.



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For other CRE-IQI publications see <https://uchr.edu.au/cre-iqi/>.

Future Directions

Work carried out by the CRE-IQI has been crucial in securing funding for the Centre of Research Excellence in Strengthening Systems for Indigenous Health Care Equity (CRE-STRIDE) 2020–2024 (NHMRC #1170882).

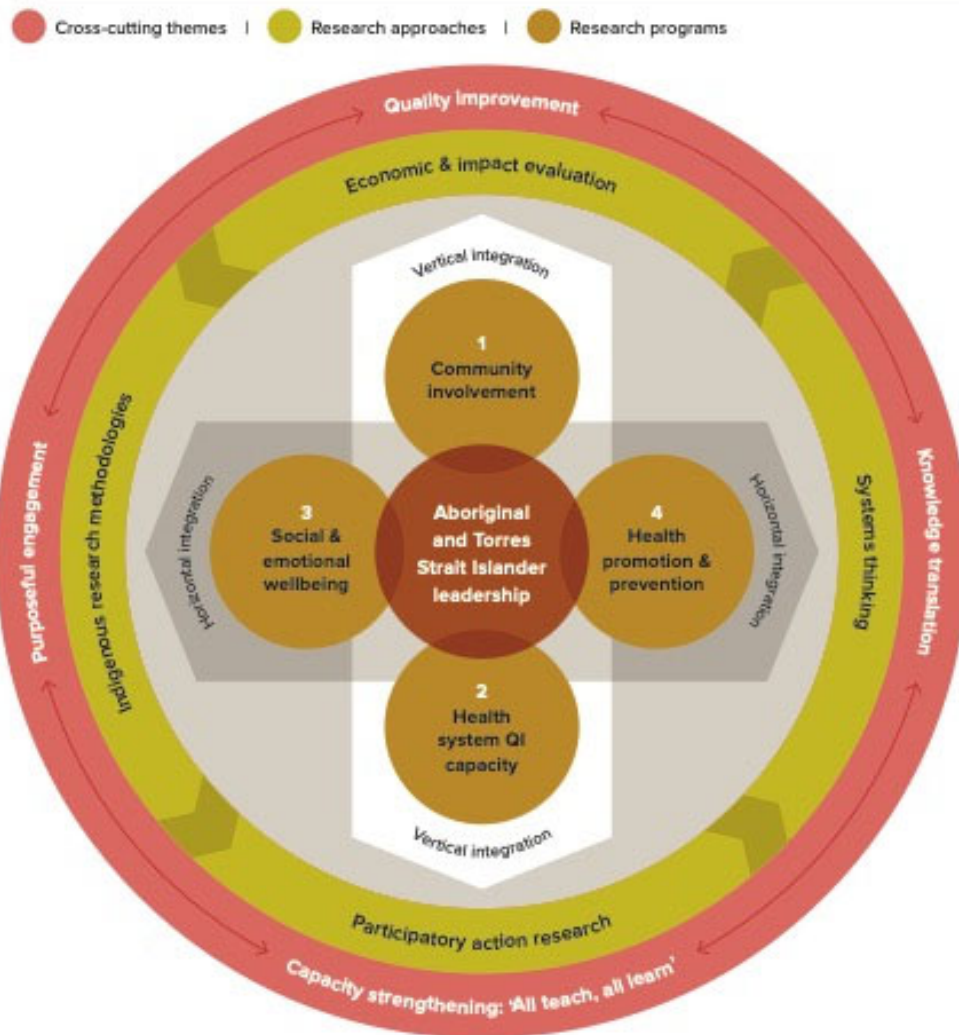
CRE-STRIDE has exceptional Indigenous leadership and collaborative strengths. Service providers, policy makers and researchers will come together in a research program that aims to improve Aboriginal and Torres Strait Islander health by embedding CQI knowledge into practice supported by policy, and by expanding the use of CQI to address the social and cultural determinants of health.

The program will be built on shared principles that support Indigenous leadership and strengthen Indigenous research capacity. Using Indigenous methodologies, participatory action research, and systems thinking approaches, the research will build new knowledge for:

- + increasing community engagement in quality improvement processes
- + strengthening health system capacity for quality improvement
- + applying quality improvement approaches to social and emotional wellbeing
- + quality improvement in health promotion and prevention.

For more information on CRE-STRIDE:
<https://ucrh.edu.au/cre-stride/>

Figure 2: CRE-STRIDE Framework



Acknowledgments

In the spirit of respect, the CRE-IQI acknowledges the people and the Elders of the Aboriginal and Torres Strait Islander Nations who are the traditional custodians of the land and waters of Australia.

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- + The George Institute for Global Health
- + James Cook University
- + Hunter Medical Research Institute
- + Northern Territory Department of Health
- + The Lowitja Institute – Australia's National Institute for Aboriginal and Torres Strait Islander Health Research
- + Aboriginal Medical Services Alliance Northern Territory
- + South Australia Health and Medical Research Council
- + Apunipima Cape York Health Council
- + Southern Queensland Centre of Excellence in Aboriginal and Torres Strait Islander Primary Health Care (Inala Indigenous Health Service)
- + National Aboriginal Community Controlled Health Organisation.

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Appendix 3: Peer-Reviewed Publications with Direct Relevance to Thesis

This appendix contains two publications of direct relevance to this thesis.

The first is the economic and impact evaluation study protocol, which was part of the broader evaluation strategy for the innovation platform. I am a co-author on this article, which was published in *BMJ Open* and is available on the journal's website at <https://bmjopen.bmj.com/content/7/12/e018572>.

Ramanathan, S, Reeves, P, Deeming, S, Bailie, RS, **Bailie, J**, Bainbridge, R, Cunningham, F, Doran, C, Bell, KM, Searles, A. Encouraging translation and assessing impact of the Centre for Research Excellence in Integrated Quality Improvement: rationale and protocol for a research impact assessment. *BMJ Open* 2017;7(12), e018572.

BMJ Open Encouraging translation and assessing impact of the Centre for Research Excellence in Integrated Quality Improvement: rationale and protocol for a research impact assessment

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ABSTRACT

Introduction There is growing recognition among health researchers and funders that the wider benefits of research such as economic, social and health impacts ought to be assessed and valued alongside academic outputs such as peer-reviewed papers. Research translation needs to increase and the pathways to impact ought to be more transparent. These processes are particularly pertinent to the Indigenous health sector given continued concerns that Indigenous communities are over-researched with little corresponding improvement in health outcomes. This paper describes the research protocol of a mixed methods study to apply FAIT (Framework to Assess the Impact from Translational health research) to the Centre for Research Excellence in Integrated Quality Improvement (CRE-IQI). FAIT will be applied to five selected CRE-IQI Flagship projects to encourage research translation and assess the wider impact of that research.

Methods and analysis Phase I will develop a modified programme logic model for each Flagship project including identifying process, output and impact metrics so progress can be monitored. A scoping review will inform potential benefits. In phase II, programme logic models will be updated to account for changes in the research pathways over time. Audit and feedback will be used to encourage research translation and collect evidence of achievement of any process, output and interim impacts. In phase III, three proven methodologies for measuring research impact—Payback, economic assessment and narratives—will be applied. Data on the application of FAIT will be collected and analysed to inform and improve FAIT's performance.

Ethics and dissemination This study is funded by a nationally competitive grant (ID 1078927) from the Australian National Health and Medical Research Council. Ethics approval was obtained from the University of Newcastle's Human Research Ethics Committee (ID: H-2017-0026). The results from the study will be presented in several peer-reviewed publications, through conference presentations and via social media.

Strengths and limitations of this study

- The proposed study uses a comprehensive mixed method four-phase design to validate a framework to encourage research translation and measure research impact.
- The study incorporates a process evaluation to understand users' experience of the framework.
- Measurement of impact uses three proven methods for impact assessment—Payback (modified), economic evaluation and narratives.
- The time lag between translation and impact means impacts may not have been realised at the point of assessment. Impact assessment in this study is limited to five research projects rather than the Centre for Research Excellence in Integrated Quality Improvement as a whole programme.

INTRODUCTION

A substantial amount of health and medical research does not translate, is not implemented by healthcare systems, is not used by end users in policy and practice, and does not create impact.¹ Research translation is the process of knowledge generation and transfer that enables those utilising the developed knowledge to apply it.² The definition for 'research impact' modified for the health and medical research context and used in this protocol is *the demonstrable effect from basic, health systems, patient and population-orientated research, and clinical trials that ultimately improves healthcare delivery, human health and quality of life, and generates benefits for the economy, society, culture, public policy or the environment.*³ Any level of suboptimal translation means the returns earned from research investments do not achieve their potential. Further, in terms of the broader fiscal environment, there



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is a growing demand for more accountability in public spending across all sectors, including health.⁴

A contributor to suboptimal translation and impact is that research translation has not been systematically encouraged, and impact measurement beyond academic outputs such as peer-reviewed publications while becoming more common in countries like the UK⁵ is still not standard practice in most other countries.⁶ There are a plethora of impact measurement frameworks available and several studies including two recent systematic reviews of these frameworks, models and applications.⁷⁻⁹ However, there is a lack of evidence to suggest that the availability of these frameworks and models has actually increased the proportion of health and medical research projects that actually measure and report on impact, rather than just outputs. There is growing recognition that translation of research into policy and practice needs to increase and that the pathways to realising impact ought to be more transparent.¹⁰ There have been several studies trialling the use of impact measurement applications in Australia,¹¹⁻¹⁵ but a national framework for measurement of research impact has not yet been implemented. However, there have been major developments in this space. Key initiatives include the following:

- ▶ The Excellence in Research for Australia (ERA), a national framework to examine how universities are translating their research into economic, social and other benefits¹³
- ▶ Australia's National Health and Medical Research Council's (NHMRC's) Advanced Health Research and Translation Centres programme¹⁶
- ▶ Medical Research Futures Fund to support translational medical research¹⁷
- ▶ Australian Research Council's (ARC's) development and piloting of a national engagement and impact assessment framework to sit alongside the current ERA¹²
- ▶ NHMRC's Centres for Innovation in Regional Health¹⁸
- ▶ Australia's National Innovation and Science Agenda, which has dedicated \$9 million to assess and report on the engagement and impact of university research.¹⁹

These initiatives confirm that research translation and impact assessment are high on Australia's research agenda, and attempts to close the gap between research outputs and impacts will be highly regarded.

In Australia, this need for greater accountability is particularly evident in the area of Aboriginal and Torres Strait Islander (thereafter respectfully referred to as Indigenous Australians) health, where health disparities continue between Indigenous and non-Indigenous Australians.^{20 21} There remain serious concerns that Indigenous Australians have been over-researched without corresponding improvements in health outcomes.²² One reason for this has been the overabundance of descriptive studies in Indigenous health that, of themselves, rarely translate to changes in policy and practice. A recent systematic review of reviews of Indigenous health and well-being research identified knowledge and methodological gaps

in documenting Indigenous health research impact and found that not one of the reviews assessed the impact of research nor explicitly referred to research impact.²³ More needs to be done to ensure that Indigenous health research improves the quality of health and health-related services delivered to Indigenous communities, and ultimately improves the health and well-being of the Indigenous community. Consideration of 'value for money' must be a component of determining the success or failure of health and well-being programmes. Currently, government agency reporting is based largely on inputs and outputs rather than impacts, and the absence of robust and available outcome data has been a significant barrier to assessing impacts. In a debate-style article on the benefits of Indigenous health research, the authors concluded that adopting a benefit-led approach and embedding the assessment of benefit from the outset of the research is a vital prerequisite to maximising research impact.²²

Recognising a need to enhance continuous quality improvement (CQI) initiatives in Indigenous primary healthcare (PHC), the NHMRC funded the Centre for Research Excellence in Integrated Quality Improvement in Indigenous PHC (CRE-IQI) from 2015 to 2019. The vision for CRE-IQI is to improve Aboriginal and Torres Strait Islander health outcomes by accelerating and strengthening large-scale PHC quality improvement efforts. Building on the partnership learning model²⁴ developed through earlier research, and on innovation platform concepts, the CRE-IQI brings together stakeholders from across different levels of the health system (clinical, policy, service coordination and support) to share and exchange their experiences, knowledge, skills, ideas and resources to accelerate and strengthen systems-level PHC improvement efforts. A significant portion of CRE-IQI resources are dedicated to the functioning and improvement of the innovation platform and cross-cutting programmes including research capacity-strengthening, strengthening collaboration and research translation. Specifically, a portion of its funding has been allocated to adopting a framework to encourage research translation and assess impact of its research programme. The selected Framework to Assess the Impact from Translational health research (FAIT) was developed by a team of health economists and health and medical researchers based at the Hunter Medical Research Institute with the specific aim of encouraging and measuring research translation and impact. The framework was based on a mixed methods study involving (1) a scoping review of existing research impact frameworks and techniques to inform the development of FAIT; (2) a development stage to design the prototype; and (3) a feedback stage where iterations of the prototype were presented to selected researchers for discussion and refinement.²⁵ The adoption of FAIT by CRE-IQI presents an opportunity to pilot the framework's implementation and trial its research impact assessment

Table 1 CRE-IQI Flagship projects selected for implementation of FAIT

Project title	Project synopsis	Years in progress	Type of FAIT implementation
Engaging stakeholders in identifying priority evidence–practice gaps and strategies for improvement in primary healthcare (ESP Project)	The ESP Project brings together the concept of knowledge cocreation and evidence on how to achieve large-scale change in quality of care. It engages a wide range of stakeholders in using aggregated continuous quality improvement data to identify priority gaps in care, barriers and enablers and strategies for improvement. ³³	2014–current	Retrospective and prospective
Ongoing collaborative analysis and reporting of data from the Audit and Best Practice in Chronic Disease National Research Partnership (ABCD Partnership)	The ABCD Partnership investigates the variation in quality of care in Indigenous primary healthcare centres. It also explores the underlying factors associated with variation at the health centre and regional level, and examines specific strategies that have been effective in improving primary care clinical performance. This information will be used to work with health service staff, management and policy makers to enhance the effective implementation of successful strategies. ³⁴	2010–current	Retrospective and prospective
Quality improvement in Aboriginal primary healthcare: lessons from the best to better the rest	This project examines six ‘high improving’ PHC services within the ABCD cohort to enhance understanding of how contextual factors interact to facilitate the success of continuous quality improvement (CQI) initiatives within a service. The findings will be used to assist striving services to increase their success in implementing CQI initiatives. ³⁵	2014–2017	Retrospective and prospective
Strategies for improving provision of maternal care for Aboriginal and Torres Strait Islander women	This project aims to use the ABCD data to ascertain which combination of components of pregnancy care has the largest positive impact on birth outcomes. This information will be used to develop a list of essential pregnancy care items, a tool and accompanying resources for health services to implement these essential care items. The project will also work with stakeholders to further develop strategies to improve maternal health outcomes. ³⁶	2017–2019	Prospective
Sustainable Family Well-Being (FWB) implementation and evaluation using CQI approaches	This project will define and develop implementation mechanisms that support FWB empowerment programme integration and implementation within family support programmes. This includes the development of evidence-informed funding models, mechanisms and sustainable ways of embedding FWB and upscaling proven family support programmes and services. ³⁶	2015–2019	Retrospective and prospective

CRE-IQI, Centre for Research Excellence in Integrated Quality Improvement; FAIT, Framework to Assess the Impact from Translational health research; PHC, primary healthcare

methodology. The framework will be applied to five selected Flagship projects to present transparency to the translation process, provide capacity to improve the speed of translation (when applied prospectively), and ultimately to assess the impact of these research projects (see [table 1](#) for details of each project).

The remainder of this paper focuses on the research protocol of a mixed methods study to document the pathway to translation (including engagement with stakeholders and barriers and enablers of translation) and measure the impact of the five aforementioned projects—all of which are at different stages of the research pipeline. There are four objectives for this study:

1. provide transparency about the pathway to generating research impact
2. examine process issues associated with the implementation of FAIT

3. test the feasibility of using FAIT’s package of validated impact assessment methodologies
4. assess the impact of the five Flagship projects.

The anticipated outcome of this study will be greater translation of research among CRE-IQI associates and others working in this field. It is also anticipated that the study will provide an evidence-based report of the impact of the five CRE-IQI projects and evidence to other health services researchers wishing to implement a framework to encourage greater translation and optimise and measure their research impact.

METHODS AND ANALYSIS

This study involves the application of a specific framework (FAIT) to encourage research translation and measure research impact.²⁵ The setting will be the CRE-IQI.

While the CRE has a project coordinating centre in Lismore, New South Wales, its work is largely carried out through collaborative teams from multiple organisations including community-controlled health services, government health services, policy organisations, universities and research institutions across New South Wales, Queensland, the Northern Territory, South Australia and Western Australia. Participants in data collection will be a mix of researchers and students who are associated with CRE-IQI and collaborators in related fields such as health service staff, clinicians, policy makers, representatives of peak Indigenous health organisations and Indigenous community members.

The study design will involve a four-stage sequential mixed method design, summarised below:

Phase I: A modified programme logic model of CRE-IQI's five selected Flagship research programmes will be developed with input from key stakeholders. The models will be developed retrospectively for ongoing research projects and prospectively for newly instigated initiatives. Part of this process will include a scoping review to identify categories of impact that will inform the type of benefits that may be expected to result from research into integrated quality improvement in Indigenous PHC and to identify potential values or sources of value associated with those benefits.

Phase II: The implementation of FAIT focusing on data collection (process, outcome and impact metrics). This stage will also incorporate a process evaluation to collect participants' perceptions of FAIT and its implementation.

Phase III: The impact of the five Flagship projects will be measured and evaluated using the package of FAIT methodologies for impact assessment, namely ayback,²⁶ economic assessment and case studies. The results will be summarised and presented by way of a scorecard, including narratives describing the process by which the research translated and generated impact.

Phase IV: The outcomes of both the implementation of FAIT and the results of the assessment of the five Flagship projects will be compiled. This report will include recommendations for the future implementation of FAIT in Indigenous health research settings.

The approximate timelines for the various activities and key dates are summarised in [figure 1](#).

The following sections provide details about the methods for each of these four phases of the study.

Phase I

A modified programme logic model

The first phase will be the creation of five modified programme logic models.²⁵ One of the modifications to the logic model as used in FAIT relates to the insertion of 'end users', which has the advantage for impact assessment purposes of identifying who will use the research outputs. However, in the context of CRE-IQI, end users are defined as collaborators along the pathway to impact that are both cocreators and co-users of the research outputs, including CQI coordinators, other health service staff, clinicians, policy makers, representatives of peak Indigenous health organisations and Indigenous community members. This definition includes both interim and final users. A further modification is the introduction of process and output metrics in addition to impact metrics to provide greater transparency between the aims and intended impacts of the research. The purpose of the logic models will be to provide a strategic map of how each of the five Flagship projects plans to generate impact. The logic models link community and other needs to the research priorities and activities. These activities should produce an output that when used by an end user creates an opportunity for the generation of impact. While recognising that translation is a multidirectional phenomenon, this approach provides 'line of sight' from need to research to impact (see [figure 2](#)).

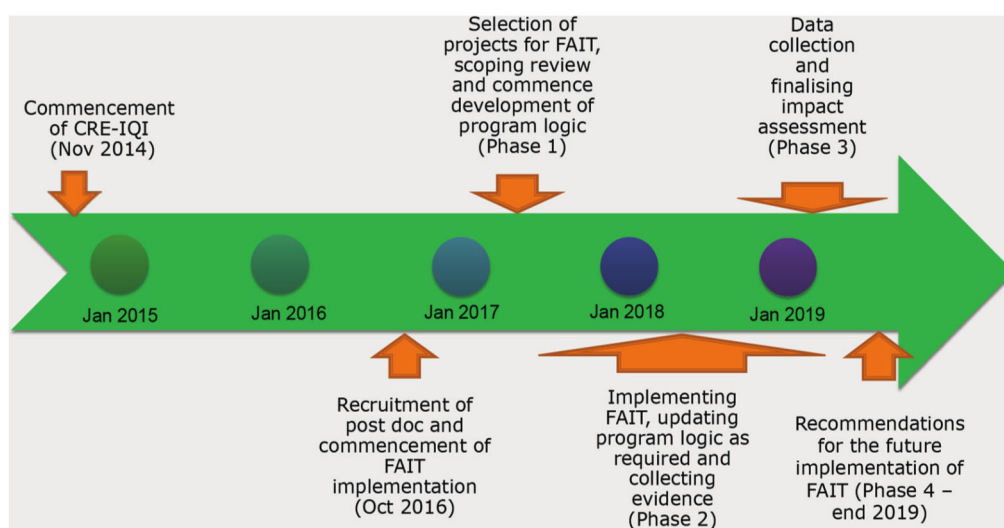


Figure 1 CRE-IQI timeline for implementation of FAIT. CRE-IQI, Centre for Research Excellence in Integrated Quality Improvement in Indigenous Primary Healthcare; FAIT, Framework to Assess the Impact of Translational health research.

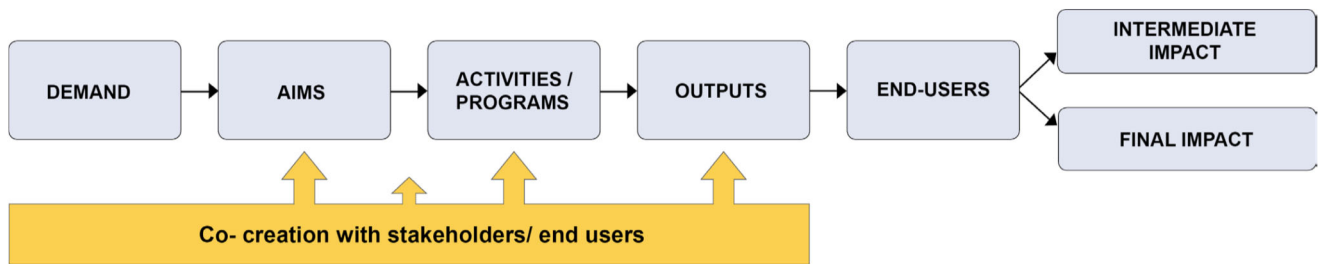


Figure 2 Modified programme logic model.

The value in articulating these processes in a programme logic model gives transparency to how the research producers believe their project will generate impact. The programme logic model provides insights about the planned activities, expected outputs and intended impacts. This information is used to determine a series of metrics to measure the project's progress against plans. Process metrics not only allow researchers to determine if the research is going to plan, they are an opportunity to include activities that have, in the literature, been associated with successful translation and the generation of impact. Output metrics help identify when key outputs or products of the research activity have been generated. Impact metrics are measures that reflect the consequence of the research output being used by end users. For example, a new clinical guideline might be the product of a Flagship project, but it will need to be used or implemented by clinicians before it can generate impact such as improved patient outcomes.

Data for the given programme logic models will be obtained through a series of semistructured individual and group telephone interviews with key stakeholders from each project and group feedback sessions to ensure all perspectives are covered. For projects that are further along the research pipeline, information obtained from researchers and collaborators will be triangulated against existing documents such as published papers, and other project documents including meeting minutes and progress reports.

With the prospective application of FAIT, the modified programme logic model will be used to discern the relevant research outputs and to describe the expected impacts when used by the end users. In a retrospective application, it will be used to give clarity to the extent to which research translation and impact were given consideration at the programme outset. While the programme logic model appears linear within this diagrammatic representation (necessary for the development of a logic model), its application, including project development, stakeholder engagement and project refinement, is in most part non-linear and iterative in nature. Hence the programme logic models will be living documents open to change at all stages of the research to ensure they capture the actual translational pathways to impact.

Scoping review

The development of the programme logic models will be informed by a scoping review. The objective of the review will be to identify categories of impact that will inform the benefits that may be expected from research about integrated quality improvement in Indigenous PHC. It will also be used to identify potential values or sources of value associated with those anticipated benefits.

The review process will follow the Joanna Briggs Institute (JBI) guideline for scoping reviews.²⁷ While still methodical, scoping reviews are typically broader in their focus with less restrictive inclusion criteria than systematic reviews.²⁸ The review will be used to map the key concepts underpinning the measurement of impact on the delivery of health services to Indigenous populations. As outlined in the JBI guideline, a three-step search strategy will be used and a provisional search strategy is described here. Step 1 of the review will be conducted using combinations of the following free text and medical subject heading (MeSH) terms in the titles and abstracts of articles from two online databases: Indigenous health research, health services research, CQI, integrated quality improvement, research impacts, knowledge generation, health impacts, health outcomes and economic impacts. Step 2 will be an analysis of the text words contained in the title and abstract of any retrieved papers and of the index terms used to describe the articles. A second search will then be undertaken using all identified keywords and index terms across all included databases. Third, the reference list of all identified reports and articles will be hand-searched for additional studies. In this review, literature will be drawn from both economic (ie, EconLit and JSTOR) and general health and medical academic databases (ie, Medline, Embase, The Cumulative Index to Nursing and Allied Health Literature, Cochrane Database of Systematic Reviews). The searches will also extend to Google Scholar and Google to identify grey literature from government departments, international organisations and research funders, including information of potential grey and published literature identified by CRE-IQI members and affiliates during the programme logic development phase. The searches will be limited to articles published in English between 1995 and 2017. This time frame is considered to be appropriate because knowledge translation, a precursor to impact assessment, first gained prominence in the late 1990s.

The data from the review will be charted to record the key information. In line with recommended scoping review guidelines, the charting of results will be iterative.^{27 28} The tabulated results will be accompanied by a narrative aligned to the review objective. The findings will be used to inform the domains of benefit and valuations for inclusion in the Payback and economic assessment of Flagship projects. No formal assessment of the quality of the studies will be undertaken and the results will not be published.

Phase II

Implementation of the FAIT framework

Phase II of the study will be the implementation of the FAIT framework over the remaining 24 months of CRE-IQI operations until the end of July 2019. This will entail sharing the programme logic models with all CRE-IQI associates, allowing for feedback and modifications to the five models and 6-monthly updating of the models including any modifications to expectations and predefined activities. Through a process of audit and feedback, Flagship project teams will have the opportunity to assess how they are tracking against their output and impact goals and to refine their research translation and engagement activities to maximise impact. In addition, CRE-IQI associates will be exposed to current thinking around research translation, implementation and impact through CRE-IQI's research capacity strengthening programme.

Data collection for this stage of the study will involve a series of online and telephone surveys of CRE-IQI management and associates to elicit their perceptions of FAIT, determine if the framework encourages translational behaviours and how the implementation of the framework can be improved. Participants will also be asked to articulate which aspects of the framework work well and which aspects need refinement.

Phase III

Research impact measurement and valuation

Currently, there is no single measurement method capable of capturing the impacts stemming from health and medical research. For this reason, FAIT employs a combination of three integrated but separate proven impact assessment methods: quantified metrics,²⁹ economic assessment³⁰ and narratives of the process by which the research in question translates and generates impact. Using qualitative project examples, the case studies will be triangulated against the Payback and economic assessment to validate the impact of the research in question.

Metrics—modified Payback

The metrics referred to in FAIT are a variation of the methods used in the Payback Framework.²⁶ Metrics will be organised under broad domains of benefit such as knowledge impacts, impacts on practice, economic impacts, policy impacts and community impacts. Semi-structured interviews and group discussions with each Flagship

project team will be used to generate process, output and impact metrics that will be used to populate the domains of benefit within Payback. These metrics will be structured to support the planned economic assessment. Robust metrics that are contextually relevant to Indigenous health research will be selected with consideration to objectivity, administrative efficiency, transparency and comparability, as well as their ability to be verified.

In cases that involve the retrospective application of FAIT, examples of process metrics will include the historical level of engagement with key stakeholders as well as activities that could assist the translation of research outputs through to others in the research pipeline. With retrospective analysis, the metrics may necessarily be constrained to outcome measures selected at the research programme outset to measure the efficacy of the research components—for example, changes in organisational systems that support the adoption of CQI within those health services that are involved in translation of findings from *Lessons from the Best*.

Economic assessment

The economic assessment component will entail a comparison of the costs associated with developing and implementing the five Flagship projects versus (where feasible) a calculated value for the expected impact or consequence of the funded research. The descriptive nature of much of CRE-IQI work will impact on the type of economic assessment that is feasible and useful. The planned assessment will collect, on a case-by-case basis, the resources used to fund the research, including non-CRE funding expended on each project prior to the commencement of CRE-IQI. The cost of running the CRE-IQI programme will be appropriately apportioned across the five Flagship projects (these projects represent the major investment of the CRE), keeping in mind that programmes such as the capacity strengthening programme benefit a range of other CRE-IQI-affiliated projects and partners. Additional costs in utilising the research outputs of each project will also be included. For example, research that develops a minimum package of pregnancy care content for implementation will have used resources to develop and evaluate the package. Implementation of that package might increase the number of maternal prenatal care consults or diagnostic tests. These consults and tests are additional costs to the health system and can be modelled on the Cooperative Research Council-endorsed evaluation framework—the Impact Tool—which uses cost benefit analysis as its foundation. Implementation of that minimum package might also have positive impacts on preterm birth, low birth weight and small-for-gestational age, which can be reported as downstream savings to the health system. The appeal in using the tool to guide the economic assessment stems from the emphasis on the logic underpinning the research activity–output–usage–impact chain to give transparency and clarity to the research, which is also at the heart of FAIT. The programme logic model

will assist in articulating programme inputs, expected outputs, uptake and ultimate impact. The total calculated expected costs and benefits will be combined by way of an impact map. Depending on the focus and stage of each Flagship project, three broad steps will be involved in the economic assessment: (1) identification and measurement of resource use; (2) measurement and valuation of the expected impact, where possible; and (3) comparison of the costs and expected impacts, where possible, in a single metric. Where practical, the analysis will assume a societal perspective to ensure all possible costs and benefits are accounted for. Expected costs and impacts will be reported in net present value terms and streams of projected future costs and benefits will be discounted at a rate of 3%.

Identification, measurement and valuation of resource use

Guided by the programme logic model, resource use pertaining to (1) the development of the research, (2) delivery of any research outputs or interventions, (3) uptake of outputs by end users and (4) health service changes will be identified, measured and valued. The retrospective nature of the application of FAIT to a majority of the Flagship projects will hamper the collection of data to inform many of the costs and benefits. This is especially true for costs incurred as a result of adopting or using the research outputs of each CRE-IQI project.

Resource use associated with development and delivery of the various projects will be costed using financial and administrative records from the respective research teams. Where appropriate, the costs associated with translation of the project findings and outputs will include any costs (including opportunity costs) incurred by the various health service organisations, such as costs related to practice change. As stated above, it will be problematic to collect data to inform these costs retrospectively. However, some attempt will be made to model these costs using administration records and detailed descriptions of uptake obtained from programme managers and CQI facilitators to inform the modelling.

Unit costs for health service resource use, where appropriate and available, will be based on the best available data at the time, including the Medicare Benefits Schedule.³¹ Resource use of marketed goods and services outside the health sector will be valued at current market prices. Unmarketed goods and services such as travel time and the time of volunteers will be costed using opportunity cost prices.

Measurement and valuation of the expected impact

Impact will be calculated for selected domains from each of the five programme logic models. The calculations will be adjusted for risk to give the expected value of the impact. Attribution will be assigned at a conservative rate, the value of which will be informed by administrative and evaluation records and qualified during the researcher and health service staff interviews. Projected valuations will include a 'drop-off' factor to account for

waning benefit over time. The sensitivity of the impact calculation to changes in attribution and drop-off will be extensively tested. Any and all assumptions underpinning the analysis will be made explicit in the reporting of the results. The economic assessment will be limited to assessments for which there is existing evidence or for which evidence can be collected.

Narratives (case studies)

The FAIT approach also incorporates the use of illustrative examples or narratives which will be compiled for each Flagship project to describe in more qualitative terms how translation occurred and how research impact was generated for each project.²⁵ Narratives can be powerful tools for communicating the nature and extent of research translation and, ultimately, research impact. They also enable quantitative findings to be placed in context and are an opportunity to explain variances in research costs, outputs and impacts. Feedback received by the ARC as part of the development of its Engagement and Impact Assessment Framework indicates that a narrative approach is the most appropriate method to convey information and data on Indigenous research particularly regarding engagement and impact.

Case studies have been the basis of the research evaluation system currently used in the UK.⁵ Within the Payback Framework, case studies are developed retrospectively for selected research projects and used to validate impact data and to provide illustrations of high impact for different Payback categories.¹⁵ In FAIT, narratives are developed progressively along the research pathway and used for describing the often complex pathways for research translation.

In other applications of FAIT, these narratives have also been important vehicles for verifying the consistency of the impact findings generated from the economic assessment and Payback quantified metrics. In this application, it is expected that the narratives are supported with evidence extracted from the quantified metrics and economic assessments, and will be informed by interviews at different points along the research pathway with key CRE-IQI researchers and key stakeholders including end users of the research such as health service staff, representatives of peak bodies, government representatives and Indigenous community leaders. It is hoped that the collaborative and prospective approach to the development of the narratives will render them less likely to be impacted by the biases that often characterise case studies based only on self-reports such as selective memory.³²

Limitations

This study is being conducted in a real-world setting, which presents some obvious limitations. Impact assessments are resource-intensive, and although the prospective collection of evidence is more cost-effective, not all the CRE-IQI Flagship projects will allow prospective collection of the required data. Final metrics for the Payback assessment and data for the narratives and economic assessments for

Hypothetical scorecard for a research project looking at increasing the delivery of cardiovascular risk assessments and follow-up for Aboriginal and Torres Strait Islander people			
Method	Domain	Metric (Planned/potential)	Final value (TBC)
Modified Payback	Knowledge translation	Presentation at a conference Citation index for journal article PhD completions	No. of attendees Citation count No. of completions
	Clinical implementation	Increased delivery of cardiovascular risk assessments (CVRA) to Indigenous adults Increased follow up to reduce cardiovascular risk Reduced complications	No. of CVRA performed No. of follow-up appointments No. of adverse events
	Community benefit	Reduced cardiovascular (CV) morbidity amongst Indigenous adults Reduced cardiovascular mortality amongst Indigenous adults Wellbeing, measure of stress	No. of CV episodes No. of CV deaths Overall wellbeing score
	Policy and legislation	Change in localised or state-based policy on regular delivery of CVRAs for Indigenous adults	Policy change
	Economic impact	Reduced hospitalisations of Indigenous adults for cardiovascular problems Reduced readmissions Shorter lengths of stay Reduced need for at home care Quicker return to work/normal duties	No. of CV hospitalisations No. of CV readmissions Average days in hospital No. of home care visits No. of days off work
Method	Metric	Example	Final value
Economic Assessment	Cost of research	Research budget	Total expenditure
	Cost of doing the CVRAs and follow up	Estimated cost of implementation (increased consultations and medications)	Total health service budget spent on CVRA
	Benefit that can be converted into \$ value	Projections of reduced CV episodes, reduced hospitalisations and associated costs avoided for the patient (e.g. time off work)	Total costs avoided
	Cost: benefit ratio	For every \$1 spent, the program delivered \$X of benefit	To be confirmed (TBC)
Narrative	<p>Community need: Aboriginal and Torres Strait Islander (Indigenous) people are disproportionately affected by cardiovascular disease and diabetes. The provision of adequate CVRAs and follow-up are shown to improve patient outcomes.</p> <p>Research response: The goal is to increase the provision of CVRAs and follow-up by investigating variations in care to identify factors that may contribute to this variation and address the gaps and barriers to undertaking CVRAs and follow-up.</p> <p>Research outcome: Increased provision of CVRAs and follow-up</p> <p>Research impact: Reduced CV morbidity and mortality and improved outcomes for Indigenous patients and the community</p>		

Figure 3 Hypothetical scorecard for a research project looking at increasing the delivery of cardiovascular risk assessments and follow-up for Aboriginal and Torres Strait Islander people.

each project will be based on what can feasibly be collected versus the ideal list of impact metrics and evidence. The lag between research translation and impact means that valuations may need to be undertaken with reference to interim rather than final impacts. For CRE-IQI Flagship projects that are further along the research pipeline, this constraint will be less problematic compared with projects that have commenced more recently. Conduct of the study in a real-world setting means there are no controls (counterfactuals); thus, attribution of impact for all five projects will be necessarily conservative. And finally, the FAIT framework is project-based and is being applied (as

intended) to a select number of CRE-IQI projects that represent a major investment of the CRE. A limitation, therefore, is that this study will not assess the impact of CRE-IQI as a whole.

Phase IV

Reporting and recommendations around the implementation of FAIT

The results, including the narratives, will be summarised and reported by way of a scorecard (see [figure 3](#) for hypothetical scorecard). This scorecard will form the basis of CRE-IQI reporting of the translation and impact

of its five Flagship projects, as well as feed into a more comprehensive evaluation of the CRE as an innovation platform (the details of which are not covered in this protocol).

The findings from the implementation of the FAIT Framework within CRE-IQI and specifically about its applicability within the Indigenous health research context will be compiled, and a workshop with key CRE-IQI researchers and stakeholders will be employed to discuss the findings and to obtain feedback with a view to the final refining of the framework for future use.

ETHICS AND DISSEMINATION

The implementation of FAIT within CRE-IQI is funded as part of a nationally competitive grant (Grant ID 1078927) through the Australian NHMRC. The study, as described in this protocol, has received ethics approval from the University of Newcastle's Human Research Ethics Committee (Ethics ID: H-2017-0026). While no participant details will be collected as part of the study, consent will be sought and recorded for each participant and associated organisation.

It is anticipated that the results from the study described in this protocol will be presented in several related publications. The first will focus on the implementation of the framework (development of the programme logic) and its evaluation (did it work?). The second will summarise the learnings from the study and present recommendations for improving FAIT. The research impact assessment findings will be presented in a series of publications.

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27. Colquhoun HL, Levac D, O'Brien KK, *et al*. Scoping reviews: time for clarity in definition, methods, and reporting. *J Clin Epidemiol* 2014;67:1291–4.
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32. Banzi R, Moja L, Pistotti V, *et al*. Conceptual frameworks and empirical approaches used to assess the impact of health research: an overview of reviews. *Health Res Policy Syst* 2011;9:26.
33. Laycock A, Bailie J, Matthews V, *et al*. Interactive Dissemination: Engaging Stakeholders in the Use of Aggregated Quality Improvement Data for System-Wide Change in Australian Indigenous Primary Health Care. *Front Public Health* 2016;4:84.
34. Bailie R, Si D, Shannon C, *et al*. Study protocol: national research partnership to improve primary health care performance and outcomes for Indigenous peoples. *BMC Health Serv Res* 2010;10:129.
35. Woods C, Carlisle K, Larkins S, *et al*. Exploring Systems That Support Good Clinical Care in Indigenous Primary Health-care Services: A Retrospective Analysis of Longitudinal Systems Assessment Tool Data from High-Improving Services. *Front Public Health* 2017;5:45.
36. Bainbridge R, McCalman J, Tsey K, *et al*. Inside-out approaches to promoting Aboriginal Australian Wellbeing: evidence from a decade of community-based participatory research. *Int J Health Wellness Soc* 2011;1:13–28.

The second publication of direct relevance to this thesis is from the social network analysis, which was part of the broader evaluation strategy for the innovation platform. I am a co-author on this article and made significant contributions to its design, implementation, analysis and interpretation. It is currently under preparation for submission.

Cunningham F, Potts B, Ramanathan S, **Bailie J**, Bainbridge R, Bailie R. Network evaluation of an innovation platform in continuous quality improvement in Australian Indigenous primary health care . Manuscript under preparation.

Appendix 4: Outcomes Authored during Candidature—Not Related to this Thesis

Other outputs that were completed during candidature, but not related to this thesis, are listed here. They include 12 peer-reviewed publications (five as first author); three reports, including an evaluation design report; nine parliamentary and inquiry submissions (six as first author); three invited research translational articles (all as first author); and 11 conference and seminar presentations (four as first author).

A4.1 Publications during candidature

1. **Bailie J**, Laycock A, Bailie R. Introducing general practice enrolment in Australia: the devil is in the detail (Letter to the Editor). *Med J Aust*; 2022; 216(3).
2. **Bailie J**, Laycock A, Matthews V, Bailie R. Increasing health assessments for people living with an intellectual disability: lessons from experience of Indigenous-specific health assessments. *Med J Aust* 2021;215(1):16-18.e1.
3. Dzidowska M, Lee K, Wylie C, **Bailie J**, Percival N, Conigrave J, Hayman N, Conigrave K. A systematic review of approaches to improve practice, detection and treatment of unhealthy alcohol use in primary health care: a role for continuous quality improvement. *BMC Fam Pract* 2020;21(1):33.
4. Diaz A, Vo B, Baade P, Matthews V, Nattabi B, **Bailie J**, Whop L, Bailie R, Garvey G. Service level factors associated with cervical screening in Aboriginal and Torres Strait Islander primary health care centres in Australia. *Int J Environ Res Public Health* 2019;16(19):3630.
5. Laycock A, **Bailie J**, Matthews V, Bailie R. Using developmental evaluation to support knowledge translation: reflections from a large-scale quality improvement project in Indigenous primary healthcare. *Health Res Policy Syst* 2019;1,70.
6. **Bailie J**, Laycock A, Matthews V, Peiris D, Bailie R. Emerging evidence of the value of health assessments for Aboriginal and Torres Strait Islander people in the primary care setting. *Aust J Prim Health* 2019;25(1):1–5.
7. Laycock A, **Bailie J**, Percival N, Matthews V, Cunningham F, Harvey G, Copley K, Patel L, Bailie R. Wide-scale continuous quality improvement: a study of stakeholders' use of quality-of-care reports at various system levels, and factors mediating use. *Front Public Health* 2019;6:378.

8. Laycock A, Harvey G, Percival N, Cunningham F, **Bailie J**, Matthews V, Copley K, Patel L, Bailie R. Application of the i-PARIHS framework for enhancing understanding of interactive dissemination to achieve wide-scale improvement in Indigenous primary healthcare. *Health Res Policy Syst* 2018;16(1):117.
9. Cunningham F, Matthews V, Sheahan A, **Bailie J**, Bailie R. Assessing collaboration in a national research partnership in quality improvement in Indigenous primary health care: a network approach. *Front Public Health* 2018;6:182.
10. **Bailie J**, Boyle J, Bailie R. Population attributable fractions of perinatal outcomes for nulliparous women associated with overweight and obesity, 1990–2014 (Letter to the Editor). *Med J Aust* 2018;208(11):505-06.
11. **Bailie J**, Matthews V, Laycock A, Connors C, Bailie R. Rigorous follow-up systems for abnormal results are essential to improve health outcomes for Aboriginal and Torres Strait Islander people. *Aust J Prim Health* 2018;24(1):1.
12. McPhail-Bell K, Matthews V, Bainbridge R, Redman-MacLaren M, Askew D, Ramanathan S, **Bailie J**, Bailie R. An ‘all teach, all learn’ approach to research capacity strengthening in Indigenous primary health care continuous quality improvement. *Front Public Health* 2018;6:107.

A4.2 Research and evaluation reports during candidature

1. Fortune N, **Bailie J**, Gordon J, Noti I, Madden R, Llewellyn G. Capturing patient disability information in a Voluntary Patient Registration scheme. Draft consultation report. Sydney: Centre for Disability Research and Policy, The University of Sydney, 2021 October 29.
2. Green E, Quilliam C, Sheepway L, Howards C, Hays C, Moore L, Rasiyah R, **Bailie J**, Inyang I, Hyde S et al. University Departments of Rural Health Quality rural student placement review. Report for the Australian Government Department of Health. Lismore, NSW: University Centre for Rural Health, 2021 May.
3. Bailey R, Hardie-Boys N, **Bailie J**, Carr J, Moodie D, McLean G, Scanlen A, Bainbridge R., Monaghan R, Walke E, Bailie R. Evaluation of the Australian Government’s investment in Aboriginal and Torres Strait Islander primary health care through the Indigenous Australians’ Health Programme: monitoring and evaluation design report. Wellington: Allen + Clarke, 2018 July. Available from: <https://www.iahpyarnes.com/wp-content/uploads/2018/12/ME-Design-Report.pdf>.

A4.3 Parliamentary and Royal Commission submissions during candidature

1. **Bailie J**. Submission to the Consultation Draft Primary Health Care 10 Year Plan. Submission to the Royal Commission into Violence, Abuse, Neglect and

- Exploitation of People with Disability. Lismore, NSW: University Centre for Rural Health, 2021.
2. **Bailie J**, Matthews V, Bailie R, Villeneuve M, Braddon M, McKenzie J, Longman J. Submission to the Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability. Lismore, NSW: University Centre for Rural Health, 2020.
 3. **Bailie J**, Laycock A, Bailie R. Submission to the Practice Incentives Program Indigenous Health Incentive Review. Lismore, NSW: University Centre for Rural Health, 2019.
 4. Bailie R, **Bailie J**. Submission to the Consultation on the National Primary Health Care Data Asset: Development Plan. Lismore, NSW: University Centre for Rural Health, 2019.
 5. **Bailie J**. Submission to the Joint Standing Committee on the National Disability Insurance Scheme; Submission No. 71. Lismore, NSW: University Centre for Rural Health, 2018.
 6. **Bailie J**. Submission to the NSW Parliamentary Inquiry on the Implementation of the National Disability Insurance Scheme. Lismore, NSW: University Centre for Rural Health, 2018.
 7. Bailie R, **Bailie J**. Submission to the Senate Select Committee on Obesity, on behalf of the Centre for Research Excellence in Integrated Quality Improvement. Lismore, NSW: University Centre for Rural Health, 2018.
 8. Matthews V, **Bailie J**, Laycock A, Bailie R. Submission to the Senate Inquiry ‘Accessibility and Quality of Mental Health Services in Rural and Remote Australia’, on behalf of the Centre for Research Excellence in Integrated Quality Improvement. Lismore, NSW: University Centre for Rural Health, 2018.
 9. **Bailie J**, Laycock A, Bailie R. Submission to the ‘Closing the Gap Refresh’, on behalf of the Centre for Research Excellence in Integrated Quality Improvement. Lismore, NSW: University Centre for Rural Health, 2018.

A4.4 International presentations during candidature

1. Laycock A, Harvey G, Percival N, Cunningham F, **Bailie J**, Matthews V, Copley K, Patel L, Bailie R. Exploring ‘beyond the box’: applying implementation theory to evaluate a quality improvement project in Aboriginal and Torres Strait Islander primary health care. Australian Evaluation Society International Evaluation Conference, 2019 September; Sydney.

2. **Bailie J**, Bailey R, Bainbridge R, Hardie-Boys N, Carr J, Walke E, Laycock A, Monaghan R, Bailie R. Co-designing a place-based evaluation. Oral presentation at: Australian Evaluation Society 2019 International Evaluation Conference, 2019 September; Sydney.
3. Langham E, Ohl M, **Bailie J**, Benveniste T, Campbell S, Conte K, Judd J, Kinchin I, McDade M, McPhail-Bell K, Muscat M, Oorloff A, Redman-MacLaren M, Taylor D, Bainbridge R., McCalman J. A systematic review of community health assessment tools. Oral presentation at: International Union for Health Promotion and Education, 2019 April; Rotorua.
4. Bailey R, Hardie-Boys N, **Bailie J**, Walke E, Bainbridge R, Monaghan R, Carr J, Bailie R. Co-design and evaluation: potential and disquiet. Oral presentation at: Aotearoa New Zealand Evaluation Association, 2018 July; Auckland.

A4.5 Other presentations during candidature

1. **Bailie J**. Increasing health assessments for people with intellectual disability in primary health care. Invited speaker at: Central Eastern PHN Expert Panel, February 2022; [online].
2. Bailie R, **Bailie J**. A framework to evaluate and understand access to health care in the Northern Rivers. Invited speaker at: University Centre for Rural Health Research Seminar Series, 2020 October; [online].
3. Dzidowska M, Lee K, Wylie C, **Bailie J**, Hayman N, Conigrave J, Percival N, Conigrave K. Approaches for improving practice in detection and treatment of unhealthy alcohol use in primary health care: where are the gaps? In: APSAD Scientific Alcohol and Drugs Conference, 2019 November; Hobart.
4. **Bailie J**, Laycock A, Matthews V, Peiris D, Conte K, Bailie R, Cunningham F, Passey M, Abimbola S, Bainbridge R. Application of principle-focused developmental evaluation approach to a national research partnership to improve Australian Indigenous health outcomes. In: Australian Evaluation Society International Evaluation Conference, 2019 September; Sydney.
5. Percival N, Strobel N, McCalman J, Matthews V, **Bailie J**, Bailie R, Burgess P. Do primary healthcare linkages with community improve preventive care for Indigenous adults? In: Public Health Prevention Conference 2019, 2019 June; Melbourne.
6. **Bailie J**. Centre for Research Excellence in Integrated Quality Improvement. In: QAIHC Data Information and CQI Network Teleconference, 2018 September; Brisbane.
7. Laycock A, **Bailie J**, Percival N, Harvey G, Cunningham F, Matthews V, Copley K, Patel L, Bailie R. Wide-scale continuous quality improvement: stakeholders' use of quality-of-care reports. In: PHC Research Conference, 2018 August; Melbourne.

A4.6 Translational articles during candidature

1. **Bailie J**, Laycock A, Matthews V, Bailie R. Intellectual disability: a path to better care. Med J Aust, InSight+ 2019;5 July [Invited]. Available from: <https://insightplus.mja.com.au/2021/24/intellectual-disability-a-path-to-better-care/>.
2. **Bailie J**, Longman J, Villeneuve M, Bailie R, Matthews V. Floods can worsen inequality. Here are 4 ways we can ensure people with disabilities aren't left behind. The Conversation 2021;15 April [Invited]. Available from: <https://theconversation.com/floods-can-worsen-inequality-here-are-4-ways-we-can-ensure-people-with-disabilities-arent-left-behind-157959>.
3. **Bailie J**, Boscheinen J. Down syndrome: changing the language of 'risk'. Med J Aust, InSight+ 2019;2 December. Available from <https://insightplus.mja.com.au/2019/47/down-syndrome-changing-the-language-of-risk/>.